

**YU24**  
**AMERICA**  
2024



**CUTTING TOOLS**



**MILLING**

**YG-1 CO., LTD.**

# MILLING TOOLS

CBN END MILLS

i-Xmill CARBIDE END MILLS

i-SMART SOLID CARBIDE MODULAR TYPE END MILLS

X5070 SOLID CARBIDE END MILLS

4G Mill SOLID CARBIDE END MILLS

X-POWER PRO SOLID CARBIDE END MILLS

TitaNox-POWER SOLID CARBIDE END MILLS

JET-POWER SOLID CARBIDE & HSS-PM END MILLS

V7 PLUS A SOLID CARBIDE END MILLS

V7 MILL INOX SOLID CARBIDE END MILLS

ALU-POWER HPC SOLID CARBIDE END MILLS

ALU-POWER SOLID CARBIDE & HSS END MILLS

D-POWER GRAPHITE SOLID CARBIDE END MILLS

STANDARD CARBIDE END MILLS

ONLY ONE COATED PM60 END MILLS

SINE POWER HSS END MILLS

TANK-POWER HSS-PM END MILLS

COBALT & HSS END MILLS

TECHNICAL DATA



# CONTENTS

## CBN END MILLS

## CARBIDE EXCHANGEABLE END MILLS

## SOLID CARBIDE END MILLS

## CARBIDE & HSS END MILLS

## SOLID CARBIDE END MILLS

## HSS END MILLS

## TECHNICAL DATA

### CBN END MILLS

CBN(Cubic Boron Nitride) Machining High Hardened Steels up to HRc70 / Mirror Finish

### i-Xmills, CARBIDE INSERT END MILLS

Various Applications Type of Inserts Available for General Steels, Pre-Hardened Steels, High Hardened Steels, Stainless Steels and Graphite

### i-Smart MODULAR TYPE END MILLS

For General Steels, Hardened Steels and Cast Iron

### X5070 SOLID CARBIDE END MILLS

For High Hardened Steels (HRc45 to HRc70)

### 4G Mill SOLID CARBIDE END MILLS

High Speed Cutting for Pre-Hardened Steels up to HRc55

### X-POWER PRO SOLID CARBIDE END MILLS

For Pre-Hardened Steels up to HRc55

### TitaNox-POWER SOLID CARBIDE END MILLS

High Speed Machining for Exotic Materials: Titanium and Stainless Steels

### JET-POWER SOLID CARBIDE & HSS-PM END MILLS

For Exotic materials like Stainless Steels, Nickel Alloys and Titanium

### V7 PLUS A SOLID CARBIDE END MILLS

High Performance Carbide End Mills for Steels, Cast Iron and Stainless Steels

### V7 MILL INOX SOLID CARBIDE END MILLS

Silent Cutting of Stainless Steels up to HRc 40. Designed as Variable Leads, YG-1's Patent.

### ALU-POWER HPC SOLID CARBIDE END MILLS

For Aluminium, Aluminium Die Cast, Non-ferrous Alloys and Plastics

### ALU-POWER END MILLS

Aluminium Alloys and Silent Cutting

### D-POWER GRAPHITE SOLID CARBIDE END MILLS

For Graphites

### STANDARD SOLID CARBIDE END MILLS

General Purpose

### ONLY ONE COATED PM60 END MILLS

Perfect Solution of Carbide Chipping under Vibrations

### SINE POWER HSS END MILLS

Perfect Solution of Carbide Chipping under Vibrations

### TANK-POWER HSS-PM END MILLS

High Toughness for Stainless Steels, Carbon steels and Alloy Steels / for General Application, Roughing & Finishing

### COBALT & HSS END MILLS

General Purpose / Coating Available

### TECHNICAL DATA

CBN  
END MILLS

i-Xmill  
END MILLS

i-SMART  
MODULAR  
TYPE END MILLS

X5070  
END MILLS

4G MILL  
END MILLS

X-POWER  
END MILLS

TitaNox-  
POWER  
END MILLS

JET-POWER  
END MILLS

V7 PLUS A  
END MILLS

V7 MILL  
INOX  
END MILLS

ALU-POWER  
HPC  
END MILLS

ALU-POWER  
END MILLS

D-POWER  
GRAPHITE  
END MILLS

STANDARD  
END MILLS

ONLY ONE  
COATED PM60  
END MILLS

SINE-POWER  
END MILLS

TANK-POWER  
END MILLS

COBALT &  
HSS  
END MILLS

TECHNICAL  
DATA

SELECTION GUIDE



MILLING TOOLS

SERIES

FLUTE

HELIX ANGLE

CUTTING EDGE SHAPE

SIZE MIN

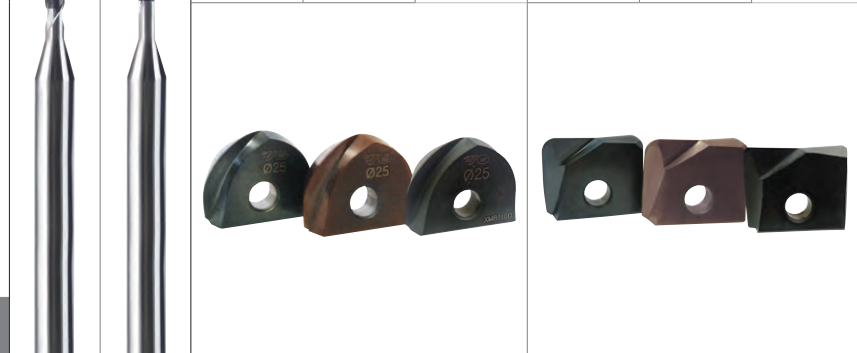
SIZE MAX

PAGE

LENGTH

SURFACE TREATMENT

SERIES	CBN		i-Xmill Insert (Inch)					
	ESB94	ESD02	XB1A	XB2C	XB1D	XR1A	XR2A	XR1D
FLUTE	2	2	2	2	2	2	2	2
HELIX ANGLE	30°	0°	-	-	-	-	-	-
CUTTING EDGE SHAPE	BALL NOSE	CORNER RADIUS	BALL NOSE	BALL NOSE	BALL NOSE	CORNER RADIUS	CORNER RADIUS	CORNER RADIUS
	R0.2	D0.5	R5/32	R5/32	R5/32	D5/16	D5/16	D5/16
SIZE MIN	R0.2	D0.5	R5/32	R5/32	R5/32	D5/16	D5/16	D5/16
SIZE MAX	R1.5	D2.0	R5/8	R5/8	R5/8	D1-1/4	D1-1/4	D1-1/4
PAGE	C45	C46	C52			C55		
LENGTH	-	-	-	-	-	-	-	-
SURFACE TREATMENT	Uncoated	Uncoated	AlTiN	Z-Coating	Diamond	AlTiN	Z-Coating	Diamond
			for GENERAL PURPOSE	for HARDENED STEEL	for GRAPHITE	for GENERAL PURPOSE	for HARDENED STEEL	for GRAPHITE



Please visit [globalyg1.com/mat](http://globalyg1.com/mat) for material search

◎ : Excellent  
○ : Good

ISO	VDI 3323	Material Description	HB	HRc							
P	1	Non-alloy steel	125						◎		
	2		190	13					◎		
	3		250	25					◎		
	4		270	28					◎		
	5		300	32					◎		
	6	180	Low alloy steel	10					◎		
	7	275		29					◎		
	8	300		32					◎		
	9	350		38					◎		
	10	200		15					◎		
	11	325	35					◎			
M	12	Stainless steel	200	15					◎		
	13		240	23					◎		
	14		180	10					◎		
	15		180	10					◎		
K	16	Grey cast iron	260	26					◎		
	17		160	3					◎		
	18		250	25					◎		
	19		130						◎		
	20		230	21					◎		
N	21	Aluminum-wrought alloy	60						○		
	22		100						○		
	23	Aluminum-cast, alloyed	75						○		
	24		90						○		
	25		130						○		
	26		110						○		
	27	90									
	28	100									
	29	Non Metallic Materials							◎		
	30	Duroplastic, Fiber Reinforced Plastic, Graphite, CFRP, GFRP, etc.									
S	31	Heat Resistant Super Alloys	200	15							
	32		280	30							
	33		250	25							
	34		350	38							
	35		320	34							
	36	400 Rm									
	37	1050 Rm									
H	38	Hardened steel	550	55					◎		
	39		630	60					◎		
	40		400	42							
	41		550	55					◎		

i-Xmill Insert (Metric)						i-Xmill Holder		
XB1N	XB2N	XBAD	XRAA	XRBA	XRAD	ZBS ZBT	ZBC	ZRS ZRT
2	2	2	2	2	2	-	-	-
-	-	-	-	-	-	-	-	-
BALL NOSE	BALL NOSE	BALL NOSE	CORNER RADIUS	CORNER RADIUS	CORNER RADIUS	BALL NOSE	BALL NOSE	CORNER RADIUS
R4.0	R4.0	R4.0	D8.0	D8.0	D8.0	-	-	-
R16.0	R16.0	R16.0	D32.0	D32.0	D32.0	-	-	-
C57			C60-C61			in C53 / mm C58	in C54 / mm C59	in C56 / mm C62
FULL RADIUS	-	-	-	-	HIGH FEED	STRAIGHT & TAPER NECK	STRAIGHT NECK	STRAIGHT & TAPER NECK
AlTiN	Z-Coating	Diamond	AlTiN	Z-Coating	Diamond	Steel	Carbide	Steel
for GENERAL PURPOSE	for HARDENED STEEL	for GRAPHITE	for GENERAL PURPOSE	for HARDENED STEEL	for GRAPHITE			



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									41

### SELECTION GUIDE



### MILLING TOOLS



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◎ : Excellent  
○ : Good

	SERIES	i-Smart Modular Head					i-Smart Modular Holder		
		XGMF15	XGMF17	XGMF20	XGMF25	XGMF29	ZMC	ZMS	ZMT
FLUTE	2	4	4	4	6	-	-	-	
HELIX ANGLE	30°	30°	27°/30° (MULTIPLE HELIX)	27°/30° (MULTIPLE HELIX)	45°	-	-	-	
CUTTING EDGE SHAPE	BALL NOSE	BALL NOSE	CORNER RADIUS	SQUARE	SQUARE	-	-	-	
SIZE MIN	R3/16	R3/16	D3/8	D3/8	D3/8	-	-	-	
SIZE MAX	R5/8	R5/8	D1-1/4	D1-1/4	D1-1/4	-	-	-	
PAGE	C70	C71	C72	C73	C74	C75	C76	C77	
LENGTH	-	-	-	-	-	STRAIGHT NECKTYPE	STRAIGHT NECKTYPE	TAPER NECKTYPE	
SURFACE TREATMENT	Y-Coating	Y-Coating	Y-Coating	Y-Coating	Y-Coating	Carbide	Steel	Steel	



	ISO	VDI 3323	Material Description	HB	HRc					
P	1	2	Non-alloy steel	125	13	○	○	○	○	○
				190	25	○	○	○	○	
				270	28	○	○	○	○	
				300	32	○	○	○	○	
				180	10	○	○	○	○	
	2	7	Low alloy steel	275	29	○	○	○	○	○
				300	32	○	○	○	○	
				350	38	◎	◎	◎	◎	
				200	15	○	○	○	○	
				325	35	◎	◎	◎	◎	
				200	15	○	○	○	○	
M	13	Stainless steel	240	23						
			180	10			○			
			180	10	○	○	○	○		
K	15	Grey cast iron	160	3	○	○	○	○		
			260	26	○	○	○	○		
			160	3	○	○	○	○		
			250	25	○	○	○	○		
17	Nodular cast iron	130	○	○	○	○				
		230	21	○	○	○	○			
N	21	Aluminum-wrought alloy	60							
			100							
			75							
			90							
	23	Aluminum-cast, alloyed	130							
			110							
	26	Copper and Copper Alloys (Bronze / Brass)	90							
			100							
			90							
			100							
29	Non Metallic Materials (Duroplastic, Fiber Reinforced Plastic, Graphite, CFRP, GFRP, etc.)									
S	31	Heat Resistant Super Alloys	200	15						
			280	30						
			250	25						
			350	38						
	32	Titanium Alloys	320	34						
			400 Rm / 1050 Rm							
H	38	Hardened steel	550	55	○	○	○	○		
			630	60						
			400	42	◎	◎	◎	◎		
			550	55	○	○	○	○		

X5070 (Inch)					X5070 (Metric)					
G826	G8A43	G850	G851	G859	G854	G8A46	G8A54	G8A28	G8A38	G8A53
4	2	4	6&8	4	4	2	2	2	2	2
0°	30°	30°	45°	0°	0°	30°	30°	30°	30°	30°
CORNER RADIUS	BALL NOSE	CORNER RADIUS	CORNER RADIUS	CORNER RADIUS	CORNER RADIUS	BALL NOSE	BALL NOSE	BALL NOSE	BALL NOSE	BALL NOSE
D1/8	R1/64	D1/16	D1/4	D2.0	D2.0	R0.05	R0.25	R0.05	R0.5	R0.2
D1/2	R1/4	D3/4	D1	D16.0	D16.0	R2.0	R1.0	R6.0	R12.5	R1.0
C86	C87	C88	C89	C90	C91	C92	C96	C97	C98	C99
High Feed	EXTENDED NECK	EXTENDED NECK	-	High Feed	High Feed Long Shank	RIB PROCESSING	RIB PROCESSING	-	STUB LENGTH EXTENDED NECK	MINIATURE
Blue Coating	Blue Coating	Blue Coating	Blue Coating	Blue Coating	Blue Coating	Blue Coating	Blue Coating	Blue Coating	Blue Coating	Blue Coating

SELECTION GUIDE



MILLING TOOLS

SERIES	
FLUTE	
HELIX ANGLE	
CUTTING EDGE SHAPE	
SIZE MIN	
SIZE MAX	
PAGE	
LENGTH	
SURFACE TREATMENT	

X5070 (Metric)						
	G8A59	G8A36	G8A50	G8A47	G8A37	G8A39
FLUTE	3	2	2	4	4	6
HELIX ANGLE	30°	30°	30°	30°	30°	45°
CUTTING EDGE SHAPE	BALL NOSE	CORNER RADIUS	CORNER RADIUS	CORNER RADIUS	CORNER RADIUS	CORNER RADIUS
SIZE MIN	R1.5	D0.3	D0.3	D3.0	D1.0	D6.0
SIZE MAX	R10.0	D20.0	D2.0	D12.0	D20.0	D20.0
PAGE	C100	C101	C103	C104	C105	C106
LENGTH	-	STUB LENGTH EXTENDED NECK	MINIATURE	EXTENDED NECK	EXTENDED NECK	EXTENDED NECK
SURFACE TREATMENT	Blue Coating	Blue Coating	Blue Coating	Blue Coating	Blue Coating	Blue Coating

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◎ : Excellent  
○ : Good

ISO	VDI 3323	Material Description	HB	HRc	G8A59	G8A36	G8A50	G8A47	G8A37	G8A39
P	1	Non-alloy steel	125							
	2		190	13						
	3		250	25						
	4		270	28						
	5	300	32							
	6	180	10							
	7	275	29							
	8	300	32							
	9	350	38							
	10	High alloyed steel, and tool steel	200	15						
	11	325	35							
M	12	Stainless steel	200	15						
	13		240	23						
	14		180	10						
K	15	Grey cast iron	180	10						
	16		260	26						
	17	Nodular cast iron	160	3						
	18		250	25						
	19	Malleable cast iron	130							
	20		230	21						
N	21	Aluminum-wrought alloy	60							
	22		100							
	23	Aluminum-cast, alloyed	75							
	24		90							
	25		130							
	26		110							
	27	Copper and Copper Alloys (Bronze / Brass)	90							
	28		100							
	29	Non Metallic Materials Duroplastic, Fiber Reinforced Plastic, Graphite, CFRP, GFRP, etc.								
	30									
S	31	Heat Resistant Super Alloys	200	15						
	32		280	30						
	33		250	25						
	34		350	38						
	35	320	34							
	36	Titanium Alloys	400 Rm							
	37		1050 Rm							
H	38	Hardened steel	550	55	◎	◎	◎	◎	◎	◎
	39		630	60	◎	◎	◎	◎	◎	◎
	40	Hardened Cast Iron	400	42	○	○	○	○	○	○
	41		550	55	◎	◎	◎	◎	◎	◎

HSS

4G Mills (Inch)													
GMF15	GMF16	GMF17	GMF18	GMF19	GMF20	GMF21	GMF22	GMF23	GMF24	GMF25	GMF26	GMF27	GMF28
2	2	4	2	2	4	4	2	2	2	4	4	4	4
30°	30°	30°	30°	30°	27°/30° (MULTIPLE HELIX)	27°/30° (MULTIPLE HELIX)	30°	30°	30°	27°/30° (MULTIPLE HELIX)	35°/38° (MULTIPLE HELIX)	30°	30°
BALL NOSE	BALL NOSE	BALL NOSE	CORNER RADIUS	CORNER RADIUS	CORNER RADIUS	CORNER RADIUS	SQUARE	SQUARE	SQUARE	SQUARE	SQUARE	SQUARE	SQUARE
R.002	R.004	R1/16	D3/64	D.008	D3/64	D3/64	D.008	D.004	D3/64	D3/64	D3/64	D3/64	D3/64
R3/8	R1/4	R1/4	D3/4	D3/4	D3/4	D3/4	D1/2	D.120	D3/4	D3/4	D3/4	D1	D1/2
C130	C132	C135	C136	C139	C145	C147	C152	C155	C158	C161	C162	C163	C166
	NECK			NECK		NECK	NECK		LONGLENGTH			LONGLENGTH	NECK
Y-Coating	Y-Coating	Y-Coating	Y-Coating	Y-Coating	Y-Coating	Y-Coating	Y-Coating	Y-Coating	Y-Coating	Y-Coating	Y-Coating	Y-Coating	Y-Coating



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SELECTION GUIDE



MILLING TOOLS

Please visit global.yg1.com/mat for material search

Table with columns for 4G Mills (Inch) and 4G Mills (Metric), including series, flute, helix angle, cutting edge shape, size min/max, page, length, and surface treatment.

Material selection table with columns for ISO, VDI 3323, Material Description, HB, HRc, and performance indicators for various materials like Non-alloy steel, Low alloy steel, Stainless steel, etc.

Table with columns for 4G Mills (Metric), including series, flute, helix angle, cutting edge shape, size min/max, page, length, and surface treatment.

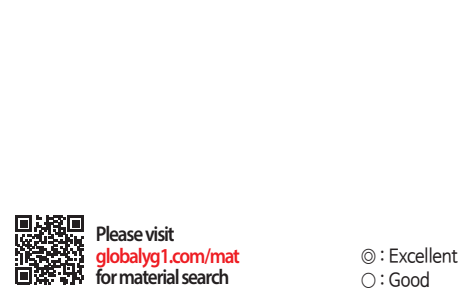
Material selection table with columns for ISO, VDI 3323, Material Description, HB, HRc, and performance indicators for various materials like Non-alloy steel, Low alloy steel, Stainless steel, etc.

# SELECTION GUIDE



## MILLING TOOLS

<b>SERIES</b>	GM153	GM207	GM639	GM649	GM212	GM103	GM208
<b>FLUTE</b>	4	4	4	4	4	4	6&8
<b>HELIX ANGLE</b>	30°	30°	30°	30°	30°	45°	45°
<b>CUTTING EDGE SHAPE</b>	SQUARE	SQUARE	CORNER RADIUS	CORNER RADIUS	CORNER RADIUS	CORNER RADIUS	SQUARE
<b>SIZE MIN</b>	D1/16	D1/8	D1/16	D1/16	D1/4	D3/8	D1/4
<b>SIZE MAX</b>	D1"	D1"	D1/2	D1/2	D1/2	D7/8	D1"
<b>PAGE</b>	<b>C396</b>	<b>C397</b>	<b>C398</b>	<b>C399</b>	<b>C400</b>	<b>C401</b>	<b>C402</b>
<b>LENGTH</b>	MEDIUM LENGTH	MINIATURE	STUB LENGTH	REGULAR LENGTH	LONG LENGTH	LONG REACH	LONG LENGTH
<b>SURFACE TREATMENT</b>	Y-Coating	Y-Coating	Y-Coating	Y-Coating	Y-Coating	Y-Coating	Y-Coating



ISO	VDI 3323	Material Description	HB	Hrc
<b>P</b>	1	Non-alloy steel	125	
	2		190	13
	3		250	25
	4		270	28
	5	300	32	
	6	180	10	
	7	275	29	
	8	300	32	
	9	350	38	
	10	High alloyed steel, and tool steel	200	15
	11		325	35
<b>M</b>	12	Stainless steel	200	15
	13		240	23
	14		180	10
<b>K</b>	15	Grey cast iron	180	10
	16		260	26
	17	Nodular cast iron	160	3
	18		250	25
	19		130	
20	Malleable cast iron	230	21	
<b>N</b>	21	Aluminum-wrought alloy	60	
	22		100	
	23	Aluminum-cast, alloyed	75	
	24		90	
	25		130	
	26		110	
	27	Copper and Copper Alloys (Bronze / Brass)	90	
	28		100	
	29			
	30	Non Metallic Materials Duroplastic, Fiber Reinforced Plastic, Graphite, CFRP, GFRP, etc.		
<b>S</b>	31	Heat Resistant Super Alloys	200	15
	32		280	30
	33		250	25
	34		350	38
	35		320	34
	36	Titanium Alloys	400 Rm	
	37		1050 Rm	
<b>H</b>	38	Hardened steel	550	55
	39		630	60
	40	Chilled Cast Iron	400	42
	41	Hardened Cast Iron	550	55

# X-Power Pro (Inch)

GM218	GM668	GM209	GM210	GM961	GM960	GM109	GM963	GM666	GM156	GM967
6&8	6&8	2	4	2	2	2	2	3~5	3~5	2
45°	45°	30°	30°	30°	30°	15°	30°	20°	20°	30°
SQUARE	CORNER RADIUS	BALL NOSE	BALL NOSE	BALL NOSE	BALL NOSE	BALL NOSE	BALL NOSE	ROUGHING	ROUGHING	BALL NOSE
D1/4	D1/4	R1/64	R1/16	R1/16	R.012	R1/64	R1/32	D1/4	D1/4	R1/64
D1"	D3/4	R3/8	R3/8	R1/2	R.031	R1/4	R3/16	D1"	D1"	R1/16
C402	C403	C404	C405	C406	C407	C408	C409	C410		C411
EXTRA LONG LENGTH	LONG LENGTH	LONG LENGTH	LONG LENGTH	MEDIUM LENGTH	MINIATURE	STUB CUT LENGTH	TAPER NECK	STUB LENGTH FINE PITCH	LONG LENGTH FINE PITCH	RIB PROCESSING
Y-Coating	Y-Coating	Y-Coating	Y-Coating	Y-Coating	Y-Coating	Y-Coating	Y-Coating	Y-Coating	Y-Coating	Y-Coating



ISO	VDI 3323	Material Description	HB	Hrc
<b>P</b>	1	Non-alloy steel	125	
	2		190	13
	3		250	25
	4		270	28
	5	300	32	
	6	180	10	
	7	275	29	
	8	300	32	
	9	350	38	
	10	High alloyed steel, and tool steel	200	15
	11		325	35
<b>M</b>	12	Stainless steel	200	15
	13		240	23
	14		180	10
<b>K</b>	15	Grey cast iron	180	10
	16		260	26
	17	Nodular cast iron	160	3
	18		250	25
	19		130	
20	Malleable cast iron	230	21	
<b>N</b>	21	Aluminum-wrought alloy	60	
	22		100	
	23	Aluminum-cast, alloyed	75	
	24		90	
	25		130	
	26		110	
	27	Copper and Copper Alloys (Bronze / Brass)	90	
	28		100	
	29			
	30	Non Metallic Materials Duroplastic, Fiber Reinforced Plastic, Graphite, CFRP, GFRP, etc.		
<b>S</b>	31	Heat Resistant Super Alloys	200	15
	32		280	30
	33		250	25
	34		350	38
	35		320	34
	36	Titanium Alloys	400 Rm	
	37		1050 Rm	
<b>H</b>	38	Hardened steel	550	55
	39		630	60
	40	Chilled Cast Iron	400	42
	41	Hardened Cast Iron	550	55

SELECTION GUIDE



MILLING TOOLS

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◎ : Excellent  
○ : Good

SERIES  
FLUTE  
HEX ANGLE  
CUTTING EDGE SHAPE  
SIZE MIN  
SIZE MAX  
PAGE  
LENGTH  
SURFACE TREATMENT

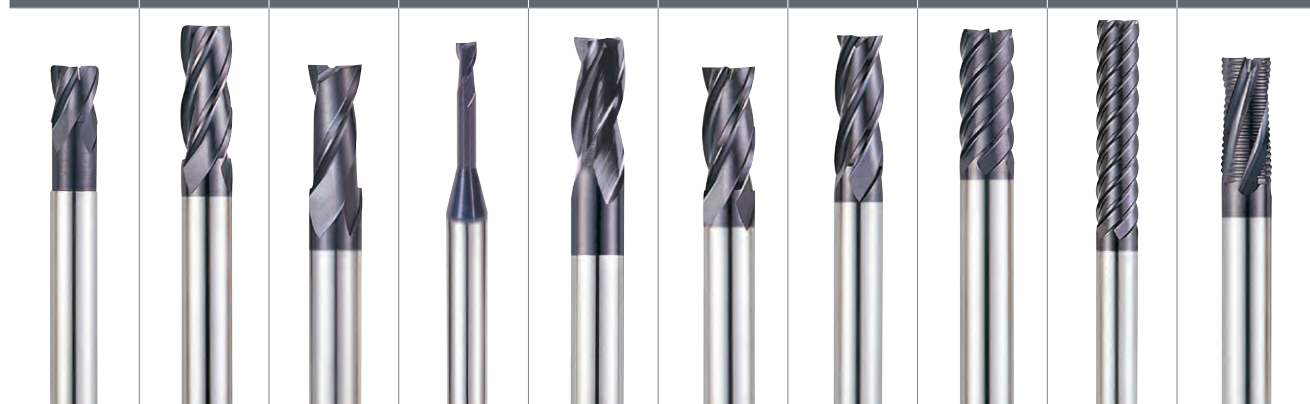
X-Power Pro (Metric)						
GM876	GM813	GM886	GM902	GM815	GM818	GM8A1
2	2	2	2	4	2	2
30°	30°	30°	30°	30°	30°	30°
BALL NOSE	BALL NOSE	BALL NOSE	BALL NOSE	BALL NOSE	CORNER RADIUS	CORNER RADIUS
R0.5	R0.5	R0.25	R0.5	R1.0	D4.0	D1.0
R8.0	R10.0	R3.0	R4.0	R8.0	D12.0	D6.0
C412	C413	C414	C416	C417	C418	C419
SHORT LENGTH	LONG LENGTH	RIB PROCESSING	TAPER NECK	LONG LENGTH	LONG LENGTH	RIB PROCESSING
Y-Coating	Y-Coating	Y-Coating	Y-Coating	Y-Coating	Y-Coating	Y-Coating



ISO	VDI 3323	Material Description	HB	Hrc
P	1	Non-alloy steel	125	
	2		190	13
	3		250	25
	4		270	28
	5	300	32	
	6	Low alloy steel	180	10
	7		275	29
	8		300	32
	9		350	38
	10		High alloyed steel, and tool steel	200
	11	325	35	
M	12	Stainless steel	200	15
	13		240	23
	14		180	10
K	15	Grey cast iron	180	10
	16		260	26
	17	Nodular cast iron	160	3
	18		250	25
	19	Malleable cast iron	130	
	20		230	21
N	21	Aluminum-wrought alloy	60	
	22		100	
	23	Aluminum-cast, alloyed	75	
	24		90	
	25		130	
	26	Copper and Copper Alloys (Bronze / Brass)	110	
	27		90	
	28	100		
	29	Non Metallic Materials (Duroplastic, Fiber Reinforced Plastic, Graphite, CFRP, GFRP, etc.)		
	30			
S	31	Heat Resistant Super Alloys	200	15
	32		280	30
	33		250	25
	34		350	38
	35		320	34
	36	Titanium Alloys	400 Rm	
	37		1050 Rm	
H	38	Hardened steel	550	55
	39		630	60
	40	Chilled Cast Iron	400	42
	41	Hardened Cast Iron	550	55

X-Power Pro (Metric)

GM839	GM819	GM810	GM883	GM895	GM811	GM817	GM812	GM834	GM814
4	4	2	2	3	4	4	6&8	6	3&4
30°	30°	30°	30°	38°	30°	30°	45°	45°	20°
CORNER RADIUS	CORNER RADIUS	SQUARE	SQUARE	SQUARE	SQUARE	SQUARE	SQUARE	SQUARE	ROUGHING
D2.0	D3.0	D0.4	D0.4	D1.0	D2.0	D2.0	D6.0	D6.0	D6.0
D12.0	D20.0	D20.0	D6.0	D16.0	D25.0	D20.0	D20.0	D25.0	D20.0
C420	C421	C422	C423	C425	C426	C427	C428	C429	C430
STUB LENGTH	LONG LENGTH	SHORT LENGTH	RIB PROCESSING	SHORT LENGTH	SHORT LENGTH	LONG LENGTH	LONG LENGTH	EXTRA LONG LENGTH	LONG LENGTH FINE PITCH
Y-Coating	Y-Coating	Y-Coating	Y-Coating	Y-Coating	Y-Coating	Y-Coating	Y-Coating	Y-Coating	Y-Coating



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○	○	○	○	○	○	○	○	○	○	2
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◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	4
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○	○	○	○	○	○	○	○	○	○	6
◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	7
◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	8
◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	9
○	○	○	○	○	○	○	○	○	○	10
◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	11
										12
										13
										14
○	○	○	○	○	○	○	○	○	○	15
○	○	○	○	○	○	○	○	○	○	16
○	○	○	○	○	○	○	○	○	○	17
○	○	○	○	○	○	○	○	○	○	18
○	○	○	○	○	○	○	○	○	○	19
○	○	○	○	○	○	○	○	○	○	20
										21
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										37
○	○	○	○	○	○	○	○	○	○	38
										39
◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	40
○	○	○	○	○	○	○	○	○	○	41

SELECTION GUIDE



MILLING TOOLS

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SERIES

FLUTE (SHANK)

HELIX ANGLE

CUTTING EDGE SHAPE

SIZE MIN

SIZE MAX

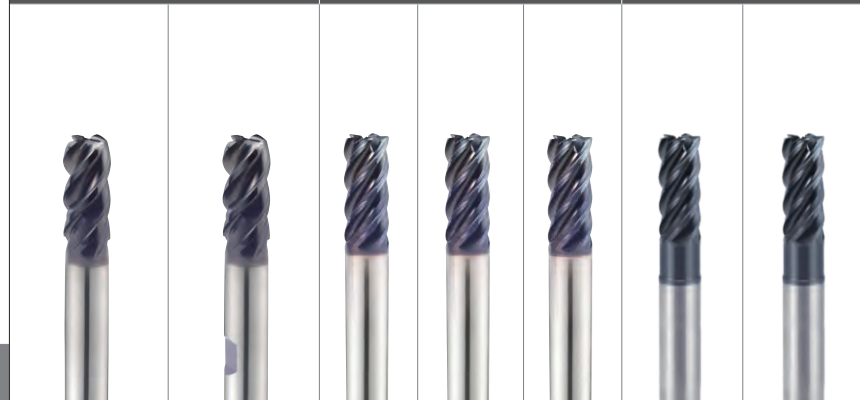
PAGE

LENGTH

SURFACE TREATMENT

TitaNox-Power (Inch)

Table with columns for UGMG42, UGMG43, UGMH12, UGMG32, UGMG34, UGMH06, UGMH07 and rows for Flute, Helix Angle, Cutting Edge Shape, Size, Length, and Surface Treatment.



Material selection table with columns for ISO, VDI 3323, Material Description, HB, HRc, and application suitability for various tool series (P, M, K, N, S, H).

HSS

CBN END MILLS

i-Xmill END MILLS

i-SMART MODULAR END MILLS

X5070 END MILLS

4G MILL END MILLS

X-POWER PRO END MILLS

TitaNox-POWER END MILLS

JET-POWER END MILLS

V7 PLUS A END MILLS

V7 MILL INOX

ALU-POWER HPC END MILLS

ALU-POWER END MILLS

D-POWER GRAPHITE END MILLS

STANDARD CARBIDE

ONLY ONE COATED PM60 END MILLS

SINE-POWER

TANK-POWER END MILLS

STANDARD COBALT & HSS

TECHNICAL DATA

Table with columns for TitaNox-Power (Inch), TitaNox-Power (Metric), and JET-POWER (Inch) and rows for EMI42, EMI43, GMG40, GMG24, GMG28, GMG30, EH108, EE882, E5075, E5074, EH094, EH095.



Material selection table with columns for application suitability for various tool series (P, M, K, N, S, H) and rows for ISO, VDI 3323, Material Description, HB, HRc.



SELECTION GUIDE



MILLING TOOLS

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Jet- Power (Inch) and JET-POWER (Metric) series specifications including Flute (Shank), Helix Angle, Cutting Edge Shape, Size Min, Size Max, Page, Length, and Surface Treatment.

Material selection table with columns for ISO, VDI 3323, Material Description, HB, HRc, and application suitability for various materials like Non-alloy steel, Low alloy steel, High alloyed steel, Stainless steel, Grey cast iron, etc.

HSS

CBN END MILLS

i-Xmill END MILLS

i-SMART MODULAR END MILLS

X5070 END MILLS

4G MILL END MILLS

X-POWER PRO END MILLS

TitaNox-POWER END MILLS

JET-POWER END MILLS

V7 PLUS A END MILLS

V7 MILL INOX

ALU-POWER HPC END MILLS

ALU-POWER END MILLS

D-POWER GRAPHITE END MILLS

STANDARD CARBIDE

ONLY ONE COATED PM60 END MILLS

SINE-POWER

TANK-POWER END MILLS

STANDARD COBALT & HSS

TECHNICAL DATA

TECHNICAL DATA

TECHNICAL DATA

TECHNICAL DATA

TECHNICAL DATA

TECHNICAL DATA

V7 Plus A(Inch) series specifications including UGMF68, UGMF76, UGMF70, UGMG53, UGMF69, UGMF77, UGMF71, UGMG54, UGMF72, UGMF74, UGMH10.



Material selection table for V7 Plus A end mills, showing application suitability for various materials like Non-alloy steel, Low alloy steel, High alloyed steel, Stainless steel, Grey cast iron, etc.

SELECTION GUIDE



MILLING TOOLS

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SERIES	V7 Plus A(Inch)									
	UGMF73	UGMF75	UGMG20	UGMG22	UGMG21	UGMG23	UGMH08	UGMH09	GMH72	
	4 (Weldon Flat)		6 (Plain Shank)		6 (Weldon Flat)		6 (Plain Shank)			
FLUTE (SHANK)	4 (Weldon Flat)		6 (Plain Shank)		6 (Weldon Flat)		6 (Plain Shank)			
HELIX ANGLE	35°/37° (MULTIPLE HELIX)	35°/37° (MULTIPLE HELIX)	45°	45°	45°	45°	45°	45°	45°	
CUTTING EDGE SHAPE	SQUARE	CORNER RADIUS	SQUARE	CORNER RADIUS	SQUARE	CORNER RADIUS	SQUARE	CORNER RADIUS	CORNER RADIUS	
SIZE MIN	3/8	3/8	1/4	1/4	3/8	3/8	1/4	1/4	3/8	
SIZE MAX	1	1	1	1	1	1	1	1	1	
PAGE	C538		C543-C544		C545		C546-C547		C550	
LENGTH	EXTENDED REACH		MULTIPLE LENGTH		MULTIPLE LENGTH		EXTENDED REACH		MULTIPLE LENGTH	
SURFACE TREATMENT	Y-Coating		Y-Coating		Y-Coating		Y-Coating		Y-Coating	CHIP SPLITTER



	ISO	VDI 3323	Material Description	HB	HRc	UGMF73	UGMF75	UGMG20	UGMG22	UGMG21	UGMG23	UGMH08	UGMH09	GMH72	
P	1		Non-alloy steel	125		⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	
	2			190	13	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙
	3			250	25	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙
	4			270	28	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙
	5		300	32	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	
	6		180	10	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙
	7		275	29	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙
	8		300	32	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙
	9		350	38	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙
	10		High alloyed steel, and tool steel	200	15	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙
	11			325	35	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙
M	12		Stainless steel	200	15	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	
	13			240	23	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	
	14			180	10	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	
K	15		Grey cast iron	180	10	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	
	16			260	26	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	
	17		Nodular cast iron	160	3	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	
	18			250	25	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	
K	19		Malleable cast iron	130		⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	
	20			230	21	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	
N	21		Aluminum-wrought alloy	60											
	22			100											
	23		Aluminum-cast, alloyed	75											
	24			90											
	25			130											
	26		Copper and Copper Alloys (Bronze / Brass)	110											
	27			90											
	28			100											
	29		Non Metallic Materials Duroplastic, Fiber Reinforced Plastic, Graphite, CFRP, GFRP, etc.												
	30														
S	31		Heat Resistant Super Alloys	200	15	○	○	○	○	○	○	○	○	○	
	32			280	30	○	○	○	○	○	○	○	○	○	
	33			250	25	○	○	○	○	○	○	○	○	○	
	34			350	38	○	○	○	○	○	○	○	○	○	
	35		320	34	○	○	○	○	○	○	○	○	○		
	36		Titanium Alloys	400 Rm		○	○	○	○	○	○	○	○	○	
	37			1050 Rm		○	○	○	○	○	○	○	○	○	
H	38		Hardened steel	550	55										
	39			630	60										
	40			Chilled Cast Iron	400	42									
	41			Hardened Cast Iron	550	55									

V7 Plus A(Metric)											
GMF52 GMF56	GMF54 GMF58	GMG55	GMF53 GMF57	GMF55 GMF59	GMG56	GMF60	GMF62	GMF61	GMF63	GMG12 GMG14	GMG16 GMG18
4 (Plain Shank)			4 (Weldon Flat)			4 (Plain Shank)		4 (Weldon Flat)		6 (Plain Shank)	
35°/37° (MULTIPLE HELIX)	35°/37° (MULTIPLE HELIX)	35°/37° (MULTIPLE HELIX)	35°/37° (MULTIPLE HELIX)	35°/37° (MULTIPLE HELIX)	35°/37° (MULTIPLE HELIX)	35°/37° (MULTIPLE HELIX)	35°/37° (MULTIPLE HELIX)	35°/37° (MULTIPLE HELIX)	35°/37° (MULTIPLE HELIX)	45°	45°
CHAMFER	CORNER RADIUS	BALL NOSE	CHAMFER	CORNER RADIUS	BALL NOSE	CHAMFER	CORNER RADIUS	CHAMFER	CORNER RADIUS	SQUARE	CORNER RADIUS
3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	6.0	6.0
25.0	25.0	25.0	25.0	25.0	25.0	20.0	20.0	20.0	20.0	25.0	25.0
C539			C540			C541		C542		C548	
MULTIPLE LENGTH			MULTIPLE LENGTH			EXTENDED REACH		EXTENDED REACH		MULTIPLE LENGTH	
Y-Coating			Y-Coating			Y-Coating		Y-Coating		Y-Coating	



⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	1
⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	2
⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	3
⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	4
⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	5
⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	6 P
⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	7
⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	8
⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	9
⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	10
⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	11
⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	12
⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	13 M
⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	14
⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	15
⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	16
⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	17 K
⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	18
⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	19
⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	20
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○	○	○	○	○	○	○	○	○	○	○	○	33
○	○	○	○	○	○	○	○	○	○	○	○	34 S
○	○	○	○	○	○	○	○	○	○	○	○	35
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# SELECTION GUIDE



## MILLING TOOLS

Please visit [globalyg1.com/mat](http://globalyg1.com/mat) for material search

**SERIES**

**FLUTE (SHANK)**

**HELIX ANGLE**

**CUTTING EDGE SHAPE**

**SIZE MIN**

**SIZE MAX**

**PAGE**

**LENGTH**

**SURFACE TREATMENT**

◎ : Excellent  
○ : Good

ALU-POWER HPC							
JAG95	JAG97	E5G95	E5G97	JAG96	JAG98	E5G96	E5G98
3		3		3		3	
37°		37°		37°		37°	
SQUARE	CORNER RADIUS	SQUARE	CORNER RADIUS	SQUARE	CORNER RADIUS	SQUARE	CORNER RADIUS
1/8	1/8	1/8	1/8	1/4	1/4	1/4	1/4
1	1	1	1	1	1	1	1
C590-C591		C592-C593		C594		C595	
STANDARD LENGTH		STANDARD LENGTH		EXTENDED NECK		EXTENDED NECK	
DLC		Uncoated		DLC		Uncoated	



ISO	VDI 3323	Material Description	HB	HRc
P	1	Non-alloy steel	125	
	2		190	13
	3		250	25
	4		270	28
	5		300	32
	6	Low alloy steel	180	10
	7		275	29
	8		300	32
	9		350	38
	10		High alloyed steel, and tool steel	200
	11	325	35	
M	12	Stainless steel	200	15
	13		240	23
	14		180	10
K	15	Grey cast iron	180	10
	16		260	26
	17	Nodular cast iron	160	3
	18		250	25
	19	Malleable cast iron	130	
	20		230	21
N	21	Aluminum-wrought alloy	60	
	22		100	
	23	Aluminum-cast, alloyed	75	
	24		90	
	25		130	
	26	Copper and Copper Alloys (Bronze / Brass)	110	
	27		90	
	28		100	
	29			
	30	Non Metallic Materials (Duroplastic, Fiber Reinforced Plastic, Graphite, CFRP, GFRP, etc.)		
S	31	Heat Resistant Super Alloys	200	15
	32		280	30
	33		250	25
	34		350	38
	35	320	34	
	36	Titanium Alloys	400 Rm	
	37		1050 Rm	
H	38	Hardened steel	550	55
	39		630	60
	40	Chilled Cast Iron	400	42
	41		550	55

ALU-POWER HPC						ALU-POWER (Inch)					
JAI38	E5I36	E5I38	JAI39	E5I37	E5I39	E5253	E5254	E5976	E5980	E5981	E5983
3		3		3		2 (Weldon)		2		3	
37°		37°		37°		42°		42°		37°	
CORNER RADIUS	SQUARE	CORNER RADIUS	CORNER RADIUS	SQUARE	CORNER RADIUS	SQUARE	SQUARE	SQUARE	SQUARE	SQUARE	CORNER RADIUS
1/8	1/2	1/8	1/4	1/2	1/4	D1/4	D1/16	D1/4	D1/8	D1/8	D1/2
1	3/4	1	1	1/2	1	D1	D1	D1	D1	D1	D1
C596		C597		C598		C599		C608		C612	
STANDARD LENGTH		STANDARD LENGTH		EXTENDED NECK		EXTENDED NECK		EXTENDED NECK		REGULAR LENGTH	
DLC		Uncoated		DLC		Uncoated		TICN		TICN	
								Uncoated		Uncoated	



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SELECTION GUIDE



MILLING TOOLS

SERIES
FLUTE
HELIX ANGLE
CUTTING EDGE SHAPE
SIZE MIN
SIZE MAX
PAGE
LENGTH
SURFACE TREATMENT

ALU-POWER (Inch)											
E5982	E5984	E5E44	E5E98	E5E45	E5977	E5985	E5973	E5974	E5978	E5975	
3	3	3	3	3	3	3	2	3	2	3	
45°	45°	30°	30°	30°	37°	37°	30°	50°	37°	40°	
SQUARE	CORNER RADIUS	ROUGHING	ROUGHING	BALL NOSE ROUGHING	SQUARE	CORNER RADIUS	CORNER RADIUS	BALL NOSE	BALL NOSE	BALL NOSE	
D1/4	D1/2	D1/4	D1/4	D1/4	D1/4	D1/2	D5/32	R1/8	R1/8	R3/64	
D1	D1	D1	D1	D1	D1	D1	D3/4	R3/8	R1/2	R5/16	
C613		C614		C615	C616	C617	C618	C619	C620	C621	
LONG LENGTH	LONG LENGTH	NECK		EXTENDED NECK		EXTENDED NECK	NECK	STUB CUT LENGTH NECK	LONG REACH	LONG LENGTH NECK	
TiCN	TiCN	TiCN	TiCN	TiCN	TiCN	TiCN	TiCN	TiCN	TiCN	TiCN	
Uncoated	Uncoated	Uncoated	Uncoated	Uncoated	Uncoated	Uncoated	Uncoated	Uncoated	Uncoated	Uncoated	
U.S.A Stock											

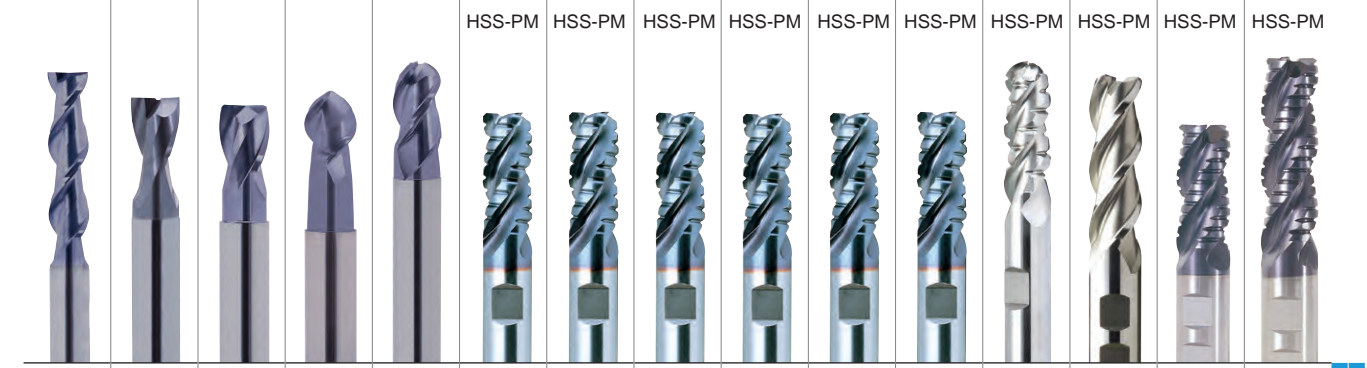


Please visit [global.yg1.com/mat](http://global.yg1.com/mat) for material search

◎ : Excellent  
○ : Good

ISO	VDI 3323	Material Description	HB	HRc
P	1	Non-alloy steel	125	
	2		190	13
	3		250	25
	4		270	28
	5		300	32
	6	Low alloy steel	180	10
	7		275	29
	8		300	32
	9		350	38
	10		High alloyed steel, and tool steel	200
	11	325	35	
M	12	Stainless steel	200	15
	13		240	23
	14		180	10
K	15	Grey cast iron	180	10
	16		260	26
	17	Nodular cast iron	160	3
	18		250	25
	19	Malleable cast iron	130	
	20		230	21
N	21	Aluminum-wrought alloy	60	
	22		100	
	23	Aluminum-cast, alloyed	75	
	24		90	
	25		130	
	26		110	
	27	Copper and Copper Alloys (Bronze / Brass)	90	
	28		100	
	29			
	30	Non Metallic Materials (Duroplastic, Fiber Reinforced Plastic, Graphite, CFRP, GFRP, etc.)		
S	31	Heat Resistant Super Alloys	200	15
	32		280	30
	33		250	25
	34		350	38
	35		320	34
	36	Titanium Alloys	400 Rm	
	37		1050 Rm	
H	38	Hardened steel	550	55
	39		630	60
	40	Chilled Cast Iron	400	42
	41		550	55

ALU-POWER (Metric)					ALU-POWER (Inch)								ALU-POWER (Metric)	
E5522 EG522	EG930	EG909	EG910	EG908	EK191	EK191	EK226	EK226	EK192	EK192	EK196	EK193 EK132	EP922	EP924
2	2	2	2	3	3	3	3	3	3	3	3	3	3	3
45°	25°	30°	50°	40°	42°	42°	42°	42°	42°	42°	42°	42°	42°	42°
SQUARE	CORNER RADIUS	CORNER RADIUS	BALL NOSE	BALL NOSE	ROUGHING	CORNER RADIUS ROUGHING	ROUGHING	CORNER RADIUS ROUGHING	ROUGHING	CORNER RADIUS ROUGHING	BALL NOSE ROUGHING	CORNER RADIUS	ROUGHING	ROUGHING
D3.0	D2.0	D4.0	R3.0	R1.0	D1/2	D3/4	D3/4	D3/4	D1/2	D3/4	R1/4	D1/2	D12.0	D12.0
D20.0	D20.0	D20.0	R10.0	R8.0	D2	D1-1/4	D2	D1-1/4	D2	D1-1/4	R5/8	D1-1/2	D32.0	D32.0
C622	C623	C624	C625	C626	C627	C583	C628		C629-C630		C631	C632	C634	C635
LONG LENGTH	STUB CUT LENGTH	STUB CUT LENGTH NECK	STUB CUT LENGTH NECK	LONG LENGTH NECK	REGULAR LENGTH for ALUMINUM	REGULAR LENGTH for ALUMINUM	MEDIUM LENGTH for ALUMINUM	MEDIUM LENGTH for ALUMINUM	LONG LENGTH for ALUMINUM	LONG LENGTH for ALUMINUM	REGULAR LENGTH for ALUMINUM	REGULAR & MEDIUM & LONG LENGTH	SHORT LENGTH for ALUMINUM	LONG LENGTH for ALUMINUM
TiCN	TiCN	TiCN	TiCN	TiCN	TiCN	TiCN	TiCN	TiCN	TiCN	TiCN	TiCN	TiCN	TiCN	TiCN
Uncoated	TiCN	TiCN	TiCN	TiCN	Uncoated	Uncoated	Uncoated	Uncoated	Uncoated	Uncoated	Uncoated	Uncoated	TiAlN	TiAlN
Call for Availability					U.S.A Stock								Call for Availability	



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# SELECTION GUIDE



## MILLING TOOLS

**SERIES**  
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**CUTTING EDGE SHAPE**  
**SIZE MIN**  
**SIZE MAX**  
**PAGE**

D-Power Graphite (Inch)					
EI107	EI099	EI106	EI971	EI972	EIB07
2, 4	2	4	2	2	4
30°	30°	30°	30°	30°	30°
SQUARE	BALL NOSE	BALL NOSE	BALL NOSE	BALL NOSE	BALL NOSE
D1/64	R.0391	R.0391	R.0391	R.0391	R.0156
D1/2	R1/4	R1/4	R1/4	R5/32	R.0625
C650	C651		C652	C653	C654
REGULAR LENGTH	REGULAR LENGTH	REGULAR LENGTH	LONG LENGTH	LONG REACH	REGULAR LENGTH NECK
Diamond	Diamond	Diamond	Diamond	Diamond	Diamond

U.S.A Stock



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◎ : Excellent  
○ : Good

ISO	VDI 3323	Material Description	HB	HRc
P	1	Non-alloy steel	125	
	2		190	13
	3		250	25
	4		270	28
	5	300	32	
	6	Low alloy steel	180	10
	7		275	29
	8		300	32
	9		350	38
	10		High alloyed steel, and tool steel	200
	11	325	35	
M	12	Stainless steel	200	15
	13		240	23
	14		180	10
	15		180	10
K	16	Grey cast iron	260	26
	17		160	3
	18		250	25
	19	Malleable cast iron	130	
	20		230	21
N	21	Aluminum-wrought alloy	60	
	22		100	
	23	Aluminum-cast, alloyed	75	
	24		90	
	25		130	
	26		110	
	27	Copper and Copper Alloys (Bronze / Brass)	90	
	28		100	
	29			
	30	Non Metallic Materials (Duroplastic, Fiber Reinforced Plastic, Graphite, CFRP, GFRP, etc.)		
S	31	Heat Resistant Super Alloys	200	15
	32		280	30
	33		250	25
	34		350	38
	35		320	34
	36	Titanium Alloys	400 Rm	
	37		1050 Rm	
H	38	Hardened steel	550	55
	39		630	60
	40	Chilled Cast Iron	400	42
	41		550	55

D-Power Graphite (Inch)		D-Power Graphite (Metric)				STANDARD CARBIDE (Inch)				
EIB05	EIB06	EI880	EI881	EI451	EI450	UGMF90	E5020	UGMF89	E5021	E5244
4	4	2	3	2	2	2	2	4	4	2
30°	30°	30°	30°	30°	30°	30°	30°	30°	30°	30°
CORNER RADIUS	CORNER RADIUS	BALL NOSE	BALL NOSE	BALL NOSE	BALL NOSE	SQUARE	SQUARE	SQUARE	SQUARE	SQUARE
D1/16	D1/32	R1.0	R1.0	R1.0	R1.0	D1/8	D1/32	D1/16	D1/16	D1/16
D1/2	D3/8	R6.0	R6.0	R6.0	R4.0	D1	D1	D1	D1	D3/4
C655	C656	C657		C658	C659	C668	C669	C670	C671	C672
REGULAR LENGTH	REGULAR LENGTH NECK	SHORT LENGTH	SHORT LENGTH	LONG LENGTH	LONG REACH	REGULAR LENGTH	REGULAR LENGTH	REGULAR LENGTH	REGULAR LENGTH	STUB LENGTH
Diamond	Diamond	Diamond	Diamond	Diamond	Diamond	Y-Coating	Uncoated	Y-Coating	Uncoated	Uncoated
U.S.A Stock		Call for Availability					TiN		TiN	TiN
							TiCN		TiCN	TiCN
							TYLON F		TYLON F	TYLON F
							TYLON E		TYLON E	TYLON E

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SIZE MIN
SIZE MAX
PAGE
LENGTH
SURFACE TREATMENT

STANDARD CARBIDE (Inch)							
UGMGF57	E5245	E5011	E5012	UGMGF58	E5026	UGMGF59	
4	4	2	4	4	2	4	
30°	30°	30°	30°	30°	30°	30°	
SQUARE	SQUARE	SQUARE	SQUARE	SQUARE	SQUARE	SQUARE	
D1/16	D1/16	D1/8	D1/8	D1/8	D1/8	D1/8	
D3/4	D3/4	D1	D1	D1	D1	D1	
C673	C674	C675	C675	C676	C677	C678	
STUB LENGTH	STUB LENGTH	LONG LENGTH	LONG LENGTH	LONG LENGTH	EXTRA LONG LENGTH	EXTRA LONG LENGTH	
Y-Coating	Uncoated	Uncoated	Uncoated	Y-Coating	Uncoated	Y-Coating	

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⊙ : Excellent  
○ : Good

ISO	VDI 3323	Material Description	HB	HRc							
P	1	Non-alloy steel	125		⊙	⊙	⊙	⊙	⊙	⊙	⊙
	2		190	13	⊙	⊙	⊙	⊙	⊙	⊙	⊙
	3		250	25	⊙	⊙	⊙	⊙	⊙	⊙	⊙
	4		270	28	⊙	⊙	⊙	⊙	⊙	⊙	⊙
	5	300	32	○	○	○	○	○	○	○	○
	6	180	10	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙
	7	275	29	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙
	8	300	32	○	○	○	○	○	○	○	○
	9	350	38	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙
	10	High alloyed steel, and tool steel	200	15	⊙	⊙	⊙	⊙	⊙	⊙	⊙
	11	325	35	○	○	○	○	○	○	○	○
M	12	Stainless steel	200	15	○	○	○	○	○	○	○
	13		240	23	○	○	○	○	○	○	○
	14		180	10	○	○	○	○	○	○	○
K	15	Grey cast iron	180	10	○	○	○	○	○	○	○
	16		260	26	○	○	○	○	○	○	○
	17	Nodular cast iron	160	3	○	○	○	○	○	○	○
	18		250	25	○	○	○	○	○	○	○
	19		130		○	○	○	○	○	○	○
20	Malleable cast iron	230	21	○	○	○	○	○	○	○	
N	21	Aluminum-wrought alloy	60		○	○	○	○	○	○	○
	22		100		○	○	○	○	○	○	○
	23	Aluminum-cast, alloyed	75		○	○	○	○	○	○	○
	24		90		○	○	○	○	○	○	○
	25		130		○	○	○	○	○	○	○
	26	Copper and Copper Alloys (Bronze / Brass)	110		○	○	○	○	○	○	○
	27		90		○	○	○	○	○	○	○
	28		100		○	○	○	○	○	○	○
	29	Non Metallic Materials (Duroplastic, Fiber Reinforced Plastic, Graphite, CFRP, GFRP, etc.)									
30											
S	31	Heat Resistant Super Alloys	200	15							
	32		280	30							
	33		250	25							
	34		350	38							
	35		320	34							
	36	Titanium Alloys	400 Rm								
	37		1050 Rm								
H	38	Hardened steel	550	55							
	39		630	60							
	40	Hardened Cast Iron	400	42							
	41		550	55							

STANDARD CARBIDE (Inch)

E5065	E5022	E5023	E5025	E5024	E5249	E5250	UGMF91	E5014	
4	2	4	2	4	2	4	4	2	
30°	30°	30°	30°	30°	30°	30°	30°	45°	
SQUARE	SQUARE	SQUARE	SQUARE	SQUARE	BALL NOSE	BALL NOSE	BALL NOSE	BALL NOSE	
D1/8	D1/32	D1/16	D1/8	D1/8	R1/16	R1/16	R1/16	R1/16	
D1	D1/2	D1/2	D1/2	D1/2	R1/2	R1/2	R1/2	R1/2	
C679	C680	C681	C682	C683	C684	C685	C686	C687	
EXTRA LONG LENGTH	STUB LENGTH DOUBLE	STUB LENGTH DOUBLE	REGULAR LENGTH DOUBLE	REGULAR LENGTH DOUBLE	REGULAR LENGTH	REGULAR LENGTH	REGULAR LENGTH	LONG LENGTH	
Uncoated	Uncoated	Uncoated	Uncoated	Uncoated	Uncoated	Uncoated	Y-Coating	Uncoated	
TIN	TIN	TIN	TIN	TIN	TIN	TIN		TIN	
TICN	TICN	TICN	TICN	TICN	TICN	TICN		TICN	
TYLON F	TYLON F	TYLON F	TYLON F	TYLON F	TYLON F	TYLON F			



⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	1
⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	2
⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	3
⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	4
⊙	⊙	⊙	⊙	⊙	⊙	⊙	○	⊙	5
⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	6
⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	7
⊙	⊙	⊙	⊙	⊙	⊙	⊙	○	⊙	8
⊙	⊙	⊙	⊙	⊙	⊙	⊙	○	⊙	9
⊙	⊙	⊙	⊙	⊙	⊙	⊙	○	⊙	10
○	○	○	○	○	○	○	○	○	11
○	○	○	○	○	○	○	○	○	12
○	○	○	○	○	○	○	○	○	13
○	○	○	○	○	○	○	○	○	14
○	○	○	○	○	○	○	○	○	15
○	○	○	○	○	○	○	○	○	16
○	○	○	○	○	○	○	○	○	17
○	○	○	○	○	○	○	○	○	18
○	○	○	○	○	○	○	○	○	19
○	○	○	○	○	○	○	○	○	20
○	○	○	○	○	○	○	○	○	21
○	○	○	○	○	○	○	○	○	22
○	○	○	○	○	○	○	○	○	23
○	○	○	○	○	○	○	○	○	24
○	○	○	○	○	○	○	○	○	25
○	○	○	○	○	○	○	○	○	26
○	○	○	○	○	○	○	○	○	27
○	○	○	○	○	○	○	○	○	28
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									41



SELECTION GUIDE



MILLING TOOLS

SERIES  
FLUTE  
HELIX ANGLE  
CUTTING EDGE SHAPE  
SIZE MIN  
SIZE MAX  
PAGE

Table with columns for STANDARD CARBIDE (Inch) series: E5060, E5018, E5062, E5251 E5252, E5216, E5069, E5243. Rows include specifications for length, surface treatment, and material compatibility.

LENGTH  
SURFACE TREATMENT

Table detailing length and surface treatment options for various carbide series, including Uncoated, TiN, TiCN, and Tylon F/Tylon E.

Please visit global.yg1.com/mat for material search. Symbols: ⊙ : Excellent, ○ : Good

Main material compatibility table with columns for ISO, VDI 3323, Material Description, HB, HRc, and carbide series (P, M, K, N, S, H) with performance indicators (⊙/○).

STANDARD CARBIDE (Inch) / STANDARD CARBIDE (Metric)

Table with columns for STANDARD CARBIDE (Inch) series: E5059, E5246, E5066, E5067, E5068, E5073, E5058, E5056 E5057, E5077, E5078, and STANDARD CARBIDE (Metric) series: EH527, EH540, EH882. Rows include specifications for length, surface treatment, and material compatibility.



Material compatibility table for the standard carbide series, including performance indicators (⊙/○) for various materials.





SELECTION GUIDE



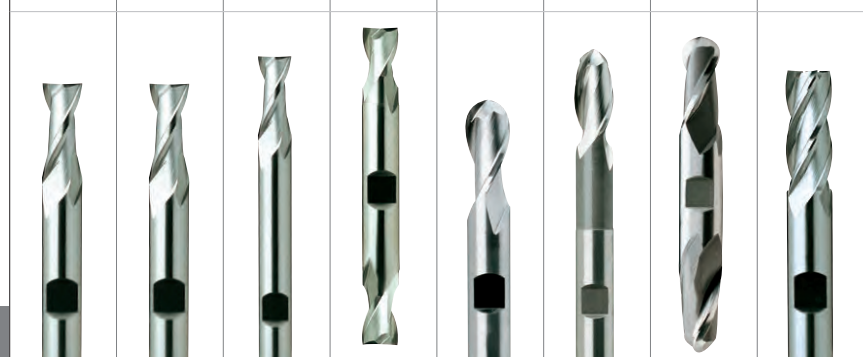
MILLING TOOLS

SERIES  
FLUTE  
HELIX ANGLE  
CUTTING EDGE SHAPE  
SIZE MIN  
SIZE MAX  
PAGE

Table with 8 columns: E2030 E1030, E2080 E1080, E2033 E1033, E2050 E1050, E2110 E1110, E2111 E1111, E2112 E1112, E2031 E1031. Rows include Helix Angle (30°), Cutting Edge Shape (Square, Ball Nose), Size Min/Max, and Page (C771-C780).

LENGTH  
SURFACE TREATMENT

Table with 8 columns: REGULAR LENGTH, LONG LENGTH, EXTENDED LENGTH, REGULAR LENGTH DOUBLE, REGULAR LENGTH, EXTENDED LENGTH, REGULAR LENGTH DOUBLE, REGULAR LENGTH. Rows include Surface Treatment (Uncoated) and Material (HSSCo8 & HSS).



Please visit [global.yg1.com/mat](http://global.yg1.com/mat) for material search. Symbols: ⊙ : Excellent, ○ : Good.

Material selection table with columns: ISO, VDI 3323, Material Description, HB, HRc. Rows are categorized by ISO codes: P (Non-alloy steel, Low alloy steel, High alloyed steel), M (Stainless steel), K (Grey cast iron, Nodular cast iron, Malleable cast iron), N (Aluminum-wrought alloy, Aluminum-cast alloyed, Copper and Copper Alloys), S (Heat Resistant Super Alloys, Titanium Alloys), H (Hardened steel, Chilled Cast Iron, Hardened Cast Iron).

COBALT & HSS (Inch)

Table with 13 columns: E2032 E1032, E2034 E1034, E2035 E1035, E2036 E1036, E2037 E1037, E2051 E1051, E2031 E1031, E2032 E1032, E2020, E2021, E2069, E2039 E1039, E2042 E1042. Rows include Helix Angle (30°), Cutting Edge Shape (Square, Ball Nose), Size Min/Max, and Page (C782-C793).

Table with 13 columns: REGULAR LENGTH, LONG LENGTH, LONG LENGTH, EXTRA LONG LENGTH, EXTRA LONG LENGTH, REGULAR LENGTH DOUBLE, REGULAR LENGTH 3/4 SHANK, REGULAR LENGTH 3/4 SHANK, REGULAR LENGTH, LONG LENGTH, REGULAR LENGTH DOUBLE, REGULAR LENGTH CENTER CUTTING, REGULAR LENGTH CENTER CUTTING. Rows include Surface Treatment (Uncoated) and Material (HSSCo8 & HSS).



Material selection table with columns: ISO, VDI 3323, Material Description, HB, HRc. Rows are categorized by ISO codes: P (Non-alloy steel, Low alloy steel, High alloyed steel), M (Stainless steel), K (Grey cast iron, Nodular cast iron, Malleable cast iron), N (Aluminum-wrought alloy, Aluminum-cast alloyed, Copper and Copper Alloys), S (Heat Resistant Super Alloys, Titanium Alloys), H (Hardened steel, Chilled Cast Iron, Hardened Cast Iron).

SELECTION GUIDE



MILLING TOOLS

SERIES  
FLUTE  
HELIX ANGLE  
CUTTING EDGE SHAPE  
SIZE MIN  
SIZE MAX  
PAGE

COBALT & HSS (Inch)							
E2039 E2042	E2040 E1040	E2162 E1162	E2041 E1041	E2175 E1175	E2053 E1053	E2100 E1100	E2001 E1001
4~8	4	6	4	6	4	6	2
30°	30°	30°	30°	30°	30°	30°	30°&39°
SQUARE	SQUARE	SQUARE	SQUARE	SQUARE	SQUARE	SQUARE	SQUARE
D1	D1/4	D1/2	D1/4	D1/2	D1/8	D2	D1/32
D2	D1-1/2	D2	D1-1/4	D2	D1	D2	D3/16
C794	C795		C796		C797	C799	C800

LENGTH  
SURFACE TREATMENT

MEDIUM LENGTH CENTER CUTTING	LONG LENGTH CENTER CUTTING	LONG LENGTH CENTER CUTTING	EXTRA LONG LENGTH CENTER CUTTING	EXTRA LONG LENGTH CENTER CUTTING	REGULAR LENGTH DOUBLE CENTER CUTTING	REGULAR COMBINATION 2 SHANK CENTER CUTTING	STUB LENGTH MINIATURE DOUBLE
Uncoated	Uncoated	Uncoated	Uncoated	Uncoated	Uncoated	Uncoated	Uncoated
HSSCo8	HSSCo8 & HSS	HSSCo8 & HSS	HSSCo8 & HSS	HSSCo8 & HSS	HSSCo8 & HSS	HSSCo8 & HSS	HSSCo8 & HSS



Please visit [globalyg1.com/mat](http://globalyg1.com/mat) for material search

◎ : Excellent  
○ : Good

ISO	VDI 3323	Material Description	HB	HRc	E2039 E2042	E2040 E1040	E2162 E1162	E2041 E1041	E2175 E1175	E2053 E1053	E2100 E1100	E2001 E1001	
P	1	Non-alloy steel	125		◎	◎	◎	◎	◎	◎	◎	◎	
	2		190	13	◎	◎	◎	◎	◎	◎	◎	◎	
	3		250	25	◎	◎	◎	◎	◎	◎	◎	◎	
	4		270	28	◎	◎	◎	◎	◎	◎	◎	◎	
	5	300	32	○	○	○	○	○	○	○	○	○	
	6	180	10	◎	◎	◎	◎	◎	◎	◎	◎	◎	
	7	275	29	◎	◎	◎	◎	◎	◎	◎	◎	◎	
	8	300	32	○	○	○	○	○	○	○	○	○	
	9	350	38	○	○	○	○	○	○	○	○	○	
	10	High alloyed steel, and tool steel	200	15	◎	◎	◎	◎	◎	◎	◎	◎	
	11		325	35	○	○	○	○	○	○	○	○	
M	12	Stainless steel	200	15									
	13		240	23									
	14		180	10									
K	15	Grey cast iron	180	10									
	16		260	26									
	17	Nodular cast iron	160	3									
	18		250	25									
	19		130										
20	Malleable cast iron	230	21										
N	21	Aluminum-wrought alloy	60		○	○	○	○	○	○	○	○	
	22		100		○	○	○	○	○	○	○	○	
	23	Aluminum-cast, alloyed	75		○	○	○	○	○	○	○	○	
	24		90		○	○	○	○	○	○	○	○	
	25		130		○	○	○	○	○	○	○	○	
	26		Copper and Copper Alloys (Bronze / Brass)	110		○	○	○	○	○	○	○	○
	27			90		○	○	○	○	○	○	○	○
	28			100		○	○	○	○	○	○	○	○
	29												
	30		Non Metallic Materials (Duroplastic, Fiber Reinforced Plastic, Graphite, CFRP, GFRP, etc.)										
S	31	Heat Resistant Super Alloys	200	15									
	32		280	30									
	33		250	25									
	34		350	38									
	35		320	34									
	36	Titanium Alloys	400 Rm										
	37		1050 Rm										
H	38	Hardened steel	550	55									
	39		630	60									
	40	Chilled Cast Iron	400	42									
	41	Hardened Cast Iron	550	55									

COBALT & HSS (Inch)

E2003 E1003	E2005 E1005	E2002 E1002	E2004 E1004	E2006 E1006	E2008 E1008	E2013 E1013	E2015 E1015	E1070	E1071	E1072	E2086	E2085
2	2	4	4	4	2	2	2	2	2	2	4~5	3~5
30°&39°	30°&39°	30°&39°	30°&39°	30°&39°	30°&39°	30°&39°	30°&39°	42°	42°	42°	30°	30°
SQUARE	SQUARE	SQUARE	SQUARE	SQUARE	BALL NOSE	BALL NOSE	BALL NOSE	SQUARE	SQUARE	SQUARE	ROUGHING	ROUGHING
D1/32	D1/16	D1/16	D1/16	D1/16	R1/32	R1/64	R1/32	D1/4	D1/4	D1/4	D1/4	D1/4
D3/16	D3/16	D3/16	D3/16	D3/16	R3/32	R3/32	R3/32	D2	D2	D1-1/2	D1	D1
C801	C802	C803	C804	C805	C806	C807	C808	C809	C810		C811	C812
REGULAR LENGTH MINIATURE DOUBLE	LONG LENGTH MINIATURE DOUBLE	STUB LENGTH MINIATURE DOUBLE	REGULAR LENGTH MINIATURE DOUBLE	LONG LENGTH MINIATURE DOUBLE	STUB LENGTH MINIATURE DOUBLE	REGULAR LENGTH MINIATURE DOUBLE	LONG LENGTH MINIATURE DOUBLE	REGULAR & MEDIUM LENGTH ALUMINUM	LONG LENGTH ALUMINUM	EXTRA LONG LENGTH ALUMINUM	STUB LENGTH FINE PITCH CENTER CUTTING	REGULAR LENGTH FINE PITCH CENTER CUTTING
Uncoated	Uncoated	Uncoated	Uncoated	Uncoated	Uncoated	Uncoated	Uncoated	Uncoated	Uncoated	Uncoated	Uncoated	Uncoated
HSSCo8 & HSS	HSSCo8 & HSS	HSSCo8 & HSS	HSSCo8 & HSS	HSSCo8 & HSS	HSSCo8 & HSS	HSSCo8 & HSS	HSSCo8 & HSS	HSSCo8 & HSS	HSSCo8 & HSS	HSSCo8 & HSS	HSSCo8 & HSS	HSSCo8 & HSS

◎	◎	◎	◎	◎	◎	◎	◎	○	○	○	◎	◎	1
◎	◎	◎	◎	◎	◎	◎	◎	○	○	○	◎	◎	2
◎	◎	◎	◎	◎	◎	◎	◎	○	○	○	◎	◎	3
◎	◎	◎	◎	◎	◎	◎	◎				◎	◎	4
○	○	○	○	○	○	○	○				○	○	5
◎	◎	◎	◎	◎	◎	◎	◎	○	○		◎	◎	6 P
◎	◎	◎	◎	◎	◎	◎	◎				◎	◎	7
○	○	○	○	○	○	○	○				○	○	8
○	○	○	○	○	○	○	○				○	○	9
◎	◎	◎	◎	◎	◎	◎	◎	○	○		◎	◎	10
○	○	○	○	○	○	○	○				○	○	11
													12
													13 M
													14
													15
													16
													17 K
													18
													19
													20
○	○	○	○	○	○	○	○	◎	◎	◎	○	○	21
○	○	○	○	○	○	○	○	◎	◎	◎	○	○	22
○	○	○	○	○	○	○	○	◎	◎	◎	○	○	23
○	○	○	○	○	○	○	○	◎	◎	◎	○	○	24
○	○	○	○	○	○	○	○	◎	◎	◎	○	○	25
○	○	○	○	○	○	○	○				○	○	26 N
○	○	○	○	○	○	○	○				○	○	27
○	○	○	○	○	○	○	○				○	○	28
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													41



SELECTION GUIDE



MILLING TOOLS



SERIES  
FLUTE  
HELIX ANGLE  
CUTTING EDGE SHAPE  
SIZE MIN  
SIZE MAX  
PAGE  
LENGTH  
SURFACE TREATMENT

COBALT & HSS (Inch)								
E2079	E2077	E2086	E2170	E2171	E2172	E2241	E2195	
3~6	4~6	3	3~8	5~8	4~8	3	4~6	
30°	30°	30°	30°	30°	30°	30°	30°	
ROUGHING	ROUGHING	ROUGHING	ROUGHING	ROUGHING	ROUGHING	ROUGHING	ROUGHING	
D1/4	D1/2	D1/4	D1/4	D1	D1/2	D1/4	D1/2	
D2	D2	D1	D2	D2	D2	D1	D1-1/2	
C813	C814	C815	C816	C817	C818	C819	C820	
REGULAR LENGTH FINE PITCH	LONG LENGTH FINE PITCH	STUB LENGTH FINE PITCH CENTER CUTTING	REGULAR LENGTH COARSE PITCH ROUGHING	MEDIUM LENGTH COARSE PITCH	LONG LENGTH COARSE PITCH	STUB LENGTH COARSE PITCH CENTER CUTTING	REGULAR LENGTH COARSE PITCH CENTER CUTTING	
Uncoated	Uncoated	Uncoated	Uncoated	Uncoated	Uncoated	Uncoated	Uncoated	
HSSCo8	HSSCo8 & HSS	HSSCo8 & HSS	HSSCo8 & HSS	HSSCo8 & HSS	HSSCo8 & HSS	HSSCo8	HSSCo8	



◎ : Excellent  
○ : Good

ISO	VDI 3323	Material Description	HB	HRc	E2079	E2077	E2086	E2170	E2171	E2172	E2241	E2195	
P	1	Non-alloy steel	125		◎	◎	◎	◎	◎	◎	◎	◎	
	2		190	13	◎	◎	◎	◎	◎	◎	◎	◎	
	3		250	25	◎	◎	◎	◎	◎	◎	◎	◎	
	4		270	28	◎	◎	◎	◎	◎	◎	◎	◎	
	5	300	32	○	○	○	○	○	○	○	○	○	
	6	180	10	◎	◎	◎	◎	◎	◎	◎	◎	◎	
	7	275	29	◎	◎	◎	◎	◎	◎	◎	◎	◎	
	8	300	32	○	○	○	○	○	○	○	○	○	○
	9	350	38	○	○	○	○	○	○	○	○	○	○
	10	High alloyed steel, and tool steel	200	15	◎	◎	◎	◎	◎	◎	◎	◎	
	11		325	35	○	○	○	○	○	○	○	○	
M	12	Stainless steel	200	15									
	13		240	23									
	14		180	10									
K	15	Grey cast iron	180	10									
	16		260	26									
	17	Nodular cast iron	160	3									
	18		250	25									
	19		130										
20	Malleable cast iron	230	21										
N	21	Aluminum-wrought alloy	60		○	○	○	○	○	○	○	○	
	22		100		○	○	○	○	○	○	○	○	
	23	Aluminum-cast, alloyed	75		○	○	○	○	○	○	○	○	
	24		90		○	○	○	○	○	○	○	○	
	25		130		○	○	○	○	○	○	○	○	
	26		110		○	○	○	○	○	○	○	○	
	27	Copper and Copper Alloys (Bronze / Brass)	90		○	○	○	○	○	○	○	○	
	28		100		○	○	○	○	○	○	○	○	
	29				○	○	○	○	○	○	○	○	
	30	Non Metallic Materials (Duroplastic, Fiber Reinforced Plastic, Graphite, CFRP, GFRP, etc.)											
S	31	Heat Resistant Super Alloys	200	15									
	32		280	30									
	33		250	25									
	34		350	38									
	35		320	34									
	36	Titanium Alloys	400 Rm										
37		1050 Rm											
H	38	Hardened steel	550	55									
	39		630	60									
	40	Chilled Cast Iron	400	42									
	41	Hardened Cast Iron	550	55									

COBALT & HSS (Inch)

E2197	E2193 E2125	E2248	E2191	E2226 E2192	E2163 E1163	E2120 E2121	E2160	E2161	E2237 E1237	E2482 E1482	E2483 E1483
4~6	3~6	4~8	3	3	2	3&4	3	3	4	2	4
30°	30°	30°	37°	37°	15°	60°	30°	30°	0°	30°	30°
ROUGHING	BALL NOSE ROUGHING	ROUGHING & FINISHING	ROUGHING	ROUGHING	SQUARE	SQUARE	SQUARE	SQUARE	CORNER ROUNDING	SQUARE	SQUARE
D1/2	R1/8	D1/4	D1/4	D1/2	D1/8	D1/16	D1/16	D1/16	D1/4	D2.0 (.0787)	D2.0 (.0787)
D1-1/2	R3/4	D2	D1-1/2	D1-1/2	D1	D3/4 D2	D1/4	D1/4	D5/8	D45.0 (1.772)	D45.0 (1.772)
C820	C821	C822	C823	C824	C825	C826	C827		C828	C829	C830
LONG LENGTH COARSE PITCH CENTER CUTTING	REGULAR & LONG LENGTH COARSE PITCH	ROUGHING & FINISHING CENTER CUTTING	REGULAR LENGTH ALUMINUM CENTER CUTTING	MEDIUM & LONG LENGTH ALUMINUM CENTER CUTTING	KEYWAY CUTTING	REGULAR LENGTH	SHORT LENGTH THROW AWAY	LONG LENGTH THROW AWAY		REGULAR LENGTH	REGULAR LENGTH
Uncoated	Uncoated	Uncoated	Uncoated	Uncoated	Uncoated	Uncoated	Uncoated	Uncoated	Uncoated	Uncoated	Uncoated
HSSCo8	HSSCo8	HSSCo8	HSSCo8	HSSCo8	HSSCo8	HSSCo8	HSSCo8	HSSCo8	HSSCo8 & HSS	HSSCo8 & HSS	HSSCo8 & HSS



◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	1
◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	2
◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	3
◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	4
○	○	○	○	○	○	○	○	○	○	○	○	5
◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	6 P
◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	7
○	○	○	○	○	○	○	○	○	○	○	○	8
◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	9
◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	10
○	○	○	○	○	○	○	○	○	○	○	○	11
						○						12
						○						13 M
						○						14
						○						15
						○						16
						○						17 K
						○						18
						○						19
						○						20
○	○	○	◎	◎	○		○	○	○	○	○	21
○	○	○	◎	◎	○		○	○	○	○	○	22
○	○	○	◎	◎	○		○	○	○	○	○	23
○	○	○	◎	◎	○		○	○	○	○	○	24
○	○	○	◎	◎	○		○	○	○	○	○	25
○	○	○	○	○	○		○	○	○	○	○	26 N
○	○	○	○	○	○		○	○	○	○	○	27
○	○	○	○	○	○		○	○	○	○	○	28
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												39 H
												40
												41





Global Cutting Tool Leader **YG-1**



MILLING



Being the best through innovation

# CBN (Cubic Boron Nitride) END MILLS

- Cubic Boron Nitride, Machining High Hardened Steels up to HRc70,  
Mirror Finish

SELECTION GUIDE



# CBN END MILLS

- Cubic Boron Nitride, Machining High Hardened Steels up to HRC70, Mirror Finish



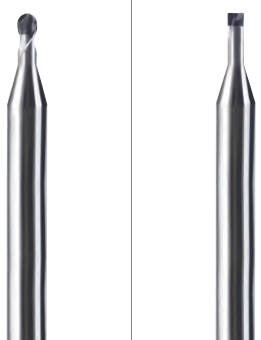
Please visit [globalyg1.com/mat](http://globalyg1.com/mat) for material search

◎ : Excellent ○ : Good

Recommended cutting conditions : p. C47

ISO	VDI 3323	Material Description	Composition / Structure / Heat Treatment	HB	HRC	
P	1	Non-alloy steel	About 0.15% C Annealed	125		
	2		About 0.45% C Annealed	190	13	
	3		About 0.45% C Quenched & Tempered	250	25	
	4		About 0.75% C Annealed	270	28	
	5		About 0.75% C Quenched & Tempered	300	32	
	6	Low alloy steel	Annealed	180	10	
	7		Quenched & Tempered	275	29	
	8		Quenched & Tempered	300	32	
	9		Quenched & Tempered	350	38	
	10		High alloyed steel, and tool steel	Annealed	200	15
	11			Quenched & Tempered	325	35
M	12	Stainless steel	Ferritic / Martensitic Annealed	200	15	
	13		Martensitic Quenched & Tempered	240	23	
	14		Austenitic	180	10	
K	15	Grey cast iron	Pearlitic / ferritic	180	10	
	16		Pearlitic (Martensitic)	260	26	
	17	Nodular cast iron	Ferritic	160	3	
	18		Pearlitic	250	25	
	19		Ferritic	130		
	20	Malleable cast iron	Pearlitic	230	21	
N	21	Aluminum-wrought alloy	Not Curable	60		
	22		Curable Hardened	100		
	23	Aluminum-cast, alloyed	≤ 12% Si, Not Curable	75		
	24		≤ 12% Si, Curable Hardened	90		
	25		> 12% Si, Not Curable	130		
	26	Copper and Copper Alloys (Bronze / Brass)	Cutting Alloys, PB>1%	110		
	27		CuZn, CuSnZn (Brass)	90		
	28		CuSn, lead-free copper and electrolytic copper	100		
	29		Non Metallic Materials	Duroplastic, Fiber Reinforced Plastic		
	30	Rubber, Wood, etc.				
S	31	Heat Resistant Super Alloys	Fe Based Annealed	200	15	
	32		Cured	280	30	
	33		Annealed	250	25	
	34		Cured	350	38	
	35	Titanium Alloys	Ni or Co Based Cast	320	34	
	36		Pure Titanium	400 Rm		
	37		Alpha + Beta Alloys Hardened	1050 Rm		
H	38	Hardened steel	Hardened	550	55	
	39		Hardened	630	60	
	40	Chilled Cast Iron	Cast	400	42	
	41	Hardened Cast Iron	Hardened	550	55	

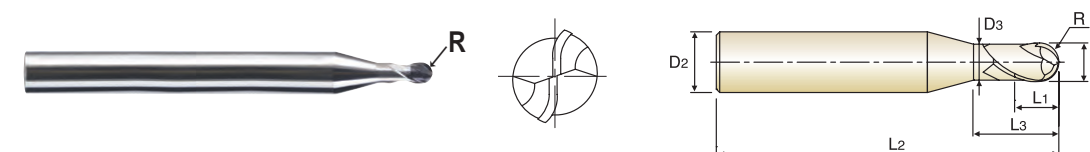
SERIES	ESB94	ESD02
FLUTE	2	2
HELIX ANGLE	30°	0°
CUTTING EDGE SHAPE	BALL NOSE	CORNER RADIUS
SIZE MIN	R0.2	D0.5
SIZE MAX	R1.5	D2.0
PAGE	C45	C46
	Uncoated	Uncoated



PLAIN SHANK ESB94 SERIES

## CBN, 2 FLUTE BALL NOSE

- ▶ Higher accuracy, better finishes, longer tool life.
- ▶ Special geometry improves tool rigidity at high Speed.
- ▶ Tighter radius tolerance (±0.005mm) assures higher accuracy.



EDP No.	Radius of Ball Nose R (±0.005)	Mill Diameter		Shank Diameter D2	Length of Cut L1	Length Below Shank L3	Overall Length L2	Neck Diameter D3
		Metric	Inch					
		D1						
ESB94004012	R0.2	0.4	.0157	4	0.3	1.2	50	0.37
ESB94005015	R0.25	0.5	.0197	4	0.4	1.5	50	0.46
ESB94006015	R0.3	0.6	.0236	4	0.5	1.5	50	0.56
ESB94008020	R0.4	0.8	.0315	4	0.6	2	50	0.76
ESB94010025	R0.5	1.0	.0394	4	0.6	2.5	50	0.95
ESB94010040	R0.5	1.0	.0394	4	0.6	4	50	0.95
ESB94010060	R0.5	1.0	.0394	4	0.6	6	50	0.95
ESB94012030	R0.6	1.2	.0472	4	0.8	3	50	1.15
ESB94015030	R0.75	1.5	.0591	4	0.95	3	50	1.45
ESB94015040	R0.75	1.5	.0591	4	0.95	4	50	1.45
ESB94015060	R0.75	1.5	.0591	4	0.95	6	50	1.45
ESB94020050	R1.0	2.0	.0787	4	1.2	5	50	1.95
ESB94020060	R1.0	2.0	.0787	4	1.2	6	50	1.95
ESB94030060	R1.5	3.0	.1181	4	1.8	6	50	2.85

Radius Tolerance(mm)	Shank Dia. Tolerance
±0.005	h5

◎ : Excellent ○ : Good

ISO	P										M				K					
	Non-alloy steel					Low alloy steel					High alloyed steel, and tool steel				Stainless steel		Grey cast iron		Nodular cast iron	Malleable cast iron
Material Description	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc	13	25	28	32	30	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend																				

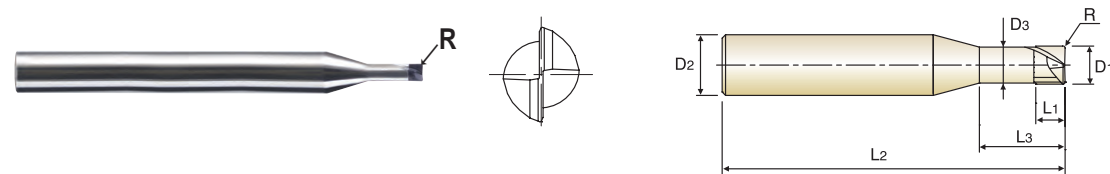
ISO	N				S						H										
	Aluminum-wrought alloy		Aluminum-cast, alloyed		Copper and Copper Alloys (Bronze / Brass)		Non Metallic Materials		Heat Resistant Super Alloys			Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron					
Material Description	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend																		◎	◎		◎



PLAIN SHANK ESD02 SERIES

### CBN, 2 FLUTE CORNER RADIUS

- ▶ Higher accuracy, better finishes, longer tool life.
- ▶ Special geometry improves tool rigidity at high Speed.
- ▶ Tighter radius tolerance ( $\pm 0.005\text{mm}$ ) assures higher accuracy.



Unit : mm

EDP No.	Radius of Ball Nose R ( $\pm 0.005$ )	Mill Diameter		Shank Diameter D2	Length of Cut L1	Length Below Shank L3	Overall Length L2	Neck Diameter D3
		Metric D1	Inch					
ESD02005052	R0.05	0.5	.0197	4	0.3	2	50	0.46
ESD02005053	R0.05	0.5	.0197	4	0.3	3	50	0.46
ESD02010053	R0.05	1.0	.0394	4	0.7	3	50	0.95
ESD02010055	R0.05	1.0	.0394	4	0.7	5	50	0.95
ESD02010103	R0.1	1.0	.0394	4	0.7	3	50	0.95
ESD02010105	R0.1	1.0	.0394	4	0.7	5	50	0.95
ESD02015105	R0.1	1.5	.0591	4	1.0	5	50	1.45
ESD02015108	R0.1	1.5	.0591	4	1.0	8	50	1.45
ESD02015205	R0.2	1.5	.0591	4	1.0	5	50	1.45
ESD02015208	R0.2	1.5	.0591	4	1.0	8	50	1.45
ESD02020106	R0.1	2.0	.0787	4	1.2	6	50	1.95
ESD02020100	R0.1	2.0	.0787	4	1.2	10	50	1.95
ESD02020206	R0.2	2.0	.0787	4	1.2	6	50	1.95
ESD02020200	R0.2	2.0	.0787	4	1.2	10	50	1.95

Corner Radius Tolerance(mm)	Shank Dia. Tolerance
$\pm 0.005$	h5

◎ : Excellent ○ : Good

ISO	P										M				K						
	Non-alloy steel					Low alloy steel					High alloyed steel, and tool steel				Stainless steel		Grey cast iron		Nodular cast iron		Malleable cast iron
Material Description	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
VDI 3323																					
HRc	13	25	28	32	30	10	29	32	38	15	35	15	23	10	10	26	3	25		21	
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230	
Recommend																					

ISO	N						S						H								
	Aluminum-wrought alloy		Aluminum-cast, alloyed		Copper and Copper Alloys (Bronze / Brass)		Non Metallic Materials		Heat Resistant Super Alloys			Titanium Alloys			Hardened steel	Chilled Cast Iron	Hardened Cast Iron				
Material Description	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
VDI 3323																					
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend																		◎	◎		◎

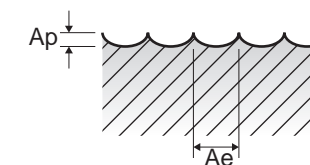


RECOMMENDED CUTTING CONDITIONS

### ESB94 SERIES 2 FLUTE BALL NOSE

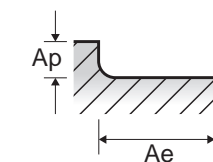
SFM(Vc) = ft./min.  
IPT(fz) = in./tooth  
RPM = rev./min.  
IPM(Feed) = in./min.

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø)								
						0.4	0.5	0.6	0.8	1.0	1.2	1.5	2.0	3.0
H	38.2-39.1	Non-alloy steel	Ø0.4~Ø0.8 = .0002"	Ø0.4~Ø0.8 = .0002"	SFM (Vc)	205	260	310	410	515	620	775	825	820
			Ø1.0~Ø3.0 = .0004"	Ø1.0~Ø3.0 = .0004"	IPT (fz)	.0005	.0006	.0008	.0008	.0012	.0012	.0012	.0016	.0016
					RPM	50000	50000	50000	50000	50000	50000	50000	40000	26500
	39.2-39.3		Ø0.4~Ø0.8 = .0002"	Ø0.4~Ø0.8 = .0002"	SFM (Vc)	205	260	310	410	515	620	775	660	665
			Ø1.0~Ø3.0 = .0004"	Ø1.0~Ø3.0 = .0004"	IPT (fz)	.0005	.0006	.0008	.0008	.0012	.0012	.0012	.0015	.0016
					RPM	50000	50000	50000	50000	50000	50000	50000	32000	21500
41	High alloyed steel, and tool steel	Ø0.4~Ø0.8 = .0002"	Ø0.4~Ø0.8 = .0002"	SFM (Vc)	205	260	310	410	515	620	775	825	820	
		Ø1.0~Ø3.0 = .0004"	Ø1.0~Ø3.0 = .0004"	IPT (fz)	.0005	.0006	.0008	.0008	.0012	.0012	.0012	.0016	.0016	
				RPM	50000	50000	50000	50000	50000	50000	50000	40000	26500	
			IPM (FEED)	47	59	79	79	118	118	118	126	83		



### ESD02 SERIES 2FLUTE CORNER RADIUS

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø)			
						0.5	1.0	1.5	2.0
H	38.2-39.1	Hardened steel	Ø0.5 = .0039"	Ø0.5 = .0004"	SFM (Vc)	260	445	465	455
			Ø1.0 = .0079"	Ø1.0 = .0004"	IPT (fz)	.0003	.0005	.0007	.0008
			Ø1.5 = .0158"	Ø1.5 = .0008"	RPM	50000	43000	30000	22000
	39.2-39.3		Ø2.0 = .0236"	Ø2.0 = .0012"	IPM (FEED)	28	39	39	35
			Ø0.5 = .0024"	Ø0.5 = .0020"	SFM (Vc)	260	310	295	290
			Ø1.0 = .0039"	Ø1.0 = .0039"	IPT (fz)	.0002	.0005	.0007	.0011
41	Hardened Cast Iron	Ø1.5 = .0079"	Ø1.5 = .0079"	RPM	50000	30000	19000	14000	
		Ø2.0 = .0118"	Ø2.0 = .0118"	IPM (FEED)	22	28	28	32	
		Ø0.5 = .0039"	Ø0.5 = .0004"	SFM (Vc)	205	260	310	410	
		Ø1.0 = .0079"	Ø1.0 = .0004"	IPT (fz)	.0005	.0006	.0008	.0008	
		Ø1.5 = .0158"	Ø1.5 = .0008"	RPM	50000	50000	50000	50000	
		Ø2.0 = .0236"	Ø2.0 = .0012"	IPM (FEED)	47	59	79	79	







Being the best through innovation



Global Cutting Tool Leader **YG-1**



CARBIDE INSERT & HOLDER

MILLING

***i-Xmill* END MILLS**

- Various Applications Type of Inserts Available for General Steels, Pre-Hardened Steels, High Hardened Steels, Stainless Steels and Graphite

SELECTION GUIDE

HSS  
CBN END MILLS  
i-Xmill END MILLS  
i-SMART MODULAR END MILLS  
X5070 END MILLS  
4G MILL END MILLS  
X-POWER PRO END MILLS  
TitaNox-POWER END MILLS  
JET-POWER END MILLS  
V7 PLUS A END MILLS  
V7 MILL INOX  
ALU-POWER HPC END MILLS  
ALU-POWER END MILLS  
D-POWER GRAPHITE END MILLS  
STANDARD CARBIDE  
ONLY ONE COATED PM60 END MILLS  
SINE-POWER  
TANK-POWER END MILLS  
STANDARD COBALT & HSS  
TECHNICAL DATA

ISO	VDI 3323	Material Description	Composition / Structure / Heat Treatment	HB	HRc	
P	1	Non-alloy steel	About 0.15% C Annealed	125		
	2		About 0.45% C Annealed	190	13	
	3		About 0.45% C Quenched & Tempered	250	25	
	4		About 0.75% C Annealed	270	28	
	5		About 0.75% C Quenched & Tempered	300	32	
	6	Low alloy steel	Annealed	180	10	
	7		Quenched & Tempered	275	29	
	8		Quenched & Tempered	300	32	
	9		Quenched & Tempered	350	38	
	10		High alloyed steel, and tool steel	Annealed	200	15
	11	Quenched & Tempered		325	35	
M	12	Stainless steel	Ferritic / Martensitic Annealed	200	15	
	13		Martensitic Quenched & Tempered	240	23	
	14		Austenitic	180	10	
K	15	Grey cast iron	Pearlitic / ferritic	180	10	
	16		Pearlitic (Martensitic)	260	26	
	17	Nodular cast iron	Ferritic	160	3	
	18		Pearlitic	250	25	
	19	Malleable cast iron	Ferritic	130		
	20		Pearlitic	230	21	
N	21	Aluminum-wrought alloy	Not Curable	60		
	22		Curable Hardened	100		
	23		≤ 12% Si, Not Curable	75		
	24	Aluminum-cast, alloyed	≤ 12% Si, Curable Hardened	90		
	25		> 12% Si, Not Curable	130		
	26		Copper and Copper Alloys (Bronze / Brass)	CuZn, CuSnZn (Brass)	110	
	27				90	
	28		CuSn, lead-free copper and electrolytic copper	100		
	29.2	Non Metallic Materials	Duroplastic, Fiber Reinforced Plastic			
	30		Rubber, Wood, etc.			
S	31	Heat Resistant Super Alloys	Fe Based Annealed	200	15	
	32		Cured	280	30	
	33		Annealed	250	25	
	34		Ni or Co Based Cured	350	38	
	35	Cast	320	34		
	36	Titanium Alloys	Pure Titanium	400 Rm		
	37		Alpha + Beta Alloys Hardened	1050 Rm		
H	38	Hardened steel	Hardened	550	55	
	39		Hardened	630	60	
	40	Chilled Cast Iron	Cast	400	42	
	41	Hardened Cast Iron	Hardened	550	55	

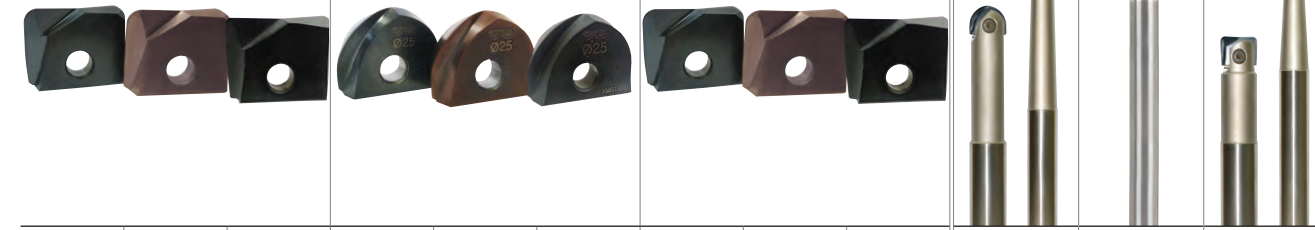
CARBIDE INSERT & HOLDER **i-Xmill** END MILLS

Available for General Steels, Pre-Hardened Steels, High Hardened Steels, Stainless Steel and Graphite

SERIES	Inch		
	XB1A	XB2C	XB1D
FLUTE	2	2	2
HELIX ANGLE	-	-	-
CUTTING EDGE SHAPE	BALL NOSE	BALL NOSE	BALL NOSE
SIZE MIN	R5/32	R5/32	R5/32
SIZE MAX	R5/8	R5/8	R5/8
PAGE	C52		
	for GENERAL PURPOSE	for HARDENED STEEL	for GRAPHITE
	AlTiN	Z-Coating	Diamond



XR1A	XR2A	XR1D	XB1N	XB2N	XBAD	XRAA	XRBA	XRAD	Inch & Metric		
									ZBS ZBT	ZBC	ZRS ZRT
2	2	2	2	2	2	2	2	2	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-
CORNER RADIUS D5/16	CORNER RADIUS D5/16	CORNER RADIUS D5/16	BALL NOSE R4.0	BALL NOSE R4.0	BALL NOSE R4.0	CORNER RADIUS D8.0	CORNER RADIUS D8.0	CORNER RADIUS D8.0	BALL NOSE	BALL NOSE	CORNER RADIUS
D1-1/4	D1-1/4	D1-1/4	R16.0	R16.0	R16.0	D32.0	D32.0	D32.0	-	-	-
C55			C57			C60-C61			in C53 / mm C58	in C54 / mm C59	in C56 / mm C62
for GENERAL PURPOSE	for HARDENED STEEL	for GRAPHITE	for GENERAL PURPOSE	for HARDENED STEEL	for GRAPHITE	for GENERAL PURPOSE	for HARDENED STEEL	for GRAPHITE	STRAIGHT & TAPER NECK	STRAIGHT NECK	STRAIGHT & TAPER NECK
AlTiN	Z-Coating	Diamond	AlTiN	Z-Coating	Diamond	AlTiN	Z-Coating	Diamond	Steel	Carbide	Steel



⊙			⊙			⊙						1
⊙			⊙			⊙						2
⊙			⊙			⊙						3
⊙			⊙			⊙						4
⊙			⊙			⊙						5
⊙			⊙			⊙						6
⊙			⊙			⊙						7
⊙			⊙			⊙						8
	⊙			⊙			⊙					9
	○			○			○					10
	○			○			○					11
⊙			⊙			⊙						12
⊙			⊙			⊙						13
⊙			⊙			⊙						14
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												41

HSS  
CBN END MILLS  
i-Xmill END MILLS  
i-SMART MODULAR END MILLS  
X5070 END MILLS  
4G MILL END MILLS  
X-POWER PRO END MILLS  
TitaNox-POWER END MILLS  
JET-POWER END MILLS  
V7 PLUS A END MILLS  
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TECHNICAL DATA



HSS

CBN END MILLS

i-Xmill END MILLS

i-SMART MODULAR END MILLS

X5070 END MILLS

4G MILL END MILLS

X-POWER PRO END MILLS

TitaNox-POWER END MILLS

JET-POWER END MILLS

V7 PLUS A END MILLS

V7 MILL INOX

ALU-POWER HPC END MILLS

ALU-POWER END MILLS

D-POWER GRAPHITE END MILLS

STANDARD CARBIDE

ONLY ONE COATED PM60 END MILLS

SINE-POWER

TANK-POWER END MILLS

STANDARD COBALT & HSS

TECHNICAL DATA



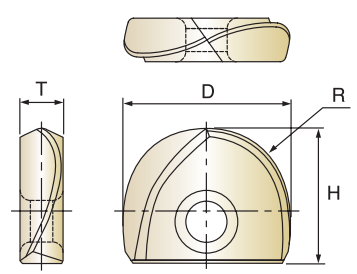
**XB1A** SERIES

**XB2C** SERIES

**XB1D** SERIES

**i-Xmill BALL INSERTS**

- ▶ Exchangeable End Mill for economic use
- ▶ Three Types of Inserts are available
  - For General Purpose (~HRc50)
  - For Hardened Material (HRc40~HRc65)
  - For Graphite
- ▶ Special Geometry and extremely abrasive resistant Coating for Excellent Performance



cutting conditions : p.C64

Unit :Inch

EDP No.			Radius of Ball Nose	Mill Diameter	Height	Thickness
For General Material	For Hardened Material	For Graphite				
			R	D	H	T
<a href="#">XB1A020</a>	<a href="#">XB2C020</a>	<a href="#">XB1D020</a>	R5/32	5/16	5/16	.094
<a href="#">XB1A024</a>	<a href="#">XB2C024</a>	<a href="#">XB1D024</a>	R3/16	3/8	3/8	.106
<a href="#">XB1A032</a>	<a href="#">XB2C032</a>	<a href="#">XB1D032</a>	R1/4	1/2	7/16	.126
<a href="#">XB1A040</a>	<a href="#">XB2C040</a>	<a href="#">XB1D040</a>	R5/16	5/8	1/2	.165
<a href="#">XB1A048</a>	<a href="#">XB2C048</a>	<a href="#">XB1D048</a>	R3/8	3/4	5/8	.205
<a href="#">XB1A100</a>	<a href="#">XB2C100</a>	<a href="#">XB1D100</a>	R1/2	1	3/4	.244
<a href="#">XB1A116</a>	<a href="#">XB2C116</a>	<a href="#">XB1D116</a>	R5/8	1-1/4	31/32	.283

• The ball radius tolerance is ±.0004" and the set-up accuracy is ±.0008"

◎ : Excellent ○ : Good

ISO	P											M			K								
	Non-alloy steel					Low alloy steel						Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron				
Material Description	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20			
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20			
HRc	13	25	28	32	32	10	29	32	38	15	35	15	23	10	10	26	3	25	42	55			
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230			
<b>XB1A</b>	◎	◎	◎	◎	◎	◎	◎	◎		◎	○				◎	◎	◎	◎	◎	◎			
<b>XB2C</b>																							
<b>XB1D</b>																							
ISO	N									S						H							
Material Description	Aluminum-wrought alloy			Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials			Heat Resistant Super Alloys						Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41		
HRc	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41		
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400Rm	1050Rm	550	630	400	550		
<b>XB1A</b>																							
<b>XB2C</b>																							
<b>XB1D</b>	○	○	○	○							◎												

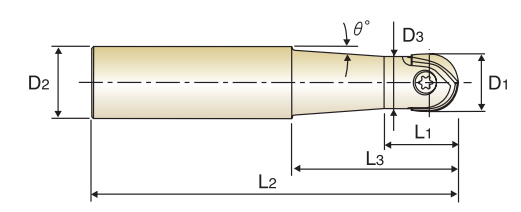


**ZBT** SERIES

**ZBS** SERIES

**i-Xmill BALL HOLDERS - STEEL**

- ▶ Premium alloy steel with excellent strength.
- ▶ Precise shank, Tolerance (h6).
- ▶ Nickel plated, to prevent corrosion and improve lubricity.

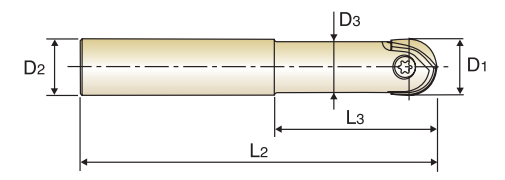


**Taper neck Type**

Unit :Inch

EDP No.	Mill Diameter	Shank Diameter	Length of Cut	Length Below Shank	Overall Length	Neck Diameter	Interference Angle	Length Type	Wrench No.	Screw No.
	D1	D2	L1	L3	L2	D3	θ°			
<a href="#">ZBT1020</a>	5/16	1/2	1/2	1-5/8	3-5/8	9/32	4° 33'	Short	TWF07	TX0807
<a href="#">ZBT2020</a>			1	2-1/2	4-3/8		3° 25'	Regular		
<a href="#">ZBT1024</a>	3/8	1/2	5/8	1-1/2	3-9/16	11/32	3° 49'	Short	TWF08	TX1008
<a href="#">ZBT2024</a>			1-1/4	2-5/16	4-3/8		3° 08'	Regular		
<a href="#">ZBT1032</a>	1/2	5/8	11/16	2-3/16	4-3/8	7/16	2° 49'	Short	TWF10	TX1210
<a href="#">ZBT1040</a>	5/8	3/4	13/16	2-9/16	5	9/16	2° 25'	Short	TWF15	TX1615
<a href="#">ZBT1048</a>	3/4	1	1	3-1/8	6	43/64	3° 53'	Short	● TWB20	TX2020
<a href="#">ZBT1100</a>	1	1-1/4	1-1/4	3-9/16	7	29/32	3° 45'	Short	● TWB25	TX2525
<a href="#">ZBT1116</a>	1-1/4	1-1/4	1-9/16	4-3/8	8	1-1/16	1° 30'	Short	● TWB30	TX3030

\* ● Required to use T-HANDLE (TWH600)



**Straight neck Type**

Unit :Inch

EDP No.	Mill Diameter	Shank Diameter	Length Below Shank	Overall Length	Neck Diameter	Length Type	Wrench No.	Screw No.
	D1	D2	L3	L2	D3			
<a href="#">ZBS1032</a>	1/2	1/2	1-3/8	3-1/2	7/16	Short	TWF10	TX1210
<a href="#">ZBS2032</a>			2-3/16	4-3/8		Regular		
<a href="#">ZBS1040</a>	5/8	5/8	1-3/8	3-3/4	9/16	Short	TWF15	TX1615
<a href="#">ZBS2040</a>			2-9/16	5		Regular		
<a href="#">ZBS1048</a>	3/4	3/4	1-9/16	4-3/8	43/64	Short	● TWB20	TX2020
<a href="#">ZBS2048</a>			3	6		Regular		
<a href="#">ZBS1100</a>	1	1	1-3/4	5	29/32	Short	● TWB25	TX2525
<a href="#">ZBS2100</a>			3-9/16	6-3/4		Regular		
<a href="#">ZBS1116</a>	1-1/4	1-1/4	2-1/4	5-1/2	1-1/16	Short	● TWB30	TX3030
<a href="#">ZBS2116</a>			4-3/8	7-3/4		Regular		

\* ● Required to use T-HANDLE (TWH600)

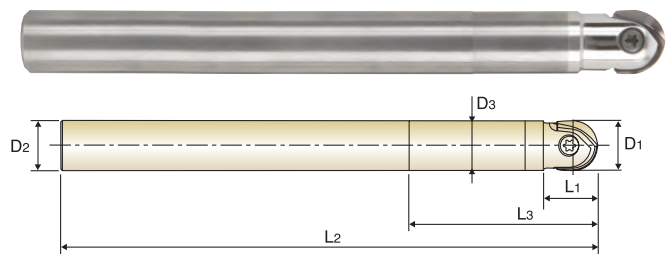
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ZBC SERIES

**i-Xmill BALL HOLDERS - CARBIDE**

- ▶ Equal tool rigidity like solid carbide end mill that makes the stable and high finishing machining with less vibration.
- ▶ The high finishing machining for the deeper part of mold.
- ▶ The tool's life of carbide ball holders is longer than steel holder.
- ▶ Shrink Fit Holding system can be applied.
- ▶ Upon request, the worn holder is able to be regenerated.



Unit :Inch

EDP No.	Mill Diameter	Shank Diameter	Length of Cut	Length Below Shank	Overall Length	Neck Diameter	Length Type	Wrench No.	Screw No.
	D1	D2	L1	L3	L2	D3			
ZBCB020	5/16	5/16	1/2	1-9/16	5-1/8	19/64	Long	TWF07	TX0807
ZBCB024	3/8	3/8	5/8	2	5-1/2	23/64	Long	TWF08	TX1008
ZBCB032	1/2	1/2	11/16	2-3/8	5-15/16	31/64	Long	TWF10	TX1210
ZBCB040	5/8	5/8	13/16	3-3/16	7-15/16	39/64	Long	TWF15	TX1615
ZBCD040				9-7/8					
ZBCB048	3/4	3/4	1	3-3/16	7-15/16	47/64	Long	TWB20	TX2020
ZBCC048				4	9-7/8				
ZBCB100	1	1	1-3/16	4-3/4	9-7/8	63/64	Long	TWB25	TX2525
ZBCB116	1-1/4	1-1/4	1-9/16	5-15/16	11-7/8	1-15/64	Long	TWB30	TX3030

\* ● Required to use T-HANDLE (TWH600)



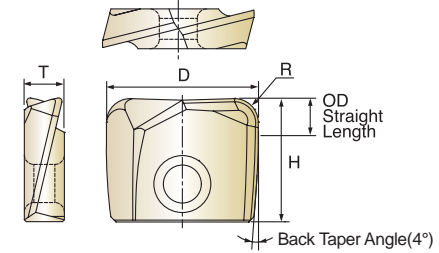
XR1A SERIES

XR2A SERIES

XR1D SERIES

**i-Xmill CORNER RADIUS INSERTS**

- ▶ The optimum geometry of the tool to achieve the better reliability and less vibration and cutting load.
- ▶ Interchangeability with i-Xmill ball holder, but the precise cutting is possible with i-Xmill corner radius holder due to higher stability and strength of tool.
- ▶ The various and wide cutting range makes it possible to machine over the roughing and finishing.
- ▶ Special coating makes high hardness with high thermal stability against oxidation.
- ▶ Three Types of Inserts are available
  - For General Purpose (~HRc50)
  - For Hardened Material (HRc40~HRc65)
  - For Graphite



cutting conditions : p.C65

Unit :Inch

EDP No.			Corner Radius	Mill Diameter	Height	Thickness	OD Straight Length
For General Material	For Hardened Material	For Graphite					
			R	D	H	T	
XR1A020 01	XR2A020 01	XR1D020 01	R1/64	5/16	5/16	.094	.079
XR1A020 02	XR2A020 02	XR1D020 02	R1/32				
XR1A024 01	XR2A024 01	XR1D024 01	R1/64	3/8	3/8	.106	.118
XR1A024 02	XR2A024 02	XR1D024 02	R1/32				
XR1A024 04	XR2A024 04	XR1D024 04	R1/16	1/2	7/16	.126	.118
XR1A032 01	XR2A032 01	XR1D032 01	R1/64				
XR1A032 02	XR2A032 02	XR1D032 02	R1/32	5/8	1/2	.165	.157
XR1A032 04	XR2A032 04	XR1D032 04	R1/16				
XR1A040 01	XR2A040 01	XR1D040 01	R1/64	3/4	5/8	.205	.157
XR1A040 02	XR2A040 02	XR1D040 02	R1/32				
XR1A040 04	XR2A040 04	XR1D040 04	R1/16	1	3/4	.244	.157
XR1A040 08	XR2A040 08	XR1D040 08	R1/8				
XR1A048 01	XR2A048 01	XR1D048 01	R1/64	1-1/4	29/32	.283	.157
XR1A048 02	XR2A048 02	XR1D048 02	R1/32				
XR1A048 04	XR2A048 04	XR1D048 04	R1/16	1-1/4	29/32	.283	.157
XR1A048 08	XR2A048 08	XR1D048 08	R1/8				
XR1A100 01	XR2A100 01	XR1D100 01	R1/64	1	3/4	.244	.157
XR1A100 02	XR2A100 02	XR1D100 02	R1/32				
XR1A100 04	XR2A100 04	XR1D100 04	R1/16	1-1/4	29/32	.283	.157
XR1A100 08	XR2A100 08	XR1D100 08	R1/8				
XR1A116 01	XR2A116 01	XR1D116 01	R1/64	1-1/4	29/32	.283	.157
XR1A116 02	XR2A116 02	XR1D116 02	R1/32				
XR1A116 04	XR2A116 04	XR1D116 04	R1/16	1-1/4	29/32	.283	.157
XR1A116 08	XR2A116 08	XR1D116 08	R1/8				

- The other corner radius values are available on request.
- The corner radius tolerance is ±.0006" and the set-up accuracy is ±.0008"

◎ : Excellent ○ : Good

ISO	P										M			K							
	Non-alloy steel					Low alloy steel					High alloyed steel and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
Material Description	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
VDI 3323	13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25	3	25	21	
HRc	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230	
HB																					
XR1A	◎	◎	◎	◎	◎	◎	◎	◎		◎	◎	◎		◎	◎	◎	◎	◎	◎	◎	
XR2A										◎	◎										
XR1D																					
ISO	N									S					H						
Material Description	Aluminum-wrought alloy			Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400Rm	1050Rm	550	630	400	550
XR1A																					
XR2A																		◎			
XR1D	◎	◎	◎	◎					◎												



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ZRT SERIES  
ZRS SERIES

**i-Xmill CORNER RADIUS HOLDERS - STEEL**

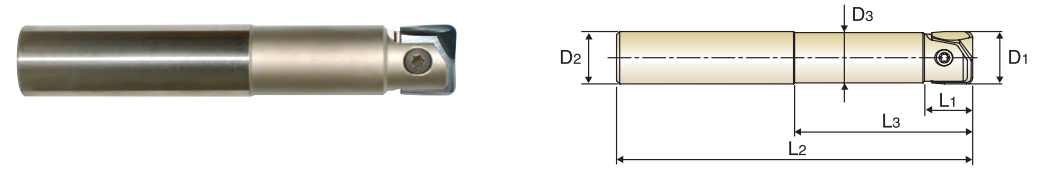
- ▶ Premium alloy steel with excellent strength.
- ▶ Precise shank, Tolerance (h6).
- ▶ Nickel plated, to prevent corrosion and improve lubricity.



**Taper neck Type**

Unit : Inch

EDP No.	Mill Diameter	Shank Diameter	Length of Cut	Length Below Shank	Overall Length	Neck Diameter	Interference Angle	Length Type	Wrench No.	Screw No.
	D1	D2	L1	L3	L2	D3	θ°			
ZRT1032	5/16	1/2	13/32	7/8	4	17/64	13° 58'	Regular	TWF07	TX0807
ZRT2032				2	5-1/8		4° 12'	Long		
ZRT2410	3/8	1/2	17/32	1	4	5/16	9° 27'	Regular	TWF08	TX1008
ZRT2420				2	5-15/16		3° 6'	Long		
ZRT3220	1/2	5/8	5/8	2-3/8	6-5/16	27/64	3° 19'	Long	TWF10	TX1210



**Straight neck Type**

Unit : Inch

EDP No.	Mill Diameter	Shank Diameter	Length of Cut	Length Below Shank	Overall Length	Neck Diameter	Length Type	Wrench No.	Screw No.
	D1	D2	L1	L3	L2	D3			
ZRS1032	1/2	1/2	17/32	1-3/16	4-3/8	7/16	Regular	TWF10	TX1210
ZRS1040	5/8	5/8	5/8	2	5-1/8	19/32	Regular	TWF15	TX1615
ZRS2040				2-9/16	6-1/2		Intermediate		
ZRS1048	3/4	3/4	23/32	2-3/8	5-1/2	23/32	Regular	TWB20	TX2020
ZRS2048				3-1/8	7-1/8		Intermediate		
ZRS1100	1	1	29/32	2-3/4	5-15/16	31/32	Regular	TWB25	TX2525
ZRS2100				3-9/16	8		Intermediate		
ZRS1116	1-1/4	1-1/4	1-1/8	3-1/8	6-5/16	1-7/32	Regular	TWB30	TX3030
ZRS2116				4	8-11/16		Intermediate		

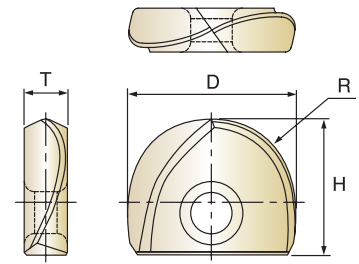
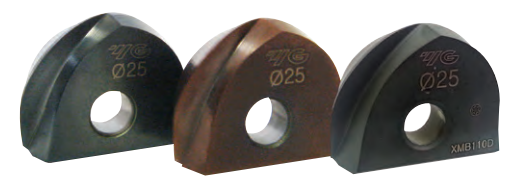
\* ● Required to use T-HANDLE (TWH600)



XB1N SERIES  
XB2N SERIES  
XBAD SERIES

**i-Xmill BALL INSERTS**

- ▶ Indexable Ball End Mill for economic use
- ▶ Three Types of Inserts are available
  - For General Purpose (~HRc50)
  - For Hardened Material (HRc40~HRc65)
  - For Graphite
- ▶ Special Geometry and extremely abrasive resistant Coating for Excellent Performance



cutting conditions : p.C64

Unit : mm

EDP No.			Radius of Ball Nose	Mill Diameter	Height	Thickness
For General Material	For Hardened Material	For Graphite	R	D	H	T
<a href="#">XB1N080</a>	<a href="#">XB2N080</a>	<a href="#">XBAD080</a>	R4.0	8.0	8	2.4
<a href="#">XB1N100</a>	<a href="#">XB2N100</a>	<a href="#">XBAD100</a>	R5.0	10.0	9.5	2.7
<a href="#">XB1N120</a>	<a href="#">XB2N120</a>	<a href="#">XBAD120</a>	R6.0	12.0	11	3.2
<a href="#">XB1N160</a>	<a href="#">XB2N160</a>	<a href="#">XBAD160</a>	R8.0	16.0	13	4.2
<a href="#">XB1N200</a>	<a href="#">XB2N200</a>	<a href="#">XBAD200</a>	R10.0	20.0	16	5.2
<a href="#">XB1N250</a>	<a href="#">XB2N250</a>	<a href="#">XBAD250</a>	R12.5	25.0	19.5	6.2
<a href="#">XB1N300</a>	<a href="#">XB2N300</a>	<a href="#">XBAD300</a>	R15.0	30.0	23.5	7.2
<a href="#">XB1N320</a>	<a href="#">XB2N320</a>	<a href="#">XBAD320</a>	R16.0	32.0	24.5	7.2

• The ball radius tolerance is ±0.01mm and the set-up accuracy is ±0.02mm

◎ : Excellent ○ : Good

ISO Material Description	P										M			K							
	Non-alloy steel					Low alloy steel					High alloyed steel and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
HRc	13	25	28	32	32	10	29	32	38	15	35	15	23	10	10	26	3	25	42	21	
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230	
XB1N	◎	◎	◎	◎	◎	◎	◎	◎									◎	◎	◎	◎	◎
XB2N										◎	○	◎									
XBAD																					

ISO Material Description	N										S					H					
	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron	
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc	15	30	25	38	34	15	30	25	38	34	15	30	25	38	34	15	30	25	38	34	15
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400Rm	1050Rm	550	630	400	550
XB1N																		○			
XB2N																		◎	◎	○	◎
XBAD																					



ZBT SERIES  
ZBS SERIES

**i-Xmill BALL HOLDERS - STEEL**

- ▶ Premium alloy steel with excellent strength.
- ▶ Precise shank, Tolerance (h6).
- ▶ Nickel plated, to prevent corrosion and improve lubricity.



**Taper neck Type**

Unit : mm

EDP No.	Mill Diameter	Shank Diameter	Length of Cut	Length Below Shank	Overall Length	Neck Diameter	Interference Angle	Length Type	Wrench No.	Screw No.
	D1	D2	L1	L3	L2	D3	θ°			
ZBT0801	8.0	12	12	35	90	7.2	4° 43'	Short	TWF07	TX0807
ZBT0802			25	55	110		3° 37'	Regular		
ZBT1001	10.0	12	15	35	90	9	2° 51'	Short	TWF08	TX1008
ZBT1002			30	55	110		2° 17'	Regular		
ZBT1201	12.0	16	17	55	110	10.5	3° 23'	Short	TWF10	TX1210
ZBT1601	16.0	20	20	65	125	14.5	2° 51'	Short	TWF15	TX1615
ZBT2001	20.0	25	25	75	145	18	3° 26'	Short	●TWB20	TX2020
ZBT2501	25.0	32	30	90	170	22.5	4° 03'	Short	●TWB25	TX2525
ZBT3001	30.0	32	40	110	195	27	1° 38'	Short	●TWB30	TX3030
ZBT3002	32.0									

\* ● Required to use T-HANDLE (TWH600)



**Straight neck Type**

Unit : mm

EDP No.	Mill Diameter	Shank Diameter	Length Below Shank	Overall Length	Neck Diameter	Length Type	Wrench No.	Screw No.
	D1	D2	L3	L2	D3			
ZBS1201	12.0	12	35	90	0.5	Short	TWF10	TX1210
ZBS1202			55	110		Regular		
ZBS1601	16.0	16	35	95	14.5	Short	TWF15	TX1615
ZBS1602			65	125		Regular		
ZBS2001	20.0	20	40	110	18	Short	●TWB20	TX2020
ZBS2002			75	145		Regular		
ZBS2501	25.0	25	45	125	22.5	Short	●TWB25	TX2525
ZBS2502			90	170		Regular		
ZBS3001	30.0	32	55	140	27	Short	●TWB30	TX3030
ZBS3002	32.0		110	195		Regular		

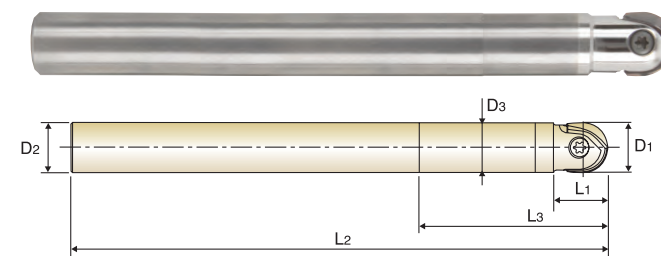
\* ● Required to use T-HANDLE (TWH600)



ZBC SERIES

**i-Xmill BALL HOLDERS - CARBIDE**

- ▶ Equal tool rigidity like solid carbide end mill that makes the stable and high finishing machining with less vibration.
- ▶ The high finishing machining for the deeper part of mold.
- ▶ The tool's life of carbide ball holders is longer than steel holder.
- ▶ Shrink Fit Holding system can be applied.
- ▶ Upon request, the worn holder is able to be regenerated.



Unit : mm

EDP No.	Mill Diameter	Shank Diameter	Length of Cut	Length Below Shank	Overall Length	Neck Diameter	Length Type	Wrench No.	Screw No.
	D1	D2	L1	L3	L2	D3			
ZBC1080	8.0	8	12	12	130	7.7	Long	TWF07	TX0807
ZBC1100	10.0	10	15	15	140	9.7	Long	TWF08	TX1008
ZBC1120	12.0	12	17	17	150	11.7	Long	TWF10	TX1210
ZBC1160	16.0	16	20	20	200	15.7	Long	TWF15	TX1615
ZBC1200	20.0	20	25	25	200	19.7	Long	●TWB20	TX2020
ZBC1250	25.0	25	30	30	200	24.7	Long	●TWB25	TX2525
ZBC1320	30.0	32	40	40	250	29.7	Long	●TWB30	TX3030
ZBC1320	32.0								

\* ● Required to use T-HANDLE (TWH600)

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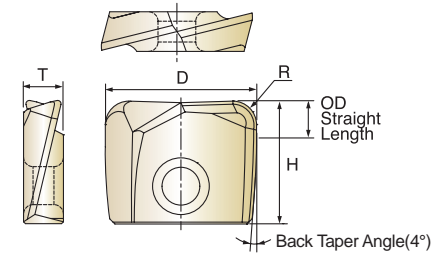
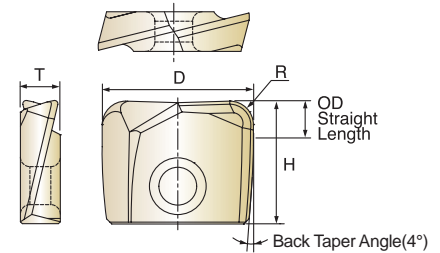
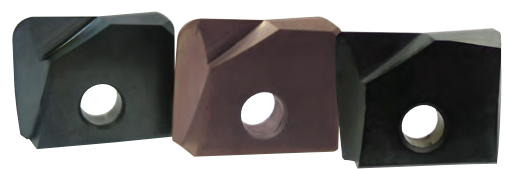
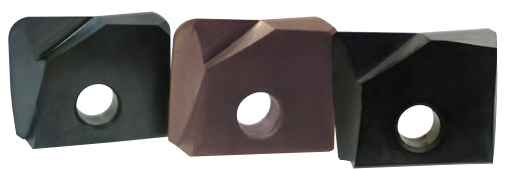


**i-Xmill CORNER RADIUS INSERTS**

**i-Xmill CORNER RADIUS INSERTS**

- ▶ The optimum geometry of the tool to achieve the better reliability and less vibration and cutting load.
- ▶ Interchangeability with i-Xmill ball holder, but the precise cutting is possible with i-Xmill corner radius holder due to higher stability and strength of tool.
- ▶ The various and wide cutting range makes it possible to machine over the roughing and finishing.
- ▶ Special coating makes high hardness with high thermal stability against oxidation.
- ▶ Three Types of Inserts are available
  - For General Purpose (~HRc50)
  - For Hardened Material (HRc40~HRc65)
  - For Graphite

- ▶ The optimum geometry of the tool to achieve the better reliability and less vibration and cutting load.
- ▶ Interchangeability with i-Xmill ball holder, but the precise cutting is possible with i-Xmill corner radius holder due to higher stability and strength of tool.
- ▶ The various and wide cutting range makes it possible to machine over the roughing and finishing.
- ▶ Special coating makes high hardness with high thermal stability against oxidation.
- ▶ Three Types of Inserts are available
  - For General Purpose (~HRc50)
  - For Hardened Material (HRc40~HRc65)
  - For Graphite



cutting conditions : p.C65

cutting conditions : p.C65

Unit : mm

Unit : mm

EDP No.	Corner Radius			Mill Diameter	Height	Thickness	OD Straight Length
	For General Material	For Hardened Material	For Graphite				
XRAA080 03	XRBA080 03	XRAD080 03	R0.3	8.0	8	2.4	2
XRAA080 05	XRBA080 05	XRAD080 05	R0.5				
XRAA080 10	XRBA080 10	XRAD080 10	R1.0				
XRAA100 05	XRBA100 05	XRAD100 05	R0.5	10.0	9.5	2.7	3
XRAA100 10	XRBA100 10	XRAD100 10	R1.0				
XRAA100 20	XRBA100 20	XRAD100 20	R2.0				
XRAA120 05	XRBA120 05	XRAD120 05	R0.5	12.0	11	3.2	3
XRAA120 10	XRBA120 10	XRAD120 10	R1.0				
XRAA120 20	XRBA120 20	XRAD120 20	R2.0				
XRAA130 05	XRBA130 05	XRAD130 05	R0.5	13.0	11.2	3.2	3
XRAA130 10	XRBA130 10	XRAD130 10	R1.0				
XRAA130 20	XRBA130 20	XRAD130 20	R2.0				
XRAA160 05	XRBA160 05	XRAD160 05	R0.5	16.0	13	4.2	4
XRAA160 10	XRBA160 10	XRAD160 10	R1.0				
XRAA160 20	XRBA160 20	XRAD160 20	R2.0				
XRAA170 05	XRBA170 05	XRAD170 05	R0.5	17.0	13	4.2	4
XRAA170 10	XRBA170 10	XRAD170 10	R1.0				
XRAA170 20	XRBA170 20	XRAD170 20	R2.0				

EDP No.	Corner Radius			Mill Diameter	Height	Thickness	OD Straight Length
	For General Material	For Hardened Material	For Graphite				
XRAA200 05	XRBA200 05	XRAD200 05	R0.5	20.0	16	5.2	4
XRAA200 10	XRBA200 10	XRAD200 10	R1.0				
XRAA200 20	XRBA200 20	XRAD200 20	R2.0				
XRAA210 05	XRBA210 05	XRAD210 05	R0.5	21.0	16	5.2	4
XRAA210 10	XRBA210 10	XRAD210 10	R1.0				
XRAA210 20	XRBA210 20	XRAD210 20	R2.0				
XRAA250 05	XRBA250 05	XRAD250 05	R0.5	25.0	19.5	6.2	4
XRAA250 10	XRBA250 10	XRAD250 10	R1.0				
XRAA250 20	XRBA250 20	XRAD250 20	R2.0				
XRAA260 05	XRBA260 05	XRAD260 05	R0.5	26.0	19.5	6.2	4
XRAA260 10	XRBA260 10	XRAD260 10	R1.0				
XRAA260 20	XRBA260 20	XRAD260 20	R2.0				
XRAA300 05	XRBA300 05	XRAD300 05	R0.5	30.0	23.5	7.2	4
XRAA300 10	XRBA300 10	XRAD300 10	R1.0				
XRAA300 20	XRBA300 20	XRAD300 20	R2.0				
XRAA320 05	XRBA320 05	XRAD320 05	R0.5	32.0	23.5	7.2	4
XRAA320 10	XRBA320 10	XRAD320 10	R1.0				
XRAA320 20	XRBA320 20	XRAD320 20	R2.0				

- The other corner radius values are available on request.
- The corner radius tolerance is ±0.015mm and the set-up accuracy is ±0.02mm

- The other corner radius values are available on request.
- The corner radius tolerance is ±0.015mm and the set-up accuracy is ±0.02mm

◎ : Excellent ○ : Good

◎ : Excellent ○ : Good

ISO	P											M			K							
	Non-alloy steel					Low alloy steel						High alloyed steel and tool steel			Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20		
HRc	13	25	28	32	32	10	29	32	38	15	35	15	23	10	10	26	3	25	21	21		
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230		
XRAA	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎		
XRBA																						
XRAD																						

ISO	N										S					H					
	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron	
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400Rm	1050Rm	550	630	400	550
XRAA																					
XRBA																					
XRAD																					

ISO	P											M			K							
	Non-alloy steel					Low alloy steel						High alloyed steel and tool steel			Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20		
HRc	13	25	28	32	32	10	29	32	38	15	35	15	23	10	10	26	3	25	21	21		
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230		
XRAA	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎		
XRBA																						
XRAD																						

ISO	N										S					H					
	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron	
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400Rm	1050Rm	550	630	400	550
XRAA																					
XRBA																					
XRAD																					

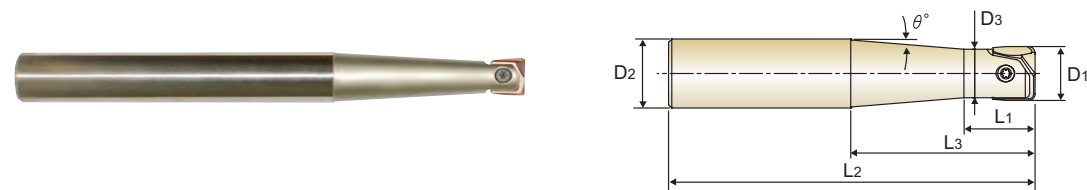




ZRT SERIES  
ZRS SERIES

**i-Xmill CORNER RADIUS HOLDERS - STEEL**

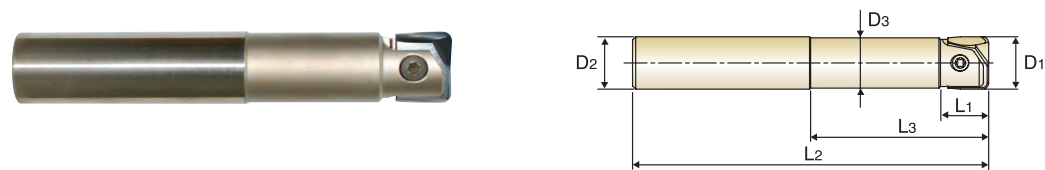
- ▶ Premium alloy steel with excellent strength.
- ▶ Precise shank, Tolerance (h6).
- ▶ Nickel plated, to prevent corrosion and improve lubricity.



**Taper neck Type**

Unit : mm

EDP No.	Mill Diameter	Shank Diameter	Length of Cut	Length Below Shank	Overall Length	Neck Diameter	Interference Angle	Length Type	Wrench No.	Screw No.
	D1	D2	L1	L3	L2	D3	θ°			
ZRT8011	8.0	12	10	22	100	6.7	9°	Regular	TWF07	TX0807
ZRT8021				50	130		2° 43'	Long		
ZRT1001	10.0	12	13	25	100	8.6	4° 45'	Regular	TWF08	TX1008
ZRT1002				50	150		1° 32'	Long		
ZRT1202	12.0 13.0	16	15	60	160	10.2	2° 32'	Long	TWF10	TX1210



**Straight neck Type**

Unit : mm

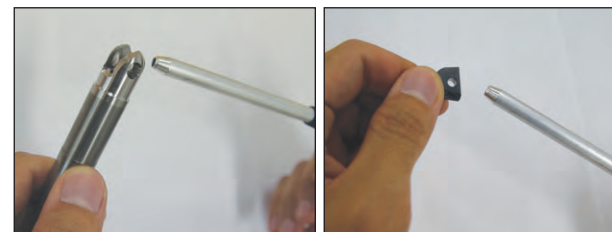
EDP No.	Mill Diameter	Shank Diameter	Length of Cut	Length Below Shank	Overall Length	Neck Diameter	Length Type	Wrench No.	Screw No.
	D1	D2	L1	L3	L2	D3			
ZRS1120	12.0 13.0	12	13	30	110	11	Regular	TWF10	TX1210
ZRS1160	16.0						Regular		
ZRS2160	17.0	16	15	50	130	15	Intermediate	TWF15	TX1615
ZRS1200	20.0			Regular					
ZRS2200	21.0	20	18	60	140	19	Intermediate	TWB20	TX2020
ZRS1250	25.0			Regular					
ZRS2250	26.0	25	23	70	150	24	Intermediate	TWB25	TX2525
ZRS1300	30.0			Regular					
ZRS2300	30.0	32	27	80	160	29	Intermediate	TWB30	TX3030
ZRS1320	32.0			Regular					
ZRS2320	32.0	32	28	80	160	31	Intermediate	TWB30	TX3030
	100			220	Regular				

\* ● Required to use T-HANDLE (TWH600)

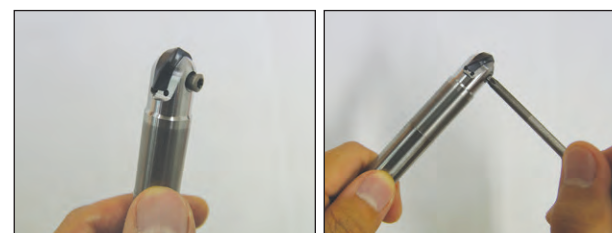


RECOMMENDED CUTTING CONDITIONS

ASSEMBLY OF i-Xmill



◀ Make sure to clean the insert and insert seat.



◀ Slide the insert into the slot of the holder.  
Tighten the screw using anti-seize compound.

SIZE	CLAMPING TORQUE
ØD	[ in • lbs ]
Ø5/16 (Ø8)	9.0
Ø3/8 (Ø10)	13.5
Ø1/2 (Ø12~Ø13)	22.5
Ø5/8 (Ø16~Ø17)	31.5
Ø3/4 (Ø20~Ø21)	44.5
Ø1 (Ø25~Ø26)	53.0
Ø1-1/4 (Ø30~Ø32)	58.0

- \* When the screw is worn out, please change the new screw.
- \* Please tighten up the screw with recommended torque. (Please refer to the table)
- \* Don't press down the insert, when the screw is tightened.

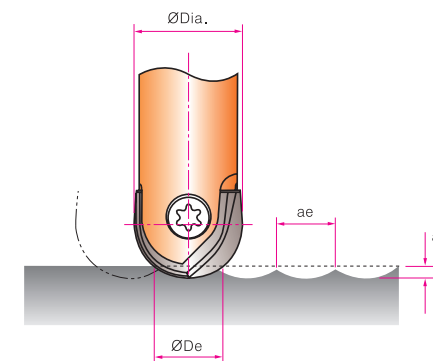


Wrench No.

	WRENCH TYPE	PRODUCT NO.	T-HANDLE No.
WING TYPE		TWFT10	-
		TWFT15	-
TORX BIT TYPE		● TWBT20	TWH600
		● TWBT25	
		● TWBT30	

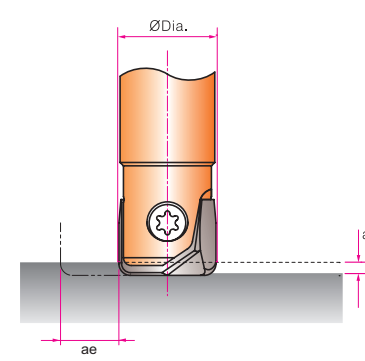
\* ● Required to use T-HANDLE (TWH600)

CUTTING CONDITION  
SCHNEIDKONDITIONEN



$$SFM [ft/min] = \frac{(RPM) \cdot (\pi) \cdot (Dia.)}{12}$$

$$IPM [inch/min] = (RPM) \cdot (IPR)$$



$$RPM [rev/min] = \frac{(SFM) \cdot (12)}{(\pi) \cdot (Dia.)}$$

$$De [inch] = 2 \sqrt{(ap) \cdot (Dia. - ap)}$$

- RPM = revolution per minute (rev/min)
- SFM = surface feet per minute (ft/min)
- Dia. = diameter of insert (inch)
- IPR = feed rate (inch/rev)
- IPM = inch per minute penetration rate
- De = effective tool diameter (inch)
- ap = axial depth of cut (inch)
- ae = radial depth of cut (inch)





RECOMMENDED CUTTING CONDITIONS



RECOMMENDED CUTTING CONDITIONS

XB1A SERIES BALL INSERTS for General Material

Table with columns: ISO, VDI 3323, Material Description, Parameter, O.D SIZE (Ø) (5/16 (8), 3/8 (10), 1/2 (12, 13), 5/8 (16, 17), 3/4 (20, 21), 1 (25, 26), 1-1/4 (30, 32)). Rows include Non-alloy steel and Low alloy steel.

SFM(Vc) = ft./min. IPT(fz) = in./tooth RPM = rev./min. IPM(Feed) = in./min.

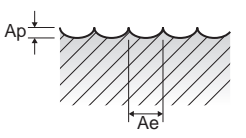
SFM(Vc) = ft./min. IPT(fz) = in./tooth RPM = rev./min. IPM(Feed) = in./min.

XB2C SERIES BALL INSERTS for Hardened Material

Table with columns: ISO, VDI 3323, Material Description, Parameter, O.D SIZE (Ø) (5/16 (8), 3/8 (10), 1/2 (12, 13), 5/8 (16, 17), 3/4 (20, 21), 1 (25, 26), 1-1/4 (30, 32)). Rows include Low alloy steel, High alloyed steel, and Hardened steel.

XB1D SERIES BALL INSERTS for Graphite

Table with columns: ISO, VDI 3323, Material Description, Parameter, O.D SIZE (Ø) (5/16 (8), 3/8 (10), 1/2 (12, 13), 5/8 (16, 17), 3/4 (20, 21), 1 (25, 26), 1-1/4 (30, 32)). Rows include Aluminum-wrought alloy, Aluminum-cast, alloyed, and Graphite.



ae : Roughing - 0.1 x D Finishing - Under Ø1/2 : .01" Under Ø3/4 : .012" From Ø3/4 : .016" ap : Roughing - Under Ø5/8 : 0.025 x D From Ø5/8 : 0.05 x D Finishing - .004"

- When the length of overhang exceeds 4xD, we recommend using the carbide shank holder with 20% lower feed
When using long (long & intermediate type holder) tools, we recommend reducing the feed rate to 70 ~ 85%.

XR1A SERIES CORNER RADIUS INSERTS for General Material

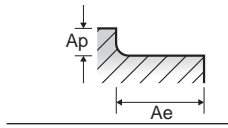
Table with columns: ISO, VDI 3323, Material Description, Parameter, O.D SIZE (Ø) (5/16 (8), 3/8 (10), 1/2 (12, 13), 5/8 (16, 17), 3/4 (20, 21), 1 (25, 26), 1-1/4 (30, 32)). Rows include Non-alloy steel, Low alloy steel, and Stainless steel.

XR2A SERIES CORNER RADIUS INSERTS for Hardened Material

Table with columns: ISO, VDI 3323, Material Description, Parameter, O.D SIZE (Ø) (5/16 (8), 3/8 (10), 1/2 (12, 13), 5/8 (16, 17), 3/4 (20, 21), 1 (25, 26), 1-1/4 (30, 32)). Rows include Low alloy steel, High alloyed steel, Grey cast iron, Nodular cast iron, and Hardened steel.

XR1D SERIES CORNER RADIUS INSERTS for Graphite

Table with columns: ISO, VDI 3323, Material Description, Parameter, O.D SIZE (Ø) (5/16 (8), 3/8 (10), 1/2 (12, 13), 5/8 (16, 17), 3/4 (20, 21), 1 (25, 26), 1-1/4 (30, 32)). Rows include Aluminum-wrought alloy, Aluminum-cast, alloyed, and Graphite.



ae : Roughing - 0.1 x D Finishing - .008" ap : Roughing - Under Ø5/8 : 0.025 x D From Ø5/8 : 0.05 x D Finishing - Under Ø5/8 : .004" From Ø5/8 : .008"

- When the length of overhang exceeds 4xD, we recommend using the carbide shank holder with 20% lower feed
When using long (long & intermediate type holder) tools, we recommend reducing the feed rate to 70 ~ 85%.

CBN END MILLS
i-Xmill END MILLS
i-SMART MODULAR END MILLS
X5070 END MILLS
4G MILL END MILLS
X-POWER PRO END MILLS
TitanX-POWER END MILLS
JET-POWER END MILLS
V7 PLUS A END MILLS
V7 MILL INOX
ALU-POWER HPC END MILLS
ALU-POWER END MILLS
D-POWER GRAPHITE END MILLS
STANDARD CARBIDE
ONLY ONE COATED PM60 END MILLS
SINE-POWER
TANK-POWER END MILLS
STANDARD COBALT & HSS
TECHNICAL DATA

CBN END MILLS
i-Xmill END MILLS
i-SMART MODULAR END MILLS
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STANDARD COBALT & HSS
TECHNICAL DATA



Global Cutting Tool Leader **YG-1**



# MILLING



Being the best through innovation



SOLID CARBIDE

# *i* - SMART MODULAR TYPE END MILL

- For General Steels, Hardened Steels and Cast Iron



SELECTION GUIDE



**CARBIDE MODULAR HEAD & HOLDER** *i-SMART* END MILLS

- Exchangeable Modular Head for Semi-finishing and finishing on Pre-Hardened Steels up to HRc55

Please visit [globalyg1.com/mat](http://globalyg1.com/mat) for material search  
 ◎: Excellent ○: Good  
 Recommended cutting conditions : p.C78

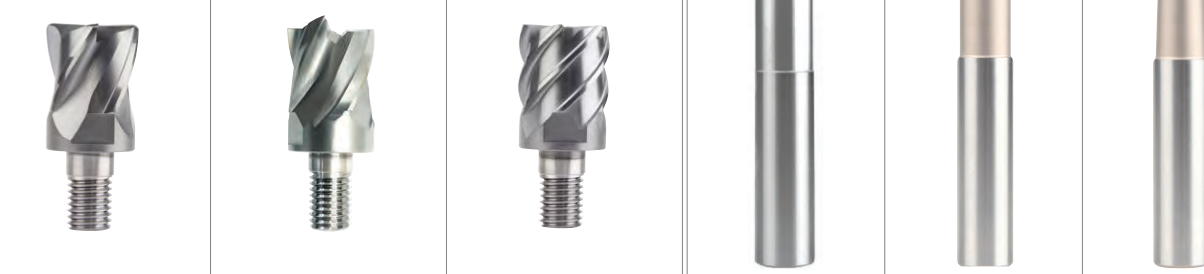
SERIES	XGMF15	XGMF17
FLUTE	2	4
HELIX ANGLE	30°	30°
CUTTING EDGE SHAPE	BALL NOSE	BALL NOSE
SIZE MIN	R3/16	R3/16
SIZE MAX	R5/8	R5/8
PAGE	C70	C71

Y-Coating Y-Coating



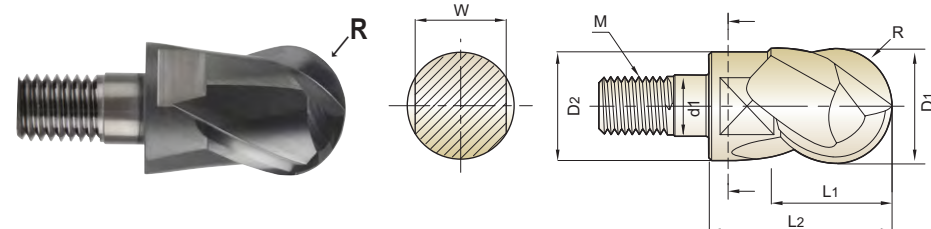
ISO	VDI 3323	Material Description	Composition / Structure / Heat Treatment	HB	HRc	XGMF15	XGMF17
P	1	Non-alloy steel	About 0.15% C Annealed	125		○	○
	2		About 0.45% C Annealed	190	13	○	○
	3		About 0.45% C Quenched & Tempered	250	25	○	○
	4		About 0.75% C Annealed	270	28	○	○
	5		About 0.75% C Quenched & Tempered	300	32	○	○
	6	Low alloy steel	Annealed	180	10	○	○
	7		Quenched & Tempered	275	29	○	○
	8		Quenched & Tempered	300	32	○	○
	9		Quenched & Tempered	350	38	◎	◎
	10-11.1		High alloyed steel, and tool steel	Annealed	200	15	○
	11.2	Quenched & Tempered		325	35	◎	◎
M	12	Stainless steel	Ferritic / Martensitic Annealed	200	15		
	13		Martensitic Quenched & Tempered	240	23		
	14.1	Austenitic	180	10			
K	15	Grey cast iron	Pearlitic / ferritic	180	10	○	○
	16		Pearlitic (Martensitic)	260	26	○	○
	17	Nodular cast iron	Ferritic	160	3	○	○
	18		Pearlitic	250	25	○	○
	19	Malleable cast iron	Ferritic	130		○	○
20	Pearlitic		230	21	○	○	
N	21	Aluminum-wrought alloy	Not Curable	60			
	22		Curable Hardened	100			
	23	Aluminum-cast, alloyed	≤ 12% Si, Not Curable	75			
	24		≤ 12% Si, Curable Hardened	90			
	25		> 12% Si, Not Curable	130			
	26	Copper and Copper Alloys (Bronze / Brass)	Cutting Alloys, PB>1%	110			
	27		CuZn, CuSnZn (Brass)	90			
	28	Non Metallic Materials	CuSn, lead-free copper and electrolytic copper	100			
	29		Duroplastic, Fiber Reinforced Plastic				
	30		Rubber, Wood, etc.				
S	31	Heat Resistant Super Alloys	Fe Based Annealed	200	15		
	32		Cured	280	30		
	33		Annealed	250	25		
	34		Cured	350	38		
	35		Cast	320	34		
	36	Titanium Alloys	Pure Titanium	400 Rm			
	37		Alpha + Beta Alloys Hardened	1050 Rm			
H	38.1-38.2	Hardened steel	Hardened	550	55	○	○
	39		Hardened	630	60		
	40	Hardened Cast Iron	Cast	400	42	◎	◎
	41		Hardened	550	55	○	○

XGMF20	XGMF25	XGMF29	ZMC	ZMS	ZMT
4	4	6	-	-	-
27°/30° (MULTIPLE HELIX)	27°/30° (MULTIPLE HELIX)	45°	-	-	-
CORNER RADIUS	SQUARE	SQUARE	-	-	-
D3/8	D3/8	D3/8	-	-	-
D1-1/4	D1-1/4	D1-1/4	-	-	-
C72	C73	C74	C75	C76	C77
-	-	-	STRAIGHT NECK	STRAIGHT NECK	TAPER NECK
Y-Coating	Y-Coating	Y-Coating	Carbide	Steel	Steel



○	○	○				1
○	○	○				2
○	○	○				3
○	○	○				4
○	○	○				5
○	○	○				6
○	○	○				7
○	○	○				8
◎	◎	◎				9
○	○	○				10
◎	◎	◎				11
						12
						13
	○					14
○	○	○				15
○	○	○				16
○	○	○				17
○	○	○				18
○	○	○				19
○	○	○				20
						21
						22
						23
						24
						25
						26
						27
						28
						29
						30
						31
						32
						33
						34
						35
						36
						37
○	○	○				38
						39
◎	◎	◎				40
○	○	○				41

**CARBIDE MODULAR HEAD, 2 FLUTE BALL NOSE**



Unit: Inch

EDP No.	Radius of Ball Nose	Mill Diameter	Neck Diameter	Length of Cut	Length Below Shank	Coupling Diameter	Wrench Width	Thread	Wrench
	R	D1	D2	L1	L2	d1	W	M	
<a href="#">XGME15024</a>	R3/16	3/8	.351	3/8	.689	.256	.315	M6	SPIS0810
<a href="#">XGME15032</a>	R1/4	1/2	.469	1/2	.835	.256	.394	M6	SPIS0810
<a href="#">XGME15040</a>	R5/16	5/8	.591	5/8	1.004	.335	.512	M8	SPIS1300
<a href="#">XGME15048</a>	R3/8	3/4	.711	3/4	1.144	.413	.669	M10	SPIS1700
<a href="#">XGME15100</a>	R1/2	1	.961	1	1.472	.492	.866	M12	SPIS2200
<a href="#">XGME15116</a>	R5/8	1-1/4	1.221	1-1/4	1.772	.669	1.063	M16	SPIS2700

Radius Tolerance(Inch)	Mill Dia. Tolerance(Inch)
±.0004	0~-.0008

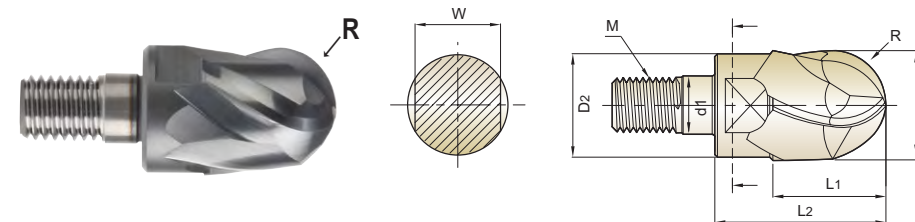
◎ : Excellent ○ : Good

ISO	P									M			K							
	Non-alloy steel			Low alloy steel			High alloyed steel, and tool steel			Stainless steel			Grey cast iron		Nodular cast iron	Malleable cast iron				
Material Description	1	2	3	4	5	6	7	8	9	10-11.1	11.2	12	13	14.1	15	16	17	18	19	20
VDI 3323	1	2	3	4	5	6	7	8	9	10-11.1	11.2	12	13	14.1	15	16	17	18	19	20
HRc	13	25	28	32	30	10	29	32	38	15	35	15	23	10	10	26	3	25	21	21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend	○	○	○	○	○	○	○	○	◎	○	◎	○	○	○	○	○	○	○	○	○

ISO	N				S					H											
	Aluminum-wrought alloy		Aluminum-cast, alloyed		Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials	Heat Resistant Super Alloys		Titanium Alloys	Hardened steel	Chilled Cast Iron	Hardened Cast Iron							
Material Description	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38.1-38.2	39	40	41
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38.1-38.2	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend																		○	◎	○	○

**CARBIDE MODULAR HEAD, 4 FLUTE BALL NOSE**



Unit: Inch

EDP No.	Radius of Ball Nose	Mill Diameter	Neck Diameter	Length of Cut	Length Below Shank	Coupling Diameter	Wrench Width	Thread	Wrench
	R	D1	D2	L1	L2	d1	W	M	
<a href="#">XGME17024</a>	R3/16	3/8	.351	3/8	.689	.256	.315	M6	SPIS0810
<a href="#">XGME17032</a>	R1/4	1/2	.469	1/2	.835	.256	.394	M6	SPIS0810
<a href="#">XGME17040</a>	R5/16	5/8	.591	5/8	1.004	.335	.512	M8	SPIS1300
<a href="#">XGME17048</a>	R3/8	3/4	.711	3/4	1.144	.413	.669	M10	SPIS1700
<a href="#">XGME17100</a>	R1/2	1	.961	1	1.472	.492	.866	M12	SPIS2200
<a href="#">XGME17116</a>	R5/8	1-1/4	1.221	1-1/4	1.772	.669	1.063	M16	SPIS2700

Radius Tolerance(Inch)	Mill Dia. Tolerance(Inch)
±.0004	0~-.0008

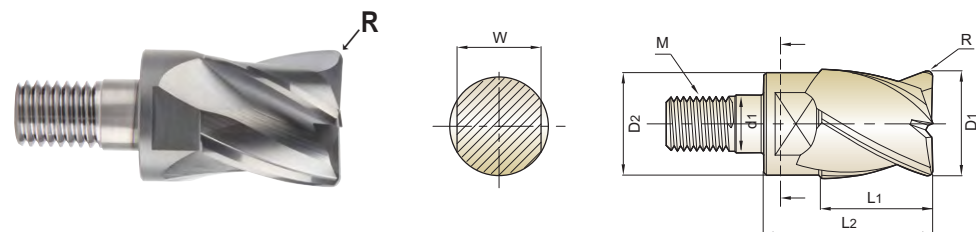
◎ : Excellent ○ : Good

ISO	P									M			K							
	Non-alloy steel			Low alloy steel			High alloyed steel, and tool steel			Stainless steel			Grey cast iron		Nodular cast iron	Malleable cast iron				
Material Description	1	2	3	4	5	6	7	8	9	10-11.1	11.2	12	13	14.1	15	16	17	18	19	20
VDI 3323	1	2	3	4	5	6	7	8	9	10-11.1	11.2	12	13	14.1	15	16	17	18	19	20
HRc	13	25	28	32	30	10	29	32	38	15	35	15	23	10	10	26	3	25	21	21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend	○	○	○	○	○	○	○	○	◎	○	◎	○	○	○	○	○	○	○	○	○

ISO	N				S					H											
	Aluminum-wrought alloy		Aluminum-cast, alloyed		Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials	Heat Resistant Super Alloys		Titanium Alloys	Hardened steel	Chilled Cast Iron	Hardened Cast Iron							
Material Description	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38.1-38.2	39	40	41
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38.1-38.2	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend																		○	◎	○	○

**CARBIDE MODULAR HEAD, 4 FLUTE MULTIPLE HELIX  
CORNER RADIUS**



Unit: Inch

EDP No.	Corner Radius	Mill Diameter	Neck Diameter	Length of Cut	Length Below Shank	Coupling Diameter	Wrench Width	Thread	Wrench
	R	D1	D2	L1	L2	d1	W	M	
XGMF20024 012	R.012	3/8	.351	3/8	.689	.256	.315	M6	SPIS0810
XGMF20024 020	R.020	3/8	.351	3/8	.689	.256	.315	M6	SPIS0810
XGMF20024 030	R.030	3/8	.351	3/8	.689	.256	.315	M6	SPIS0810
XGMF20024 040	R.040	3/8	.351	3/8	.689	.256	.315	M6	SPIS0810
XGMF20024 050	R.050	3/8	.351	3/8	.689	.256	.315	M6	SPIS0810
XGMF20024 060	R.060	3/8	.351	3/8	.689	.256	.315	M6	SPIS0810
XGMF20024 080	R.080	3/8	.351	3/8	.689	.256	.315	M6	SPIS0810
XGMF20032 020	R.020	1/2	.469	1/2	.835	.256	.394	M6	SPIS0810
XGMF20032 030	R.030	1/2	.469	1/2	.835	.256	.394	M6	SPIS0810
XGMF20032 040	R.040	1/2	.469	1/2	.835	.256	.394	M6	SPIS0810
XGMF20032 060	R.060	1/2	.469	1/2	.835	.256	.394	M6	SPIS0810
XGMF20032 080	R.080	1/2	.469	1/2	.835	.256	.394	M6	SPIS0810
XGMF20040 020	R.020	5/8	.591	5/8	1.004	.335	.512	M8	SPIS1300
XGMF20040 030	R.030	5/8	.591	5/8	1.004	.335	.512	M8	SPIS1300
XGMF20040 040	R.040	5/8	.591	5/8	1.004	.335	.512	M8	SPIS1300
XGMF20040 060	R.060	5/8	.591	5/8	1.004	.335	.512	M8	SPIS1300
XGMF20040 080	R.080	5/8	.591	5/8	1.004	.335	.512	M8	SPIS1300
XGMF20048 030	R.030	3/4	.711	3/4	1.144	.413	.669	M10	SPIS1700
XGMF20048 040	R.040	3/4	.711	3/4	1.144	.413	.669	M10	SPIS1700
XGMF20048 080	R.080	3/4	.711	3/4	1.144	.413	.669	M10	SPIS1700
XGMF20100 030	R.030	1	.961	1	1.472	.492	.866	M12	SPIS2200
XGMF20100 040	R.040	1	.961	1	1.472	.492	.866	M12	SPIS2200
XGMF20100 080	R.080	1	.961	1	1.472	.492	.866	M12	SPIS2200
XGMF20116 030	R.030	1-1/4	1.221	1-1/4	1.772	.669	1.063	M16	SPIS2700
XGMF20116 040	R.040	1-1/4	1.221	1-1/4	1.772	.669	1.063	M16	SPIS2700
XGMF20116 080	R.080	1-1/4	1.221	1-1/4	1.772	.669	1.063	M16	SPIS2700

Radius Tolerance(Inch)	Mill Dia. Tolerance(Inch)
±.0008	0~.0012

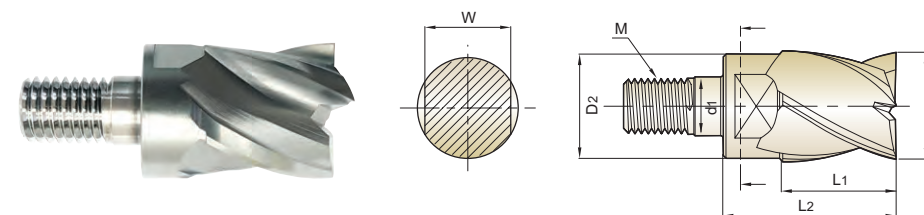
◎ : Excellent ○ : Good

ISO Material Description	P										M			K						
	Non-alloy steel					Low alloy steel					High alloyed steel, and tool steel		Stainless steel		Grey cast iron	Nodular cast iron	Malleable cast iron			
VDI 3323	1	2	3	4	5	6	7	8	9	10-11.1	11.2	12	13	14.1	15	16	17	18	19	20
HRc	13	25	28	32	30	10	29	32	38	15	35	15	23	10	10	26	3	25	21	21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend	○	○	○	○	○	○	○	○	○	◎	◎	○	○	○	○	○	○	○	○	○

ISO Material Description	N					S					H										
	Aluminum-wrought alloy		Aluminum-cast, alloyed		Copper and Copper Alloys (Bronze / Brass)	Non Metallic Materials		Heat Resistant Super Alloys			Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron						
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38.1-38.2	39	40	41
HRc	21	22	23	24	25	26	27	28	29	30	15	30	25	38	34	55	60	55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend																○	○	○	○	◎	○

**CARBIDE MODULAR HEAD, 4 FLUTE MULTIPLE HELIX**



Unit: Inch

EDP No.	Mill Diameter	Neck Diameter	Length of Cut	Length Below Shank	Coupling Diameter	Wrench Width	Thread	Wrench
	D1	D2	L1	L2	d1	W	M	
XGMF25024	3/8	.351	3/8	.689	.256	.315	M6	SPIS0810
XGMF25032	1/2	.469	1/2	.835	.256	.394	M6	SPIS0810
XGMF25040	5/8	.591	5/8	1.004	.335	.512	M8	SPIS1300
XGMF25048	3/4	.711	3/4	1.144	.413	.669	M10	SPIS1700
XGMF25100	1	.961	1	1.472	.492	.866	M12	SPIS2200
XGMF25116	1-1/4	1.221	1-1/4	1.772	.669	1.063	M16	SPIS2700

Mill Dia. Tolerance(Inch)
0~.0012

◎ : Excellent ○ : Good

ISO Material Description	P										M			K							
	Non-alloy steel					Low alloy steel					High alloyed steel, and tool steel		Stainless steel		Grey cast iron	Nodular cast iron	Malleable cast iron				
VDI 3323	1	2	3	4	5	6	7	8	9	10-11.1	11.2	12	13	14.1	15	16	17	18	19	20	
HRc	13	25	28	32	30	10	29	32	38	15	35	15	23	10	10	26	3	25	21	21	
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230	
Recommend	○	○	○	○	○	○	○	○	○	◎	◎	○	○	○	○	○	○	○	○	○	○

ISO Material Description	N					S					H										
	Aluminum-wrought alloy		Aluminum-cast, alloyed		Copper and Copper Alloys (Bronze / Brass)	Non Metallic Materials		Heat Resistant Super Alloys			Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron						
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38.1-38.2	39	40	41
HRc	21	22	23	24	25	26	27	28	29	30	15	30	25	38	34	55	60	55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend																○	○	○	○	◎	○



HSS

HSS



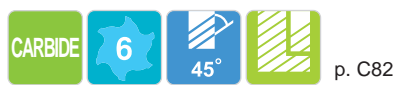
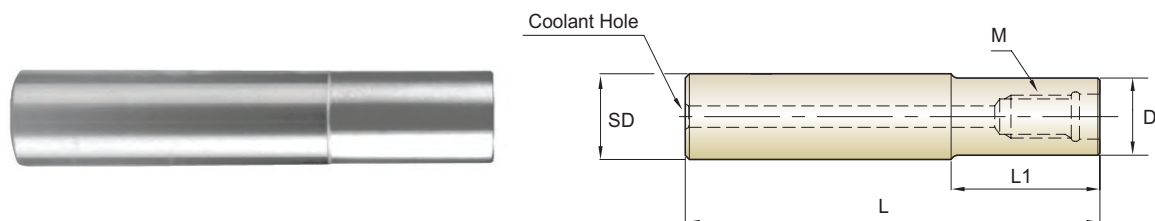
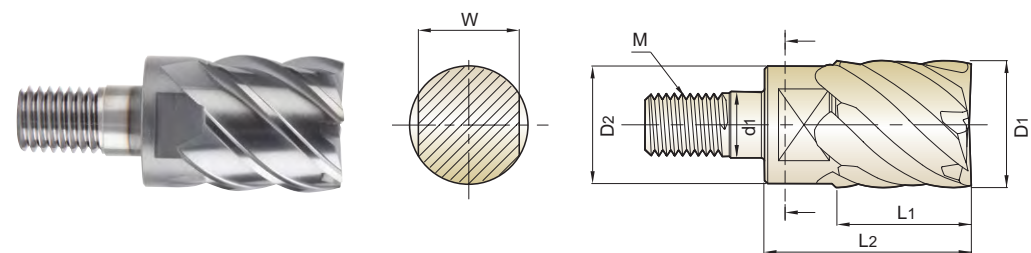
XGMF29 SERIES



ZMC SERIES

CARBIDE MODULAR HEAD, 6 FLUTE 45° HELIX

CARBIDE HOLDER, STRAIGHT NECK TYPE



Unit: Inch

EDP No.	Mill Diameter	Neck Diameter	Length of Cut	Length Below Shank	Coupling Diameter	Wrench Width	Thread	Wrench
	D1	D2	L1	L2	d1	W	M	
<a href="#">XGMF29024</a>	3/8	.351	3/8	.689	.256	.315	M6	<a href="#">SPIS0810</a>
<a href="#">XGMF29032</a>	1/2	.469	1/2	.835	.256	.394	M6	<a href="#">SPIS0810</a>
<a href="#">XGMF29040</a>	5/8	.591	5/8	1.004	.335	.512	M8	<a href="#">SPIS1300</a>
<a href="#">XGMF29048</a>	3/4	.711	3/4	1.144	.413	.669	M10	<a href="#">SPIS1700</a>
<a href="#">XGMF29100</a>	1	.961	1	1.472	.492	.866	M12	<a href="#">SPIS2200</a>
<a href="#">XGMF29116</a>	1-1/4	1.221	1-1/4	1.772	.669	1.063	M16	<a href="#">SPIS2700</a>

Mill Dia. Tolerance(Inch)
0~- .0012

Unit: Inch

EDP No.	Mill Diameter	Shank Diameter	Overall Length	Neck Length	Neck Diameter	Thread Size	Wrench No.	Coolant Hole
		SD	L	L1	D	M		
<a href="#">ZMC024A024</a>	3/8	3/8	2-3/4	25/32	23/64	M6	<a href="#">SPIS0810</a>	5/64
<a href="#">ZMC024B024</a>			3-15/16	1-37/64				
<a href="#">ZMC024C024</a>			5-1/8	2-3/4				
<a href="#">ZMC032A032</a>	1/2	1/2	3-1/8	25/32	29/64	M6	<a href="#">SPIS0810</a>	5/64
<a href="#">ZMC032B032</a>			3-15/16	1-37/64				
<a href="#">ZMC032C032</a>			5-1/8	2-3/4				
<a href="#">ZMC040A040</a>	5/8	5/8	3-15/16	1-37/64	19/32	M8	<a href="#">SPIS1300</a>	1/8
<a href="#">ZMC040B040</a>			5-7/8	3-5/32				
<a href="#">ZMC040C040</a>			7-7/8	4-23/32				
<a href="#">ZMC048A048</a>	3/4	3/4	3-15/16	1-37/64	45/64	M10	<a href="#">SPIS1700</a>	5/32
<a href="#">ZMC048B048</a>			5-7/8	3-5/32				
<a href="#">ZMC048C048</a>			7-7/8	4-23/32				
<a href="#">ZMC048D048</a>	1	1	9-13/16	6-19/64	61/64	M12	<a href="#">SPIS2200</a>	13/64
<a href="#">ZMC100A100</a>			5-7/8	2-3/4				
<a href="#">ZMC100B100</a>			7-7/8	3-15/16				
<a href="#">ZMC100C100</a>	1-1/4	1-1/4	9-13/16	5-29/32	1-9/64	M16	<a href="#">SPIS2700</a>	15/64
<a href="#">ZMC100D100</a>			11-13/16	7-7/8				
<a href="#">ZMC116A116</a>			5-7/8	2-3/4				
<a href="#">ZMC116B116</a>	1-1/4	1-1/4	7-7/8	4-23/32	1-9/64	M16	<a href="#">SPIS2700</a>	15/64
<a href="#">ZMC116C116</a>			9-13/16	5-29/32				
<a href="#">ZMC116D116</a>			11-13/16	7-7/8				
<a href="#">ZMC116E116</a>	1-1/4	1-1/4	13-3/4	9-27/32	1-9/64	M16	<a href="#">SPIS2700</a>	15/64

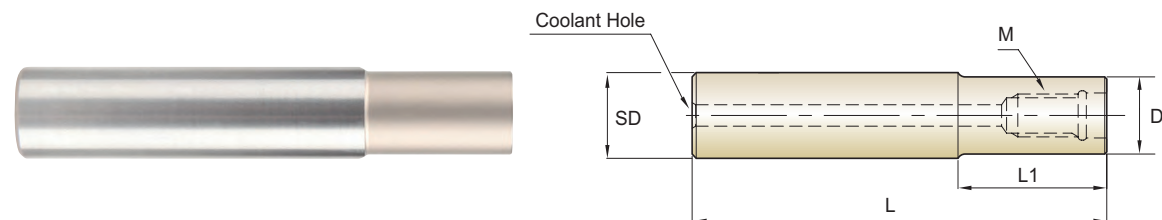
◎ : Excellent ○ : Good

ISO	P										M					K						
Material Description	Non-alloy steel					Low alloy steel					High alloyed steel, and tool steel					Stainless steel		Grey cast iron		Nodular cast iron		Malleable cast iron
VDI 3323	1	2	3	4	5	6	7	8	9	10-11.1	11.2	12	13	14.1	15	16	17	18	19	20		
HRC	13	25	28	32	30	10	29	32	38	15	35	15	23	10	10	26	3	25	130	21		
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230		
Recommend	○	○	○	○	○	○	○	○	◎	○	◎	○	○	○	○	○	○	○	○	○		

ISO	N					S					H										
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)		Non Metallic Materials			Heat Resistant Super Alloys					Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron	
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38.1-38.2	39	40	41
HRC											15	30	25	38	34	55	60	55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend																		○	◎	○	○

**STEEL HOLDER, STRAIGHT NECK TYPE**



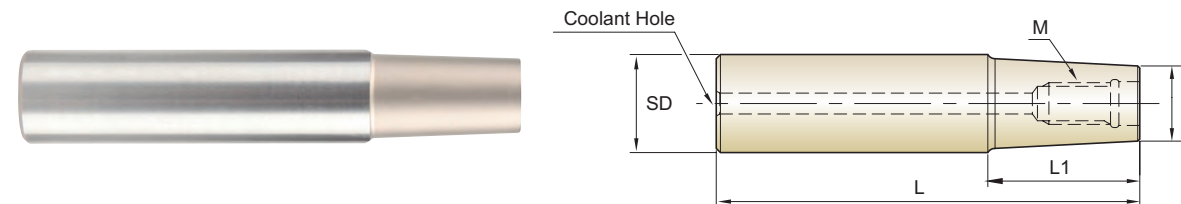
Unit: Inch

EDP No.	Mill Diameter	Shank Diameter	Overall Length	Neck Length	Neck Diameter	Thread Size	Coolant Hole
		SD					
<a href="#">ZMS024A024</a>	3/8	3/8	2-3/4	25/32	23/64	M6	1/8
<a href="#">ZMS032A032</a>	1/2	1/2	3-35/64	1-3/16	29/64	M6	1/8
<a href="#">ZMS040A040</a>	5/8	5/8	3-15/16	1-3/16	19/32	M8	5/32
<a href="#">ZMS048A048</a>	3/4	3/4	3-15/16	1-3/16	45/64	M10	13/64
<a href="#">ZMS100A100</a>	1	1	4-17/32	1-37/64	61/64	M12	13/64
<a href="#">ZMS116A116</a>	1-1/4	1-1/4	4-59/64	1-37/64	1-9/64	M16	15/64

**Wrench**

Model	Wrench No.	Wrench Width	Mill Diameter	Clamping Torque [in•lbs]
	<a href="#">SPIS0810</a>	.315	3/8	57.6
		.394	1/2	57.6
	<a href="#">SPIS1300</a>	.512	5/8	88.6
	<a href="#">SPIS1700</a>	.669	3/4	106.3
	<a href="#">SPIS2200</a>	.866	1	132.9
	<a href="#">SPIS2700</a>	1.063	1-1/4	177.1

**STEEL HOLDER, TAPER NECK TYPE**



Unit: Inch

EDP No.	Mill Diameter	Shank Diameter	Overall Length	Neck Length	Neck Diameter	Thread Size	Coolant Hole
		SD					
<a href="#">ZMT024A032</a>	3/8	1/2	3-15/16	1-31/32	23/64	M6	1/8
<a href="#">ZMT032A040</a>	1/2	5/8	5-1/8	2-3/4	29/64	M6	1/8
<a href="#">ZMT040A048</a>	5/8	3/4	5-29/32	3-35/64	19/32	M8	5/32
<a href="#">ZMT048A100</a>	3/4	1	6-11/16	3-15/16	45/64	M10	13/64
<a href="#">ZMT100A116</a>	1	1-1/4	7-7/8	4-21/64	61/64	M12	13/64
<a href="#">ZMT116A116</a>	1-1/4	1-1/4	7-7/8	4-21/64	1-9/64	M16	15/64

**Wrench**

Model	Wrench No.	Wrench Width	Mill Diameter	Clamping Torque [in•lbs]
	<a href="#">SPIS0810</a>	.315	3/8	57.6
		.394	1/2	57.6
	<a href="#">SPIS1300</a>	.512	5/8	88.6
	<a href="#">SPIS1700</a>	.669	3/4	106.3
	<a href="#">SPIS2200</a>	.866	1	132.9
	<a href="#">SPIS2700</a>	1.063	1-1/4	177.1

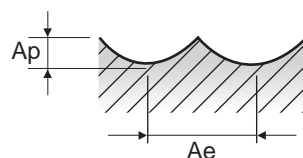


RECOMMENDED CUTTING CONDITIONS

**XGMF15 SERIES 2 FLUTE BALL NOSE - Plain Cutting**

RPM = rev./min. FEED = inch/min.  
Vc = ft/min. fz = inch/tooth

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	O.D SIZE					
						R3/16 x3/8	R1/4 x1/2	R5/16 x5/8	R3/8 x3/4	R1/2 x1	R5/8x1-1/4
P	1-5	Non-alloy steel	0.08D	0.03D	SFM(Vc)	558	558	558	558	558	558
					IPT(fz)	0.008	0.008	0.009	0.01	0.011	0.012
					RPM	5680	4260	3410	2840	2130	1700
	6-8	Low alloy steel	0.08D	0.03D	SFM(Vc)	558	558	558	558	558	558
					IPT(fz)	0.008	0.008	0.009	0.01	0.011	0.012
					RPM	5680	4260	3410	2840	2130	1700
	9	Low alloy steel	0.08D	0.03D	SFM(Vc)	541	541	541	541	541	541
					IPT(fz)	0.007	0.007	0.008	0.009	0.009	0.01
					RPM	5510	4140	3310	2760	2070	1650
	10-11.1	High alloyed steel, and tool steel	0.08D	0.03D	SFM(Vc)	558	558	558	558	558	558
					IPT(fz)	0.008	0.008	0.009	0.01	0.011	0.012
					RPM	5680	4260	3410	2840	2130	1700
11.2	High alloyed steel, and tool steel	0.08D	0.03D	SFM(Vc)	541	541	541	541	541	541	
				IPT(fz)	0.007	0.007	0.008	0.009	0.009	0.01	
				RPM	5510	4140	3310	2760	2070	1650	
K	15-20	Grey cast iron Nodular cast iron Malleable cast iron	0.08D	0.03D	SFM(Vc)	558	558	558	558	558	558
					IPT(fz)	0.008	0.008	0.009	0.01	0.011	0.012
					RPM	5680	4260	3410	2840	2130	1700
H	38.1-38.2	Hardened steel	0.08D	0.03D	SFM(Vc)	453	453	453	453	453	453
					IPT(fz)	0.006	0.007	0.007	0.008	0.008	0.009
					RPM	4610	3460	2770	2310	1730	1380
	40	Chilled Cast Iron	0.08D	0.03D	SFM(Vc)	541	541	541	541	541	541
					IPT(fz)	0.007	0.007	0.008	0.009	0.009	0.01
					RPM	5510	4140	3310	2760	2070	1650
	41	Hardened Cast Iron	0.08D	0.03D	SFM(Vc)	453	453	453	453	453	453
					IPT(fz)	0.006	0.007	0.007	0.008	0.008	0.009
					RPM	4610	3460	2770	2310	1730	1380

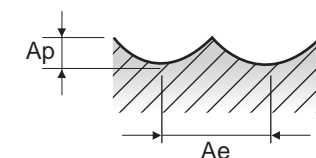


RECOMMENDED CUTTING CONDITIONS

**XGMF17 SERIES 4 FLUTE BALL NOSE - Plain Cutting**

RPM = rev./min. FEED = inch/min.  
Vc = ft/min. fz = inch/tooth

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	O.D SIZE					
						R3/16 x3/8	R1/4 x1/2	R5/16 x5/8	R3/8 x3/4	R1/2 x1	R5/8x1-1/4
P	1-5	Non-alloy steel	0.05D	0.02D	SFM(Vc)	968	968	968	968	968	968
					IPT(fz)	0.006	0.006	0.007	0.007	0.007	0.008
					RPM	9860	7390	5920	4930	3700	2960
	6-8	Low alloy steel	0.05D	0.02D	SFM(Vc)	968	968	968	968	968	968
					IPT(fz)	0.006	0.006	0.007	0.007	0.007	0.008
					RPM	9860	7390	5920	4930	3700	2960
	9	Low alloy steel	0.05D	0.02D	SFM(Vc)	771	771	771	771	771	771
					IPT(fz)	0.005	0.006	0.006	0.006	0.006	0.007
					RPM	7850	5890	4710	3930	2940	2360
	10-11.1	High alloyed steel, and tool steel	0.05D	0.02D	SFM(Vc)	968	968	968	968	968	968
					IPT(fz)	0.006	0.006	0.007	0.007	0.007	0.008
					RPM	9860	7390	5920	4930	3700	2960
11.2	High alloyed steel, and tool steel	0.05D	0.02D	SFM(Vc)	771	771	771	771	771	771	
				IPT(fz)	0.005	0.006	0.006	0.006	0.006	0.007	
				RPM	7850	5890	4710	3930	2940	2360	
K	15-20	Grey cast iron Nodular cast iron Malleable cast iron	0.05D	0.02D	SFM(Vc)	968	968	968	968	968	968
					IPT(fz)	0.006	0.006	0.007	0.007	0.007	0.008
					RPM	9860	7390	5920	4930	3700	2960
H	38.1-38.2	Hardened steel	0.05D	0.02D	SFM(Vc)	689	689	689	689	689	689
					IPT(fz)	0.005	0.005	0.005	0.006	0.006	0.006
					RPM	7020	5260	4210	3510	2630	2110
	40	Chilled Cast Iron	0.05D	0.02D	SFM(Vc)	771	771	771	771	771	771
					IPT(fz)	0.005	0.006	0.006	0.006	0.006	0.007
					RPM	7850	5890	4710	3930	2940	2360
	41	Hardened Cast Iron	0.05D	0.02D	SFM(Vc)	689	689	689	689	689	689
					IPT(fz)	0.005	0.005	0.005	0.006	0.006	0.006
					RPM	7020	5260	4210	3510	2630	2110



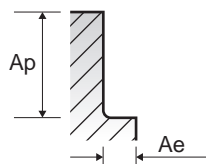


**XGMF20 SERIES 4 FLUTE CORNER RADIUS - Side Cutting**

RPM = rev./min. FEED = inch/min.  
Vc = ft/min. fz = inch/tooth

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	O.D SIZE					
						3/8	1/2	5/8	3/4	1	1*1/4
P	1-5	Non-alloy steel	0.05D	0.8D	SFM(Vc)	512	512	512	512	512	512
					IPT(fz)	0.001	0.001	0.001	0.001	0.001	0.001
					RPM	5210	3910	3130	2610	1950	1560
	6-8	Low alloy steel	0.05D	0.8D	SFM(Vc)	512	512	512	512	512	512
					IPT(fz)	0.001	0.001	0.001	0.001	0.001	0.001
					RPM	5210	3910	3130	2610	1950	1560
	9	Low alloy steel	0.05D	0.8D	SFM(Vc)	344	344	344	344	344	344
					IPT(fz)	0.001	0.001	0.001	0.001	0.001	0.001
					RPM	3510	2630	2110	1750	1320	1050
	10-11.1	High alloyed steel, and tool steel	0.05D	0.8D	SFM(Vc)	512	512	512	512	512	512
					IPT(fz)	0.001	0.001	0.001	0.001	0.001	0.001
					RPM	5210	3910	3130	2610	1950	1560
11.2	High alloyed steel, and tool steel	0.05D	0.8D	SFM(Vc)	344	344	344	344	344	344	
				IPT(fz)	0.001	0.001	0.001	0.001	0.001	0.001	
				RPM	3510	2630	2110	1750	1320	1050	
K	15-20	Grey cast iron Nodular cast iron Malleable cast iron	0.02D	0.8D	SFM(Vc)	512	512	512	512	512	512
					IPT(fz)	0.001	0.001	0.001	0.001	0.001	0.001
					RPM	5210	3910	3130	2610	1950	1560
H	38.1-38.2	Hardened steel	0.02D	0.8D	SFM(Vc)	207	207	207	207	207	207
					IPT(fz)	0.001	0.001	0.001	0.001	0.001	0.001
					RPM	2110	1580	1260	1050	790	630
H	40	Chilled Cast Iron	0.05D	0.8D	SFM(Vc)	344	344	344	344	344	344
					IPT(fz)	0.001	0.001	0.001	0.001	0.001	0.001
					RPM	3510	2630	2110	1750	1320	1050
H	41	Hardened Cast Iron	0.02D	0.8D	SFM(Vc)	207	207	207	207	207	207
					IPT(fz)	0.001	0.001	0.001	0.001	0.001	0.001
					RPM	2110	1580	1260	1050	790	630

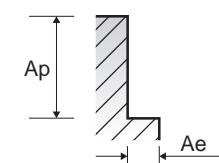
\* 1.5xD Axial cutting depth should be for DIA over 5/8inch



**XGMF25 SERIES 6 FLUTE SQUARE - Side Cutting**

RPM = rev./min. FEED = inch/min.  
Vc = ft/min. fz = inch/tooth

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	O.D SIZE					
						3/8	1/2	5/8	3/4	1	1*1/4
P	1-5	Non-alloy steel	0.05D	0.6D	SFM(Vc)	427	427	427	427	427	427
					IPT(fz)	0.002	0.002	0.002	0.002	0.002	0.002
					RPM	4340	3260	2610	2170	1630	1300
	6-8	Low alloy steel	0.05D	0.6D	SFM(Vc)	427	427	427	427	427	427
					IPT(fz)	0.002	0.002	0.002	0.002	0.002	0.002
					RPM	4340	3260	2610	2170	1630	1300
	9	Low alloy steel	0.05D	0.6D	SFM(Vc)	262	262	262	262	262	262
					IPT(fz)	0.001	0.001	0.001	0.001	0.001	0.001
					RPM	2670	2010	1600	1340	1000	800
	10-11.1	High alloyed steel, and tool steel	0.05D	0.6D	SFM(Vc)	427	427	427	427	427	427
					IPT(fz)	0.002	0.002	0.002	0.002	0.002	0.002
					RPM	4340	3260	2610	2170	1630	1300
11.2	High alloyed steel, and tool steel	0.05D	0.6D	SFM(Vc)	262	262	262	262	262	262	
				IPT(fz)	0.001	0.001	0.001	0.001	0.001	0.001	
				RPM	2670	2010	1600	1340	1000	800	
M	14.1	Stainless steel	0.05D	0.6D	SFM(Vc)	217	217	217	217	217	217
					IPT(fz)	0.001	0.001	0.001	0.001	0.001	0.001
					RPM	2210	1650	1320	1100	830	660
K	15-20	Grey cast iron Nodular cast iron Malleable cast iron	0.05D	0.6D	SFM(Vc)	427	427	427	427	427	427
					IPT(fz)	0.002	0.002	0.002	0.002	0.002	0.002
					RPM	4340	3260	2610	2170	1630	1300
H	38.1-38.2	Hardened steel	0.05D	0.6D	SFM(Vc)	174	174	174	174	174	174
					IPT(fz)	0.001	0.001	0.001	0.001	0.001	0.001
					RPM	1770	1330	1060	890	660	530
H	40	Chilled Cast Iron	0.05D	0.6D	SFM(Vc)	262	262	262	262	262	262
					IPT(fz)	0.001	0.001	0.001	0.001	0.001	0.001
					RPM	2670	2010	1600	1340	1000	800
H	41	Hardened Cast Iron	0.02D	0.6D	SFM(Vc)	174	174	174	174	174	174
					IPT(fz)	0.001	0.001	0.001	0.001	0.001	0.001
					RPM	1770	1330	1060	890	660	530





XGMF29 SERIES

6 FLUTE SQUARE - Side Cutting

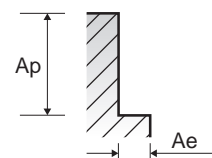
Normal

RPM = rev./min. FEED = inch/min.  
Vc = ft/min. fz = inch/tooth

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	O.D SIZE					
						3/8	1/2	5/8	3/4	1	1*1/4
P	1-5	Non-alloy steel	0.1D	0.8D	SFM(Vc)	364	364	364	364	364	364
					IPT(fz)	0.004	0.004	0.004	0.004	0.004	0.004
					RPM	3710	2780	2230	1850	1390	1110
	6-8	Low alloy steel	0.1D	0.8D	SFM(Vc)	364	364	364	364	364	364
					IPT(fz)	0.004	0.004	0.004	0.004	0.004	0.004
					RPM	3710	2780	2230	1850	1390	1110
	9	High alloyed steel, and tool steel	0.1D	0.8D	SFM(Vc)	253	253	253	253	253	253
					IPT(fz)	0.004	0.004	0.004	0.004	0.004	0.004
					RPM	2570	1930	1540	1290	960	770
	10-11.1	High alloyed steel, and tool steel	0.1D	0.8D	SFM(Vc)	364	364	364	364	364	364
					IPT(fz)	0.004	0.004	0.004	0.004	0.004	0.004
					RPM	3710	2780	2230	1850	1390	1110
11.2	High alloyed steel, and tool steel	0.1D	0.8D	SFM(Vc)	253	253	253	253	253	253	
				IPT(fz)	0.004	0.004	0.004	0.004	0.004	0.004	
				RPM	2570	1930	1540	1290	960	770	
K	15-20	Grey cast iron Nodular cast iron Malleable cast iron	0.1D	0.8D	SFM(Vc)	364	364	364	364	364	364
					IPT(fz)	0.004	0.004	0.004	0.004	0.004	0.004
					RPM	3710	2780	2230	1850	1390	1110
H	38.1-38.2	Hardened steel	0.05D	0.6D	SFM(Vc)	108	108	108	108	108	108
					IPT(fz)	0.001	0.001	0.001	0.001	0.001	0.001
					RPM	1100	830	660	550	410	330
	40	Chilled Cast Iron	0.05D	0.8D	SFM(Vc)	253	253	253	253	253	253
					IPT(fz)	0.004	0.004	0.004	0.004	0.004	0.004
					RPM	2570	1930	1540	1290	960	770
	41	Hardened Cast Iron	0.05D	0.6D	SFM(Vc)	108	108	108	108	108	108
					IPT(fz)	0.001	0.001	0.001	0.001	0.001	0.001
					RPM	1100	830	660	550	410	330

High

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	O.D SIZE					
						3/8	1/2	5/8	3/4	1	1*1/4
P	11.2	High alloyed steel, and tool steel	0.05D	0.6D	SFM(Vc)	1089	1089	1089	1089	1089	1089
					IPT(fz)	0.004	0.004	0.004	0.004	0.004	0.004
					RPM	11090	8320	6660	5550	4160	3330
					IPM(FEED)	249	186.7	149.4	124.5	93.4	74.7
H	38.1-38.2	Hardened steel	0.05D	0.4D	SFM(Vc)	545	545	545	545	545	545
					IPT(fz)	0.004	0.004	0.004	0.004	0.004	0.004
					RPM	5550	4160	3330	2770	2080	1660
	40	Chilled Cast Iron	0.05D	0.6D	SFM(Vc)	1089	1089	1089	1089	1089	1089
					IPT(fz)	0.004	0.004	0.004	0.004	0.004	0.004
					RPM	11090	8320	6660	5550	4160	3330
	41	Hardened Cast Iron	0.05D	0.4D	SFM(Vc)	545	545	545	545	545	545
					IPT(fz)	0.004	0.004	0.004	0.004	0.004	0.004
					RPM	5550	4160	3330	2770	2080	1660





Leading Through Innovation



SOLID CARBIDE

# X5070 END MILLS

- For High Hardened Steels (HRc45 to HRc70)  
High Speed Machining and Dry Cutting



SELECTION GUIDE



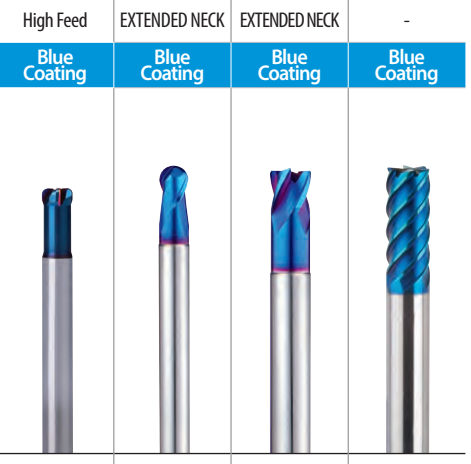
SERIES	Inch			
	G826	G8A43	G850	G851
FLUTE	4	2	4	6&8
HELIX ANGLE	0°	30°	30°	45°
CUTTING EDGE SHAPE	CORNER RADIUS	BALL NOSE	CORNER RADIUS	CORNER RADIUS
SIZE MIN	D1/8	R1/64	D1/16	D1/4
SIZE MAX	D1/2	R1/4	D3/4	D1
PAGE	C86	C87	C88	C89

**SOLID CARBIDE**  
**X5070**  
**END MILLS**  
High Hardened Steels HRC45 to HRC70,  
High Speed Machining, Dry Cutting

Please visit [globalyg1.com/mat](http://globalyg1.com/mat) for material search

◎ : Excellent ○ : Good

Recommended cutting conditions : p. C107



ISO	VDI 3323	Material Description	Composition / Structure / Heat Treatment	HB	HRC	
P	1	Non-alloy steel	About 0.15% C Annealed	125		
	2		About 0.45% C Annealed	190	13	
	3		About 0.45% C Quenched & Tempered	250	25	
	4		About 0.75% C Annealed	270	28	
	5		About 0.75% C Quenched & Tempered	300	32	
	6	Low alloy steel	Annealed	180	10	
	7		Quenched & Tempered	275	29	
	8		Quenched & Tempered	300	32	
	9		Quenched & Tempered	350	38	
	10		High alloyed steel, and tool steel	Annealed	200	15
	11			Quenched & Tempered	325	35
M	12	Stainless steel	Ferritic / Martensitic Annealed	200	15	
	13		Martensitic Quenched & Tempered	240	23	
	14		Austenitic	180	10	
K	15	Grey cast iron	Pearlitic / ferritic	180	10	
	16		Pearlitic (Martensitic)	260	26	
	17	Nodular cast iron	Ferritic	160	3	
	18		Pearlitic	250	25	
	19	Malleable cast iron	Ferritic	130		
	20		Pearlitic	230	21	
N	21	Aluminum-wrought alloy	Not Curable	60		
	22		Curable Hardened	100		
	23	Aluminum-cast, alloyed	≤ 12% Si, Not Curable	75		
	24		≤ 12% Si, Curable Hardened	90		
	25		> 12% Si, Not Curable	130		
	26	Copper and Copper Alloys (Bronze / Brass)	Cutting Alloys, PB>1%	110		
	27		CuZn, CuSnZn (Brass)	90		
	28	Non Metallic Materials	CuSn, lead-free copper and electrolytic copper	100		
	29		Duroplastic, Fiber Reinforced Plastic			
	30	Rubber, Wood, etc.				
S	31	Heat Resistant Super Alloys	Fe Based Annealed	200	15	
	32		Fe Based Cured	280	30	
	33		Ni or Co Based Annealed	250	25	
	34		Ni or Co Based Cured	350	38	
	35		Ni or Co Based Cast	320	34	
	36	Titanium Alloys	Pure Titanium	400 Rm		
	37		Alpha + Beta Alloys Hardened	1050 Rm		
H	38	Hardened steel	Hardened	550	55	
	39		Hardened	630	60	
	40	Chilled Cast Iron	Cast	400	42	
	41	Hardened Cast Iron	Hardened	550	55	

Metric													
G859	G854	G8A46	G8A54	G8A28	G8A38	G8A53	G8A59	G8A36	G8A50	G8A47	G8A37	G8A39	
4	4	2	2	2	2	2	3	2	2	4	4	6	
0°	0°	30°	30°	30°	30°	30°	30°	30°	30°	30°	30°	45°	
CORNER RADIUS	CORNER RADIUS	BALL NOSE	BALL NOSE	BALL NOSE	BALL NOSE	BALL NOSE	BALL NOSE	CORNER RADIUS	CORNER RADIUS	CORNER RADIUS	CORNER RADIUS	CORNER RADIUS	
D2.0	D2.0	R0.05	R0.25	R0.05	R0.5	R0.2	R1.5	D0.3	D0.3	D3.0	D1.0	D6.0	
D16.0	D16.0	R2.0	R1.0	R6.0	R12.5	R1.0	R10.0	D20.0	D2.0	D12.0	D20.0	D20.0	
C90	C91	C92	C96	C97	C98	C99	C100	C101	C103	C104	C105	C106	
High Feed	High Feed Long Shank	RIB PROCESSING	RIB PROCESSING	-	STUB LENGTH EXTENDED NECK	MINIATURE	-	STUB LENGTH EXTENDED NECK	MINIATURE	EXTENDED NECK	EXTENDED NECK	EXTENDED NECK	
Blue Coating	Blue Coating	Blue Coating	Blue Coating	Blue Coating	Blue Coating	Blue Coating	Blue Coating	Blue Coating	Blue Coating	Blue Coating	Blue Coating	Blue Coating	

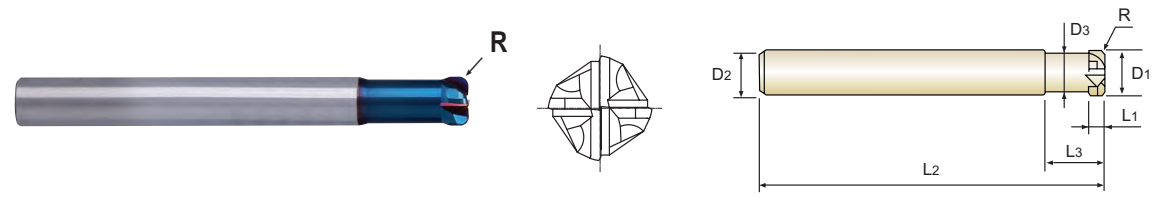




PLAIN SHANK G826 SERIES

CARBIDE, 4 FLUTE STUB LENGTH CORNER RADIUS HIGH FEED

- ▶ Excellent wear resistance at heavy feed rates on high hardened material.
- ▶ Designed with reduced clearance angles and short flutes for strength.
- ▶ High hardness & heat resistance coating for long life in dry applications.



CARBIDE 4 BLUE ±.0002 PLAIN p.C107-C108

High Feed End Mill U.S.A Stock

EDP No.	Corner Radius	Mill Diameter	Shank Diameter	Length of Cut	Length Below Shank	Overall Length	Neck Diameter
	R	D1	D2	L1	L3	L2	D3
G826082	R1/32	1/8	1/4	.050	3/8	2-1/4	.110
G826124	R1/16	3/16	1/4	.075	3/8	2-1/4	.180
G826164	R1/16	1/4	1/4	.100	1/2	2-1/2	.220
G826206	R3/32	5/16	5/16	.130	5/8	2-1/2	.280
G826246	R3/32	3/8	3/8	.150	3/4	2-3/4	.330
G826328	R1/8	1/2	1/2	.200	1	3-1/4	.460

The original bright blue color may discolor during use, however, the performance will not be negatively affected

Mill Dia. Tolerance (inch)	Corner Radius Tolerance (inch)	Shank Dia. Tolerance
0--.0008	±.0002	h5

Comparison of the endteeth shape

- Reduced clearance angles and short flutes strengthens corner radius and reduces chattering
- Extra-short flute length for high rigidity
- Heavy core with reduced diameter allows greater depths and maximum rigidity

© : Excellent ○ : Good

ISO	P										M				K					
	Non-alloy steel					Low alloy steel					High alloyed steel, and tool steel		Stainless steel		Grey cast iron		Nodular cast iron		Malleable cast iron	
Material Description	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
VDI 3323																				
HRc	13	25	28	32	30	10	29	32	38	15	35	15	23	10	10	26	3	25	21	21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend					○					○										

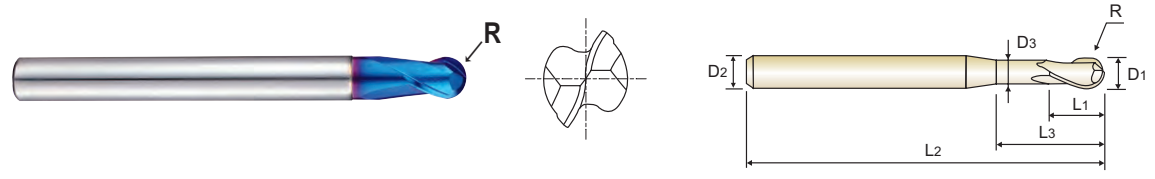
ISO	N					S					H										
	Aluminum-wrought alloy		Aluminum-cast, alloyed		Copper and Copper Alloys (Bronze / Brass)	Non Metallic Materials		Heat Resistant Super Alloys			Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron						
Material Description	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
VDI 3323																					
HRc	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HB	60	100	75	90	130	110	90	100			15	30	25	38	34	400 Rm	1050 Rm	55	60	42	55
Recommend																		◎	◎	○	◎



PLAIN SHANK G8A43 SERIES

CARBIDE, 2 FLUTE STUB LENGTH BALL NOSE with EXTENDED NECK

- ▶ Designed to machine high hardened materials.
- ▶ Suitable for dry cutting, high speed cutting due to newly developed raw-material and new coating.
- ▶ Excellent workpiece finish.
- ▶ Designed for high precision milling operation.
- ▶ Higher wear-resistance.



CARBIDE 2 BLUE 30° ±.0002 ±.0004 PLAIN p.C109

U.S.A Stock

EDP No.	Radius of Ball Nose	Mill Diameter	Shank Diameter	Length of Cut	Length Below Shank	Overall Length	Neck Diameter
	R	D1	D2	L1	L3	L2	D3
G8A43002	R1/64	1/32	1/4	1/32	1/16	2	.029
G8A43004	R1/32	1/16	1/4	1/16	1/8	2	.059
G8A43006	R3/64	3/32	1/4	3/32	3/16	2	.090
G8A43008	R1/16	1/8	1/4	1/8	1/4	2-1/2	.121
G8A43012	R3/32	3/16	1/4	3/16	3/8	3	.184
G8A43016	R1/8	1/4	1/4	1/4	1/2	3-1/2	.246
G8A43020	R5/32	5/16	5/16	5/16	5/8	4	.309
G8A43024	R3/16	3/8	3/8	3/8	3/4	4	.371
G8A43032	R1/4	1/2	1/2	1/2	1	4-1/2	.496

The original bright blue color may discolor during use, however, the performance will not be negatively affected

Size	Radius Tolerance (Inch)	Mill Dia. Tolerance (Inch)	Shank Dia. Tolerance
up to Ø1/4	±.0002	0--.0005	h5
over Ø1/4	±.0004	0--.0006	

© : Excellent ○ : Good

ISO	P										M				K					
	Non-alloy steel					Low alloy steel					High alloyed steel, and tool steel		Stainless steel		Grey cast iron		Nodular cast iron		Malleable cast iron	
Material Description	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
VDI 3323																				
HRc	13	25	28	32	30	10	29	32	38	15	35	15	23	10	10	26	3	25	21	21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend					○					○										

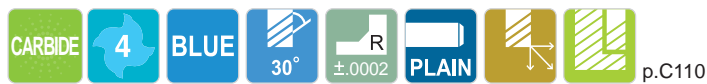
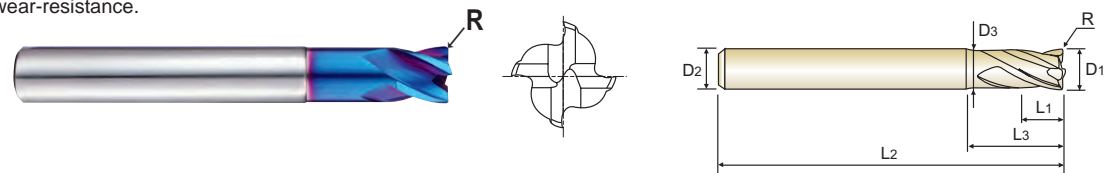
ISO	N					S					H										
	Aluminum-wrought alloy		Aluminum-cast, alloyed		Copper and Copper Alloys (Bronze / Brass)	Non Metallic Materials		Heat Resistant Super Alloys			Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron						
Material Description	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
VDI 3323																					
HRc	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HB	60	100	75	90	130	110	90	100			15	30	25	38	34	400 Rm	1050 Rm	55	60	42	55
Recommend																		◎	◎	○	◎



PLAIN SHANK G850 SERIES

CARBIDE, 4 FLUTE STUB LENGTH CORNER RADIUS with EXTENDED NECK

- ▶ Designed to machine high hardened materials.
- ▶ Suitable for dry cutting, high speed cutting due to newly developed raw-material and new coating.
- ▶ Excellent workpiece finish.
- ▶ Deep slotting is possible by reduced neck.
- ▶ Corner radius for preventing the chipping in high speed machining.
- ▶ Higher wear-resistance.



◆ U.S.A Stock

Unit : Inch

EDP No.	Corner Radius	Mill Diameter	Shank Diameter	Length of Cut	Length Below Shank	Overall Length	Neck Diameter
	R	D1	D2	L1	L3	L2	D3
<b>G85004</b>	R.004	1/16	1/8	3/32	-	1-1/2	-
<b>G85008</b>	R.004	1/8	1/4	5/32	1/4	2	.119
<b>G85012</b>	R.004	3/16	1/4	1/4	3/8	2	.181
<b>G85016</b>	R.008	1/4	1/4	5/16	9/16	2	.238
<b>G85020</b>	R.008	5/16	5/16	3/8	3/4	2-1/2	.301
<b>G85024</b>	R.008	3/8	3/8	1/2	1	3	.363
<b>G85032</b>	R.012	1/2	1/2	5/8	1-3/16	3	.488
<b>G85040</b>	R.012	5/8	5/8	3/4	1-1/2	3-1	.613
<b>G85048</b>	R.012	3/4	3/4	1	1-3/4	4	.738

↘ The original bright blue color may discolor during use, however, the performance will not be negatively affected

Size	Corner Radius Tolerance (Inch)	Mill Dia. Tolerance (Inch)	Shank Dia. Tolerance
up to Ø1/4	±.0002	0---.0005	h5
over Ø1/4	±.0004	0---.0006	

◎ : Excellent ○ : Good

ISO	P										M				K						
	Non-alloy steel					Low alloy steel					High alloyed steel, and tool steel				Stainless steel		Grey cast iron		Nodular cast iron		Malleable cast iron
Material Description	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
HRc	13	25	28	32	30	10	29	32	38	15	35	15	23	10	10	26	3	25	21	21	
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230	
Recommend					○			○	○		○										

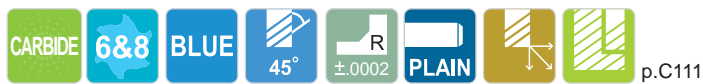
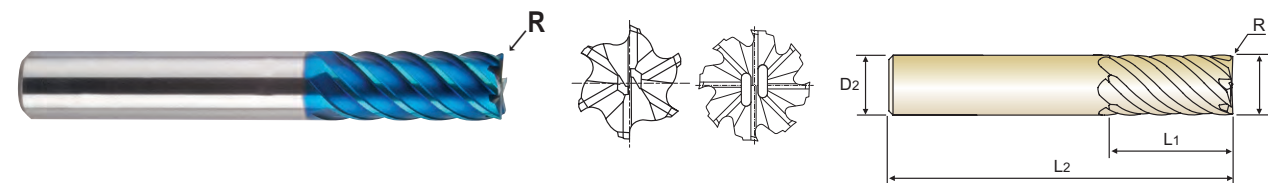
ISO	N					S					H										
	Aluminum-wrought alloy		Aluminum-cast, alloyed		Copper and Copper Alloys (Bronze / Brass)	Non Metallic Materials			Heat Resistant Super Alloys		Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron						
Material Description	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HB	60	100	75	90	130	110	90	100			15	30	25	38	34	400 Rm	1050 Rm	55	60	42	55
Recommend																		◎	◎	◎	◎



PLAIN SHANK G851 SERIES

CARBIDE, 6&8 FLUTE 45° HELIX CORNER RADIUS

- ▶ Designed to machine high hardened materials.
- ▶ Suitable for dry cutting, high speed cutting due to newly developed raw-material and new coating.
- ▶ Excellent workpiece finish.
- ▶ Corner radius for preventing the chipping in high speed machining.
- ▶ Higher wear-resistance.



◆ U.S.A Stock

Unit : Inch

EDP No.	Corner Radius	Mill Diameter	Shank Diameter	Length of Cut	Overall Length	No. of Flute
	R	D1	D2	L1	L2	
<b>G85116</b>	R.02	1/4	1/4	1/2	2-1/4	6
<b>G85120</b>	R.02	5/16	5/16	3/4	2-1/2	6
<b>G85125</b>	R.03	3/8	3/8	7/8	2-7/8	6
<b>G85133</b>	R.03	1/2	1/2	1	3-1/4	6
<b>G85140</b>	R.03	5/8	5/8	1-1/4	3-5/8	6
<b>G85141</b>	R.06	5/8	5/8	1-1/4	3-5/8	6
<b>G85148</b>	R.03	3/4	3/4	1-1/2	4-1/8	8
<b>G85149</b>	R.06	3/4	3/4	1-1/2	4-1/8	8
<b>G85164</b>	R.03	1	1	1-3/4	4-1/4	8
<b>G85165</b>	R.06	1	1	1-3/4	4-1/4	8
<b>G85167</b>	R.03	1	1	4-1/8	7	8
<b>G85168</b>	R.06	1	1	4-1/8	7	8

↘ The original bright blue color may discolor during use, however, the performance will not be negatively affected

Size	Corner Radius Tolerance (Inch)	Mill Dia. Tolerance (Inch)	Shank Dia. Tolerance
up to Ø1/4	±.0002	0---.0005	h5
over Ø1/4	±.0004	0---.0006	

◎ : Excellent ○ : Good

ISO	P										M				K						
	Non-alloy steel					Low alloy steel					High alloyed steel, and tool steel				Stainless steel		Grey cast iron		Nodular cast iron		Malleable cast iron
Material Description	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
HRc	13	25	28	32	30	10	29	32	38	15	35	15	23	10	10	26	3	25	21	21	
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230	
Recommend					○			○	○		○										

ISO	N					S					H										
	Aluminum-wrought alloy		Aluminum-cast, alloyed		Copper and Copper Alloys (Bronze / Brass)	Non Metallic Materials			Heat Resistant Super Alloys		Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron						
Material Description	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HB	60	100	75	90	130	110	90	100			15	30	25	38	34	400 Rm	1050 Rm	55	60	42	55
Recommend																		◎	◎	◎	◎



HSS

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PLAIN SHANK G859 SERIES



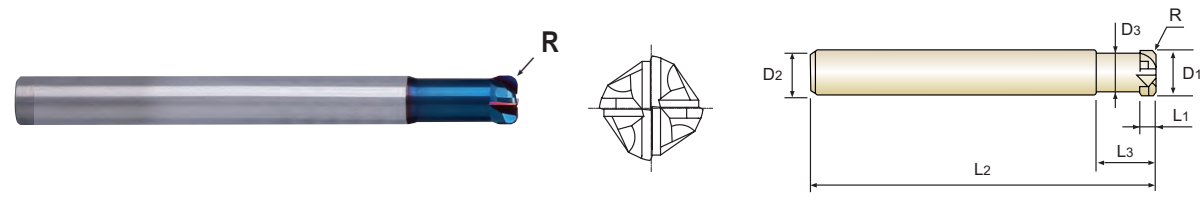
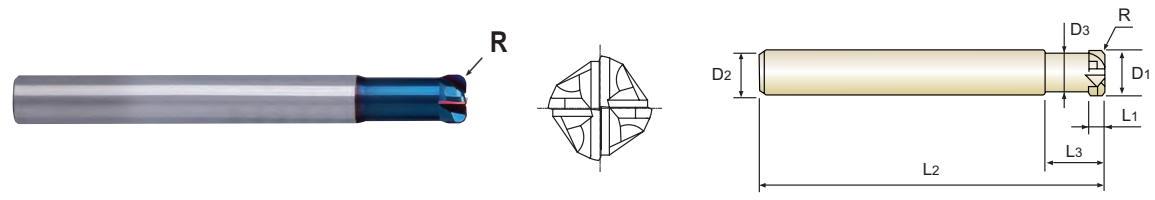
PLAIN SHANK G854 SERIES

CARBIDE, 4 FLUTE STUB LENGTH CORNER RADIUS HIGH FEED

CARBIDE, 4 FLUTE STUB LENGTH CORNER RADIUS HIGH FEED (Long Shank)

- ▶ Excellent wear resistance at heavy feed rates on high hardened material.
- ▶ Designed with reduced clearance angles and short flutes for strength.
- ▶ High hardness & heat resistance coating for long life in dry applications.

- ▶ Excellent wear resistance at heavy feed rates on high hardened material.
- ▶ Designed with reduced clearance angles and short flutes for strength.
- ▶ High hardness & heat resistance coating for long life in dry applications.



CARBIDE 4 BLUE PLAIN ±0.005 p.C112-C113

High Feed End Mill U.S.A Stock

CARBIDE 4 BLUE PLAIN ±0.005 p.C112-C113

High Feed End Mill U.S.A Stock

EDP No.	Corner Radius R	Mill Diameter		Shank Diameter D2	Length of Cut L1	Length Below Shank L3	Overall Length L2	Neck Diameter D3
		Metric D1	Inch					
		Unit : mm						
G859020	R0.5	2.0	.0787	6	1	6	50	1.8
G859030	R0.5	3.0	.1181	6	1.2	8	50	2.8
G859040	R0.5	4.0	.1575	6	1.5	10	50	3.8
G859060	R0.5	6.0	.2362	6	2.5	12	60	5.4
G859061	R1.0	6.0	.2362	6	2.5	12	60	5.4
G859081	R1.0	8.0	.3150	8	3.5	16	60	7.2
G859082	R2.0	8.0	.3150	8	3.5	16	60	7.2
G859101	R1.0	10.0	.3937	10	4	20	70	9
G859102	R2.0	10.0	.3937	10	4	20	70	9
G859122	R2.0	12.0	.4724	12	5	25	80	11
G859123	R3.0	12.0	.4724	12	5	25	80	11
G859163	R3.0	16.0	.6299	16	6.5	30	90	15

EDP No.	Corner Radius R	Mill Diameter		Shank Diameter D2	Length of Cut L1	Length Below Shank L3	Overall Length L2	Neck Diameter D3
		Metric D1	Inch					
		Unit : mm						
G854020	R0.5	2.0	.0787	6	1	6	70	1.8
G854030	R0.5	3.0	.1181	6	1.2	8	70	2.8
G854040	R0.5	4.0	.1575	6	1.5	10	70	3.8
G854050	R1.0	5.0	.1969	6	2	10	70	4.6
G854060	R0.5	6.0	.2362	6	2.5	12	90	5.4
G854061	R1.0	6.0	.2362	6	2.5	12	90	5.4
G854062	R1.5	6.0	.2362	6	2.5	12	90	5.4
G854081	R1.0	8.0	.3150	8	3.5	16	100	7.2
G854082	R2.0	8.0	.3150	8	3.5	16	100	7.2
G854101	R1.0	10.0	.3937	10	4	20	100	9
G854102	R2.0	10.0	.3937	10	4	20	100	9
G854122	R2.0	12.0	.4724	12	5	25	110	11
G854123	R3.0	12.0	.4724	12	5	25	110	11
G854163	R3.0	16.0	.6299	16	6.5	30	130	15

The original bright blue color may discolor during use, however, the performance will not be negatively affected

Mill Dia. Tolerance (inch)	Corner Radius Tolerance (inch)	Shank Dia. Tolerance
0---.0008	±.0002	h5

The original bright blue color may discolor during use, however, the performance will not be negatively affected

Mill Dia. Tolerance (inch)	Corner Radius Tolerance (inch)	Shank Dia. Tolerance
0---.0008	±.0002	h5

**Comparison of the endteeth shape**

- Reduced clearance angles and short flutes strengthens corner radius and reduces chattering
- Extra-short flute length for high rigidity
- Heavy core with reduced diameter allows greater depths and maximum rigidity

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- Reduced clearance angles and short flutes strengthens corner radius and reduces chattering
- Extra-short flute length for high rigidity
- Heavy core with reduced diameter allows greater depths and maximum rigidity

© : Excellent ○ : Good

ISO Material Description	P										M				K							
	Non-alloy steel					Low alloy steel					High alloyed steel, and tool steel				Stainless steel		Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
HRc	13	25	28	32	30	10	29	32	38	15	35	15	23	10	10	26	3	25	3	25	130	21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230		
Recommend					○					○												

ISO Material Description	N										S					H							
	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron			
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41		
HRc											15	30	25	38	34			55	60	42	55		
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550		
Recommend																		◎	◎	○	◎		

© : Excellent ○ : Good

ISO Material Description	P										M				K							
	Non-alloy steel					Low alloy steel					High alloyed steel, and tool steel				Stainless steel		Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
HRc	13	25	28	32	30	10	29	32	38	15	35	15	23	10	10	26	3	25	3	25	130	21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230		
Recommend					○					○												

ISO Material Description	N										S					H							
	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron			
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41		
HRc											15	30	25	38	34			55	60	42	55		
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550		
Recommend																		◎	◎	○	◎		

HSS

HSS



PLAIN SHANK G8A46 SERIES

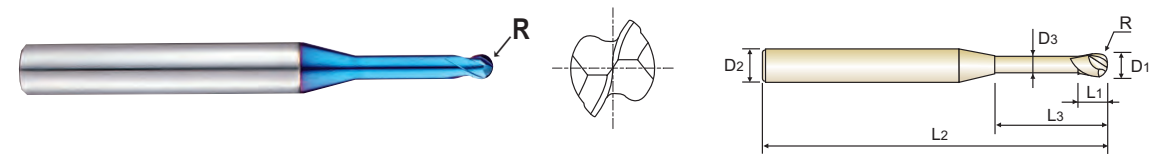
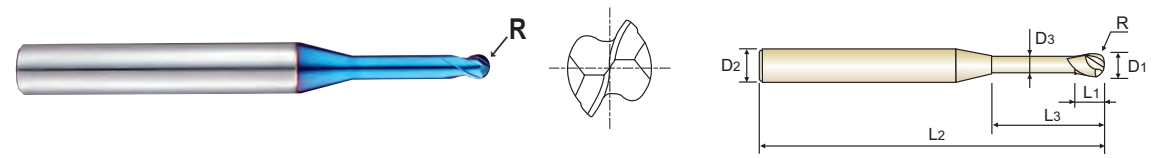
PLAIN SHANK G8A46 SERIES

CARBIDE, 2 FLUTE BALL NOSE for RIB PROCESSING

CARBIDE, 2 FLUTE BALL NOSE for RIB PROCESSING

- Designed to machine high hardened materials.
Suitable for dry cutting, high speed cutting thanks to newly developed raw-material and new coating.
Excellent workpiece finish.
Designed for high precision milling operation.
Higher wear-resistance.

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U.S.A Stock

U.S.A Stock

Table with 8 columns: EDP No., Radius of Ball Nose, Mill Diameter (Metric/Inch), Shank Diameter, Length of Cut, Length Below Shank, Overall Length, Neck Diameter. Lists various end mill models like G8A46805, G8A46806, etc.

Table with 8 columns: EDP No., Radius of Ball Nose, Mill Diameter (Metric/Inch), Shank Diameter, Length of Cut, Length Below Shank, Overall Length, Neck Diameter. Lists various end mill models like G8A46990, G8A46918, etc.

The original bright blue color may discolor during use, however, the performance will not be negatively affected

The original bright blue color may discolor during use, however, the performance will not be negatively affected

Table with 2 columns: Mill Dia. Tolerance(mm), Shank Dia. Tolerance. Values: 0~-0.012, h5

Table with 2 columns: Mill Dia. Tolerance(mm), Shank Dia. Tolerance. Values: 0~-0.012, h5

NEXT PAGE

NEXT PAGE

ISO material compatibility chart with columns for P (Non-alloy steel, Low alloy steel, High alloyed steel, tool steel), M (Stainless steel, Grey cast iron, Nodular cast iron, Malleable cast iron), S (Aluminum-wrought alloy, Aluminum-cast, alloyed, Copper and Copper Alloys, Non Metallic Materials, Heat Resistant Super Alloys, Titanium Alloys), H (Hardened steel, Chilled Cast Iron, Hardened Cast Iron).

ISO material compatibility chart with columns for P (Non-alloy steel, Low alloy steel, High alloyed steel, tool steel), M (Stainless steel, Grey cast iron, Nodular cast iron, Malleable cast iron), S (Aluminum-wrought alloy, Aluminum-cast, alloyed, Copper and Copper Alloys, Non Metallic Materials, Heat Resistant Super Alloys, Titanium Alloys), H (Hardened steel, Chilled Cast Iron, Hardened Cast Iron).

HSS

HSS



PLAIN SHANK G8A46 SERIES

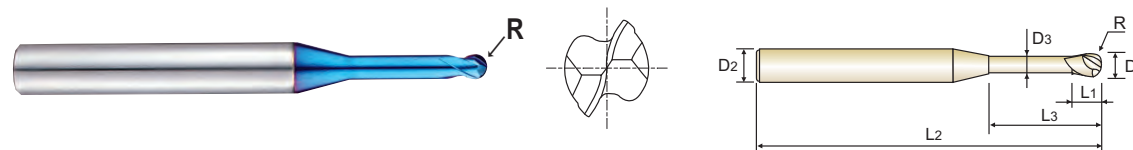
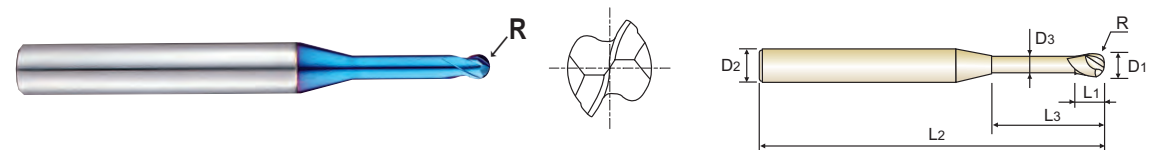
PLAIN SHANK G8A46 SERIES

### CARBIDE, 2 FLUTE BALL NOSE for RIB PROCESSING

### CARBIDE, 2 FLUTE BALL NOSE for RIB PROCESSING

- ▶ Designed to machine high hardened materials.
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- ▶ Excellent workpiece finish.
- ▶ Designed for high precision milling operation.
- ▶ Higher wear-resistance.

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- ▶ Higher wear-resistance.



◆ U.S.A Stock

◆ U.S.A Stock

Unit : mm

EDP No.	Radius of Ball Nose R (±0.005)	Mill Diameter		Shank Diameter D2	Length of Cut L1	Length Below Shank L3	Overall Length L2	Neck Diameter D3
		Metric D1	Inch					
<a href="#">G8A46931</a>	R0.75	1.5	.0472	4	1.2	10	45	1.45
<a href="#">G8A46906</a>	R0.75	1.5	.0472	4	1.2	12	45	1.45
<a href="#">G8A46992</a>	R0.75	1.5	.0472	4	1.2	14	50	1.45
<a href="#">G8A46907</a>	R0.75	1.5	.0472	4	1.2	16	50	1.45
<a href="#">G8A46932</a>	R0.75	1.5	.0472	4	1.2	20	55	1.45
<a href="#">G8A46939</a>	R1.0	2.0	.0787	4	1.6	4	45	1.95
<a href="#">G8A46940</a>	R1.0	2.0	.0787	4	1.6	6	45	1.95
<a href="#">G8A46020</a>	R1.0	2.0	.0787	4	1.6	8	45	1.95
<a href="#">G8A46941</a>	R1.0	2.0	.0787	4	1.6	10	45	1.95
<a href="#">G8A46942</a>	R1.0	2.0	.0787	4	1.6	12	50	1.95
<a href="#">G8A46943</a>	R1.0	2.0	.0787	4	1.6	14	50	1.95
<a href="#">G8A46909</a>	R1.0	2.0	.0787	4	1.6	16	50	1.95
<a href="#">G8A46993</a>	R1.0	2.0	.0787	4	1.6	18	55	1.95
<a href="#">G8A46910</a>	R1.0	2.0	.0787	4	1.6	20	55	1.95
<a href="#">G8A46944</a>	R1.0	2.0	.0787	4	1.6	22	60	1.95
<a href="#">G8A46945</a>	R1.0	2.0	.0787	4	1.6	25	60	1.95
<a href="#">G8A46967</a>	R1.0	2.0	.0787	4	1.6	30	70	1.95
<a href="#">G8A46948</a>	R1.5	3.0	.1181	6	2.4	12	50	2.85
<a href="#">G8A46984</a>	R1.5	3.0	.1181	6	2.4	14	55	2.85
<a href="#">G8A46030</a>	R1.5	3.0	.1181	6	2.4	16	55	2.85
<a href="#">G8A46985</a>	R1.5	3.0	.1181	6	2.4	18	60	2.85
<a href="#">G8A46911</a>	R1.5	3.0	.1181	6	2.4	20	60	2.85
<a href="#">G8A46968</a>	R1.5	3.0	.1181	6	2.4	25	65	2.85
<a href="#">G8A46969</a>	R1.5	3.0	.1181	6	2.4	30	70	2.85

Unit : mm

EDP No.	Radius of Ball Nose R (±0.005)	Mill Diameter		Shank Diameter D2	Length of Cut L1	Length Below Shank L3	Overall Length L2	Neck Diameter D3
		Metric D1	Inch					
<a href="#">G8A46970</a>	R1.5	3.0	.1181	6	2.4	35	80	2.85
<a href="#">G8A46950</a>	R2.0	4.0	.1575	6	3.2	12	60	3.85
<a href="#">G8A46040</a>	R2.0	4.0	.1575	6	3.2	16	60	3.85
<a href="#">G8A46912</a>	R2.0	4.0	.1575	6	3.2	20	65	3.85
<a href="#">G8A46913</a>	R2.0	4.0	.1575	6	3.2	25	70	3.85
<a href="#">G8A46971</a>	R2.0	4.0	.1575	6	3.2	30	70	3.85
<a href="#">G8A46972</a>	R2.0	4.0	.1575	6	3.2	35	80	3.85
<a href="#">G8A46973</a>	R2.0	4.0	.1575	6	3.2	40	90	3.85
<a href="#">G8A46974</a>	R2.0	4.0	.1575	6	3.2	45	90	3.85
<a href="#">G8A46975</a>	R2.0	4.0	.1575	6	3.2	50	100	3.85

▶ The original bright blue color may discolor during use, however, the performance will not be negatively affected

Mill Dia. Tolerance(mm)	Shank Dia. Tolerance
0~-0.012	h5

▶ The original bright blue color may discolor during use, however, the performance will not be negatively affected

Mill Dia. Tolerance(mm)	Shank Dia. Tolerance
0~-0.012	h5

▶ NEXT PAGE

▶ The original bright blue color may discolor during use, however, the performance will not be negatively affected

Mill Dia. Tolerance(mm)	Shank Dia. Tolerance
0~-0.012	h5

◎ : Excellent ○ : Good

ISO Material Description	P									M				K						
	Non-alloy steel			Low alloy steel			High alloyed steel, and tool steel			Stainless steel		Grey cast iron	Nodular cast iron		Malleable cast iron					
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend					○			○	○	○										

ISO Material Description	N					S					H										
	Aluminum-wrought alloy		Aluminum-cast, alloyed		Copper and Copper Alloys (Bronze / Brass)	Non Metallic Materials		Heat Resistant Super Alloys			Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron						
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend																		◎	◎	○	◎

◎ : Excellent ○ : Good

ISO Material Description	P									M				K						
	Non-alloy steel			Low alloy steel			High alloyed steel, and tool steel			Stainless steel		Grey cast iron	Nodular cast iron		Malleable cast iron					
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend					○			○	○	○										

ISO Material Description	N					S					H										
	Aluminum-wrought alloy		Aluminum-cast, alloyed		Copper and Copper Alloys (Bronze / Brass)	Non Metallic Materials		Heat Resistant Super Alloys			Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron						
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend																		◎	◎	○	◎

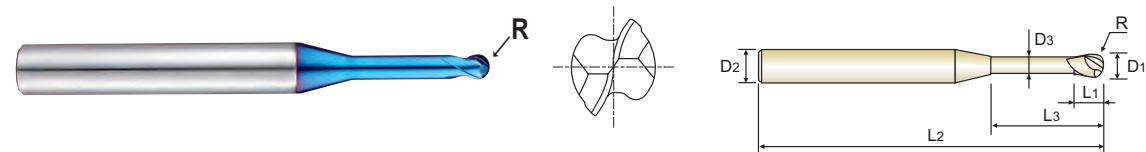




PLAIN SHANK G8A54 SERIES

CARBIDE, 2 FLUTE BALL NOSE for RIB PROCESSING

- ▶ Designed to machine high hardened materials.
- ▶ Suitable for dry cutting, high speed cutting thanks to newly developed raw-material and new coating.
- ▶ Excellent workpiece finish.
- ▶ Designed for high precision milling operation.
- ▶ Higher wear-resistance.



◆ U.S.A Stock

EDP No.	Radius of Ball Nose R (±0.005)	Mill Diameter		Shank Diameter D2	Length of Cut L1	Length Below Shank L3	Overall Length L2	Neck Diameter D3
		Metric	Inch					
		D1						
G8A54005	R0.25	0.5	.0197	6	0.5	1.5	50	0.45
G8A54901	R0.25	0.5	.0197	6	0.5	3.3	50	0.45
G8A54006	R0.3	0.6	.0236	6	0.6	2	50	0.55
G8A54902	R0.3	0.6	.0236	6	0.6	4	50	0.55
G8A54008	R0.4	0.8	.0315	6	0.8	2.5	50	0.75
G8A54903	R0.4	0.8	.0315	6	0.8	5.5	50	0.75
G8A54010	R0.5	1.0	.0394	6	1	3.3	50	0.95
G8A54904	R0.5	1.0	.0394	6	1	6.7	50	0.95
G8A54905	R0.5	1.0	.0394	6	1	12	50	0.95
G8A54012	R0.6	1.2	.0472	6	1.2	4.4	50	1.15
G8A54906	R0.6	1.2	.0472	6	1.2	8	50	1.15
G8A54015	R0.75	1.5	.0591	6	1.5	5	50	1.45
G8A54907	R0.75	1.5	.0591	6	1.5	9.7	50	1.45
G8A54908	R0.75	1.5	.0591	6	1.5	15	50	1.45
G8A54020	R1.0	2.0	.0787	6	2	6	50	1.95
G8A54909	R1.0	2.0	.0787	6	2	13	50	1.95
G8A54910	R1.0	2.0	.0787	6	2	20	60	1.95

↙ The original bright blue color may discolor during use, however, the performance will not be negatively affected

Mill Dia. Tolerance(mm)	Shank Dia. Tolerance
0~-0.012	h5

◎ : Excellent ○ : Good

ISO	P											M				K					
	Non-alloy steel					Low alloy steel						High alloyed steel, and tool steel				Stainless steel		Grey cast iron	Nodular cast iron		Malleable cast iron
Material Description	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
HRc	13	25	28	32	30	10	29	32	38	15	35	15	23	10	10	26	3	25	21	21	
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230	
Recommend					○					○	○										

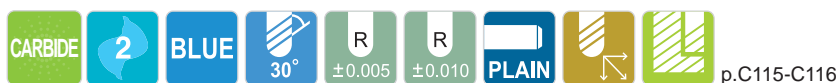
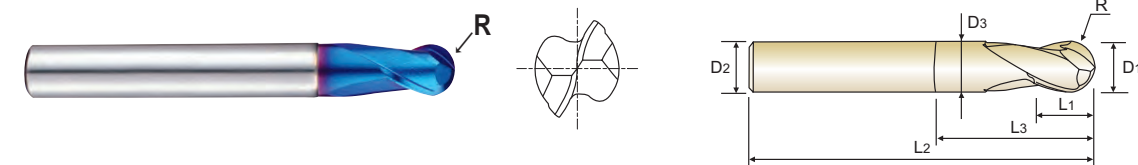
ISO	N					S					H										
	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys			Titanium Alloys	Hardened steel	Chilled Cast Iron	Hardened Cast Iron				
Material Description	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc	60	100	75	90	130	110	90	100			15	30	25	38	34	400 Rm	1050 Rm	55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend																		◎	◎	○	◎



PLAIN SHANK G8A28 SERIES

CARBIDE, 2 FLUTE BALL NOSE

- ▶ Designed to machine high hardened materials.
- ▶ Suitable for dry cutting, high speed cutting thanks to newly developed raw-material and new coating.
- ▶ Excellent workpiece finish.
- ▶ Designed for high precision milling operation.
- ▶ Higher wear-resistance.



◆ U.S.A Stock

EDP No.	Radius of Ball Nose R	Mill Diameter		Shank Diameter D2	Length of Cut L1	Length Below Shank L3	Overall Length L2	Neck Diameter D3
		Metric	Inch					
		D1						
G8A28001	R0.05	0.1	.0039	4	0.2	-	40	-
G8A28002	R0.1	0.2	.0079	4	0.3	-	40	-
G8A28003	R0.15	0.3	.0118	4	0.5	-	40	-
G8A28004	R0.2	0.4	.0157	4	0.6	-	40	-
G8A28005	R0.25	0.5	.0197	4	0.7	-	40	-
G8A28006	R0.3	0.6	.0236	4	0.9	-	40	-
G8A28007	R0.35	0.7	.0276	4	1.1	-	40	-
G8A28008	R0.4	0.8	.0315	4	1.2	-	40	-
G8A28009	R0.45	0.9	.0354	4	1.4	-	40	-
G8A280104S	R0.5	1.0	.0394	4	1.5	3	50	0.95
G8A28010	R0.5	1.0	.0394	6	1.5	3	50	0.95
G8A280154S	R0.75	1.5	.0591	4	2	4	50	1.45
G8A28015	R0.75	1.5	.0591	6	2	4	50	1.45
G8A280204S	R1.0	2.0	.0787	4	2.5	5	50	1.95
G8A28020	R1.0	2.0	.0787	6	2.5	5	50	1.95
G8A280254S	R1.25	2.5	.0984	4	3	7	50	2.4
G8A28025	R1.25	2.5	.0984	6	3	7	50	2.4
G8A28030	R1.5	3.0	.1181	6	4	10	60	2.85
G8A28035	R1.75	3.5	.1378	6	4.5	10	60	3.35
G8A28040	R2.0	4.0	.1575	6	5	10	60	3.85
G8A28045	R2.25	4.5	.1772	6	5.5	10	60	4.35
G8A28050	R2.5	5.0	.1969	6	6	12	60	4.85
G8A28055	R2.75	5.5	.2165	6	6.5	12	60	5.35
G8A28060	R3.0	6.0	.2362	6	7	15	60	5.85
G8A28903	R3.0	6.0	.2362	6	9	30	90	5.85
G8A28901	R4.0	8.0	.3150	8	9	15	60	7.7
G8A28080	R4.0	8.0	.3150	8	9	15	80	7.7
G8A28904	R4.0	8.0	.3150	8	12	30	100	7.7
G8A28902	R5.0	10.0	.3937	10	11	25	60	9.7
G8A28100	R5.0	10.0	.3937	10	11	25	80	9.7
G8A28905	R5.0	10.0	.3937	10	15	30	100	9.7
G8A28120	R6.0	12.0	.4724	12	14	25	80	11.7

Size	Corner Radius Tolerance (mm)	Mill Dia. Tolerance (mm)	Shank Dia. Tolerance
up to R3	±0.005	0 ~ - 0.012	h5
over R3	±0.010	0 ~ - 0.015	

↙ The original bright blue color may discolor during use, however, the performance will not be negatively affected

◎ : Excellent ○ : Good

ISO	P											M				K					
	Non-alloy steel					Low alloy steel						High alloyed steel, and tool steel				Stainless steel		Grey cast iron	Nodular cast iron		Malleable cast iron
Material Description	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
HRc	13	25	28	32	30	10	29	32	38	15	35	15	23	10	10	26	3	25	21	21	
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230	
Recommend					○					○	○										

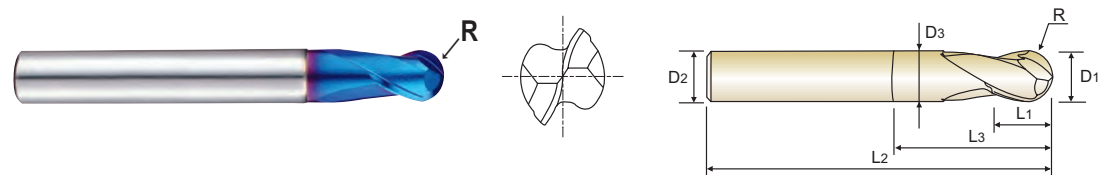
ISO	N					S					H										
	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys			Titanium Alloys	Hardened steel	Chilled Cast Iron	Hardened Cast Iron				
Material Description	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc	60	100	75	90	130	110	90	100			15	30	25	38	34	400 Rm	1050 Rm	55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend																		◎	◎	○	◎



PLAIN SHANK **G8A38** SERIES

**CARBIDE, 2 FLUTE STUB LENGTH BALL NOSE with EXTENDED NECK**

- ▶ Designed to machine high hardened materials.
- ▶ Suitable for dry cutting, high speed cutting due to newly developed raw-material and new coating.
- ▶ Excellent workpiece finish.
- ▶ Designed for high precision milling operation.
- ▶ Higher wear-resistance.



CARBIDE 2 BLUE 30° ±0.005 ±0.010 PLAIN p.C115-C116 **U.S.A Stock**

EDP No.	Radius of Ball Nose R	Mill Diameter		Shank Diameter D2	Length of Cut L1	Length Below Shank L3	Overall Length L2	Neck Diameter D3
		Metric	Inch					
		D1						
<b>G8A38010</b>	R0.5	1.0	.0394	4	1	2.2	50	0.95
<b>G8A38012</b>	R0.6	1.2	.0472	4	1.2	2.6	50	1.15
<b>G8A38015</b>	R0.75	1.5	.0591	4	1.5	3	50	1.45
<b>G8A380204S</b>	R1.0	2.0	.0787	4	2	4	50	1.95
<b>G8A38020</b>	R1.0	2.0	.0787	6	2	4	50	1.95
<b>G8A38030</b>	R1.5	3.0	.1181	6	3	6	60	2.85
<b>G8A38040</b>	R2.0	4.0	.1575	6	4	8	70	3.85
<b>G8A38050</b>	R2.5	5.0	.1969	6	5	10	80	4.85
<b>G8A38060</b>	R3.0	6.0	.2362	6	6	12	90	5.85
<b>G8A38070</b>	R3.5	7.0	.2756	8	7	14	90	6.7
<b>G8A38080</b>	R4.0	8.0	.3150	8	8	16	100	7.7
<b>G8A38090</b>	R4.5	9.0	.3543	10	9	18	100	8.7
<b>G8A38100</b>	R5.0	10.0	.3937	10	10	20	100	9.7
<b>G8A38120</b>	R6.0	12.0	.4724	12	12	24	110	11.7
<b>G8A38140</b>	R7.0	14.0	.5512	14	14	28	110	13.7
<b>G8A38160</b>	R8.0	16.0	.6299	16	16	32	140	15.7
<b>G8A38180</b>	R9.0	18.0	.7087	18	18	36	140	17.7
<b>G8A38200</b>	R10.0	20.0	.7874	20	20	40	160	19.7
<b>G8A38250</b>	R12.5	25.0	.9843	25	25	50	180	24.7

▶ The original bright blue color may discolor during use, however, the performance will not be negatively affected

Size	Corner Radius Tolerance (mm)	Mill Dia. Tolerance (mm)	Shank Dia. Tolerance
up to R3	±0.005	0 -- 0.012	h5
over R3	±0.010	0 -- 0.015	

◎ : Excellent ○ : Good

ISO	P										M				K					
	Non-alloy steel					Low alloy steel					High alloyed steel, and tool steel		Stainless steel		Grey cast iron		Nodular cast iron		Malleable cast iron	
Material Description	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
VDI 3323																				
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend					○					○	○									

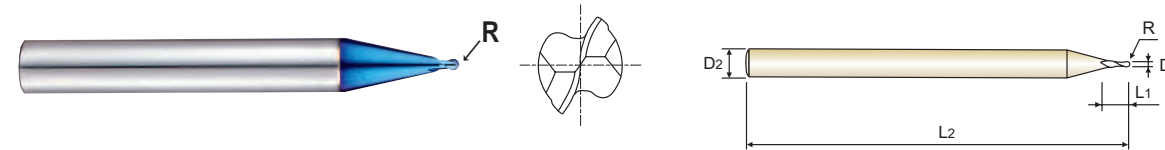
ISO	N					S					H										
	Aluminum-wrought alloy		Aluminum-cast, alloyed		Copper and Copper Alloys (Bronze / Brass)	Non Metallic Materials		Heat Resistant Super Alloys			Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron						
Material Description	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
VDI 3323																					
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend																		◎	◎	○	◎



PLAIN SHANK **G8A53** SERIES

**CARBIDE, 2 FLUTE MINIATURE BALL NOSE**

- ▶ Designed to machine high hardened materials.
- ▶ Suitable for dry cutting, high speed cutting thanks to newly developed raw-material and new coating.
- ▶ Excellent workpiece finish.
- ▶ Designed for high precision milling operation.
- ▶ Higher wear-resistance.



CARBIDE 2 BLUE 30° ±0.005 PLAIN p.C115-C116 **U.S.A Stock**

EDP No.	Radius of Ball Nose R (±0.005)	Mill Diameter		Shank Diameter D2	Length of Cut L1	Overall Length L2
		Metric	Inch			
		D1				
<b>G8A53004</b>	R0.2	0.4	.0157	6	0.4	50
<b>G8A53005</b>	R0.25	0.5	.0197	6	0.5	50
<b>G8A53006</b>	R0.3	0.6	.0236	6	0.6	50
<b>G8A53008</b>	R0.4	0.8	.0315	6	0.8	50
<b>G8A53010</b>	R0.5	1.0	.0394	6	1.0	50
<b>G8A53012</b>	R0.6	1.2	.0472	6	1.2	50
<b>G8A53015</b>	R0.75	1.5	.0591	6	1.5	50
<b>G8A53020</b>	R1.0	2.0	.0787	6	2.0	50

▶ The original bright blue color may discolor during use, however, the performance will not be negatively affected

Mill Dia. Tolerance(mm)	Shank Dia. Tolerance
0~-0.012	h5

◎ : Excellent ○ : Good

ISO	P										M				K						
	Non-alloy steel					Low alloy steel					High alloyed steel, and tool steel		Stainless steel		Grey cast iron		Nodular cast iron		Malleable cast iron		
Material Description	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
VDI 3323																					
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21	
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230	
Recommend					○					○	○										

ISO	N					S					H										
	Aluminum-wrought alloy		Aluminum-cast, alloyed		Copper and Copper Alloys (Bronze / Brass)	Non Metallic Materials		Heat Resistant Super Alloys			Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron						
Material Description	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
VDI 3323																					
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend																		◎	◎	○	◎

HSS

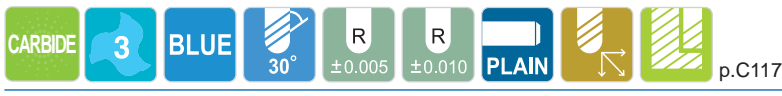
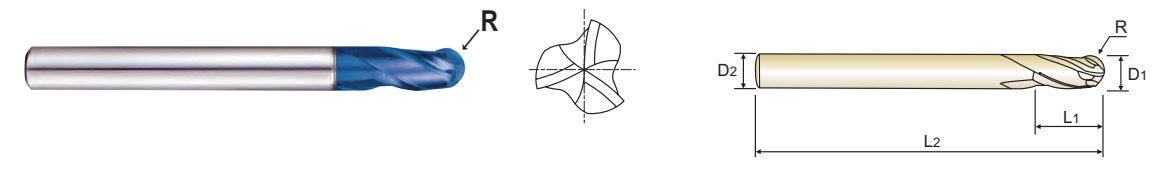
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PLAIN SHANK G8A59 SERIES

CARBIDE, 3 FLUTE BALL NOSE

- ▶ Designed to machine high hardened materials.
- ▶ Suitable for dry cutting, high speed cutting thanks to newly developed raw-material and new coating.
- ▶ Excellent workpiece finish.
- ▶ Designed for high precision milling operation.
- ▶ Higher wear-resistance.



◆ U.S.A Stock

EDP No.	Radius of Ball Nose R	Mill Diameter		Shank Diameter D2	Length of Cut L1	Overall Length L2
		Metric	Inch			
		D1				
G8A59030	R1.5	3.0	.1181	6	8	60
G8A59040	R2.0	4.0	.1575	6	8	70
G8A59050	R2.5	5.0	.1969	6	10	80
G8A59060	R3.0	6.0	.2362	6	12	90
G8A59080	R4.0	8.0	.3150	8	14	100
G8A59100	R5.0	10.0	.3937	10	18	100
G8A59120	R6.0	12.0	.4724	12	22	110
G8A59160	R8.0	16.0	.6299	16	30	140
G8A59200	R10.0	20.0	.7874	20	38	160

↙ The original bright blue color may discolor during use, however, the performance will not be negatively affected

Size	Corner Radius Tolerance (mm)	Mill Dia. Tolerance (mm)	Shank Dia. Tolerance
up to R3	±0.005	0 ~ - 0.012	h5
over R3	±0.010	0 ~ - 0.015	

◎ : Excellent ○ : Good

ISO	P										M				K							
	Non-alloy steel					Low alloy steel					High alloyed steel, and tool steel				Stainless steel		Grey cast iron		Nodular cast iron		Malleable cast iron	
Material Description	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
HRc	13	25	28	32	30	10	29	32	38	15	35	15	23	10	10	26	3	25	3	25	21	21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230		
Recommend					○					○												

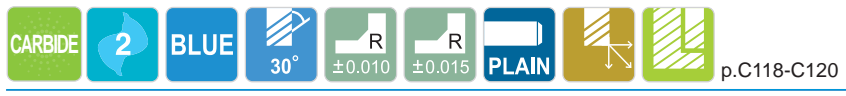
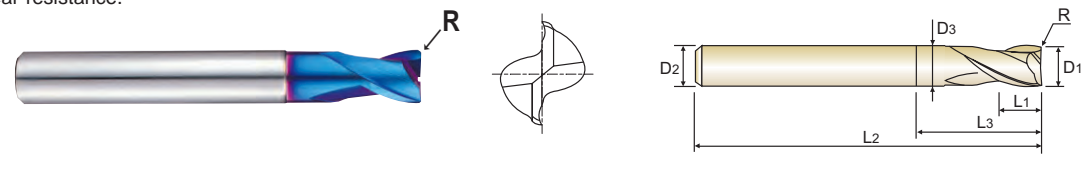
ISO	N					S					H										
	Aluminum-wrought alloy		Aluminum-cast, alloyed		Copper and Copper Alloys (Bronze / Brass)	Heat Resistant Super Alloys			Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron								
Material Description	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34	55	60	42	42	55	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend																◎	◎	○	○	◎	◎



PLAIN SHANK G8A36 SERIES

CARBIDE, 2 FLUTE STUB LENGTH CORNER RADIUS with EXTENDED NECK

- ▶ Designed to machine high hardened materials.
- ▶ Suitable for dry cutting, high speed cutting due to newly developed raw-material and new coating.
- ▶ Excellent workpiece finish.
- ▶ Deep slotting is possible by reduced neck.
- ▶ Corner radius for preventing the chipping in high speed machining.
- ▶ Higher wear-resistance.



◆ U.S.A Stock

EDP No.	Corner Radius R	Mill Diameter		Shank Diameter D2	Length of Cut L1	Length Below Shank L3	Overall Length L2	Neck Diameter D3
		Metric	Inch					
		D1						
G8A36003	-	0.3	.0118	3	0.45	-	40	-
G8A36004	-	0.4	.0157	3	0.6	-	40	-
G8A36005	R0.05	0.5	.0197	3	0.7	-	40	-
G8A36907	R0.05	0.5	.0197	4	1	-	40	-
G8A36006	R0.05	0.6	.0236	3	0.9	-	40	-
G8A36908	R0.05	0.6	.0236	4	1.2	-	40	-
G8A36909	R0.05	0.7	.0276	4	1.4	-	40	-
G8A36008	R0.05	0.8	.0315	3	1.2	-	40	-
G8A36910	R0.05	0.8	.0315	4	1.6	-	40	-
G8A36911	R0.05	0.9	.0354	4	2	-	40	-
G8A36010	R0.1	1.0	.0394	3	1.5	-	40	-
G8A36901	R0.1	1.0	.0394	4	1.5	-	40	-
G8A36903	R0.1	1.0	.0394	6	1.5	-	40	-
G8A36015	R0.1	1.5	.0591	3	2.2	-	40	-
G8A36904	R0.1	1.5	.0591	6	2.2	-	40	-
G8A36020	R0.1	2.0	.0787	3	3	6	40	1.95
G8A36902	R0.1	2.0	.0787	4	3	6	40	1.95
G8A36905	R0.1	2.0	.0787	6	3	6	40	1.95
G8A36025	R0.1	2.5	.0984	3	4	6	40	2.4
G8A36906	R0.1	2.5	.0984	6	4	6	40	2.4
G8A36030	R0.1	3.0	.1181	6	4	7	45	2.85
G8A36035	R0.1	3.5	.1378	6	5	9	45	3.35
G8A36040	R0.1	4.0	.1575	6	5	9	45	3.85
G8A36045	R0.1	4.5	.1772	6	6	10	45	4.35

↙ The original bright blue color may discolor during use, however, the performance will not be negatively affected

Size	Corner Radius Tolerance (mm)	Mill Dia. Tolerance (mm)	Shank Dia. Tolerance
up to Ø6	±0.010	0 ~ - 0.012	h5
over Ø6	±0.015	0 ~ - 0.015	

▶ NEXT PAGE

◎ : Excellent ○ : Good

ISO	P										M				K							
	Non-alloy steel					Low alloy steel					High alloyed steel, and tool steel				Stainless steel		Grey cast iron		Nodular cast iron		Malleable cast iron	
Material Description	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
HRc	13	25	28	32	30	10	29	32	38	15	35	15	23	10	10	26	3	25	3	25	21	21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230		
Recommend					○					○												

ISO	N					S					H										
	Aluminum-wrought alloy		Aluminum-cast, alloyed		Copper and Copper Alloys (Bronze / Brass)	Heat Resistant Super Alloys			Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron								
Material Description	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34	55	60	42	42	55	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend																◎	◎	○	○	◎	◎

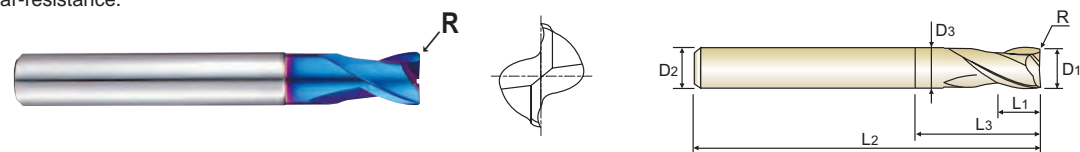




PLAIN SHANK **G8A36** SERIES

**CARBIDE, 2 FLUTE STUB LENGTH CORNER RADIUS with EXTENDED NECK**

- ▶ Designed to machine high hardened materials.
- ▶ Suitable for dry cutting, high speed cutting due to newly developed raw-material and new coating.
- ▶ Excellent workpiece finish.
- ▶ Deep slotting is possible by reduced neck.
- ▶ Corner radius for preventing the chipping in high speed machining.
- ▶ Higher wear-resistance.



◆ U.S.A Stock

Unit : mm

EDP No.	Corner Radius R	Mill Diameter D1		Shank Diameter D2	Length of Cut L1	Length Below Shank L3	Overall Length L2	Neck Diameter D3
		Metric	Inch					
<b>G8A36050</b>	R0.2	5.0	.1969	6	6	11	50	4.85
<b>G8A36060</b>	R0.2	6.0	.2362	6	7	14	50	5.85
<b>G8A36080</b>	R0.2	8.0	.3150	8	9	18	60	7.7
<b>G8A36100</b>	R0.2	10.0	.3937	10	12	25	75	9.7
<b>G8A36120</b>	R0.3	12.0	.4724	12	15	30	75	11.7
<b>G8A36160</b>	R0.3	16.0	.6299	16	18	38	90	15.7
<b>G8A36200</b>	R0.3	20.0	.7874	20	24	45	100	19.7

↙ The original bright blue color may discolor during use, however, the performance will not be negatively affected

Size	Corner Radius Tolerance (mm)	Mill Dia. Tolerance (mm)	Shank Dia. Tolerance
up to Ø6	±0.010	0 ~ - 0.012	h5
over Ø6	±0.015	0 ~ - 0.015	

◎ : Excellent ○ : Good

ISO	P										M				K						
	Non-alloy steel					Low alloy steel					High alloyed steel, and tool steel				Stainless steel		Grey cast iron		Nodular cast iron		Malleable cast iron
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21	
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230	
Recommend					○					○											

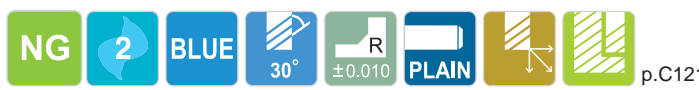
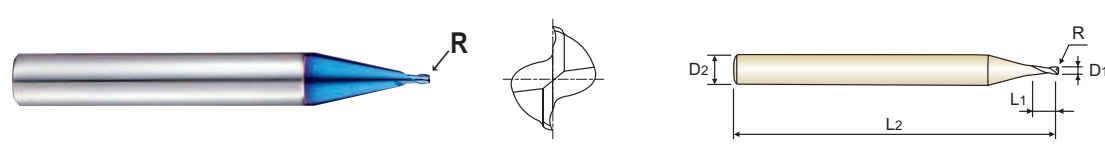
ISO	N				S						H										
	Aluminum-wrought alloy		Aluminum-cast, alloyed		Copper and Copper Alloys (Bronze / Brass)		Non Metallic Materials		Heat Resistant Super Alloys				Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron				
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34	55	60	42	42	55	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend																◎	◎	○	○	○	◎



PLAIN SHANK **G8A50** SERIES

**CARBIDE, 2 FLUTE MINIATURE CORNER RADIUS**

- ▶ Designed to machine high hardened materials.
- ▶ Suitable for dry cutting, high speed cutting thanks to newly developed raw-material and new coating.
- ▶ Excellent workpiece finish.
- ▶ Corner radius for preventing the chipping in high speed machining.
- ▶ Higher wear-resistance.



◆ U.S.A Stock

Unit : mm

EDP No.	Corner Radius R (±0.010)	Mill Diameter D1		Shank Diameter D2	Length of Cut L1	Overall Length L2
		Metric	Inch			
<b>G8A50003</b>	-	0.3	.0118	6	0.45	50
<b>G8A50004</b>	-	0.4	.0157	6	0.6	50
<b>G8A50005</b>	R0.05	0.5	.0197	6	0.7	50
<b>G8A50006</b>	R0.05	0.6	.0236	6	0.9	50
<b>G8A50008</b>	R0.05	0.8	.0315	6	1.2	50
<b>G8A50010</b>	R0.1	1.0	.0394	6	1.5	50
<b>G8A50012</b>	R0.1	1.2	.0472	6	1.8	50
<b>G8A50015</b>	R0.15	1.5	.0591	6	2.2	50
<b>G8A50020</b>	R0.15	2.0	.0787	6	2.2	50

↙ The original bright blue color may discolor during use, however, the performance will not be negatively affected

Mill Dia. Tolerance(mm)	Shank Dia. Tolerance
0~-0.012	h5

◎ : Excellent ○ : Good

ISO	P										M				K						
	Non-alloy steel					Low alloy steel					High alloyed steel, and tool steel				Stainless steel		Grey cast iron		Nodular cast iron		Malleable cast iron
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21	
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230	
Recommend					○					○											

ISO	N				S						H										
	Aluminum-wrought alloy		Aluminum-cast, alloyed		Copper and Copper Alloys (Bronze / Brass)		Non Metallic Materials		Heat Resistant Super Alloys				Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron				
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34	55	60	42	42	55	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend																◎	◎	○	○	○	◎

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HSS



PLAIN SHANK G8A47 SERIES



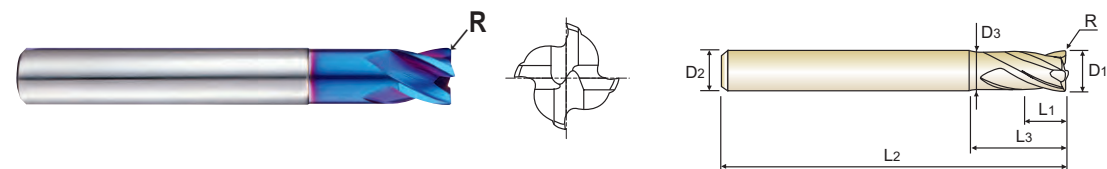
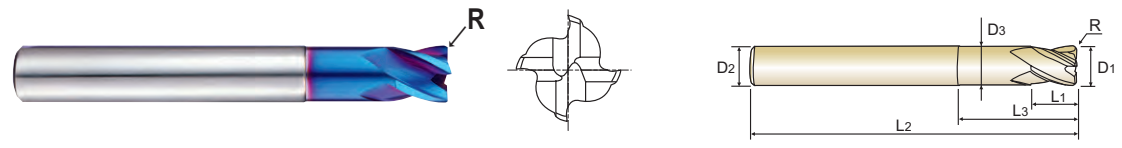
PLAIN SHANK G8A37 SERIES

**CARBIDE, 4 FLUTE CORNER RADIUS with EXTENDED NECK**

**CARBIDE, 4 FLUTE STUB LENGTH CORNER RADIUS with EXTENDED NECK**

- ▶ Designed to machine high hardened materials.
- ▶ Suitable for dry cutting, high speed cutting thanks to newly developed raw-material and new coating.
- ▶ Excellent workpiece finish.
- ▶ Deep slotting is possible by reduced neck.
- ▶ Corner radius for preventing the chipping in high speed machining.
- ▶ Higher wear-resistance.

- ▶ Designed to machine high hardened materials.
- ▶ Suitable for dry cutting, high speed cutting due to newly developed raw-material and new coating.
- ▶ Excellent workpiece finish.
- ▶ Deep slotting is possible by reduced neck.
- ▶ Corner radius for preventing the chipping in high speed machining.
- ▶ Higher wear-resistance.



CARBIDE 4 BLUE 30° ±0.010 ±0.015 PLAIN p.C122 U.S.A Stock

CARBIDE 4 BLUE 30° ±0.010 ±0.015 PLAIN p.C123 U.S.A Stock

EDP No.	Corner Radius	Mill Diameter		Shank Diameter	Length of Cut	Length Below Shank	Overall Length	Neck Diameter
		Metric	Inch					
		R	D1					
G8A47916	R0.3	3.0	.1181	6	4	12	55	2.85
G8A47917	R0.3	3.0	.1181	6	4	16	55	2.85
G8A47918	R0.3	3.0	.1181	6	4	20	55	2.85
G8A47030	R0.5	3.0	.1181	6	4	10	55	2.85
G8A47901	R0.5	3.0	.1181	6	4	16	55	2.85
G8A47902	R0.5	3.0	.1181	6	4	20	55	2.85
G8A47919	R0.3	4.0	.1575	6	5	12	55	3.85
G8A47920	R0.3	4.0	.1575	6	5	16	55	3.85
G8A47921	R0.3	4.0	.1575	6	5	20	55	3.85
G8A47040	R0.5	4.0	.1575	6	5	12	55	3.85
G8A47903	R0.5	4.0	.1575	6	5	16	55	3.85
G8A47904	R0.5	4.0	.1575	6	5	20	55	3.85
G8A47922	R1.0	4.0	.1575	6	5	12	55	3.85
G8A47060	R0.5	6.0	.2362	6	7	20	60	5.85
G8A47905	R1.0	6.0	.2362	6	7	20	60	5.85
G8A47906	R1.5	6.0	.2362	6	7	20	60	5.85
G8A47910	R0.5	8.0	.3150	8	9	25	60	7.7
G8A47080	R1.0	8.0	.3150	8	9	25	60	7.7
G8A47907	R1.5	8.0	.3150	8	9	25	60	7.7
G8A47913	R2.0	8.0	.3150	8	9	25	60	7.7
G8A47911	R0.5	10.0	.3937	10	11	32	70	9.7
G8A47100	R1.0	10.0	.3937	10	11	32	70	9.7
G8A47908	R1.5	10.0	.3937	10	11	32	70	9.7
G8A47914	R2.0	10.0	.3937	10	11	32	70	9.7
G8A47912	R0.5	12.0	.4724	12	12	38	80	11.7
G8A47120	R1.0	12.0	.4724	12	12	38	80	11.7
G8A47909	R1.5	12.0	.4724	12	12	38	80	11.7
G8A47915	R2.0	12.0	.4724	12	12	38	80	11.7

EDP No.	Corner Radius	Mill Diameter		Shank Diameter	Length of Cut	Length Below Shank	Overall Length	Neck Diameter
		Metric	Inch					
		R	D1					
G8A37010	R0.1	1.0	.0394	3	1.5	-	40	-
G8A37901	R0.1	1.0	.0394	6	1.5	-	40	-
G8A37015	R0.1	1.5	.0591	3	2.2	-	40	-
G8A37902	R0.1	1.5	.0591	6	2.2	-	40	-
G8A37020	R0.1	2.0	.0787	3	3	6	40	1.95
G8A37903	R0.1	2.0	.0787	6	3	6	40	1.95
G8A37025	R0.1	2.5	.0984	3	4	6	40	2.4
G8A37904	R0.1	2.5	.0984	6	4	6	40	2.4
G8A37030	R0.1	3.0	.1181	6	4	7	45	2.85
G8A37035	R0.1	3.5	.1378	6	5	9	45	3.35
G8A37040	R0.1	4.0	.1575	6	5	9	45	3.85
G8A37045	R0.1	4.5	.1772	6	6	10	45	4.35
G8A37050	R0.2	5.0	.1969	6	6	11	50	4.85
G8A37060	R0.2	6.0	.2362	6	7	14	50	5.85
G8A37080	R0.2	8.0	.3150	8	9	18	60	7.7
G8A37100	R0.2	10.0	.3937	10	12	25	75	9.7
G8A37120	R0.3	12.0	.4724	12	15	30	75	11.7
G8A37160	R0.3	16.0	.6299	16	18	38	90	15.7
G8A37200	R0.3	20.0	.7874	20	24	45	100	19.7

Size	Corner Radius Tolerance (mm)	Mill Dia. Tolerance (mm)	Shank Dia. Tolerance
up to Ø6	±0.010	0 ~ - 0.012	h5
over Ø6	±0.015	0 ~ - 0.015	

↙ The original bright blue color may discolor during use, however, the performance will not be negatively affected

Size	Corner Radius Tolerance (mm)	Mill Dia. Tolerance (mm)	Shank Dia. Tolerance
up to Ø6	±0.010	0 ~ - 0.012	h5
over Ø6	±0.015	0 ~ - 0.015	

◎ : Excellent ○ : Good

ISO	P										M				K						
	Non-alloy steel					Low alloy steel					High alloyed steel, and tool steel				Stainless steel		Grey cast iron		Nodular cast iron		Malleable cast iron
Material Description	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
HRc	13	25	28	32	30	10	29	32	38	15	35	15	23	10	10	26	3	25		21	
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230	
Recommend					○					○	○										

ISO	N					S					H										
	Aluminum-wrought alloy		Aluminum-cast, alloyed		Copper and Copper Alloys (Bronze / Brass)	Non Metallic Materials		Heat Resistant Super Alloys			Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron						
Material Description	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc	60	100	75	90	130	110	90	100			15	30	25	38	34	400 Rm	1050 Rm	55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend																		◎	◎	○	◎

◎ : Excellent ○ : Good

ISO	P										M				K						
	Non-alloy steel					Low alloy steel					High alloyed steel, and tool steel				Stainless steel		Grey cast iron		Nodular cast iron		Malleable cast iron
Material Description	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
HRc	13	25	28	32	30	10	29	32	38	15	35	15	23	10	10	26	3	25		21	
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230	
Recommend					○					○	○										

ISO	N					S					H										
	Aluminum-wrought alloy		Aluminum-cast, alloyed		Copper and Copper Alloys (Bronze / Brass)	Non Metallic Materials		Heat Resistant Super Alloys			Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron						
Material Description	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc	60	100	75	90	130	110	90	100			15	30	25	38	34	400 Rm	1050 Rm	55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend																		◎	◎	○	◎

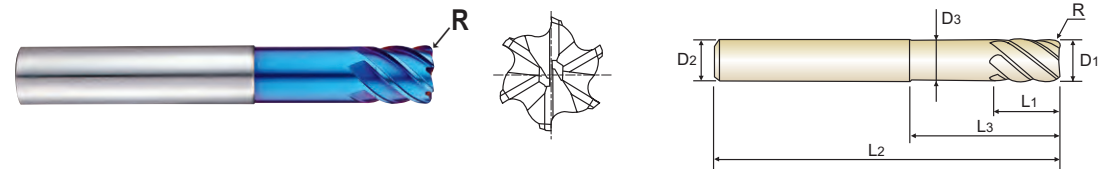
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PLAIN SHANK G8A39 SERIES

CARBIDE, 6 FLUTE 45° HELIX CORNER RADIUS with EXTENDED NECK

- ▶ Designed to machine high hardened materials.
- ▶ Suitable for dry cutting, high speed cutting thanks to newly developed raw-material and new coating.
- ▶ Excellent workpiece finish.
- ▶ Deep slotting is possible by reduced neck.
- ▶ Corner radius for preventing the chipping in high speed machining.
- ▶ Higher wear-resistance.



CARBIDE 6 BLUE 45° ±0.010 ±0.015 PLAIN U.S.A Stock

EDP No.	Corner Radius R	Mill Diameter		Shank Diameter D2	Length of Cut L1	Length Below Shank L3	Overall Length L2	Neck Diameter D3
		Metric D1	Inch					
G8A39916	R0.25	6.0	.2362	6	6	14	50	5.85
G8A39060	R0.5	6.0	.2362	6	6	14	50	5.85
G8A39901	R0.5	6.0	.2362	6	13	-	70	-
* G8A39910	R0.5	6.0	.2362	6	26	-	70	-
G8A39080	R0.5	8.0	.3150	8	8	24	60	7.7
G8A39902	R0.5	8.0	.3150	8	19	-	90	-
* G8A39911	R0.5	8.0	.3150	8	36	-	90	-
G8A39903	R0.5	10.0	.3937	10	22	-	100	-
G8A39100	R1.0	10.0	.3937	10	10	30	70	9.7
G8A39904	R1.0	10.0	.3937	10	22	-	100	-
* G8A39912	R1.0	10.0	.3937	10	46	-	100	-
G8A39905	R0.5	12.0	.4724	12	26	-	110	-
G8A39120	R1.0	12.0	.4724	12	12	30	75	11.7
G8A39906	R1.0	12.0	.4724	12	26	-	110	-
* G8A39913	R1.0	12.0	.4724	12	56	-	110	-
G8A39160	R1.0	16.0	.6299	16	32	-	130	-
G8A39907	R1.5	16.0	.6299	16	32	-	130	-
* G8A39914	R1.5	16.0	.6299	16	66	-	130	-
G8A39200	R1.0	20.0	.7874	20	38	-	140	-
G8A39908	R1.5	20.0	.7874	20	38	-	140	-
G8A39909	R2.0	20.0	.7874	20	38	-	140	-
* G8A39915	R2.0	20.0	.7874	20	76	-	140	-

The original bright blue color may discolor during use, however, the performance will not be negatively affected

Size	Corner Radius Tolerance (mm)	Mill Dia. Tolerance (mm)	Shank Dia. Tolerance
up to Ø6	±0.010	0--0.02	h5
over Ø6	±0.015	(* Extra Long Type : 0--0.03)	

◎ : Excellent ○ : Good

ISO	P										M				K						
	Non-alloy steel					Low alloy steel					High alloyed steel, and tool steel				Stainless steel		Grey cast iron		Nodular cast iron		Malleable cast iron
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
HRc	13	25	28	32	30	10	29	32	38	15	35	15	23	10	10	26	3	25	21	21	
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230	
Recommend					○					○											

ISO	N					S					H										
	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)		Non Metallic Materials			Heat Resistant Super Alloys				Titanium Alloys		Hardened steel		Chilled Cast Iron		Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34	55	60	55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend																◎	◎	◎	◎	○	◎

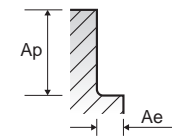


RECOMMENDED CUTTING CONDITIONS

G826 SERIES 4 FLUTE CORNER RADIUS - SIDE CUTTING

ISO	VDI 3323	Material Description	HRc	Ae	Ap	Parameter	Diameter (Ø)					
							1/8	3/16	1/4	5/16	3/8	1/2
P	5	Non-alloy steel	32	0.3D	0.1R	SFM (vc)	685	810	820	820	835	850
						IPT (fz)	.0071	.0109	.0144	.0180	.0212	.0277
						RPM	21000	16500	12500	10000	8500	6500
						IPM (feed)	600	720	720	720	720	720
						SFM (vc)	685	810	820	820	835	850
						IPT (fz)	.0071	.0109	.0144	.0180	.0212	.0277
	8-9	Low alloy steel	32-38	0.3D	0.1R	SFM (vc)	685	810	820	820	835	850
						IPT (fz)	.0071	.0109	.0144	.0180	.0212	.0277
						RPM	21000	16500	12500	10000	8500	6500
						IPM (feed)	600	720	720	720	720	720
						SFM (vc)	685	810	820	820	835	850
						IPT (fz)	.0071	.0109	.0144	.0180	.0212	.0277
11.1	High alloyed steel, and tool steel	35	0.3D	0.1R	SFM (vc)	685	810	820	820	835	850	
					IPT (fz)	.0071	.0109	.0144	.0180	.0212	.0277	
					RPM	21000	16500	12500	10000	8500	6500	
					IPM (feed)	600	720	720	720	720	720	
					SFM (vc)	525	665	655	655	660	655	
					IPT (fz)	.0059	.0102	.0138	.0172	.0205	.0275	
11.2	High alloyed steel, and tool steel	44	0.3D	0.1R	SFM (vc)	525	665	655	655	660	655	
					IPT (fz)	.0059	.0102	.0138	.0172	.0205	.0275	
					RPM	16000	13500	10000	8000	6700	5000	
					IPM (feed)	380	550	550	550	550	550	
					SFM (vc)	395	565	555	555	560	565	
					IPT (fz)	.0063	.0091	.0124	.0154	.0184	.0244	
H	38.1	Hardened steel	45-49	0.3D	0.1R	SFM (vc)	525	665	655	655	660	655
						IPT (fz)	.0059	.0102	.0138	.0172	.0205	.0275
						RPM	16000	13500	10000	8000	6700	5000
						IPM (feed)	380	550	550	550	550	550
						SFM (vc)	295	395	395	395	395	395
						IPT (fz)	.0047	.0078	.0104	.0130	.0156	.0208
	38.2	Hardened steel	50-55	0.3D	0.1R	SFM (vc)	295	395	395	395	395	395
						IPT (fz)	.0047	.0078	.0104	.0130	.0156	.0208
						RPM	9000	8000	6000	4800	4000	3000
						IPM (feed)	170	250	250	250	250	250
						SFM (vc)	215	280	280	280	280	280
						IPT (fz)	.0035	.0066	.0087	.0110	.0132	.0174
39.1	Hardened steel	56-60	0.3D	0.05R	SFM (vc)	6500	5700	4300	3400	2850	2150	
					IPT (fz)	92	150	150	150	150	150	
					RPM	9000	8000	6000	4800	4000	3000	
					IPM (feed)	170	250	250	250	250	250	
					SFM (vc)	295	395	395	395	395	395	
					IPT (fz)	.0047	.0078	.0104	.0130	.0156	.0208	
39.2	Hardened steel	61-65	0.3D	0.05R	SFM (vc)	215	280	280	280	280	280	
					IPT (fz)	.0035	.0066	.0087	.0110	.0132	.0174	
					RPM	6500	5700	4300	3400	2850	2150	
					IPM (feed)	92	150	150	150	150	150	
					SFM (vc)	525	665	655	655	660	655	
					IPT (fz)	.0059	.0102	.0138	.0172	.0205	.0275	
40	Chilled Cast Iron	42	0.3D	0.1R	SFM (vc)	16000	13500	10000	8000	6700	5000	
					IPT (fz)	380	550	550	550	550	550	
					RPM	16000	13500	10000	8000	6700	5000	
					IPM (feed)	380	550	550	550	550	550	
					SFM (vc)	395	565	555	555	560	565	
					IPT (fz)	.0063	.0091	.0124	.0154	.0184	.0244	
41	Hardened Cast Iron	55	0.3D	0.1R	SFM (vc)	12000	11500	8500	6800	5700	4300	
					IPT (fz)	300	420	420	420	420	420	
					RPM	12000	11500	8500	6800	5700	4300	
					IPM (feed)	300	420	420	420	420	420	
					SFM (vc)	395	565	555	555	560	565	
					IPT (fz)	.0063	.0091	.0124	.0154	.0184	.0244	

SFM = Surface Feet per Minute  
RPM = Revolutions Per Minute  
IPT = Inches Per Tooth  
IPM = Inches Per Minute  
Ap : Inch (Axial Depth of Cut)  
Ae : Inch (Radial Depth of Cut)





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RECOMMENDED CUTTING CONDITIONS



RECOMMENDED CUTTING CONDITIONS

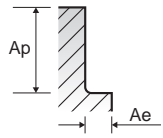
**G826 SERIES 4 FLUTE CORNER RADIUS - SIDE CUTTING**

**G8A43 SERIES 2 FLUTE BALL NOSE**

**NORMAL SPEED**

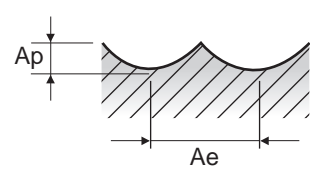
ISO	VDI 3323	Material Description	HRc	Ae	Ap	Parameter	Diameter (Ø)					
							1/8	3/16	1/4	5/16	3/8	1/2
P	5	Non-alloy steel	32	0.5D	0.2R	SFM (vc)	295	370	360	370	375	365
						IPT (fz)	.0068	.0103	.0141	.0172	.0204	.0277
						RPM	9000	7500	5500	4500	3800	2800
						IPM (feed)	245	310	310	310	310	310
	8-9	Low alloy steel	32-38	0.5D	0.2R	SFM (vc)	295	370	360	370	375	365
						IPT (fz)	.0068	.0103	.0141	.0172	.0204	.0277
						RPM	9000	7500	5500	4500	3800	2800
						IPM (feed)	245	310	310	310	310	310
	11.1	High alloyed steel, and tool steel	35	0.5D	0.2R	SFM (vc)	295	370	360	370	375	365
						IPT (fz)	.0068	.0103	.0141	.0172	.0204	.0277
						RPM	9000	7500	5500	4500	3800	2800
						IPM (feed)	245	310	310	310	310	310
11.2	High alloyed steel, and tool steel	44	0.5D	0.2R	SFM (vc)	215	250	255	255	255	255	
					IPT (fz)	.0060	.0098	.0128	.0161	.0192	.0256	
					RPM	6500	5100	3900	3100	2600	1950	
					IPM (feed)	155	200	200	200	200	200	
H	38.1	45-49	0.5D	0.2R	SFM (vc)	215	250	255	255	255	255	
					IPT (fz)	.0060	.0098	.0128	.0161	.0192	.0256	
					RPM	6500	5100	3900	3100	2600	1950	
					IPM (feed)	155	200	200	200	200	200	
	38.2	50-55	0.5D	0.2R	SFM (vc)	140	185	185	180	180	185	
					IPT (fz)	.0058	.0092	.0125	.0159	.0189	.0250	
					RPM	4300	3800	2800	2200	1850	1400	
					IPM (feed)	100	140	140	140	140	140	
	39.1	56-60	0.5D	0.1R	SFM (vc)	90	115	115	115	115	115	
					IPT (fz)	.0040	.0074	.0100	.0125	.0150	.0199	
					RPM	2700	2350	1750	1400	1170	880	
					IPM (feed)	43	70	70	70	70	70	
39.2	61-65	0.5D	0.1R	SFM (vc)	60	80	80	80	80	80		
				IPT (fz)	.0032	.0045	.0060	.0075	.0089	.0119		
				RPM	1800	1650	1250	1000	840	630		
				IPM (feed)	23	30	30	30	30	30		
40	Chilled Cast Iron	42	0.5D	0.2R	SFM (vc)	215	250	255	255	255	255	
					IPT (fz)	.0060	.0098	.0128	.0161	.0192	.0256	
					RPM	6500	5100	3900	3100	2600	1950	
					IPM (feed)	155	200	200	200	200	200	
41	Hardened Cast Iron	55	0.5D	0.1R	SFM (vc)	140	185	185	180	180	185	
					IPT (fz)	.0058	.0092	.0125	.0159	.0189	.0250	
					RPM	4300	3800	2800	2200	1850	1400	
					IPM (feed)	100	140	140	140	140	140	

SFM = Surface Feet per Minute  
 RPM = Revolutions Per Minute  
 IPT = Inches Per Tooth  
 IPM = Inches Per Minute  
 Ap : Inch (Axial Depth of Cut)  
 Ae : Inch (Radial Depth of Cut)



ISO	VDI 3323	Material Description	HRc	Ae	Ap	Parameter	Diameter (Ø)								
							1/32	1/16	3/32	1/8	3/16	1/4	5/16	3/8	1/2
P	5	Non-alloy steel	32	0.05D	0.02D	SFM (vc)	410	815	1220	1085	915	910	910	910	
						IPT (fz)	.0019	.0023	.0023	.0036	.0061	.0069	.0074	.0078	.0083
						RPM	50000	49700	49700	33100	18600	13900	11100	9300	6950
						IPM (feed)	189	224	224	236	228	191	165	146	116
	8-9	Low alloy steel	32-38	0.05D	0.02D	SFM (vc)	410	815	1220	1085	915	910	910	910	
						IPT (fz)	.0019	.0023	.0023	.0036	.0061	.0069	.0074	.0078	.0083
						RPM	50000	49700	49700	33100	18600	13900	11100	9300	6950
						IPM (feed)	189	224	224	236	228	191	165	146	116
	11.1	High alloyed steel, and tool steel	35	0.05D	0.02D	SFM (vc)	410	815	1220	1085	915	910	910	910	
						IPT (fz)	.0019	.0023	.0023	.0036	.0061	.0069	.0074	.0078	.0083
						RPM	50000	49700	49700	33100	18600	13900	11100	9300	6950
						IPM (feed)	189	224	224	236	228	191	165	146	116
11.2	High alloyed steel, and tool steel	44	0.05D	0.02D	SFM (vc)	410	780	1175	1040	875	875	875	875		
					IPT (fz)	.0017	.0020	.0020	.0033	.0054	.0060	.0064	.0069	.0073	
					RPM	50000	47800	47800	31800	17800	13400	10700	8900	6680	
					IPM (feed)	165	189	189	209	193	161	138	122	98	
H	38.1	45-49	0.05D	0.02D	SFM (vc)	410	780	1175	1040	875	875	875	875		
					IPT (fz)	.0017	.0020	.0020	.0033	.0054	.0060	.0064	.0069	.0073	
					RPM	50000	47800	47800	31800	17800	13400	10700	8900	6680	
					IPM (feed)	165	189	189	209	193	161	138	122	98	
	38.2	50-55	0.05D	0.02D	SFM (vc)	370	655	980	865	735	720	735	735		
					IPT (fz)	.0017	.0020	.0020	.0030	.0049	.0055	.0059	.0063	.0067	
					RPM	45000	40000	40000	26500	15000	11000	9000	7500	5600	
					IPM (feed)	150	158	158	158	148	122	106	95	75	
	39.1	Hardened steel	56-60	0.05D	0.02D	SFM (vc)	325	575	860	770	665	655	655	650	
						IPT (fz)	.0015	.0018	.0018	.0026	.0044	.0049	.0053	.0057	.0061
						RPM	40000	35000	35000	23500	13500	10000	8000	6600	5000
						IPM (feed)	118	124	124	124	120	98	85	75	61
39.2	Hardened steel	61-65	0.05D	0.02D	SFM (vc)	285	525	785	685	565	575	575	570		
					IPT (fz)	.0015	.0017	.0017	.0026	.0043	.0048	.0052	.0056	.0056	
					RPM	35000	32000	32000	21000	11500	8800	7000	5800	4400	
					IPM (feed)	102	110	110	110	100	85	73	65	49	
39.3	Hardened steel	66-70	0.05D	0.02D	SFM (vc)	285	465	700	620	515	525	530	520		
					IPT (fz)	.0013	.0016	.0016	.0024	.0040	.0043	.0047	.0051	.0051	
					RPM	35000	28500	28500	19000	10500	8000	6500	5300	4000	
					IPM (feed)	91	91	91	91	83	69	61	54	41	
40	Chilled Cast Iron	42	0.05D	0.02D	SFM (vc)	410	780	1175	1040	875	875	875	875		
					IPT (fz)	.0017	.0020	.0020	.0033	.0054	.0060	.0064	.0069	.0073	
					RPM	50000	47800	47800	31800	17800	13400	10700	8900	6680	
					IPM (feed)	165	189	189	209	193	161	138	122	98	
41	Hardened Cast Iron	55	0.05D	0.02D	SFM (vc)	370	655	980	865	735	720	735	735		
					IPT (fz)	.0017	.0020	.0020	.0030	.0049	.0055	.0059	.0063	.0067	
					RPM	45000	40000	40000	26500	15000	11000	9000	7500	5600	
					IPM (feed)	150	158	158	158	148	122	106	95	75	

SFM = Surface Feet per Minute  
 RPM = Revolutions Per Minute  
 IPT = Inches Per Tooth  
 IPM = Inches Per Minute  
 Ap : Inch (Axial Depth of Cut)  
 Ae : Inch (Radial Depth of Cut)



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RECOMMENDED CUTTING CONDITIONS



RECOMMENDED CUTTING CONDITIONS

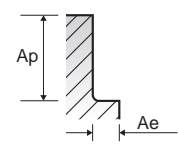
**G850 SERIES 4 FLUTE CORNER RADIUS - SIDE CUTTING**

**G851 SERIES 6 & 8 FLUTE CORNER RADIUS - SIDE CUTTING**

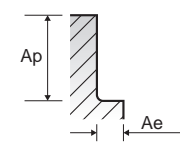
ISO	VDI 3323	Material Description	HRc	Ae	Ap	Parameter	Diameter (Ø)								
							1/16	1/8	3/16	1/4	5/16	3/8	1/2	5/8	3/4
P	5	Non-alloy steel	32	0.03D	1.0D	SFM (vc)	685	675	810	810	815	805	825	810	805
						IPT (fz)	.0004	.0006	.0010	.0012	.0015	.0018	.0021	.0024	.0026
						RPM	41950	20600	16500	12400	9950	8200	6300	4950	4100
						IPM (feed)	69	52	66	58	60	58	52	48	43
	8-9	Low alloy steel	32-38	0.03D	1.0D	SFM (vc)	685	675	810	810	815	805	825	810	805
						IPT (fz)	.0004	.0006	.0010	.0012	.0015	.0018	.0021	.0024	.0026
						RPM	41950	20600	16500	12400	9950	8200	6300	4950	4100
						IPM (feed)	69	52	66	58	60	58	52	48	43
	11.1	High alloyed steel, and tool steel	35	0.03D	1.0D	SFM (vc)	685	675	810	810	815	805	825	810	805
						IPT (fz)	.0004	.0006	.0010	.0012	.0015	.0018	.0021	.0024	.0026
						RPM	41950	20600	16500	12400	9950	8200	6300	4950	4100
						IPM (feed)	69	52	66	58	60	58	52	48	43
11.2	High alloyed steel, and tool steel	44	0.03D	1.0D	SFM (vc)	535	535	645	640	640	635	650	645	640	
					IPT (fz)	.0004	.0006	.0010	.0011	.0014	.0016	.0019	.0022	.0025	
					RPM	32750	16350	13100	9800	7850	6450	4950	3950	3250	
					IPM (feed)	50	37	50	42	43	42	37	35	32	
H	38.1	45-49	0.03D	1.0D	SFM (vc)	535	535	645	640	640	635	650	645	640	
					IPT (fz)	.0004	.0006	.0010	.0011	.0014	.0016	.0019	.0022	.0025	
					RPM	32750	16350	13100	9800	7850	6450	4950	3950	3250	
					IPM (feed)	50	37	50	42	43	42	37	35	32	
	38.2	50-55	0.03D	1.0D	SFM (vc)	360	355	425	425	430	420	430	425	420	
					IPT (fz)	.0004	.0006	.0009	.0011	.0014	.0016	.0019	.0022	.0026	
					RPM	22050	10850	8700	6500	5250	4300	3300	2600	2150	
					IPM (feed)	33	25	33	28	29	28	25	23	22	
	39.1	Hardened steel	56-60	0.03D	1.0D	SFM (vc)	300	295	330	325	330	330	325	325	335
						IPT (fz)	.0003	.0004	.0007	.0009	.0010	.0012	.0014	.0016	.0019
						RPM	18250	9000	6700	5000	4050	3350	2500	2000	1700
						IPM (feed)	21	16	19	17	17	16	14	13	13
39.2	61-65	0.03D	1.0D	SFM (vc)	225	230	265	260	265	265	260	260	265		
				IPT (fz)	.0002	.0004	.0006	.0006	.0008	.0009	.0011	.0014	.0015		
				RPM	13850	7100	5350	3950	3250	2700	2000	1600	1350		
				IPM (feed)	13	10	12	10	11	10	9	9	8		
39.3	66-70	0.03D	1.0D	SFM (vc)	195	200	230	230	230	225	230	230	225		
				IPT (fz)	.0002	.0003	.0005	.0006	.0007	.0008	.0010	.0011	.0013		
				RPM	11950	6050	4650	3500	2800	2300	1750	1400	1150		
				IPM (feed)	9	7	9	8	8	7	7	6	6		
40	Chilled Cast Iron	42	0.03D	1.0D	SFM (vc)	535	535	645	640	640	635	650	645	640	
					IPT (fz)	.0004	.0006	.0010	.0011	.0014	.0016	.0019	.0022	.0025	
					RPM	32750	16350	13100	9800	7850	6450	4950	3950	3250	
					IPM (feed)	50	37	50	42	43	42	37	35	32	
41	Hardened Cast Iron	55	0.03D	1.0D	SFM (vc)	360	355	425	425	430	420	430	425	420	
					IPT (fz)	.0004	.0006	.0009	.0011	.0014	.0016	.0019	.0022	.0026	
					RPM	22050	10850	8700	6500	5250	4300	3300	2600	2150	
					IPM (feed)	33	25	33	28	29	28	25	23	22	

ISO	VDI 3323	Material Description	HRc	Ae	Ap	Parameter	Diameter (Ø)						
							1/4	5/16	3/8	1/2	5/8	3/4	1
P	5	Non-alloy steel	32	0.05D	1.0D	SFM (vc)	1535	1690	1755	1610	1650	1740	1650
						IPT (fz)	.0014	.0015	.0017	.0023	.0026	.0020	.0021
						RPM	23450	20650	17900	12300	10100	8850	6300
						IPM (feed)	199	191	183	168	159	141	104
	8-9	Low alloy steel	32-38	0.05D	1.0D	SFM (vc)	1535	1690	1755	1610	1650	1740	1650
						IPT (fz)	.0014	.0015	.0017	.0023	.0026	.0020	.0021
						RPM	23450	20650	17900	12300	10100	8850	6300
						IPM (feed)	199	191	183	168	159	141	104
	11.1	High alloyed steel, and tool steel	35	0.05D	1.0D	SFM (vc)	1535	1690	1755	1610	1650	1740	1650
						IPT (fz)	.0014	.0015	.0017	.0023	.0026	.0020	.0021
						RPM	23450	20650	17900	12300	10100	8850	6300
						IPM (feed)	199	191	183	168	159	141	104
11.2	High alloyed steel, and tool steel	44	0.05D	1.0D	SFM (vc)	1455	1605	1670	1545	1605	1690	1610	
					IPT (fz)	.0014	.0015	.0016	.0021	.0025	.0019	.0022	
					RPM	22200	19600	17000	11800	9800	8600	6150	
					IPM (feed)	182	175	167	152	147	133	106	
H	38.1	45-49	0.05D	1.0D	SFM (vc)	1455	1605	1670	1545	1605	1690	1610	
					IPT (fz)	.0014	.0015	.0016	.0021	.0025	.0019	.0022	
					RPM	22200	19600	17000	11800	9800	8600	6150	
					IPM (feed)	182	175	167	152	147	133	106	
	38.2	50-55	0.05D	1.0D	SFM (vc)	990	1080	1115	990	990	1040	995	
					IPT (fz)	.0020	.0022	.0024	.0031	.0037	.0029	.0033	
					RPM	15100	13200	11350	7550	6050	5300	3800	
					IPM (feed)	182	172	162	141	135	123	100	
	39.1	Hardened steel	56-60	0.03D	1.0D	SFM (vc)	835	910	935	820	825	865	825
						IPT (fz)	.0016	.0017	.0019	.0025	.0030	.0024	.0026
						RPM	12750	11150	9500	6250	5050	4400	3150
						IPM (feed)	123	115	108	93	92	83	65
39.2	61-65	0.03D	1.0D	SFM (vc)	650	710	730	655	665	695	655		
				IPT (fz)	.0013	.0014	.0015	.0020	.0021	.0015	.0016		
				RPM	9900	8700	7450	5000	4050	3550	2500		
				IPM (feed)	78	73	69	59	50	44	31		
39.3	66-70	0.03D	1.0D	SFM (vc)	495	540	560	495	490	520	495		
				IPT (fz)	.0012	.0013	.0014	.0019	.0019	.0014	.0014		
				RPM	7550	6600	5700	3800	3000	2650	1900		
				IPM (feed)	54	51	49	43	34	30	22		
40	Chilled Cast Iron	42	0.05D	1.0D	SFM (vc)	1455	1605	1670	1545	1605	1690	1610	
					IPT (fz)	.0014	.0015	.0016	.0021	.0025	.0019	.0022	
					RPM	22200	19600	17000	11800	9800	8600	6150	
					IPM (feed)	182	175	167	152	147	133	106	
41	Hardened Cast Iron	55	0.05D	1.0D	SFM (vc)	990	1080	1115	990	990	1040	995	
					IPT (fz)	.0020	.0022	.0024	.0031	.0037	.0029	.0033	
					RPM	15100	13200	11350	7550	6050	5300	3800	
					IPM (feed)	182	172	162	141	135	123	100	

SFM = Surface Feet per Minute  
 RPM = Revolutions Per Minute  
 IPT = Inches Per Tooth  
 IPM = Inches Per Minute  
 Ap : Inch (Axial Depth of Cut)  
 Ae : Inch (Radial Depth of Cut)



SFM = Surface Feet per Minute  
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 Ap : Inch (Axial Depth of Cut)  
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RECOMMENDED CUTTING CONDITIONS



RECOMMENDED CUTTING CONDITIONS

**G859, G854 SERIES 4 FLUTE CORNER RADIUS - SIDE CUTTING**

**G859, G854 SERIES 4 FLUTE CORNER RADIUS - SIDE CUTTING**

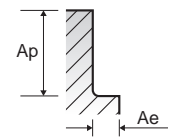
**HIGH SPEED**

**NORMAL SPEED**

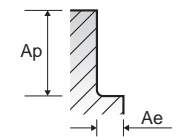
ISO	VDI 3323	Material Description	HRc	Ae	Ap	Parameter	Diameter (Ø)								
							2	3	4	5	6	8	10	12	16
P	5	Non-alloy steel	32	0.3D	0.1R	SFM (vc)	600	680	700	775	835	825	825	815	825
						IPT (fz)	.0051	.0072	.0101	.0118	.0135	.0182	.0228	.0276	.0364
						RPM	29000	22000	17000	15000	13500	10000	8000	6600	5000
						IPM (feed)	591	630	689	709	728	728	728	728	728
	8-9	Low alloy steel	32-38	0.3D	0.1R	SFM (vc)	600	680	700	775	835	825	825	815	825
						IPT (fz)	.0051	.0072	.0101	.0118	.0135	.0182	.0228	.0276	.0364
						RPM	29000	22000	17000	15000	13500	10000	8000	6600	5000
						IPM (feed)	591	630	689	709	728	728	728	728	728
	11.1	High alloyed steel, and tool steel	35	0.3D	0.1R	SFM (vc)	600	680	700	775	835	825	825	815	825
						IPT (fz)	.0051	.0072	.0101	.0118	.0135	.0182	.0228	.0276	.0364
						RPM	29000	22000	17000	15000	13500	10000	8000	6600	5000
						IPM (feed)	591	630	689	709	728	728	728	728	728
11.2	High alloyed steel, and tool steel	44	0.3D	0.1R	SFM (vc)	455	525	535	565	650	660	660	655	645	
					IPT (fz)	.0044	.0058	.0091	.0044	.0129	.0172	.0215	.0260	.0353	
					RPM	22000	17000	13000	11000	10500	8000	6400	5300	3900	
					IPM (feed)	386	394	472	192	543	551	551	551	551	
H	38.1	Hardened steel	45-49	0.3D	0.1R	SFM (vc)	455	525	535	565	650	660	660	655	645
						IPT (fz)	.0044	.0058	.0091	.0044	.0129	.0172	.0215	.0260	.0353
						RPM	22000	17000	13000	11000	10500	8000	6400	5300	3900
						IPM (feed)	386	394	472	192	543	551	551	551	551
	38.2	Hardened steel	50-55	0.3D	0.1R	SFM (vc)	310	385	455	515	555	560	555	555	545
						IPT (fz)	.0052	.0063	.0082	.0099	.0120	.0159	.0200	.0241	.0328
						RPM	15000	12500	11000	10000	9000	6800	5400	4500	3300
						IPM (feed)	309	315	362	394	433	433	433	433	433
	39.1	Hardened steel	56-60	0.3D	0.05R	SFM (vc)	225	295	330	360	395	395	390	395	395
						IPT (fz)	.0040	.0048	.0068	.0084	.0098	.0138	.0176	.0216	.0288
						RPM	11000	9500	8000	7000	6400	4800	3800	3200	2400
						IPM (feed)	175	181	217	236	252	264	268	276	276
39.2	Hardened steel	61-65	0.3D	0.05R	SFM (vc)	180	215	230	255	280	280	280	280	270	
					IPT (fz)	.0028	.0036	.0051	.0062	.0079	.0118	.0139	.0158	.0197	
					RPM	8700	6900	5600	4900	4500	3400	2700	2250	1650	
					IPM (feed)	97	98	114	122	142	161	150	142	130	
40	Chilled Cast Iron	42	0.3D	0.1R	SFM (vc)	455	525	535	565	650	660	660	655	645	
					IPT (fz)	.0044	.0058	.0091	.0044	.0129	.0172	.0215	.0260	.0353	
					RPM	22000	17000	13000	11000	10500	8000	6400	5300	3900	
					IPM (feed)	386	394	472	192	543	551	551	551	551	
41	Hardened Cast Iron	55	0.3D	0.1R	SFM (vc)	310	385	455	515	555	560	555	555	545	
					IPT (fz)	.0052	.0063	.0082	.0099	.0120	.0159	.0200	.0241	.0328	
					RPM	15000	12500	11000	10000	9000	6800	5400	4500	3300	
					IPM (feed)	309	315	362	394	433	433	433	433	433	

ISO	VDI 3323	Material Description	HRc	Ae	Ap	Parameter	Diameter (Ø)								
							2	3	4	5	6	8	10	12	16
P	5	Non-alloy steel	32	0.5D	0.2R	SFM (vc)	280	295	330	335	360	360	360	360	365
						IPT (fz)	.0047	.0067	.0087	.0110	.0130	.0173	.0215	.0259	.0342
						RPM	13500	9550	7950	6500	5800	4350	3500	2900	2200
						IPM (feed)	256	256	276	287	301	301	301	301	301
	8-9	Low alloy steel	32-38	0.5D	0.2R	SFM (vc)	280	295	330	335	360	360	360	360	365
						IPT (fz)	.0047	.0067	.0087	.0110	.0130	.0173	.0215	.0259	.0342
						RPM	13500	9550	7950	6500	5800	4350	3500	2900	2200
						IPM (feed)	256	256	276	287	301	301	301	301	301
	11.1	High alloyed steel, and tool steel	35	0.5D	0.2R	SFM (vc)	280	295	330	335	360	360	360	360	365
						IPT (fz)	.0047	.0067	.0087	.0110	.0130	.0173	.0215	.0259	.0342
						RPM	13500	9550	7950	6500	5800	4350	3500	2900	2200
						IPM (feed)	256	256	276	287	301	301	301	301	301
11.2	High alloyed steel, and tool steel	44	0.5D	0.2R	SFM (vc)	195	215	235	245	255	250	255	255	255	
					IPT (fz)	.0039	.0059	.0079	.0098	.0118	.0158	.0197	.0235	.0311	
					RPM	9550	6900	5750	4800	4100	3050	2450	2050	1550	
					IPM (feed)	150	163	181	189	193	193	193	193	193	
H	38.1	Hardened steel	45-49	0.5D	0.2R	SFM (vc)	195	215	235	245	255	250	255	255	255
						IPT (fz)	.0039	.0059	.0079	.0098	.0118	.0158	.0197	.0235	.0311
						RPM	9550	6900	5750	4800	4100	3050	2450	2050	1550
						IPM (feed)	150	163	181	189	193	193	193	193	193
	38.2	Hardened steel	50-55	0.5D	0.2R	SFM (vc)	115	140	165	175	180	180	180	180	180
						IPT (fz)	.0040	.0059	.0079	.0093	.0119	.0157	.0197	.0238	.0314
						RPM	5500	4550	4000	3400	2900	2200	1750	1450	1100
						IPM (feed)	87	108	126	126	138	138	138	138	138
	39.1	Hardened steel	56-60	0.5D	0.1R	SFM (vc)	65	90	105	115	115	115	115	115	115
						IPT (fz)	.0030	.0039	.0052	.0072	.0099	.0130	.0166	.0197	.0261
						RPM	3200	2850	2550	2200	1850	1400	1100	925	700
						IPM (feed)	39	45	53	63	73	73	73	73	73
39.2	Hardened steel	61-65	0.5D	0.1R	SFM (vc)	45	60	70	75	85	80	80	80	80	
					IPT (fz)	.0025	.0032	.0040	.0047	.0057	.0078	.0097	.0117	.0155	
					RPM	2200	1900	1750	1500	1350	995	795	665	500	
					IPM (feed)	22	24	28	28	31	31	31	31	31	
40	Chilled Cast Iron	42	0.5D	0.2R	SFM (vc)	195	215	235	245	255	250	255	255	255	
					IPT (fz)	.0039	.0059	.0079	.0098	.0118	.0158	.0197	.0235	.0311	
					RPM	9550	6900	5750	4800	4100	3050	2450	2050	1550	
					IPM (feed)	150	163	181	189	193	193	193	193	193	
41	Hardened Cast Iron	55	0.5D	0.2R	SFM (vc)	115	140	165	175	180	180	180	180	180	
					IPT (fz)	.0040	.0059	.0079	.0093	.0119	.0157	.0197	.0238	.0314	
					RPM	5500	4550	4000	3400	2900	2200	1750	1450	1100	
					IPM (feed)	87	108	126	126	138	138	138	138	138	

SFM = Surface Feet per Minute  
 RPM = Revolutions Per Minute  
 IPT = Inches Per Tooth  
 IPM = Inches Per Minute  
 Ap : Inch (Axial Depth of Cut)  
 Ae : Inch (Radial Depth of Cut)



SFM = Surface Feet per Minute  
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 Ap : Inch (Axial Depth of Cut)  
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RECOMMENDED CUTTING CONDITIONS



RECOMMENDED CUTTING CONDITIONS

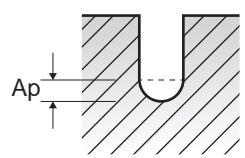
G8A46, G8A54 SERIES 2 FLUTE BALL NOSE - RED PROCESSING

G8A38, G8A28, G8A53 SERIES 2 FLUTE BALL NOSE

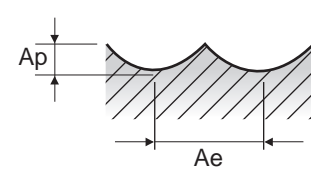
Table with columns: ISO, VDI 3323, Material Description, HRc, Parameter, Diameter (Ø) (0.2 to 4), SFM (vc), IPT (fz), RPM, IPM (feed), Ap (mm). Rows include Non-alloy steel, Low alloy steel, High alloyed steel, and tool steel.

Table with columns: ISO, VDI 3323, Material Description, HRc, Ae, Ap, Parameter, Diameter (Ø) (0.2 to 2), SFM (vc), IPT (fz), RPM, IPM (feed). Rows include Non-alloy steel, Low alloy steel, High alloyed steel, and tool steel.

SFM = Surface Feet per Minute
RPM = Revolutions Per Minute
IPT = Inches Per Tooth
IPM = Inches Per Minute
Ap : Inch (Axial Depth of Cut)
Ae : Inch (Radial Depth of Cut)



SFM = Surface Feet per Minute
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Ap : Inch (Axial Depth of Cut)
Ae : Inch (Radial Depth of Cut)



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RECOMMENDED CUTTING CONDITIONS



RECOMMENDED CUTTING CONDITIONS

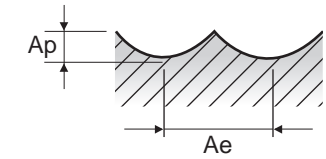
**G8A38, G8A28, G8A53 SERIES 2 FLUTE BALL NOSE**

**G8A59 SERIES 3 FLUTE BALL NOSE**

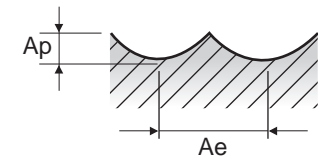
ISO	VDI 3323	Material Description	HRc	Ae	Ap	Parameter	Diameter (Ø)								
							3	4	5	6	8	10	12	16	20
P	5	Non-alloy steel	32	0.05D	0.02D	SFM (vc)	1025	1025	960	860	915	960	860	920	915
						IPT (fz)	.0036	.0047	.0061	.0069	.0074	.0078	.0083	.0093	.0104
						RPM	33100	24900	18600	13900	11100	9300	6950	5570	4450
						IPM (feed)	236	236	228	191	165	146	116	104	93
	8-9	Low alloy steel	32-38	0.05D	0.02D	SFM (vc)	1025	1025	960	860	915	960	860	920	915
						IPT (fz)	.0036	.0047	.0061	.0069	.0074	.0078	.0083	.0093	.0104
						RPM	33100	24900	18600	13900	11100	9300	6950	5570	4450
						IPM (feed)	236	236	228	191	165	146	116	104	93
	11.1	High alloyed steel, and tool steel	35	0.05D	0.02D	SFM (vc)	1025	1025	960	860	915	960	860	920	915
						IPT (fz)	.0036	.0047	.0061	.0069	.0074	.0078	.0083	.0093	.0104
						RPM	33100	24900	18600	13900	11100	9300	6950	5570	4450
						IPM (feed)	236	236	228	191	165	146	116	104	93
11.2	High alloyed steel, and tool steel	44	0.05D	0.02D	SFM (vc)	985	985	915	830	880	915	825	880	885	
					IPT (fz)	.0033	.0044	.0054	.0060	.0064	.0069	.0073	.0081	.0090	
					RPM	31800	23900	17800	13400	10700	8900	6680	5350	4300	
					IPM (feed)	209	209	193	161	138	122	98	87	77	
H	38.1	45-49	0.05D	0.02D	SFM (vc)	985	985	915	830	880	915	825	880	885	
					IPT (fz)	.0033	.0044	.0054	.0060	.0064	.0069	.0073	.0081	.0090	
					RPM	31800	23900	17800	13400	10700	8900	6680	5350	4300	
					IPM (feed)	209	209	193	161	138	122	98	87	77	
	38.2	50-55	0.05D	0.02D	SFM (vc)	820	825	775	680	740	775	695	740	740	
					IPT (fz)	.0030	.0040	.0049	.0055	.0059	.0063	.0067	.0074	.0082	
					RPM	26500	20000	15000	11000	9000	7500	5600	4500	3600	
					IPM (feed)	158	158	148	122	106	95	75	67	59	
	39.1	Hardened steel	56-60	0.05D	0.02D	SFM (vc)	725	720	695	620	660	680	620	660	660
						IPT (fz)	.0026	.0035	.0044	.0049	.0053	.0057	.0061	.0066	.0073
						RPM	23500	17500	13500	10000	8000	6600	5000	4000	3200
						IPM (feed)	124	124	120	98	85	75	61	53	47
39.2	Hardened steel	61-65	0.05D	0.02D	SFM (vc)	650	660	595	545	575	600	545	575	575	
					IPT (fz)	.0026	.0034	.0043	.0048	.0052	.0056	.0056	.0056	.0057	
					RPM	21000	16000	11500	8800	7000	5800	4400	3500	2800	
					IPM (feed)	110	110	100	85	73	65	49	39	32	
39.3	Hardened steel	66-70	0.05D	0.02D	SFM (vc)	585	600	540	495	535	545	495	530	525	
					IPT (fz)	.0024	.0031	.0040	.0043	.0047	.0051	.0051	.0053	.0051	
					RPM	19000	14500	10500	8000	6500	5300	4000	3200	2550	
					IPM (feed)	91	91	83	69	61	54	41	34	26	
40	Chilled Cast Iron	42	0.05D	0.02D	SFM (vc)	985	985	915	830	880	915	825	880	885	
					IPT (fz)	.0033	.0044	.0054	.0060	.0064	.0069	.0073	.0081	.0090	
					RPM	31800	23900	17800	13400	10700	8900	6680	5350	4300	
					IPM (feed)	209	209	193	161	138	122	98	87	77	
41	Hardened Cast Iron	55	0.05D	0.02D	SFM (vc)	820	825	775	680	740	775	695	740	740	
					IPT (fz)	.0030	.0040	.0049	.0055	.0059	.0063	.0067	.0074	.0082	
					RPM	26500	20000	15000	11000	9000	7500	5600	4500	3600	
					IPM (feed)	158	158	148	122	106	95	75	67	59	

ISO	VDI 3323	Material Description	HRc	Ae	Ap	Parameter	Diameter (Ø)								
							3	4	5	6	8	10	12	16	20
P	5	Non-alloy steel	32	0.05D	0.02D	SFM (vc)	990	995	1030	1115	1115	1115	1120	1105	1115
						IPT (fz)	.0035	.0042	.0048	.0062	.0071	.0079	.0088	.0090	.0088
						RPM	32000	24080	20000	18000	13500	10800	9050	6700	5400
						IPM (feed)	339	303	285	337	289	257	240	181	142
	8-9	Low alloy steel	32-38	0.05D	0.02D	SFM (vc)	990	995	1030	1115	1115	1115	1120	1105	1115
						IPT (fz)	.0035	.0042	.0048	.0062	.0071	.0079	.0088	.0090	.0088
						RPM	32000	24080	20000	18000	13500	10800	9050	6700	5400
						IPM (feed)	339	303	285	337	289	257	240	181	142
	11.1 - 11.2	High alloyed steel, and tool steel	35-44	0.05D	0.02D	SFM (vc)	990	995	1030	1115	1115	1115	1120	1105	1115
						IPT (fz)	.0035	.0042	.0048	.0062	.0071	.0079	.0088	.0090	.0088
						RPM	32000	24080	20000	18000	13500	10800	9050	6700	5400
						IPM (feed)	339	303	285	337	289	257	240	181	142
38.1 - 38.2	Hardened steel	45-49 50-55	0.05D	0.02D	SFM (vc)	830	830	865	940	930	940	940	940	940	
					IPT (fz)	.0028	.0035	.0043	.0054	.0061	.0066	.0074	.0075	.0075	
					RPM	26840	20130	16780	15200	11300	9100	7590	5690	4550	
					IPM (feed)	228	214	214	245	207	181	168	128	103	
39.1	Hardened steel	56-60	0.05D	0.02D	SFM (vc)	615	615	640	755	760	760	760	760	755	
					IPT (fz)	.0028	.0034	.0039	.0048	.0057	.0062	.0069	.0071	.0071	
					RPM	19840	14880	12400	12200	9200	7350	6130	4600	3670	
					IPM (feed)	169	153	145	177	157	136	126	98	78	
39.2	Hardened steel	61-65	0.05D	0.02D	SFM (vc)	580	585	600	685	685	685	685	685	680	
					IPT (fz)	.0028	.0034	.0039	.0045	.0053	.0057	.0057	.0057	.0058	
					RPM	18680	14220	11670	11100	8320	6660	5530	4160	3300	
					IPM (feed)	159	144	137	151	132	113	95	71	57	
39.3	Hardened steel	66-70	0.05D	0.02D	SFM (vc)	395	395	410	470	470	470	470	470	470	
					IPT (fz)	.0028	.0034	.0039	.0043	.0049	.0056	.0057	.0056	.0057	
					RPM	12780	9580	8000	7590	5690	4550	3800	2850	2280	
					IPM (feed)	109	98	93	97	84	77	65	48	39	
40	Chilled Cast Iron	42	0.05D	0.02D	SFM (vc)	990	995	1030	1115	1115	1115	1120	1105	1115	
					IPT (fz)	.0035	.0042	.0048	.0062	.0071	.0079	.0088	.0090	.0088	
					RPM	32000	24080	20000	18000	13500	10800	9050	6700	5400	
					IPM (feed)	339	303	285	337	289	257	240	181	142	
41	Hardened Cast Iron	55	0.05D	0.02D	SFM (vc)	830	830	865	940	930	940	940	940	940	
					IPT (fz)	.0028	.0035	.0043	.0054	.0061	.0066	.0074	.0075	.0075	
					RPM	26840	20130	16780	15200	11300	9100	7590	5690	4550	
					IPM (feed)	228	214	214	245	207	181	168	128	103	

SFM = Surface Feet per Minute  
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 Ap : Inch (Axial Depth of Cut)  
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RECOMMENDED CUTTING CONDITIONS



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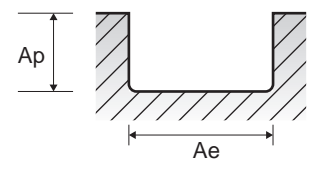
**G8A36 SERIES 2 FLUTE CORNER RADIUS - SLOTTING**

**G8A36 SERIES 2 FLUTE CORNER RADIUS - SLOTTING**

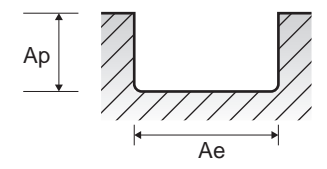
ISO	VDI 3323	Material Description	HRc	Ae	Ap	Parameter	Diameter (Ø)								
							0.2	0.3	0.4	0.5	0.6	0.8	0.9	1	2
P	5	Non-alloy steel	32	1.0D	0.05D	SFM (vc)	105	155	205	260	310	410	455	495	685
						IPT (fz)	.0001	.0001	.0001	.0002	.0002	.0002	.0003	.0003	.0005
						RPM	50000	50000	50000	50000	50000	50000	49000	48000	33300
						IPM (feed)	5	8	9	15	19	24	26	30	34
	8-9	Low alloy steel	32-38	1.0D	0.05D	SFM (vc)	105	155	205	260	310	410	455	495	685
						IPT (fz)	.0001	.0001	.0001	.0002	.0002	.0002	.0003	.0003	.0005
						RPM	50000	50000	50000	50000	50000	50000	49000	48000	33300
						IPM (feed)	5	8	9	15	19	24	26	30	34
	11.1	High alloyed steel, and tool steel	35	1.0D	0.05D	SFM (vc)	105	155	205	260	310	410	455	495	685
						IPT (fz)	.0001	.0001	.0001	.0002	.0002	.0002	.0003	.0003	.0005
						RPM	50000	50000	50000	50000	50000	50000	49000	48000	33300
						IPM (feed)	5	8	9	15	19	24	26	30	34
11.2	High alloyed steel, and tool steel	44	1.0D	0.05D	SFM (vc)	95	140	185	230	280	330	360	390	535	
					IPT (fz)	.0001	.0001	.0001	.0001	.0002	.0002	.0003	.0003	.0005	
					RPM	45000	45000	45000	45000	45000	40000	39000	38000	2600	
					IPM (feed)	32	38	38	39	39	38	38	33	30	
H	38.1	45-49	1.0D	0.05D	SFM (vc)	95	140	185	230	280	330	360	390	535	
					IPT (fz)	.0001	.0001	.0001	.0001	.0002	.0002	.0003	.0003	.0005	
					RPM	45000	45000	45000	45000	45000	40000	39000	38000	26000	
					IPM (feed)	5	6	7	11	14	17	21	22	27	
	38.2	50-55	1.0D	0.05D	SFM (vc)	80	125	165	205	245	245	260	265	360	
					IPT (fz)	.0001	.0001	.0001	.0001	.0001	.0002	.0002	.0003	.0005	
					RPM	40000	40000	40000	40000	40000	30000	27800	25500	17500	
					IPM (feed)	4	5	6	9	11	12	13	14	17	
	39.1	Hardened steel	56-60	1.0D	0.05D	SFM (vc)	70	100	135	170	185	205	210	210	300
						IPT (fz)	.0000	.0000	.0001	.0001	.0001	.0001	.0002	.0002	.0003
						RPM	33000	33000	33000	33000	30000	25000	22700	20500	14500
						IPM (feed)	2	3	4	6	6	7	8	9	10
39.2	Hardened steel	61-65	1.0D	0.05D	SFM (vc)	70	75	105	130	155	155	160	165	225	
					IPT (fz)	.0000	.0000	.0000	.0001	.0001	.0001	.0001	.0002	.0003	
					RPM	33000	25000	25000	25000	25000	19000	17500	16000	11000	
					IPM (feed)	2	2	2	3	4	4	5	5	6	
39.3	Hardened steel	66-70	1.0D	0.02D	SFM (vc)	55	60	80	105	125	125	130	130	195	
					IPT (fz)	.0000	.0000	.0001	.0001	.0001	.0001	.0001	.0001	.0003	
					RPM	26400	20000	20000	20000	20000	15200	14000	12500	9500	
					IPM (feed)	1	1	2	2	3	3	4	3	5	
40	Chilled Cast Iron	42	1.0D	0.05D	SFM (vc)	95	140	185	230	280	330	360	390	535	
					IPT (fz)	.0001	.0001	.0001	.0001	.0002	.0002	.0003	.0003	.0005	
					RPM	45000	45000	45000	45000	45000	40000	39000	38000	26000	
					IPM (feed)	5	6	7	11	14	17	21	22	27	
41	Hardened Cast Iron	55	1.0D	0.05D	SFM (vc)	80	125	165	205	245	245	260	265	360	
					IPT (fz)	.0001	.0001	.0001	.0001	.0001	.0002	.0002	.0003	.0005	
					RPM	40000	40000	40000	40000	40000	30000	27800	25500	17500	
					IPM (feed)	4	5	6	9	11	12	13	14	17	

ISO	VDI 3323	Material Description	HRc	Ae	Ap	Parameter	Diameter (Ø)								
							3	4	5	6	8	10	12	16	20
P	5	Non-alloy steel	32	1.0D	0.05D	SFM (vc)	675	690	810	810	815	805	820	810	805
						IPT (fz)	.0008	.0010	.0012	.0014	.0019	.0022	.0026	.0030	.0033
						RPM	21800	16700	15700	13100	9880	7800	6650	4900	3900
						IPM (feed)	34	35	39	37	37	34	34	29	26
	8-9	Low alloy steel	32-38	1.0D	0.05D	SFM (vc)	675	690	810	810	815	805	820	810	805
						IPT (fz)	.0008	.0010	.0012	.0014	.0019	.0022	.0026	.0030	.0033
						RPM	21800	16700	15700	13100	9880	7800	6650	4900	3900
						IPM (feed)	34	35	39	37	37	34	34	29	26
	11.1	High alloyed steel, and tool steel	35	1.0D	0.05D	SFM (vc)	675	690	810	810	815	805	820	810	805
						IPT (fz)	.0008	.0010	.0012	.0014	.0019	.0022	.0026	.0030	.0033
						RPM	21800	16700	15700	13100	9880	7800	6650	4900	3900
						IPM (feed)	34	35	39	37	37	34	34	29	26
11.2	High alloyed steel, and tool steel	44	1.0D	0.05D	SFM (vc)	535	545	645	640	645	635	650	645	640	
					IPT (fz)	.0008	.0011	.0013	.0014	.0018	.0022	.0026	.0029	.0034	
					RPM	17300	13200	12500	10350	7800	6150	5250	3900	3100	
					IPM (feed)	27	28	32	30	28	27	27	23	21	
H	38.1	45-49	1.0D	0.05D	SFM (vc)	535	545	645	640	645	635	650	645	640	
					IPT (fz)	.0008	.0011	.0013	.0014	.0018	.0022	.0026	.0029	.0034	
					RPM	17300	13200	12500	10350	7800	6150	5250	3900	3100	
					IPM (feed)	27	28	32	30	28	27	27	23	21	
	38.2	50-55	1.0D	0.05D	SFM (vc)	355	365	430	425	430	425	435	430	425	
					IPT (fz)	.0007	.0010	.0012	.0014	.0017	.0020	.0023	.0027	.0034	
					RPM	11500	8800	8300	6900	5200	4100	3500	2600	2050	
					IPM (feed)	17	17	20	19	18	16	16	14	14	
	39.1	Hardened steel	56-60	1.0D	0.05D	SFM (vc)	295	295	330	330	330	330	330	330	330
						IPT (fz)	.0005	.0008	.0009	.0010	.0013	.0016	.0019	.0020	.0025
						RPM	9500	7200	6400	5300	4000	3200	2650	2000	1600
						IPM (feed)	10	11	11	11	10	10	8	8	8
39.2	Hardened steel	61-65	1.0D	0.05D	SFM (vc)	230	230	265	260	265	265	260	265	270	
					IPT (fz)	.0004	.0006	.0007	.0008	.0011	.0012	.0014	.0016	.0019	
					RPM	7500	5600	5100	4200	3200	2550	2100	1600	1300	
					IPM (feed)	6	7	7	7	7	6	6	5	5	
39.3	Hardened steel	66-70	1.0D	0.02D	SFM (vc)	200	195	230	230	230	225	230	230	225	
					IPT (fz)	.0004	.0005	.0006	.0007	.0009	.0009	.0011	.0014	.0014	
					RPM	6400	4750	4450	3700	2800	2200	1860	1400	1100	
					IPM (feed)	5	5	5	5	5	4	4	4	3	
40	Chilled Cast Iron	42	1.0D	0.05D	SFM (vc)	535	545	645	640	645	635	650	645	640	
					IPT (fz)	.0008	.0011	.0013	.0014	.0018	.0022	.0026	.0029	.0034	
					RPM	17300	13200	12500	10350	7800	6150	5250	3900	3100	
					IPM (feed)	27	28	32	30	28	27	27	23	21	
41	Hardened Cast Iron	55	1.0D	0.05D	SFM (vc)	355	365	430	425	430	425	435	430	425	
					IPT (fz)	.0007	.0010	.0012	.0014	.0017	.0020	.0023	.0027	.0034	
					RPM	11500	8800	8300	6900	5200	4100	3500	2600	2050	
					IPM (feed)	17	17	20	19	18	16	16	14	14	

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RECOMMENDED CUTTING CONDITIONS

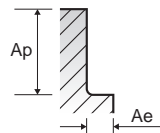


RECOMMENDED CUTTING CONDITIONS

G8A36 SERIES 2 FLUTE CORNER RADIUS - SIDE CUTTING

ISO	VDI 3323	Material Description	HRc	Ae	Ap	Parameter	Diameter (Ø)																				
							1	2	3	4	5	6	8	10	12	16	20										
<b>P</b>	5	Non-alloy steel	32	0.03D	1.0D	SFM (vc)	495	685	675	690	810	810	815	805	820	810	805										
						IPT (fz)	.0004	.0007	.0011	.0015	.0018	.0020	.0026	.0030	.0035	.0042	.0047										
						RPM	48000	33300	21800	16700	15700	13100	9880	7800	6650	4900	3900										
						IPM (feed)	41	47	47	49	57	53	52	47	47	41	37										
	8-9	Low alloy steel	32-38	0.03D	1.0D	SFM (vc)	495	685	675	690	810	810	815	805	820	810	805										
						IPT (fz)	.0004	.0007	.0011	.0015	.0018	.0020	.0026	.0030	.0035	.0042	.0047										
						RPM	48000	33300	21800	16700	15700	13100	9880	7800	6650	4900	3900										
						IPM (feed)	41	47	47	49	57	53	52	47	47	41	37										
	11.1	High alloyed steel, and tool steel	35	0.03D	1.0D	SFM (vc)	495	685	675	690	810	810	815	805	820	810	805										
						IPT (fz)	.0004	.0007	.0011	.0015	.0018	.0020	.0026	.0030	.0035	.0042	.0047										
						RPM	48000	33300	21800	16700	15700	13100	9880	7800	6650	4900	3900										
						IPM (feed)	41	47	47	49	57	53	52	47	47	41	37										
11.2		44	0.03D	1.0D	SFM (vc)	390	535	535	545	645	640	645	635	650	645	640											
					IPT (fz)	.0004	.0007	.0011	.0015	.0018	.0021	.0026	.0031	.0036	.0042	.0048											
					RPM	38000	26000	17300	13200	12500	10350	7800	6150	5250	3900	3100											
					IPM (feed)	32	38	38	39	45	43	41	38	38	33	30											
<b>H</b>	38.1		45-49	0.03D	1.0D	SFM (vc)	390	535	535	545	645	640	645	635	650	645	640										
						IPT (fz)	.0004	.0007	.0011	.0015	.0018	.0021	.0026	.0031	.0036	.0042	.0048										
						RPM	38000	26000	17300	13200	12500	10350	7800	6150	5250	3900	3100										
						IPM (feed)	32	38	38	39	45	43	41	38	38	33	30										
	38.2		50-55	0.03D	1.0D	SFM (vc)	265	360	355	365	430	425	430	425	435	430	425										
						IPT (fz)	.0004	.0007	.0010	.0014	.0017	.0020	.0024	.0028	.0033	.0040	.0046										
						RPM	25500	17500	11500	8800	8300	6900	5200	4100	3500	2600	2050										
						IPM (feed)	20	24	24	25	28	27	25	23	23	21	19										
	39.1	Hardened steel	56-60	0.03D	1.0D	SFM (vc)	210	300	295	295	330	330	330	330	330	330	330										
						IPT (fz)	.0003	.0005	.0008	.0010	.0013	.0015	.0018	.0020	.0025	.0030	.0034										
						RPM	20500	14500	9500	7200	6400	5300	4000	3200	2650	2000	1600										
						IPM (feed)	12	15	15	15	16	16	14	13	13	12	11										
39.2		61-65	0.03D	1.0D	SFM (vc)	165	225	230	230	265	260	265	265	260	265	270											
					IPT (fz)	.0003	.0004	.0006	.0009	.0010	.0012	.0014	.0018	.0021	.0025	.0027											
					RPM	16000	11000	7500	5600	5100	4200	3200	2550	2100	1600	1300											
					IPM (feed)	8	9	9	10	10	10	9	9	9	8	7											
39.3		66-70	0.03D	1.0D	SFM (vc)	130	195	200	195	230	230	230	225	230	230	225											
					IPT (fz)	.0002	.0004	.0005	.0007	.0009	.0009	.0013	.0014	.0016	.0021	.0018											
					RPM	12500	9500	6400	4750	4450	3700	2800	2200	1860	1400	1100											
					IPM (feed)	5	7	7	7	8	7	7	6	6	6	4											
40	Chilled Cast Iron	42	0.03D	1.0D	SFM (vc)	390	535	535	545	645	640	645	635	650	645	640											
					IPT (fz)	.0004	.0007	.0011	.0015	.0018	.0021	.0026	.0031	.0036	.0042	.0048											
					RPM	38000	26000	17300	13200	12500	10350	7800	6150	5250	3900	3100											
					IPM (feed)	32	38	38	39	45	43	41	38	38	33	30											
41	Hardened Cast Iron	55	0.03D	1.0D	SFM (vc)	265	360	355	365	430	425	430	425	435	430	425											
					IPT (fz)	.0004	.0007	.0010	.0014	.0017	.0020	.0024	.0028	.0033	.0040	.0046											
					RPM	25500	17500	11500	8800	8300	6900	5200	4100	3500	2600	2050											
					IPM (feed)	20	24	24	25	28	27	25	23	23	21	19											

SFM = Surface Feet per Minute  
RPM = Revolutions Per Minute  
IPT = Inches Per Tooth  
IPM = Inches Per Minute  
Ap : Inch (Axial Depth of Cut)  
Ae : Inch (Radial Depth of Cut)



G8A50 SERIES 2 FLUTE CORNER RADIUS - SLOTTING

ISO	VDI 3323	Material Description	HRc	Ae	Ap	Parameter	Diameter (Ø)																				
							0.3	0.4	0.5	0.6	0.8	1	1.2	1.5	2												
<b>P</b>	5	Non-alloy steel	32	1.0D	0.05D	SFM (vc)	155	205	260	310	410	495	520	570	685												
						IPT (fz)	.0001	.0001	.0002	.0002	.0002	.0003	.0004	.0004	.0005												
						RPM	50000	50000	50000	50000	50000	48000	42000	37000	33300												
						IPM (feed)	8	9	15	19	24	30	31	31	34												
	8-9	Low alloy steel	32-38	1.0D	0.05D	SFM (vc)	155	205	260	310	410	495	520	570	685												
						IPT (fz)	.0001	.0001	.0002	.0002	.0002	.0003	.0004	.0004	.0005												
						RPM	50000	50000	50000	50000	50000	48000	42000	37000	33300												
						IPM (feed)	8	9	15	19	24	30	31	31	34												
	11.1	High alloyed steel, and tool steel	35	1.0D	0.05D	SFM (vc)	155	205	260	310	410	495	520	570	685												
						IPT (fz)	.0001	.0001	.0002	.0002	.0002	.0003	.0004	.0004	.0005												
						RPM	50000	50000	50000	50000	50000	48000	42000	37000	33300												
						IPM (feed)	8	9	15	19	24	30	31	31	34												
11.2		44	1.0D	0.05D	SFM (vc)	140	185	230	280	330	390	420	470	535													
					IPT (fz)	.0001	.0001	.0001	.0002	.0002	.0003	.0004	.0004	.0005													
					RPM	45000	45000	45000	45000	40000	38000	34000	30500	26000													
					IPM (feed)	6	7	11	14	17	22	25	26	27													
<b>H</b>	38.1		45-49	1.0D	0.05D	SFM (vc)	140	185	230	280	330	390	420	470	535												
						IPT (fz)	.0001	.0001	.0001	.0002	.0002	.0003	.0004	.0004	.0005												
						RPM	45000	45000	45000	45000	40000	38000	34000	30500	26000												
						IPM (feed)	6	7	11	14	17	22	25	26	27												
	38.2	Hardened steel	50-55	1.0D	0.05D	SFM (vc)	125	165	205	245	245	265	280	325	360												
						IPT (fz)	.0001	.0001	.0001	.0001	.0002	.0003	.0003	.0004	.0005												
						RPM	40000	40000	40000	40000	30000	25500	22500	21000	17500												
						IPM (feed)	5	6	9	11	12	14	15	16	17												
	39.1		56-60	1.0D	0.02D	SFM (vc)	100	135	170	185	205	210	245	265	300												
						IPT (fz)	.0000	.0001	.0001	.0001	.0001	.0002	.0003	.0003	.0003												
						RPM	33000	33000	33000	30000	25000	20500	20000	17000	14500												
						IPM (feed)	3	4	6	6	7	9	10	10	10												
39.2																											

HSS

HSS



RECOMMENDED CUTTING CONDITIONS



RECOMMENDED CUTTING CONDITIONS

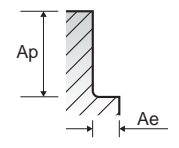
G8A47 SERIES 4 FLUTE CORNER RADIUS - SIDE CUTTING

G8A37 SERIES 4 FLUTE CORNER RADIUS - SIDE CUTTING

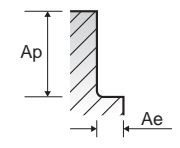
Table with columns: ISO, VDI 3323, Material Description, HRc, Ae, Ap, Parameter, Diameter (Ø) [1, 2, 3, 4, 5, 6, 8, 10, 12, 16, 20]. Rows include Non-alloy steel, Low alloy steel, High alloyed steel, and Hardened steel.

Table with columns: ISO, VDI 3323, Material Description, HRc, Ae, Ap, Parameter, Diameter (Ø) [1, 2, 3, 4, 5, 6, 8, 10, 12, 16, 20]. Rows include Non-alloy steel, Low alloy steel, High alloyed steel, and Hardened steel.

SFM = Surface Feet per Minute
RPM = Revolutions Per Minute
IPT = Inches Per Tooth
IPM = Inches Per Minute
Ap : Inch (Axial Depth of Cut)
Ae : Inch (Radial Depth of Cut)



SFM = Surface Feet per Minute
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Ap : Inch (Axial Depth of Cut)
Ae : Inch (Radial Depth of Cut)





**X5070  
END MILLS**

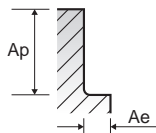
RECOMMENDED CUTTING CONDITIONS

**G8A39** SERIES

**6 FLUTE CORNER RADIUS - SIDE CUTTING**

ISO	VDI 3323	Material Description	HRc	Ae	Ap	Parameter	Diameter (Ø)					
							6	8	10	12	16	20
<b>P</b>	5	Non-alloy steel	32	0.05D	1.0D	SFM (vc)	1535	1650	1650	1610	1650	1650
						IPT (fz)	.0014	.0018	.0020	.0023	.0026	.0028
						RPM	24800	20000	16000	13000	10000	8000
						IPM (feed)	211	217	193	177	158	132
	8-9	Low alloy steel	32-38	0.05D	1.0D	SFM (vc)	1535	1650	1650	1610	1650	1650
						IPT (fz)	.0014	.0018	.0020	.0023	.0026	.0028
						RPM	24800	20000	16000	13000	10000	8000
						IPM (feed)	211	217	193	177	158	132
	11.1	High alloyed steel, and tool steel	35	0.05D	1.0D	SFM (vc)	1535	1650	1650	1610	1650	1650
						IPT (fz)	.0014	.0018	.0020	.0023	.0026	.0028
						RPM	24800	20000	16000	13000	10000	8000
						IPM (feed)	211	217	193	177	158	132
11.2	High alloyed steel, and tool steel	44	0.05D	1.0D	SFM (vc)	1455	1565	1595	1545	1600	1610	
					IPT (fz)	.0014	.0017	.0019	.0021	.0025	.0029	
					RPM	23500	19000	15500	12500	9700	7800	
					IPM (feed)	193	197	177	161	146	134	
<b>H</b>	38.1	Hardened steel	45-49	0.05D	1.0D	SFM (vc)	1455	1565	1595	1545	1600	1610
						IPT (fz)	.0014	.0017	.0019	.0021	.0025	.0029
						RPM	23500	19000	15500	12500	9700	7800
						IPM (feed)	193	197	177	161	146	134
	38.2	Hardened steel	50-55	0.05D	1.0D	SFM (vc)	990	990	980	990	990	990
						IPT (fz)	.0020	.0025	.0028	.0031	.0037	.0044
						RPM	16000	12000	9500	8000	6000	4800
						IPM (feed)	193	181	161	150	134	126
	39.1	Hardened steel	56-60	0.03D	1.0D	SFM (vc)	835	825	825	815	825	825
						IPT (fz)	.0016	.0020	.0024	.0025	.0030	.0035
						RPM	13500	10000	8000	6600	5000	4000
						IPM (feed)	130	122	114	98	91	83
39.2	Hardened steel	61-65	0.03D	1.0D	SFM (vc)	650	660	660	655	660	660	
					IPT (fz)	.0013	.0016	.0018	.0020	.0020	.0021	
					RPM	10500	8000	6400	5300	4000	3200	
					IPM (feed)	83	79	71	63	49	40	
39.3	Hardened steel	66-70	0.03D	1.0D	SFM (vc)	495	495	495	495	495	495	
					IPT (fz)	.0012	.0015	.0018	.0019	.0019	.0019	
					RPM	8000	6000	4800	4000	3000	2400	
					IPM (feed)	57	55	51	45	34	27	
40	Chilled Cast Iron	42	0.05D	1.0D	SFM (vc)	1455	1565	1595	1545	1600	1610	
					IPT (fz)	.0014	.0017	.0019	.0021	.0025	.0029	
					RPM	23500	19000	15500	12500	9700	7800	
					IPM (feed)	193	197	177	161	146	134	
41	Hardened Cast Iron	55	0.05D	1.0D	SFM (vc)	990	990	980	990	990	990	
					IPT (fz)	.0020	.0025	.0028	.0031	.0037	.0044	
					RPM	16000	12000	9500	8000	6000	4800	
					IPM (feed)	193	181	161	150	134	126	

SFM = Surface Feet per Minute  
 RPM = Revolutions Per Minute  
 IPT = Inches Per Tooth  
 IPM = Inches Per Minute  
 Ap : Inch (Axial Depth of Cut)  
 Ae : Inch (Radial Depth of Cut)







Being the best through innovation

SOLID CARBIDE



# 4G Mill END MILLS

- High Speed Cutting for Pre-Hardened Steels up to HRc55

SELECTION GUIDE



SOLID CARBIDE  
4G MILLS

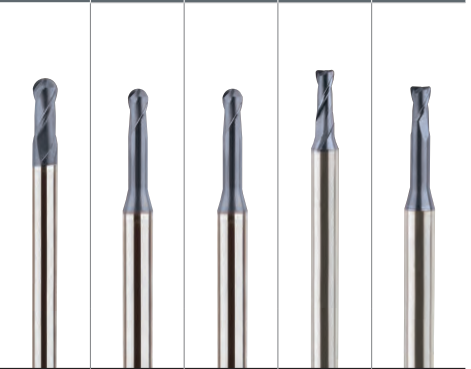
- High Speed Cutting for Pre-Hardened Steels up to HRc55



Please visit [globalyg1.com/mat](http://globalyg1.com/mat) for material search  
 ◎ : Excellent ○ : Good  
 Recommended cutting conditions : p. C268

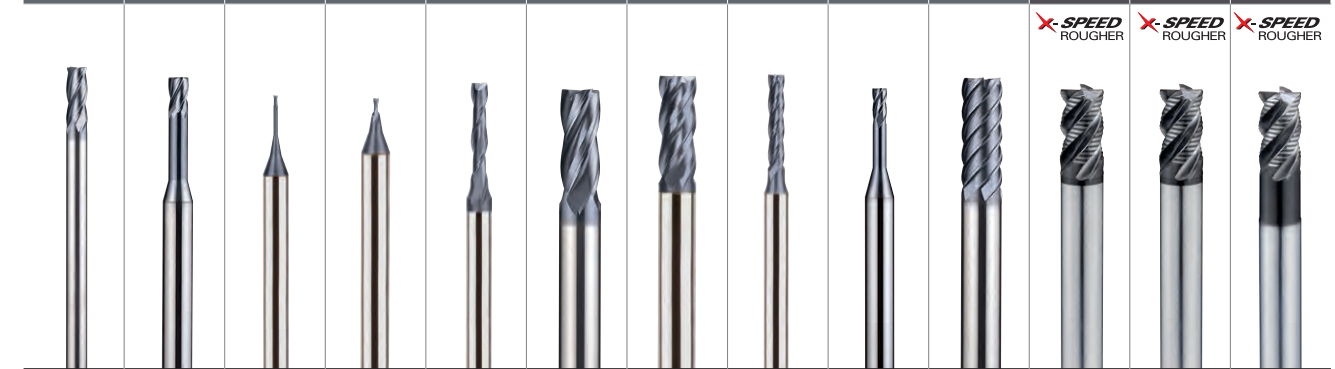
ISO	VDI 3323	Material Description	Composition / Structure / Heat Treatment	HB	HRc
P	1	Non-alloy steel	About 0.15% C Annealed	125	
	2		About 0.45% C Annealed	190	13
	3		About 0.45% C Quenched & Tempered	250	25
	4		About 0.75% C Annealed	270	28
	5		About 0.75% C Quenched & Tempered	300	32
	6	Low alloy steel	Annealed	180	10
	7		Quenched & Tempered	275	29
	8		Quenched & Tempered	300	32
	9		Quenched & Tempered	350	38
	10		High alloyed steel, and tool steel	Annealed	200
	11	Quenched & Tempered		325	35
M	12	Stainless steel	Ferritic / Martensitic Annealed	200	15
	13		Martensitic Quenched & Tempered	240	23
	14		Austenitic	180	10
K	15	Grey cast iron	Pearlitic / ferritic	180	10
	16		Pearlitic (Martensitic)	260	26
	17	Nodular cast iron	Ferritic	160	3
	18		Pearlitic	250	25
	19		Ferritic	130	
20	Malleable cast iron	Pearlitic	230	21	
N	21	Aluminum-wrought alloy	Not Curable	60	
	22		Curable Hardened	100	
	23	Aluminum-cast, alloyed	≤ 12% Si, Not Curable	75	
	24		≤ 12% Si, Curable Hardened	90	
	25		> 12% Si, Not Curable	130	
	26	Copper and Copper Alloys (Bronze / Brass)	Cutting Alloys, PB>1%	110	
	27		CuZn, CuSnZn (Brass)	90	
	28		CuSn, lead-free copper and electrolytic copper	100	
	29		Non Metallic Materials	Duroplastic, Fiber Reinforced Plastic	
	30	Rubber, Wood, etc.			
S	31	Heat Resistant Super Alloys	Fe Based Annealed	200	15
	32		Cured	280	30
	33		Annealed	250	25
	34		Ni or Co Based Cured	350	38
	35		Cast	320	34
	36	Titanium Alloys	Pure Titanium	400 Rm	
	37		Alpha + Beta Alloys Hardened	1050 Rm	
H	38	Hardened steel	Hardened	550	55
	39		Hardened	630	60
	40	Chilled Cast Iron	Cast	400	42
	41	Hardened Cast Iron	Hardened	550	55

SERIES	Inch				
	GMF15	GMF16	GMF17	GMF18	GMF19
FLUTE	2	2	4	2	2
HELIX ANGLE	30°	30°	30°	30°	30°
CUTTING EDGE SHAPE	BALL NOSE	BALL NOSE	BALL NOSE	CORNER RADIUS	CORNER RADIUS
SIZE MIN	R.002	R.004	R1/16	D3/64	D.008
SIZE MAX	R3/8	R1/4	R1/4	D3/4	D3/4
PAGE	C130	C132	C135	C136	C139



	GMF15	GMF16	GMF17	GMF18	GMF19
NECK					
Y-Coating	○	○	○	○	○

SERIES	Inch												
	GMF20	GMF21	GMF22	GMF23	GMF24	GMF25	GMF26	GMF27	GMF28	GMF29	G907 G928	G908 G929	G909 G930
FLUTE	4	4	2	2	2	4	4	4	4	6	4&5	4&5	4&5
HELIX ANGLE	27°/30° (MULTIPLE HELIX)	27°/30° (MULTIPLE HELIX)	30°	30°	30°	27°/30° (MULTIPLE HELIX)	35°/38° (MULTIPLE HELIX)	30°	30°	45°	4 Flute : 44°/45° 5 Flute : 44°/44.5°/45°	4 Flute : 44°/45° 5 Flute : 44°/44.5°/45°	4 Flute : 44°/45° 5 Flute : 44°/44.5°/45°
CORNER RADIUS	D3/64	D3/64	SQUARE	SQUARE	SQUARE	SQUARE	SQUARE	SQUARE	SQUARE	SQUARE	CORNER RADIUS ROUGHING	CORNER RADIUS ROUGHING	CORNER RADIUS ROUGHING
SIZE MIN	D3/64	D3/64	D.008	D.004	D3/64	D3/64	D3/64	D3/64	D3/64	D1/4	D1/4	D1/4	D1/4
SIZE MAX	D3/4	D3/4	D1/2	D.120	D3/4	D3/4	D3/4	D1	D1/2	D3/4	D1	D1	D3/4
PAGE	C145	C147	C152	C155	C158	C161	C162	C163	C166	C168	C169	C170	C171



	GMF20	GMF21	GMF22	GMF23	GMF24	GMF25	GMF26	GMF27	GMF28	GMF29	G907 G928	G908 G929	G909 G930
NECK													
LONG LENGTH													
Y-Coating	○	○	○	○	○	○	○	○	○	○	◎	◎	◎



SELECTION GUIDE



SOLID CARBIDE 4G MILLS

- High Speed Cutting for Pre-Hardened Steels up to HRc55

Please visit globalyg1.com/mat for material search

⊙ : Excellent ○ : Good

Recommended cutting conditions : p. C268

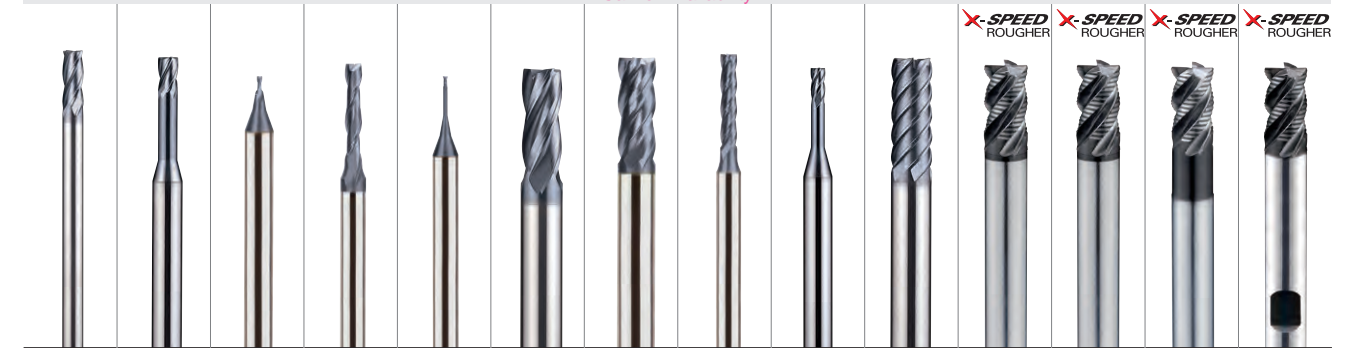
Table with columns: ISO, VDI 3323, Material Description, Composition / Structure / Heat Treatment, HB, HRc, and 5 series columns (SEM98, SEM846, SEM846, SEM99, SEM61) with performance indicators (○/⊙).

Technical specifications table for 4G Mills including Series, Flute, Helix Angle, Cutting Edge Shape, Size Min, Size Max, and Page.



Call for Availability

Technical specifications table for X-Speed Rougher 4G Mills including Series, Flute, Helix Angle, Cutting Edge Shape, Size Min, Size Max, and Page.



Call for Availability

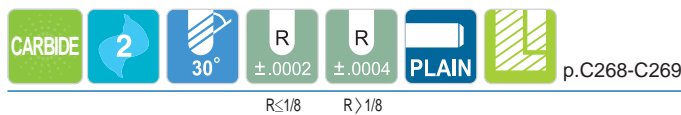
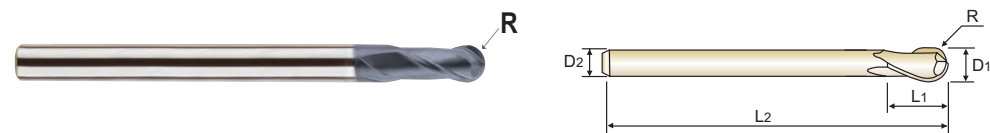




PLAIN SHANK GMF15 SERIES

CARBIDE, 2 FLUTE BALL NOSE

- ▶ New coating and new tool geometry gives outstanding cutting performance and wear resistance.
- ▶ Unique ball nose geometry with superior cutting edges result in decreased cutting forces.
- ▶ Excellent performance when cutting steels, up to HRc55



EDP No.	Radius of Ball Nose	Mill Diameter	Shank Diameter	Length of Cut	Overall Length
	R	D1	D2	L1	L2
GMF15901	R.002	.004	3/16	.008	1-1/2
GMF15902	R.004	.008	3/16	1/64	1-1/2
GMF15903	R.006	.012	3/16	1/32	1-1/2
GMF15904	R.075	.015	3/16	1/32	1-1/2
GMF15905	R.010	.020	3/16	3/64	1-1/2
GMF15906	R.012	.024	3/16	3/64	1-1/2
GMF15907	R.014	.028	3/16	1/16	1-1/2
GMF15908	R.0155	.031	3/16	1/16	1-1/2
GMF15909	R.0175	.035	3/16	5/64	1-1/2
GMF15003	R.0234	3/64	3/16	3/32	2
GMF15910	R.0234	3/64	1/4	3/32	2
GMF15911	R.0234	3/64	1/4	3/32	2-3/4
GMF15004	R1/32	1/16	3/16	5/32	2
GMF15912	R1/32	1/16	1/4	5/32	2
GMF15913	R1/32	1/16	1/4	5/32	2-3/4
GMF15005	R.0391	5/64	1/4	1/8	1-1/2
GMF15914	R.0391	5/64	3/16	3/16	2
GMF15915	R.0391	5/64	1/4	3/16	2
GMF15916	R.0391	5/64	1/4	3/16	3-1/8
GMF15006	R3/64	3/32	1/4	1/4	2-3/8
GMF15917	R3/64	3/32	1/4	1/4	3-1/8
GMF15008	R1/16	1/8	1/4	3/16	1-1/2
GMF15918	R1/16	1/8	3/16	1/4	2-3/8
GMF15919	R1/16	1/8	1/4	1/4	2-3/8
GMF15920	R1/16	1/8	1/4	1/4	3-1/8
GMF15921	R1/16	1/8	1/4	1/4	4
GMF15012	R3/32	3/16	1/4	1/4	2
GMF15922	R3/32	3/16	3/16	5/16	2-3/4
GMF15923	R3/32	3/16	1/4	5/16	2-3/4
GMF15924	R3/32	3/16	3/16	5/16	4
GMF15925	R3/32	3/16	1/4	5/16	4
GMF15926	R3/32	3/16	1/4	5/16	4-1/2

▶ NEXT PAGE

◎:Excellent ○:Good

ISO Material Description	P										M				K			H		
	Non-alloy steel					Low alloy steel					High alloyed steel, and tool steel				Stainless steel		Grey cast iron	Nodular cast iron		Malleable cast iron
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc	13	25	28	32	30	10	29	32	38	15	35	15	23	10	10	26	3	25	130	21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend	○	○	○	◎	◎	○	◎	◎	◎	○	◎	○	◎	◎	○	○	○	○	○	○

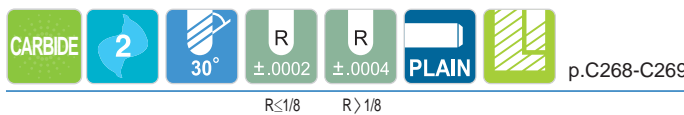
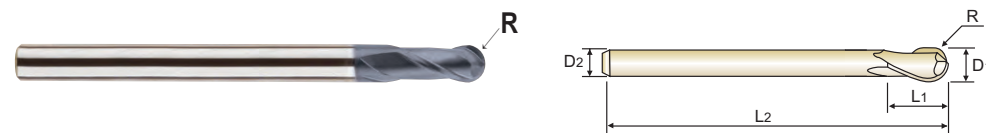
ISO Material Description	N										S					H					
	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron	
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc	60	100	75	90	130	110	90	100			15	30	25	38	34	400 Rm	1050 Rm	55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend																		○	◎	○	○



PLAIN SHANK GMF15 SERIES

CARBIDE, 2 FLUTE BALL NOSE

- ▶ New coating and new tool geometry gives outstanding cutting performance and wear resistance.
- ▶ Unique ball nose geometry with superior cutting edges result in decreased cutting forces.
- ▶ Excellent performance when cutting steels, up to HRc55



EDP No.	Radius of Ball Nose	Mill Diameter	Shank Diameter	Length of Cut	Overall Length
	R	D1	D2	L1	L2
GMF15013	R.102	13/64	1/4	5/16	2-3/8
GMF15927	R.102	13/64	1/4	3/8	3-1/8
GMF15016	R1/8	1/4	1/4	3/8	2
GMF15928	R1/8	1/4	1/4	3/8	3-1/8
GMF15929	R1/8	1/4	1/4	1/2	3-1/2
GMF15930	R1/8	1/4	1/4	1/2	5
GMF15018	R9/64	9/32	5/16	9/16	3-1/2
GMF15020	R5/32	5/16	5/16	1/2	2
GMF15931	R5/32	5/16	5/16	1/2	3-1/2
GMF15932	R5/32	5/16	5/16	9/16	4
GMF15933	R5/32	5/16	5/16	9/16	6
GMF15024	R3/16	3/8	3/8	5/8	2-3/8
GMF15934	R3/16	3/8	3/8	5/8	3-1/2
GMF15935	R3/16	3/8	3/8	11/16	4
GMF15936	R3/16	3/8	3/8	11/16	5
GMF15937	R3/16	3/8	3/8	11/16	6
GMF15938	R3/16	3/8	3/8	11/16	7
GMF15032	R1/4	1/2	1/2	11/16	3-1/8
GMF15939	R1/4	1/2	1/2	11/16	4
GMF15940	R1/4	1/2	1/2	7/8	4-1/4
GMF15941	R1/4	1/2	1/2	7/8	6
GMF15942	R1/4	1/2	1/2	7/8	8
GMF15036	R9/32	9/16	9/16	1	4
GMF15040	R5/16	5/8	5/8	1	4
GMF15943	R5/16	5/8	5/8	1-3/16	6
GMF15048	R3/8	3/4	3/4	1-3/16	4
GMF15944	R3/8	3/4	3/4	1-1/2	6

Size	Radius Tolerance (Inch)	Mill Dia. Tolerance (Inch)	Shank Dia. Tolerance
up to Ø1/4	±.0002	0~-.0005	h5
over Ø1/4	±.0004	0~-.0006	

◎:Excellent ○:Good

ISO Material Description	P										M				K			H		
	Non-alloy steel					Low alloy steel					High alloyed steel, and tool steel				Stainless steel		Grey cast iron	Nodular cast iron		Malleable cast iron
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc	13	25	28	32	30	10	29	32	38	15	35	15	23	10	10	26	3	25	130	21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend	○	○	○	◎	◎	○	◎	◎	◎	○	◎	○	◎	◎	○	○	○	○	○	○

ISO Material Description	N										S					H					
	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron	
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc	60	100	75	90	130	110	90	100			15	30	25	38	34	400 Rm	1050 Rm	55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend																		○	◎	○	○

HSS

HSS



PLAIN SHANK GMF16 SERIES

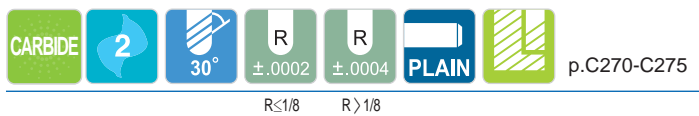
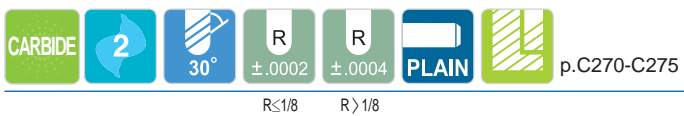
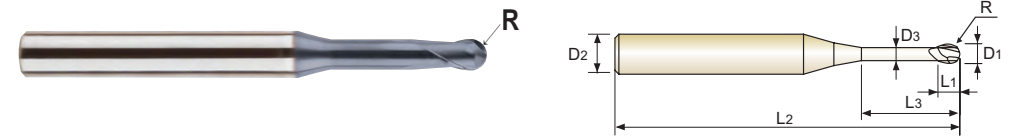
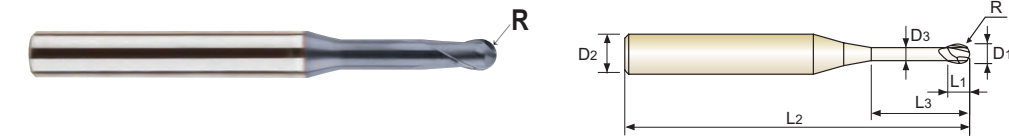
PLAIN SHANK GMF16 SERIES

CARBIDE, 2 FLUTE BALL NOSE WITH NECK

CARBIDE, 2 FLUTE BALL NOSE WITH NECK

- ▶ New coating and new tool geometry gives outstanding cutting performance and wear resistance.
- ▶ Unique ball nose geometry with superior cutting edges result in decreased cutting forces.
- ▶ Excellent performance when cutting steels, up to HRC55

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- ▶ Unique ball nose geometry with superior cutting edges result in decreased cutting forces.
- ▶ Excellent performance when cutting steels, up to HRC55



EDP No.	Radius of Ball Nose	Mill Diameter	Shank Diameter	Length of Cut	Length Below Shank	Overall Length	Neck Diameter
	R	D1	D2	L1	L3	L2	D3
GMF16901	R.004	.008	3/16	.008	1/64	1-1/2	.006
GMF16902	R.004	.008	3/16	.008	3/64	1-1/2	.006
GMF16903	R.006	.012	3/16	.010	3/64	1-1/2	.010
GMF16904	R.006	.012	3/16	.010	5/64	1-1/2	.010
GMF16905	R.006	.012	3/16	.010	1/8	1-1/2	.010
GMF16906	R.0075	.015	3/16	1/64	3/64	1-1/2	.013
GMF16907	R.0075	.015	3/16	1/64	5/64	1-1/2	.013
GMF16908	R.0075	.015	3/16	1/64	1/8	1-1/2	.013
GMF16909	R.0075	.015	3/16	1/64	5/32	1-1/2	.013
GMF16910	R.010	.020	3/16	1/64	3/64	1-3/4	.018
GMF16911	R.010	.020	3/16	1/64	5/64	1-3/4	.018
GMF16912	R.010	.020	3/16	1/64	1/8	1-3/4	.018
GMF16913	R.010	.020	3/16	1/64	5/32	1-3/4	.018
GMF16914	R.010	.020	3/16	1/64	3/16	1-3/4	.018
GMF16915	R.010	.020	3/16	1/64	1/4	1-3/4	.018
GMF16916	R.010	.020	3/16	1/64	5/16	1-3/4	.018
GMF16917	R.010	.020	3/16	1/64	3/8	1-3/4	.018
GMF16918	R.012	.024	3/16	1/32	5/64	1-3/4	.022
GMF16919	R.012	.024	3/16	1/32	1/8	1-3/4	.022
GMF16920	R.012	.024	3/16	1/32	5/32	1-3/4	.022
GMF16921	R.012	.024	3/16	1/32	3/16	1-3/4	.022
GMF16922	R.012	.024	3/16	1/32	1/4	1-3/4	.022
GMF16923	R.012	.024	3/16	1/32	5/16	1-3/4	.022
GMF16924	R.012	.024	3/16	1/32	3/8	1-3/4	.022
GMF16925	R.012	.024	3/16	1/32	1/2	1-3/4	.022
GMF16002	R1/64	1/32	3/16	1/32	5/64	1-3/4	.029
GMF16926	R1/64	1/32	3/16	1/32	1/8	1-3/4	.029
GMF16927	R1/64	1/32	3/16	1/32	5/32	1-3/4	.029
GMF16928	R1/64	1/32	3/16	1/32	3/16	1-3/4	.029
GMF16929	R1/64	1/32	3/16	1/32	1/4	1-3/4	.029
GMF16930	R1/64	1/32	3/16	1/32	5/16	1-3/4	.029
GMF16931	R1/64	1/32	3/16	1/32	3/8	1-3/4	.029

EDP No.	Radius of Ball Nose	Mill Diameter	Shank Diameter	Length of Cut	Length Below Shank	Overall Length	Neck Diameter
	R	D1	D2	L1	L3	L2	D3
GMF16003	R.0234	3/64	3/16	3/64	1/8	2	.044
GMF16932	R.0234	3/64	3/16	3/64	5/32	2	.044
GMF16933	R.0234	3/64	3/16	3/64	3/16	2	.044
GMF16934	R.0234	3/64	3/16	3/64	1/4	2	.044
GMF16935	R.0234	3/64	3/16	3/64	5/16	2	.044
GMF16936	R.0234	3/64	3/16	3/64	3/8	2	.044
GMF16937	R.0234	3/64	3/16	3/64	1/2	2	.044
GMF16938	R.0234	3/64	3/16	3/64	9/16	2	.044
GMF16939	R.0234	3/64	3/16	3/64	5/8	2	.044
GMF16940	R.0234	3/64	3/16	3/64	3/4	2	.044
GMF16004	R1/32	1/16	3/16	1/16	5/32	2	.060
GMF16941	R1/32	1/16	3/16	1/16	1/4	2	.060
GMF16942	R1/32	1/16	3/16	1/16	5/16	2	.060
GMF16943	R1/32	1/16	3/16	1/16	3/8	2	.060
GMF16944	R1/32	1/16	3/16	1/16	1/2	2	.060
GMF16945	R1/32	1/16	3/16	1/16	9/16	2	.060
GMF16946	R1/32	1/16	3/16	1/16	5/8	2	.060
GMF16005	R.0391	5/64	3/16	5/64	1/4	2	.076
GMF16948	R.0391	5/64	3/16	5/64	5/16	2	.076
GMF16949	R.0391	5/64	3/16	5/64	3/8	2	.076
GMF16950	R.0391	5/64	3/16	5/64	1/2	2	.076
GMF16951	R.0391	5/64	3/16	5/64	9/16	2	.076
GMF16952	R.0391	5/64	3/16	5/64	5/8	2	.076
GMF16953	R.0391	5/64	3/16	5/64	11/16	2	.076
GMF16954	R.0391	5/64	3/16	5/64	3/4	2	.076
GMF16955	R.0391	5/64	3/16	5/64	1	2-3/8	.076
GMF16956	R.0391	5/64	3/16	5/64	1-3/16	2-3/4	.076
GMF16006	R3/64	3/32	3/16	3/32	3/8	2	.089
GMF16957	R3/64	3/32	3/16	3/32	3/4	2	.089
GMF16008	R1/16	1/8	1/4	1/8	5/16	2	.119
GMF16958	R1/16	1/8	1/4	1/8	3/8	2	.119

▶ NEXT PAGE  
◎: Excellent ○: Good

▶ NEXT PAGE  
◎: Excellent ○: Good

ISO	P										M				K			H		
	Non-alloy steel					Low alloy steel					High alloyed steel, and tool steel				Stainless steel		Grey cast iron		Nodular cast iron	Malleable cast iron
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc	13	25	28	32	30	10	29	32	38	15	35	15	23	10	10	26	3	25	21	21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend	○	○	○	◎	◎	○	◎	◎	◎	○	◎	○	○	○	○	○	○	○	○	○

ISO	N					S					H										
	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys			Titanium Alloys	Hardened steel	Chilled Cast Iron	Hardened Cast Iron				
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend																		○	◎	◎	○

ISO	P										M				K			H			
	Non-alloy steel					Low alloy steel					High alloyed steel, and tool steel				Stainless steel		Grey cast iron		Nodular cast iron	Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
HRc	13	25	28	32	30	10	29	32	38	15	35	15	23	10	10	26	3	25	21	21	
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230	
Recommend	○	○	○	◎	◎	○	◎	◎	◎	○	◎	○	○	○	○	○	○	○	○	○	○

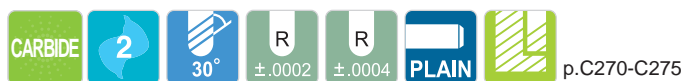
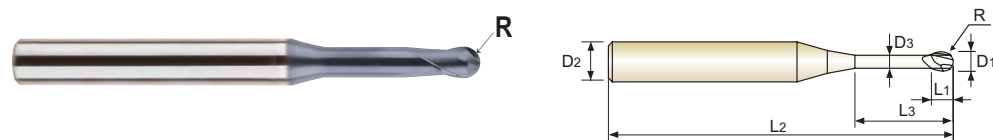
ISO	N					S					H										
	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys			Titanium Alloys	Hardened steel	Chilled Cast Iron	Hardened Cast Iron				
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend																		○	◎	◎	○



PLAIN SHANK GMF16 SERIES

CARBIDE, 2 FLUTE BALL NOSE WITH NECK

- ▶ New coating and new tool geometry gives outstanding cutting performance and wear resistance.
- ▶ Unique ball nose geometry with superior cutting edges result in decreased cutting forces.
- ▶ Excellent performance when cutting steels, up to HRC55



R ≤ 1/8 R > 1/8

EDP No.	Radius of Ball Nose	Mill Diameter	Shank Diameter	Length of Cut	Length Below Shank	Overall Length	Neck Diameter
	R	D1	D2	L1	L3	L2	D3
GMF16959	R1/16	1/8	1/4	1/8	1/2	2	.119
GMF16960	R1/16	1/8	1/4	1/8	9/16	2-3/8	.119
GMF16961	R1/16	1/8	1/4	1/8	5/8	2-3/8	.119
GMF16962	R1/16	1/8	1/4	1/8	11/16	2-3/8	.119
GMF16963	R1/16	1/8	1/4	1/8	3/4	2-3/8	.119
GMF16964	R1/16	1/8	1/4	1/8	1	2-3/4	.119
GMF16965	R1/16	1/8	1/4	1/8	1-3/16	2-3/4	.119
GMF16966	R1/16	1/8	1/4	1/8	1-3/8	2-3/4	.119
GMF16012	R3/32	3/16	1/4	5/32	3/8	2	.181
GMF16967	R3/32	3/16	1/4	5/32	1/2	2	.181
GMF16968	R3/32	3/16	1/4	5/32	9/16	2-3/8	.181
GMF16969	R3/32	3/16	1/4	5/32	5/8	2-3/8	.181
GMF16970	R3/32	3/16	1/4	5/32	11/16	2-3/8	.181
GMF16971	R3/32	3/16	1/4	5/32	3/4	2-3/8	.181
GMF16972	R3/32	3/16	1/4	5/32	1	2-3/4	.181
GMF16973	R3/32	3/16	1/4	5/32	1-3/16	2-3/4	.181
GMF16974	R3/32	3/16	1/4	5/32	1-3/8	2-3/4	.181
GMF16975	R3/32	3/16	1/4	5/32	1-1/2	3-1/8	.181
GMF16013	R.102	13/64	1/4	1/4	1-3/16	2-3/4	.197
GMF16016	R1/8	1/4	1/4	5/16	3/4	2-3/8	.244
GMF16976	R1/8	1/4	1/4	5/16	1-3/16	2-3/8	.244
GMF16020	R5/32	5/16	5/16	3/8	1	2-3/4	.300
GMF16977	R5/32	5/16	5/16	9/16	1-3/8	4	.300
GMF16024	R3/16	3/8	3/8	1/2	1-3/16	3	.363
GMF16978	R3/16	3/8	3/8	11/16	1-3/16	4	.363
GMF16979	R3/16	3/8	3/8	11/16	1-1/2	4	.363
GMF16032	R1/4	1/2	1/2	9/16	1-1/4	3-1/8	.488
GMF16980	R1/4	1/2	1/2	7/8	1-1/4	4-1/4	.488

Size	Radius Tolerance (Inch)	Mill Dia. Tolerance (Inch)	Shank Dia. Tolerance
up to Ø1/4	±.0002	0~-.0005	h5
over Ø1/4	±.0004	0~-.0006	

◎ : Excellent ○ : Good

ISO Material Description	P											M				K					
	Non-alloy steel					Low alloy steel						High alloyed steel, and tool steel	Stainless steel		Grey cast iron	Nodular cast iron	Malleable cast iron				
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
HRc	13	25	28	32	30	10	29	32	38	15	35	15	23	10	10	26	3	25	21	21	
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230	
Recommend	○	○	○	◎	◎	○	◎	◎	◎	○	◎	○	○	○	○	○	○	○	○	○	○

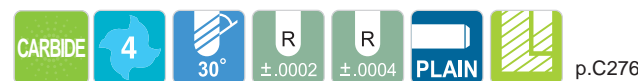
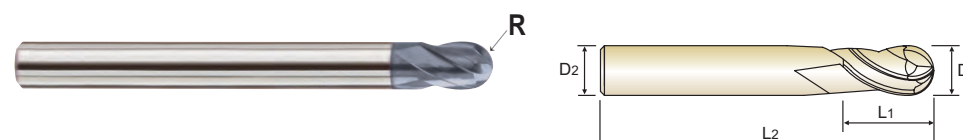
ISO Material Description	N										S					H					
	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys			Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron			
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc	60	100	75	90	130	110	90	100			15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend																		○	◎	◎	○



PLAIN SHANK GMF17 SERIES

CARBIDE, 4 FLUTE BALL NOSE

- ▶ New coating and new tool geometry gives outstanding cutting performance and wear resistance.
- ▶ Unique ball nose geometry with superior cutting edges result in decreased cutting forces.
- ▶ Excellent performance when cutting steels, up to HRC55
- ▶ Cutting edge strength is increased and part finish is improved due to new End Geometry



R1/8 R > 1/8

EDP No.	Corner Radius	Mill Diameter	Shank Diameter	Length of Cut	Overall Length
	R	D1	D2	L1	L2
GMF17008	R1/16	1/8	1/4	1/8	2-3/8
GMF17012	R3/32	3/16	1/4	5/32	2-3/4
GMF17016	R1/8	1/4	1/4	1/4	3-1/2
GMF17020	R5/32	5/16	5/16	5/16	4
GMF17024	R3/16	3/8	3/8	3/8	4
GMF17032	R1/4	1/2	1/2	1/2	4-1/4

Size	Radius Tolerance (Inch)	Mill Dia. Tolerance (Inch)	Shank Dia. Tolerance
up to Ø1/4	±.0002	0~-.0008	h5
over Ø1/4	±.0004		

ISO Material Description	P											M				K					
	Non-alloy steel					Low alloy steel						High alloyed steel, and tool steel	Stainless steel		Grey cast iron	Nodular cast iron	Malleable cast iron				
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
HRc	13	25	28	32	30	10	29	32	38	15	35	15	23	10	10	26	3	25	21	21	
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230	
Recommend	○	○	○	◎	◎	○	◎	◎	◎	○	◎	○	○	○	○	○	○	○	○	○	○

ISO Material Description	N										S					H					
	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys			Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron			
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc	60	100	75	90	130	110	90	100			15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend																		○	◎	◎	○

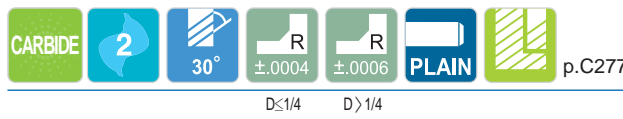
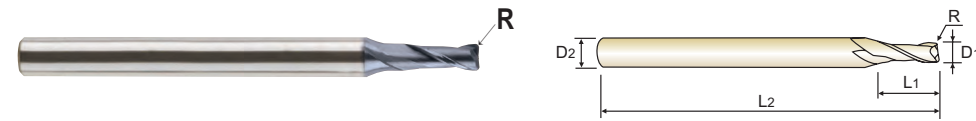




PLAIN SHANK GMF18 SERIES

CARBIDE, 2 FLUTE CORNER RADIUS

- ▶ New coating and new tool geometry gives outstanding cutting performance and wear resistance.
- ▶ Excellent performance when cutting steels, up to HRc55
- ▶ Available in various length shanks and corner radiuses.



EDP No.	Corner Radius R	Mill Diameter D1	Shank Diameter D2	Length of Cut L1	Overall Length L2
GMF18003	R.008	3/64	1/4	3/32	2
GMF18901	R.012	3/64	1/4	3/32	2
GMF18004	R.008	1/16	1/4	5/32	2
GMF18902	R.012	1/16	1/4	5/32	2
GMF18903	R.020	1/16	1/4	5/32	2
GMF18005	R.008	5/64	1/4	1/4	2
GMF18904	R.012	5/64	1/4	1/4	2
GMF18905	R.020	5/64	1/4	1/4	2
GMF18008	R.008	1/8	1/4	5/16	2-3/8
GMF18906	R.012	1/8	1/4	5/16	2-3/8
GMF18907	R.020	1/8	1/4	5/16	2-3/8
GMF18940	R.030	1/8	1/4	5/16	2-3/8
GMF18009	R.008	9/64	1/4	3/8	2-3/4
GMF18908	R.012	9/64	1/4	3/8	2-3/4
GMF18909	R.020	9/64	1/4	3/8	2-3/4
GMF18941	R.030	9/64	1/4	3/8	2-3/4
GMF18910	R.040	9/64	1/4	3/8	2-3/4
GMF18013	R.008	13/64	1/4	1/2	3-1/2
GMF18911	R.012	13/64	1/4	1/2	3-1/2
GMF18912	R.020	13/64	1/4	1/2	3-1/2
GMF18942	R.030	13/64	1/4	1/2	3-1/2
GMF18913	R.040	13/64	1/4	1/2	3-1/2
GMF18016	R.008	1/4	1/4	5/8	2-3/8
GMF18914	R.012	1/4	1/4	5/8	2-3/8
GMF18915	R.020	1/4	1/4	5/8	2-3/8
GMF18943	R.030	1/4	1/4	5/8	2-3/8

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ISO Material Description	P										M				K			H		
	Non-alloy steel					Low alloy steel					High alloyed steel, and tool steel				Stainless steel		Grey cast iron		Nodular cast iron	Malleable cast iron
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc	13	25	28	32	30	10	29	32	38	15	35	15	23	10	10	26	3	25	3	21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend	○	○	◎	◎	◎	○	◎	◎	◎	○	◎	○	○	○	○	○	○	○	○	○

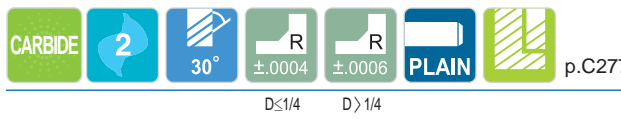
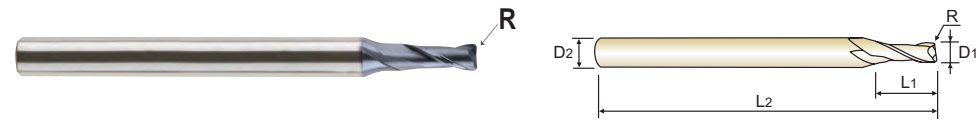
ISO Material Description	N										S					H					
	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron	
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend																		○	◎	◎	○



PLAIN SHANK GMF18 SERIES

CARBIDE, 2 FLUTE CORNER RADIUS

- ▶ New coating and new tool geometry gives outstanding cutting performance and wear resistance.
- ▶ Excellent performance when cutting steels, up to HRc55
- ▶ Available in various length shanks and corner radiuses.



EDP No.	Corner Radius R	Mill Diameter D1	Shank Diameter D2	Length of Cut L1	Overall Length L2
GMF18916	R.040	1/4	1/4	5/8	2-3/8
GMF18917	R.008	1/4	1/4	5/8	3-1/2
GMF18918	R.012	1/4	1/4	5/8	3-1/2
GMF18919	R.020	1/4	1/4	5/8	3-1/2
GMF18944	R.030	1/4	1/4	5/8	3-1/2
GMF18920	R.040	1/4	1/4	5/8	3-1/2
GMF18020	R.020	5/16	5/16	3/4	2-3/4
GMF18945	R.030	5/16	5/16	3/4	2-3/4
GMF18921	R.040	5/16	5/16	3/4	2-3/4
GMF18922	R.020	5/16	5/16	3/4	4
GMF18946	R.030	5/16	5/16	3/4	4
GMF18923	R.040	5/16	5/16	3/4	4
GMF18924	R.060	5/16	5/16	3/4	4
GMF18925	R.080	5/16	5/16	3/4	4
GMF18024	R.020	3/8	3/8	1	3
GMF18947	R.030	3/8	3/8	1	3
GMF18926	R.040	3/8	3/8	1	3
GMF18927	R.020	3/8	3/8	1	4
GMF18948	R.030	3/8	3/8	1	4
GMF18928	R.040	3/8	3/8	1	4
GMF18929	R.060	3/8	3/8	1	4
GMF18930	R.080	3/8	3/8	1	4
GMF18032	R.020	1/2	1/2	1-3/16	3-1/8
GMF18949	R.030	1/2	1/2	1-3/16	3-1/8
GMF18931	R.040	1/2	1/2	1-3/16	3-1/8
GMF18932	R.020	1/2	1/2	1-3/16	4-1/4

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ISO Material Description	P										M				K			H		
	Non-alloy steel					Low alloy steel					High alloyed steel, and tool steel				Stainless steel		Grey cast iron		Nodular cast iron	Malleable cast iron
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc	13	25	28	32	30	10	29	32	38	15	35	15	23	10	10	26	3	25	3	21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend	○	○	◎	◎	◎	○	◎	◎	◎	○	◎	○	○	○	○	○	○	○	○	○

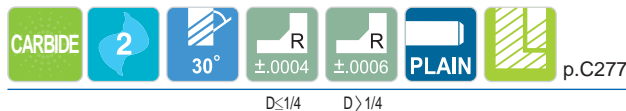
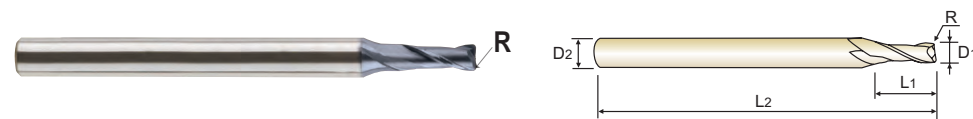
ISO Material Description	N										S					H					
	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron	
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend																		○	◎	◎	○

# YG 4G MILL END MILLS

PLAIN SHANK GMF18 SERIES

## CARBIDE, 2 FLUTE CORNER RADIUS

- ▶ New coating and new tool geometry gives outstanding cutting performance and wear resistance.
- ▶ Excellent performance when cutting steels, up to HRC55
- ▶ Available in various length shanks and corner radiuses.



EDP No.	Corner Radius	Mill Diameter	Shank Diameter	Length of Cut	Overall Length
	R	D <sub>1</sub>	D <sub>2</sub>	L <sub>1</sub>	L <sub>2</sub>
<a href="#">GMF18950</a>	R.030	1/2	1/2	1-3/16	4-1/4
<a href="#">GMF18933</a>	R.040	1/2	1/2	1-3/16	4-1/4
<a href="#">GMF18934</a>	R.060	1/2	1/2	1-3/16	4-1/4
<a href="#">GMF18935</a>	R.080	1/2	1/2	1-3/16	4-1/4
<a href="#">GMF18936</a>	R.100	1/2	1/2	1-3/16	4-1/4
<a href="#">GMF18937</a>	R.118	1/2	1/2	1-3/16	4-1/4
<a href="#">GMF18951</a>	R.030	9/16	5/8	1-3/8	6
<a href="#">GMF18036</a>	R.040	9/16	5/8	1-3/8	6
<a href="#">GMF18952</a>	R.030	5/8	5/8	1-1/4	6
<a href="#">GMF18040</a>	R.040	5/8	5/8	1-1/4	6
<a href="#">GMF18938</a>	R.080	5/8	5/8	1-1/4	6
<a href="#">GMF18953</a>	R.030	3/4	3/4	1-1/2	6
<a href="#">GMF18048</a>	R.040	3/4	3/4	1-1/2	6
<a href="#">GMF18939</a>	R.080	3/4	3/4	1-1/2	6

Size	Radius Tolerance (Inch)	Mill Dia. Tolerance (Inch)	Shank Dia. Tolerance
up to Ø1/4	±.0004	0~-.0005	h5
over Ø1/4	±.0006	0~-.0006	

◎ : Excellent ○ : Good

ISO	P											M				K					
	Non-alloy steel					Low alloy steel						High alloyed steel, and tool steel				Stainless steel		Grey cast iron	Nodular cast iron	Malleable cast iron	
Material Description	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
HRc	13	25	28	32	30	10	29	32	38	15	35	15	23	10	10	26	3	25	21	21	
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230	
Recommend	○	○	◎	◎	◎	○	◎	◎	◎	○	◎	○	○	○	○	○	○	○	○	○	○

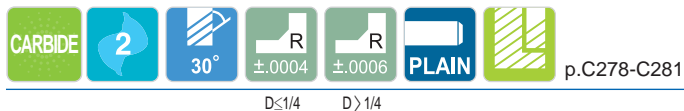
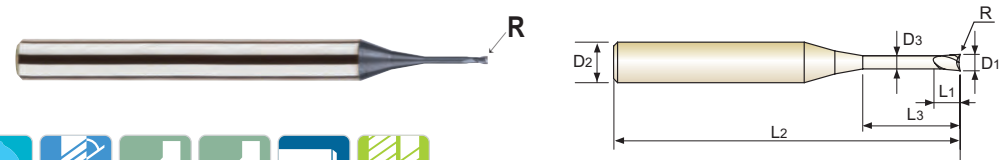
ISO	N					S					H											
	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys			Titanium Alloys	Hardened steel	Chilled Cast Iron	Hardened Cast Iron					
Material Description	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	
HRc	60	100	75	90	130	110	90	100			15	30	25	38	34	400 Rm	1050 Rm	55	60	42	55	
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550	
Recommend	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○

# YG 4G MILL END MILLS

PLAIN SHANK GMF19 SERIES

## CARBIDE, 2 FLUTE CORNER RADIUS WITH NECK

- ▶ New coating and new tool geometry gives outstanding cutting performance and wear resistance.
- ▶ Excellent performance when cutting steels, up to HRC55
- ▶ Available in many more various length shanks and corner radiuses.



EDP No.	Corner Radius	Mill Diameter	Shank Diameter	Length of Cut	Length Below Shank	Overall Length	Neck Diameter
	R	D <sub>1</sub>	D <sub>2</sub>	L <sub>1</sub>	L <sub>3</sub>	L <sub>2</sub>	D <sub>3</sub>
<a href="#">GMF19901</a>	R.001	.008	3/16	.010	3/64	1-1/2	.006
<a href="#">GMF19902</a>	R.002	.008	3/16	.010	3/64	1-1/2	.006
<a href="#">GMF19903</a>	R.001	.012	3/16	1/64	3/64	1-1/2	.010
<a href="#">GMF19904</a>	R.001	.012	3/16	1/64	5/64	1-1/2	.010
<a href="#">GMF19905</a>	R.002	.012	3/16	1/64	3/64	1-1/2	.010
<a href="#">GMF19906</a>	R.002	.012	3/16	1/64	5/64	1-1/2	.010
<a href="#">GMF19907</a>	R.002	.015	3/16	1/32	3/64	1-1/2	.013
<a href="#">GMF19908</a>	R.002	.015	3/16	1/32	1/16	1-1/2	.013
<a href="#">GMF19909</a>	R.002	.015	3/16	1/32	5/64	1-1/2	.013
<a href="#">GMF19910</a>	R.002	.015	3/16	1/32	3/32	1-1/2	.013
<a href="#">GMF19911</a>	R.004	.015	3/16	1/32	3/64	1-1/2	.013
<a href="#">GMF19912</a>	R.004	.015	3/16	1/32	5/64	1-1/2	.013
<a href="#">GMF19913</a>	R.002	.020	3/16	1/32	3/64	1-3/4	.018
<a href="#">GMF19914</a>	R.002	.020	3/16	1/32	1/16	1-3/4	.018
<a href="#">GMF19915</a>	R.002	.020	3/16	1/32	5/64	1-3/4	.018
<a href="#">GMF19916</a>	R.002	.020	3/16	1/32	5/32	1-3/4	.018
<a href="#">GMF19917</a>	R.004	.020	3/16	1/32	5/64	1-3/4	.018
<a href="#">GMF19918</a>	R.004	.020	3/16	1/32	1/8	1-3/4	.018
<a href="#">GMF19919</a>	R.002	.024	3/16	1/32	1/8	1-3/4	.022
<a href="#">GMF19920</a>	R.002	.024	3/16	1/32	1/4	1-3/4	.022
<a href="#">GMF19921</a>	R.004	.024	3/16	1/32	5/64	1-3/4	.022
<a href="#">GMF19922</a>	R.004	.024	3/16	1/32	5/32	1-3/4	.022
<a href="#">GMF19923</a>	R.004	.024	3/16	1/32	1/4	1-3/4	.022
<a href="#">GMF19924</a>	R.008	.024	3/16	1/32	5/64	1-3/4	.022
<a href="#">GMF19925</a>	R.008	.024	3/16	1/32	5/32	1-3/4	.022
<a href="#">GMF19926</a>	R.008	.024	3/16	1/32	1/4	1-3/4	.022
<a href="#">GMF19927</a>	R.002	.031	3/16	3/64	5/64	1-3/4	.029
<a href="#">GMF19928</a>	R.002	.031	3/16	3/64	5/32	1-3/4	.029
<a href="#">GMF19929</a>	R.002	.031	3/16	3/64	1/4	1-3/4	.029
<a href="#">GMF19930</a>	R.004	.031	3/16	3/64	5/64	1-3/4	.029

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◎ : Excellent ○ : Good

ISO	P											M				K					
	Non-alloy steel					Low alloy steel						High alloyed steel, and tool steel				Stainless steel		Grey cast iron	Nodular cast iron	Malleable cast iron	
Material Description	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
HRc	13	25	28	32	30	10	29	32	38	15	35	15	23	10	10	26	3	25	21	21	
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230	
Recommend	○	○	◎	◎	◎	○	◎	◎	◎	○	◎	○	○	○	○	○	○	○	○	○	○

ISO	N					S					H											
	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys			Titanium Alloys	Hardened steel	Chilled Cast Iron	Hardened Cast Iron					
Material Description	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	
HRc	60	100	75	90	130	110	90	100			15	30	25	38	34	400 Rm	1050 Rm	55	60	42	55	
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550	
Recommend	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○

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PLAIN SHANK GMF19 SERIES



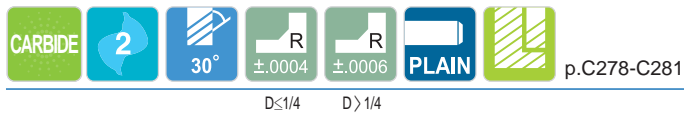
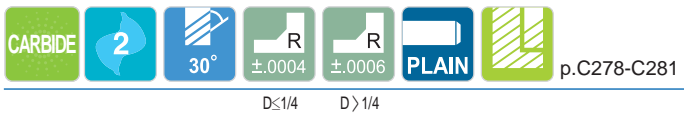
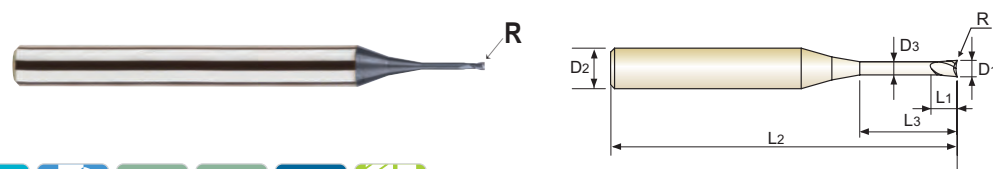
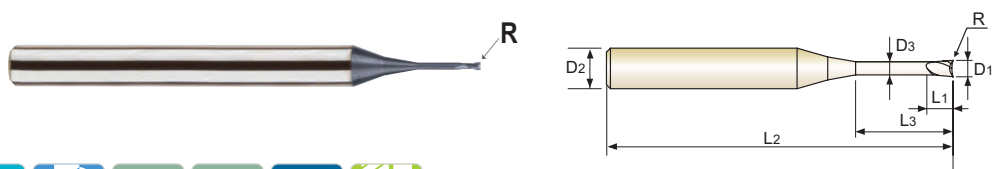
PLAIN SHANK GMF19 SERIES

**CARBIDE, 2 FLUTE CORNER RADIUS WITH NECK**

**CARBIDE, 2 FLUTE CORNER RADIUS WITH NECK**

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- ▶ Excellent performance when cutting steels, up to HRC55
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- ▶ Excellent performance when cutting steels, up to HRC55
- ▶ Available in many more various length shanks and corner radii.



EDP No.	Corner Radius	Mill Diameter	Shank Diameter	Length of Cut	Length Below Shank	Overall Length	Neck Diameter
	R	D1	D2	L1	L3	L2	D3
GMF19931	R.004	.031	3/16	3/64	5/32	1-3/4	.029
GMF19932	R.004	.031	3/16	3/64	1/4	1-3/4	.029
GMF19933	R.004	.031	3/16	3/64	5/16	1-3/4	.029
GMF19934	R.008	.031	3/16	3/64	5/32	1-3/4	.029
GMF19935	R.008	.031	3/16	3/64	1/4	1-3/4	.029
GMF19936	R.008	.031	3/16	3/64	5/16	1-3/4	.029
GMF19003	R.002	3/64	3/16	1/16	1/8	2	.044
GMF19937	R.002	3/64	3/16	1/16	5/32	2	.044
GMF19938	R.002	3/64	3/16	1/16	1/4	2	.044
GMF19939	R.004	3/64	3/16	1/16	1/8	2	.044
GMF19940	R.004	3/64	3/16	1/16	5/32	2	.044
GMF19941	R.004	3/64	3/16	1/16	1/4	2	.044
GMF19942	R.004	3/64	3/16	1/16	5/16	2	.044
GMF19943	R.004	3/64	3/16	1/16	3/8	2	.044
GMF19944	R.008	3/64	3/16	1/16	1/8	2	.044
GMF19945	R.008	3/64	3/16	1/16	5/32	2	.044
GMF19946	R.008	3/64	3/16	1/16	1/4	2	.044
GMF19947	R.008	3/64	3/16	1/16	5/16	2	.044
GMF19948	R.008	3/64	3/16	1/16	3/8	2	.044
GMF19949	R.012	3/64	3/16	1/16	5/32	2	.044
GMF19950	R.012	3/64	3/16	1/16	1/4	2	.044
GMF19951	R.012	3/64	3/16	1/16	5/16	2	.044
GMF19952	R.012	3/64	3/16	1/16	3/8	2	.044
GMF19004	R.002	1/16	3/16	3/32	5/32	2	.060
GMF19953	R.002	1/16	3/16	3/32	1/4	2	.060
GMF19954	R.002	1/16	3/16	3/32	5/16	2	.060
GMF19955	R.004	1/16	3/16	3/32	5/32	2	.060
GMF19956	R.004	1/16	3/16	3/32	1/4	2	.060
GMF19957	R.004	1/16	3/16	3/32	5/16	2	.060
GMF19958	R.008	1/16	3/16	3/32	5/32	2	.060

EDP No.	Corner Radius	Mill Diameter	Shank Diameter	Length of Cut	Length Below Shank	Overall Length	Neck Diameter
	R	D1	D2	L1	L3	L2	D3
GMF19959	R.008	1/16	3/16	3/32	1/4	2	.060
GMF19960	R.008	1/16	3/16	3/32	5/16	2	.060
GMF19961	R.008	1/16	3/16	3/32	3/8	2	.060
GMF19962	R.008	1/16	3/16	3/32	1/2	2	.060
GMF19963	R.012	1/16	3/16	3/32	5/32	2	.060
GMF19964	R.012	1/16	3/16	3/32	1/4	2	.060
GMF19965	R.012	1/16	3/16	3/32	5/16	2	.060
GMF19966	R.012	1/16	3/16	3/32	3/8	2	.060
GMF19967	R.012	1/16	3/16	3/32	1/2	2	.060
GMF19005	R.004	5/64	3/16	1/8	1/4	2	.076
GMF19968	R.004	5/64	3/16	1/8	5/16	2	.076
GMF19969	R.004	5/64	3/16	1/8	3/8	2	.076
GMF19970	R.004	5/64	3/16	1/8	1/2	2	.076
GMF19971	R.008	5/64	3/16	1/8	1/4	2	.076
GMF19972	R.008	5/64	3/16	1/8	5/16	2	.076
GMF19973	R.008	5/64	3/16	1/8	3/8	2	.076
GMF19974	R.008	5/64	3/16	1/8	1/2	2	.076
GMF19975	R.008	5/64	3/16	1/8	5/8	2	.076
GMF19976	R.012	5/64	3/16	1/8	1/4	2	.076
GMF19977	R.012	5/64	3/16	1/8	5/16	2	.076
GMF19978	R.012	5/64	3/16	1/8	3/8	2	.076
GMF19979	R.012	5/64	3/16	1/8	1/2	2	.076
GMF19980	R.012	5/64	3/16	1/8	5/8	2	.076
GMF19981	R.020	5/64	3/16	1/8	1/4	2	.076
GMF19982	R.020	5/64	3/16	1/8	5/16	2	.076
GMF19983	R.020	5/64	3/16	1/8	3/8	2	.076
GMF19984	R.020	5/64	3/16	1/8	1/2	2	.076
GMF19985	R.020	5/64	3/16	1/8	9/16	2	.076
GMF19008	R.004	1/8	1/4	3/16	3/8	2	.119
GMF19986	R.004	1/8	1/4	3/16	1/2	2	.119

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◎ : Excellent ○ : Good

ISO	P											M				K					
	Non-alloy steel					Low alloy steel						High alloyed steel, and tool steel		Stainless steel		Grey cast iron		Nodular cast iron		Malleable cast iron	
Material Description	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
HRc	13	25	28	32	38	10	29	32	38	15	35	15	23	10	10	26	3	25		21	
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230	
Recommend	○	○	◎	◎	◎	○	◎	◎	◎	○	◎	○	○	○	○	○	○	○	○	○	○

ISO	N					S					H											
	Aluminum-wrought alloy		Aluminum-cast, alloyed		Copper and Copper Alloys (Bronze / Brass)	Non Metallic Materials		Heat Resistant Super Alloys			Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron							
Material Description	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	
HRc	60	100	75	90	130	110	90	100			15	30	25	38	34		55	60	42	55	55	
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550	
Recommend																		○	◎	◎	○	○

◎ : Excellent ○ : Good

ISO	P											M				K						
	Non-alloy steel					Low alloy steel						High alloyed steel, and tool steel		Stainless steel		Grey cast iron		Nodular cast iron		Malleable cast iron		
Material Description	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20		
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20		
HRc	13	25	28	32	38	10	29	32	38	15	35	15	23	10	10	26	3	25		21		
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230		
Recommend	○	○	◎	◎	◎	○	◎	◎	◎	○	◎	○	○	○	○	○	○	○	○	○	○	○

ISO	N					S					H											
	Aluminum-wrought alloy		Aluminum-cast, alloyed		Copper and Copper Alloys (Bronze / Brass)	Non Metallic Materials		Heat Resistant Super Alloys			Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron							
Material Description	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	
HRc	60	100	75	90	130	110	90	100			15	30	25	38	34		55	60	42	55	55	
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550	
Recommend																		○	◎	◎	○	○



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# YG 4G MILL END MILLS

PLAIN SHANK GMF19 SERIES

# YG 4G MILL END MILLS

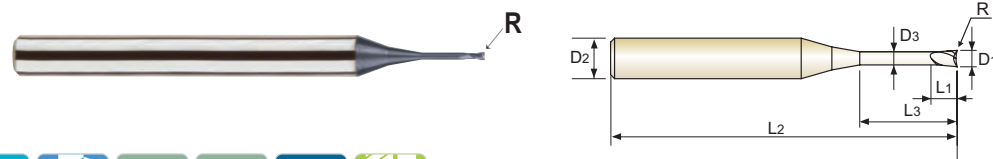
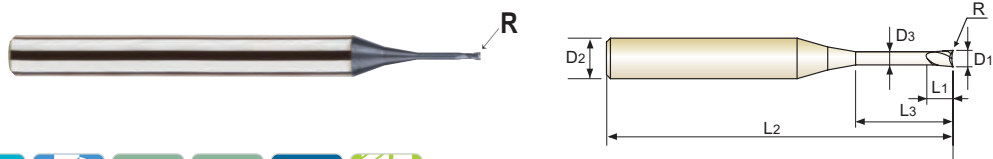
PLAIN SHANK GMF19 SERIES

## CARBIDE, 2 FLUTE CORNER RADIUS WITH NECK

## CARBIDE, 2 FLUTE CORNER RADIUS WITH NECK

- ▶ New coating and new tool geometry gives outstanding cutting performance and wear resistance.
- ▶ Excellent performance when cutting steels, up to HRC55
- ▶ Available in many more various length shanks and corner radiuses.

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- ▶ Excellent performance when cutting steels, up to HRC55
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CARBIDE 2 30° ±.0004 ±.0006 PLAIN p.C278-C281

D<1/4 D>1/4

CARBIDE 2 30° ±.0004 ±.0006 PLAIN p.C278-C281

D<1/4 D>1/4

Unit : Inch

EDP No.	Corner Radius	Mill Diameter	Shank Diameter	Length of Cut	Length Below Shank	Overall Length	Neck Diameter
	R	D1	D2	L1	L3	L2	D3
<a href="#">GMF19987</a>	R.004	1/8	1/4	3/16	5/8	2-3/8	.119
<a href="#">GMF19988</a>	R.008	1/8	1/4	3/16	5/16	2	.119
<a href="#">GMF19989</a>	R.008	1/8	1/4	3/16	3/8	2	.119
<a href="#">GMF19990</a>	R.008	1/8	1/4	3/16	1/2	2	.119
<a href="#">GMF19991</a>	R.008	1/8	1/4	3/16	5/8	2-3/8	.119
<a href="#">GMF19992</a>	R.008	1/8	1/4	3/16	3/4	2-3/8	.119
<a href="#">GMF19993</a>	R.008	1/8	1/4	3/16	1	2-3/4	.119
<a href="#">GMF19994</a>	R.012	1/8	1/4	3/16	5/16	2	.119
<a href="#">GMF19995</a>	R.012	1/8	1/4	3/16	3/8	2	.119
<a href="#">GMF19996</a>	R.012	1/8	1/4	3/16	1/2	2	.119
<a href="#">GMF19997</a>	R.012	1/8	1/4	3/16	5/8	2-3/8	.119
<a href="#">GMF19998</a>	R.012	1/8	1/4	3/16	3/4	2-3/8	.119
<a href="#">GMF19999</a>	R.020	1/8	1/4	3/16	5/16	2	.119
<a href="#">GMF19801</a>	R.020	1/8	1/4	3/16	3/8	2	.119
<a href="#">GMF19802</a>	R.020	1/8	1/4	3/16	1/2	2	.119
<a href="#">GMF19803</a>	R.020	1/8	1/4	3/16	5/8	2-3/8	.119
<a href="#">GMF19804</a>	R.020	1/8	1/4	3/16	3/4	2-3/8	.119
<a href="#">GMF19805</a>	R.020	1/8	1/4	3/16	1	2-3/4	.119
<a href="#">GMF19845</a>	R.030	1/8	1/4	3/16	3/8	2	.119
<a href="#">GMF19846</a>	R.030	1/8	1/4	3/16	1/2	2	.119
<a href="#">GMF19847</a>	R.030	1/8	1/4	3/16	5/16	2	.119
<a href="#">GMF19848</a>	R.030	1/8	1/4	3/16	3/4	2-3/8	.119
<a href="#">GMF19849</a>	R.030	1/8	1/4	3/16	5/8	2-3/8	.119
<a href="#">GMF19850</a>	R.030	1/8	1/4	3/16	1	2-3/4	.119
<a href="#">GMF19806</a>	R.040	1/8	1/4	3/16	5/16	2	.119
<a href="#">GMF19807</a>	R.040	1/8	1/4	3/16	3/8	2	.119
<a href="#">GMF19808</a>	R.040	1/8	1/4	3/16	1/2	2	.119
<a href="#">GMF19809</a>	R.040	1/8	1/4	3/16	5/8	2-3/8	.119
<a href="#">GMF19810</a>	R.040	1/8	1/4	3/16	3/4	2-3/8	.119
<a href="#">GMF19012</a>	R.004	3/16	1/4	1/4	3/8	2	.181

Unit : Inch

EDP No.	Corner Radius	Mill Diameter	Shank Diameter	Length of Cut	Length Below Shank	Overall Length	Neck Diameter
	R	D1	D2	L1	L3	L2	D3
<a href="#">GMF19811</a>	R.004	3/16	1/4	1/4	1/2	2	.181
<a href="#">GMF19812</a>	R.004	3/16	1/4	1/4	5/8	2-3/8	.181
<a href="#">GMF19813</a>	R.008	3/16	1/4	1/4	3/8	2	.181
<a href="#">GMF19814</a>	R.008	3/16	1/4	1/4	1/2	2	.181
<a href="#">GMF19815</a>	R.008	3/16	1/4	1/4	5/8	2-3/8	.181
<a href="#">GMF19816</a>	R.008	3/16	1/4	1/4	3/4	2-3/8	.181
<a href="#">GMF19817</a>	R.008	3/16	1/4	1/4	1	2-3/4	.181
<a href="#">GMF19818</a>	R.012	3/16	1/4	1/4	1/2	2	.181
<a href="#">GMF19819</a>	R.012	3/16	1/4	1/4	5/8	2-3/8	.181
<a href="#">GMF19820</a>	R.012	3/16	1/4	1/4	3/4	2-3/8	.181
<a href="#">GMF19821</a>	R.012	3/16	1/4	1/4	1	2-3/4	.181
<a href="#">GMF19822</a>	R.020	3/16	1/4	1/4	3/8	2	.181
<a href="#">GMF19823</a>	R.020	3/16	1/4	1/4	1/2	2	.181
<a href="#">GMF19824</a>	R.020	3/16	1/4	1/4	5/8	2-3/8	.181
<a href="#">GMF19825</a>	R.020	3/16	1/4	1/4	3/4	2-3/8	.181
<a href="#">GMF19826</a>	R.020	3/16	1/4	1/4	1	2-3/4	.181
<a href="#">GMF19827</a>	R.020	3/16	1/4	1/4	1-3/16	2-3/4	.181
<a href="#">GMF19851</a>	R.030	3/16	1/4	1/4	3/8	2	.181
<a href="#">GMF19852</a>	R.030	3/16	1/4	1/4	1/2	2	.181
<a href="#">GMF19853</a>	R.030	3/16	1/4	1/4	5/8	2-3/8	.181
<a href="#">GMF19854</a>	R.030	3/16	1/4	1/4	3/4	2-3/8	.181
<a href="#">GMF19855</a>	R.030	3/16	1/4	1/4	1	2-3/4	.181
<a href="#">GMF19856</a>	R.030	3/16	1/4	1/4	1-3/16	2-3/4	.181
<a href="#">GMF19828</a>	R.040	3/16	1/4	1/4	3/8	2	.181
<a href="#">GMF19829</a>	R.040	3/16	1/4	1/4	1/2	2	.181
<a href="#">GMF19830</a>	R.040	3/16	1/4	1/4	5/8	2-3/8	.181
<a href="#">GMF19831</a>	R.040	3/16	1/4	1/4	3/4	2-3/8	.181
<a href="#">GMF19016</a>	R.008	1/4	1/4	3/8	3/4	2-3/8	.244
<a href="#">GMF19832</a>	R.012	1/4	1/4	3/8	3/4	2-3/8	.244
<a href="#">GMF19833</a>	R.020	1/4	1/4	3/8	3/4	2-3/8	.244

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◎ : Excellent ○ : Good

◎ : Excellent ○ : Good

ISO	P										M				K					
	Non-alloy steel					Low alloy steel					High alloyed steel, and tool steel		Stainless steel		Grey cast iron		Nodular cast iron		Malleable cast iron	
Material Description	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc	13	25	28	32	38	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend	◎	◎	◎	◎	◎	○	◎	◎	◎	○	◎	○	○	○	○	○	○	○	○	○

ISO	N					S					H										
	Aluminum-wrought alloy		Aluminum-cast, alloyed		Copper and Copper Alloys (Bronze / Brass)	Non Metallic Materials		Heat Resistant Super Alloys			Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron						
Material Description	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc	60	100	75	90	130	110	90	100			15	30	25	38	34		55	60	42	55	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend																		○	◎	◎	○

ISO	P										M				K						
	Non-alloy steel					Low alloy steel					High alloyed steel, and tool steel		Stainless steel		Grey cast iron		Nodular cast iron		Malleable cast iron		
Material Description	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
HRc	13	25	28	32	38	10	29	32	38	15	35	15	23	10	10	26	3	25		21	
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230	
Recommend	◎	◎	◎	◎	◎	○	◎	◎	◎	○	◎	○	○	○	○	○	○	○	○	○	○

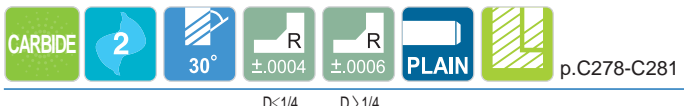
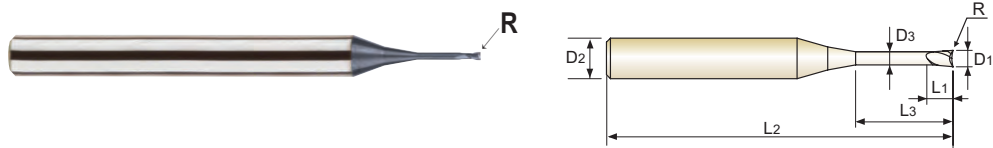
ISO	N					S					H										
	Aluminum-wrought alloy		Aluminum-cast, alloyed		Copper and Copper Alloys (Bronze / Brass)	Non Metallic Materials		Heat Resistant Super Alloys			Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron						
Material Description	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc	60	100	75	90	130	110	90	100			15	30	25	38	34		55	60	42	55	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend																		○	◎	◎	○



PLAIN SHANK **GMF19** SERIES

**CARBIDE, 2 FLUTE CORNER RADIUS WITH NECK**

- ▶ New coating and new tool geometry gives outstanding cutting performance and wear resistance.
- ▶ Excellent performance when cutting steels, up to HRC55
- ▶ Available in many more various length shanks and corner radiuses.



EDP No.	Corner Radius	Mill Diameter	Shank Diameter	Length of Cut	Length Below Shank	Overall Length	Neck Diameter
	R	D1	D2	L1	L3	L2	D3
<a href="#">GMF19834</a>	R.040	1/4	1/4	3/8	3/4	2-3/8	.244
<a href="#">GMF19835</a>	R.020	1/4	1/4	5/8	1-3/16	3-1/2	.244
<a href="#">GMF19857</a>	R.030	1/4	1/4	3/8	3/4	2-3/8	.244
<a href="#">GMF19858</a>	R.030	1/4	1/4	5/8	1-3/16	3-1/2	.244
<a href="#">GMF19020</a>	R.008	5/16	5/16	1/2	1	2-3/4	.300
<a href="#">GMF19836</a>	R.012	5/16	5/16	1/2	1	2-3/4	.300
<a href="#">GMF19837</a>	R.020	5/16	5/16	1/2	1	2-3/4	.300
<a href="#">GMF19859</a>	R.030	5/16	5/16	1/2	1	2-3/4	.300
<a href="#">GMF19838</a>	R.040	5/16	5/16	1/2	1	2-3/4	.300
<a href="#">GMF19024</a>	R.012	3/8	3/8	5/8	1-3/16	3	.363
<a href="#">GMF19839</a>	R.020	3/8	3/8	5/8	1-3/16	3	.363
<a href="#">GMF19860</a>	R.030	3/8	3/8	5/8	1-3/16	3	.363
<a href="#">GMF19840</a>	R.040	3/8	3/8	5/8	1-3/16	3	.363
<a href="#">GMF19032</a>	R.020	1/2	1/2	11/16	1-1/4	3-1/8	.488
<a href="#">GMF19861</a>	R.030	1/2	1/2	11/16	1-1/4	3-1/8	.488
<a href="#">GMF19841</a>	R.040	1/2	1/2	11/16	1-1/4	3-1/8	.488
<a href="#">GMF19842</a>	R.060	1/2	1/2	11/16	1-1/4	3-1/8	.488
<a href="#">GMF19040</a>	R.020	5/8	5/8	3/4	1-3/8	4	.613
<a href="#">GMF19862</a>	R.030	5/8	5/8	3/4	1-3/8	4	.613
<a href="#">GMF19843</a>	R.040	5/8	5/8	3/4	1-3/8	4	.613
<a href="#">GMF19048</a>	R.020	3/4	3/4	1	1-1/2	4	.738
<a href="#">GMF19863</a>	R.030	3/4	3/4	1	1-1/2	4	.738
<a href="#">GMF19844</a>	R.040	3/4	3/4	1	1-1/2	4	.738

Size	Radius Tolerance (Inch)	Mill Dia. Tolerance (Inch)	Shank Dia. Tolerance
up to Ø1/4	±.0004	0~-.0005	h5
over Ø1/4	±.0006	0~-.0006	

©: Excellent ○: Good

ISO	P											M				K					
	Non-alloy steel					Low alloy steel						High alloyed steel, and tool steel				Stainless steel		Grey cast iron		Nodular cast iron	
Material Description	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
HRc	13	25	28	32	30	10	29	32	38	15	35	15	23	10	10	26	3	25		21	
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230	
Recommend	○	○	◎	◎	◎	○	◎	◎	◎	○	◎	○	○	○	○	○	○	○	○	○	

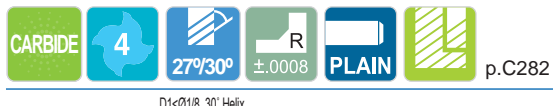
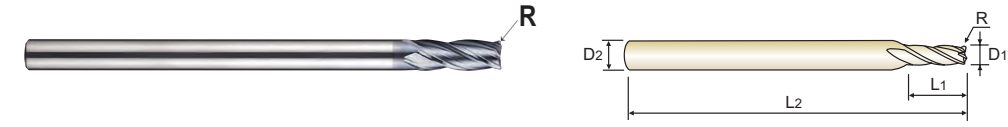
ISO	N					S					H											
	Aluminum-wrought alloy		Aluminum-cast, alloyed		Copper and Copper Alloys (Bronze / Brass)	Heat Resistant Super Alloys			Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron									
Material Description	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	
HRc	60	100	75	90	130	110	90	100			15	30	25	38	34		55	60	42	55	55	
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550	
Recommend	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○



PLAIN SHANK **GMF20** SERIES

**CARBIDE, 4 FLUTE CORNER RADIUS**

- ▶ New coating and new tool geometry gives outstanding cutting performance and wear resistance.
- ▶ Excellent performance when cutting steels, up to HRC55
- ▶ Available in many more various length shanks and corner radiuses.
- ▶ Due to Multiple Helix on 1/8" and over diameter end mills, vibration is minimized and tool life increased.
- ▶ 4 flute series has new designs to reduce vibrations



EDP No.	Corner Radius	Mill Diameter	Shank Diameter	Length of Cut	Overall Length
	R	D1	D2	L1	L2
<a href="#">GMF20003</a>	R.004	3/64	1/4	3/32	2
<a href="#">GMF20005</a>	R.004	5/64	1/4	1/4	2
<a href="#">GMF20901</a>	R.008	5/64	1/4	1/4	2
<a href="#">GMF20008</a>	R.008	1/8	1/4	5/16	2-3/8
<a href="#">GMF20902</a>	R.012	1/8	1/4	5/16	2-3/8
<a href="#">GMF20903</a>	R.020	1/8	1/4	5/16	2-3/8
<a href="#">GMF20933</a>	R.030	1/8	1/4	5/16	2-3/8
<a href="#">GMF20012</a>	R.008	3/16	1/4	3/8	2-3/4
<a href="#">GMF20904</a>	R.012	3/16	1/4	3/8	2-3/4
<a href="#">GMF20905</a>	R.020	3/16	1/4	3/8	2-3/4
<a href="#">GMF20934</a>	R.030	3/16	1/4	3/8	2-3/4
<a href="#">GMF20906</a>	R.040	3/16	1/4	3/8	2-3/4
<a href="#">GMF20013</a>	R.012	13/64	1/4	1/2	3-1/2
<a href="#">GMF20907</a>	R.020	13/64	1/4	1/2	3-1/2
<a href="#">GMF20935</a>	R.030	13/64	1/4	1/2	3-1/2
<a href="#">GMF20016</a>	R.008	1/4	1/4	5/8	3-1/2
<a href="#">GMF20908</a>	R.012	1/4	1/4	5/8	3-1/2
<a href="#">GMF20909</a>	R.020	1/4	1/4	5/8	3-1/2
<a href="#">GMF20936</a>	R.030	1/4	1/4	5/8	3-1/2
<a href="#">GMF20910</a>	R.040	1/4	1/4	5/8	3-1/2
<a href="#">GMF20020</a>	R.012	5/16	5/16	3/4	2-3/4
<a href="#">GMF20911</a>	R.020	5/16	5/16	3/4	2-3/4
<a href="#">GMF20937</a>	R.030	5/16	5/16	3/4	2-3/4
<a href="#">GMF20912</a>	R.040	5/16	5/16	3/4	2-3/4
<a href="#">GMF20913</a>	R.008	5/16	5/16	3/4	4
<a href="#">GMF20914</a>	R.012	5/16	5/16	3/4	4
<a href="#">GMF20915</a>	R.020	5/16	5/16	3/4	4
<a href="#">GMF20938</a>	R.030	5/16	5/16	3/4	4
<a href="#">GMF20916</a>	R.040	5/16	5/16	3/4	4
<a href="#">GMF20917</a>	R.060	5/16	5/16	3/4	4

©: Excellent ○: Good

ISO	P											M				K					
	Non-alloy steel					Low alloy steel						High alloyed steel, and tool steel				Stainless steel		Grey cast iron		Nodular cast iron	
Material Description	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
HRc	13	25	28	32	30	10	29	32	38	15	35	15	23	10	10	26	3	25		21	
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230	
Recommend	○	○	◎	◎	◎	○	◎	◎	◎	○	◎	○	○	○	○	○	○	○	○	○	○

ISO	N					S					H											
	Aluminum-wrought alloy		Aluminum-cast, alloyed		Copper and Copper Alloys (Bronze / Brass)	Heat Resistant Super Alloys			Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron									
Material Description	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	
HRc	60	100	75	90	130	110	90	100			15	30	25	38	34		55	60	42	55	55	
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550	
Recommend	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○

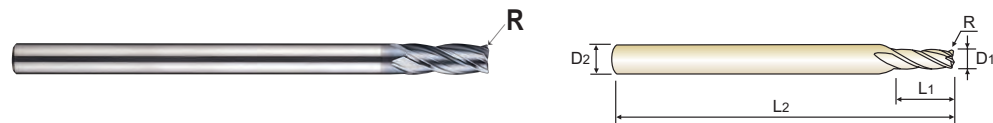
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# YG 4G MILL END MILLS

PLAIN SHANK **GMF20** SERIES

## CARBIDE, 4 FLUTE CORNER RADIUS

- ▶ New coating and new tool geometry gives outstanding cutting performance and wear resistance.
- ▶ Excellent performance when cutting steels, up to HRc55
- ▶ Available in many more various length shanks and corner radii.
- ▶ Due to Multiple Helix on 1/8" and over diameter end mills, vibration is minimized and tool life increased.
- ▶ 4 flute series has new designs to reduce vibrations



D1-Ø1/8, 30° Helix

Unit : Inch

EDP No.	Corner Radius	Mill Diameter	Shank Diameter	Length of Cut	Overall Length
	R	D1	D2	L1	L2
<a href="#">GMF20918</a>	R.080	5/16	5/16	3/4	4
<a href="#">GMF20024</a>	R.020	3/8	3/8	1	3
<a href="#">GMF20939</a>	R.030	3/8	3/8	1	3
<a href="#">GMF20919</a>	R.012	3/8	3/8	1	4
<a href="#">GMF20920</a>	R.020	3/8	3/8	1	4
<a href="#">GMF20940</a>	R.030	3/8	3/8	1	4
<a href="#">GMF20921</a>	R.040	3/8	3/8	1	4
<a href="#">GMF20922</a>	R.060	3/8	3/8	1	4
<a href="#">GMF20923</a>	R.080	3/8	3/8	1	4
<a href="#">GMF20032</a>	R.020	1/2	1/2	1-3/16	3-1/8
<a href="#">GMF20941</a>	R.030	1/2	1/2	1-3/16	3-1/8
<a href="#">GMF20924</a>	R.040	1/2	1/2	1-3/16	3-1/8
<a href="#">GMF20925</a>	R.020	1/2	1/2	1-3/16	4-1/4
<a href="#">GMF20942</a>	R.030	1/2	1/2	1-3/16	4-1/4
<a href="#">GMF20926</a>	R.040	1/2	1/2	1-3/16	4-1/4
<a href="#">GMF20927</a>	R.060	1/2	1/2	1-3/16	4-1/4
<a href="#">GMF20928</a>	R.080	1/2	1/2	1-3/16	4-1/4
<a href="#">GMF20040</a>	R.020	5/8	5/8	1-1/4	6
<a href="#">GMF20943</a>	R.030	5/8	5/8	1-1/4	6
<a href="#">GMF20929</a>	R.040	5/8	5/8	1-1/4	6
<a href="#">GMF20930</a>	R.060	5/8	5/8	1-1/4	6
<a href="#">GMF20931</a>	R.080	5/8	5/8	1-1/4	6
<a href="#">GMF20944</a>	R.030	3/4	3/4	1-1/2	6
<a href="#">GMF20048</a>	R.040	3/4	3/4	1-1/2	6
<a href="#">GMF20932</a>	R.080	3/4	3/4	1-1/2	6

Mill Dia. Tolerance (Inch)	Corner Radius Tolerance (Inch)	Shank Dia. Tolerance
0~-.0012	±.0008	h5

◎ : Excellent ○ : Good

ISO Material Description	P											M				K				
	Non-alloy steel					Low alloy steel						High alloyed steel, and tool steel		Stainless steel		Grey cast iron		Nodular cast iron	Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc	13	25	28	32	30	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend	○	○	◎	◎	◎	○	◎	◎	◎	◎	◎	○	◎	◎	○	○	○	○	○	○

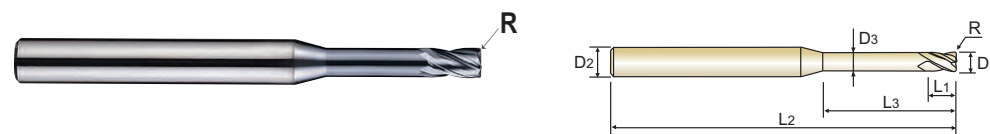
ISO Material Description	N										S					H					
	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron	
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc	60	100	75	90	130	110	90	100			15	30	25	38	34	400 Rm	1050 Rm	55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend																		○	◎	◎	○

# YG 4G MILL END MILLS

PLAIN SHANK **GMF21** SERIES

## CARBIDE, 4 FLUTE CORNER RADIUS WITH NECK

- ▶ New coating and new tool geometry gives outstanding cutting performance and wear resistance.
- ▶ Excellent performance when cutting steels, up to HRc55
- ▶ Due to Multiple Helix on 1/8" and over diameter end mills, vibration is minimized and tool life increased.
- ▶ 4 flute series has new designs to reduce vibrations



D1-Ø1/8, 30° Helix

Unit : Inch

EDP No.	Corner Radius	Mill Diameter	Shank Diameter	Length of Cut	Length Below Shank	Overall Length	Neck Diameter
	R	D1	D2	L1	L3	L2	D3
<a href="#">GMF21003</a>	R.004	3/64	3/16	1/16	5/32	2	.044
<a href="#">GMF21901</a>	R.004	3/64	3/16	1/16	1/4	2	.044
<a href="#">GMF21902</a>	R.004	3/64	3/16	1/16	5/16	2	.044
<a href="#">GMF21903</a>	R.008	3/64	3/16	1/16	5/32	2	.044
<a href="#">GMF21904</a>	R.008	3/64	3/16	1/16	1/4	2	.044
<a href="#">GMF21905</a>	R.008	3/64	3/16	1/16	5/16	2	.044
<a href="#">GMF21906</a>	R.012	3/64	3/16	1/16	5/32	2	.044
<a href="#">GMF21907</a>	R.012	3/64	3/16	1/16	1/4	2	.044
<a href="#">GMF21908</a>	R.012	3/64	3/16	1/16	5/16	2	.044
<a href="#">GMF21004</a>	R.004	1/16	3/16	3/32	1/4	2	.060
<a href="#">GMF21909</a>	R.004	1/16	3/16	3/32	5/16	2	.060
<a href="#">GMF21910</a>	R.004	1/16	3/16	3/32	3/8	2	.060
<a href="#">GMF21911</a>	R.004	1/16	3/16	3/32	1/2	2	.060
<a href="#">GMF21912</a>	R.008	1/16	3/16	3/32	1/4	2	.060
<a href="#">GMF21913</a>	R.008	1/16	3/16	3/32	5/16	2	.060
<a href="#">GMF21914</a>	R.008	1/16	3/16	3/32	3/8	2	.060
<a href="#">GMF21915</a>	R.008	1/16	3/16	3/32	1/2	2	.060
<a href="#">GMF21916</a>	R.012	1/16	3/16	3/32	1/4	2	.060
<a href="#">GMF21917</a>	R.012	1/16	3/16	3/32	5/16	2	.060
<a href="#">GMF21918</a>	R.012	1/16	3/16	3/32	3/8	2	.060
<a href="#">GMF21919</a>	R.012	1/16	3/16	3/32	1/2	2	.060
<a href="#">GMF21920</a>	R.020	1/16	3/16	3/32	1/4	2	.060
<a href="#">GMF21921</a>	R.020	1/16	3/16	3/32	5/16	2	.060
<a href="#">GMF21922</a>	R.020	1/16	3/16	3/32	3/8	2	.060
<a href="#">GMF21923</a>	R.020	1/16	3/16	3/32	1/2	2	.060
<a href="#">GMF21005</a>	R.004	5/64	3/16	1/8	1/4	2	.076
<a href="#">GMF21924</a>	R.004	5/64	3/16	1/8	5/16	2	.076
<a href="#">GMF21925</a>	R.004	5/64	3/16	1/8	3/8	2	.076
<a href="#">GMF21926</a>	R.004	5/64	3/16	1/8	1/2	2	.076
<a href="#">GMF21927</a>	R.008	5/64	3/16	1/8	1/4	2	.076

▶ NEXT PAGE

◎ : Excellent ○ : Good

ISO Material Description	P											M				K				
	Non-alloy steel					Low alloy steel						High alloyed steel, and tool steel		Stainless steel		Grey cast iron		Nodular cast iron	Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc	13	25	28	32	30	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend	○	○	◎	◎	◎	○	◎	◎	◎	◎	◎	○	◎	◎	○	○	○	○	○	○

ISO Material Description	N										S					H					
	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron	
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc	60	100	75	90	130	110	90	100			15	30	25	38	34	400 Rm	1050 Rm	55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend																		○	◎	◎	○



HSS

HSS



PLAIN SHANK GMF21 SERIES



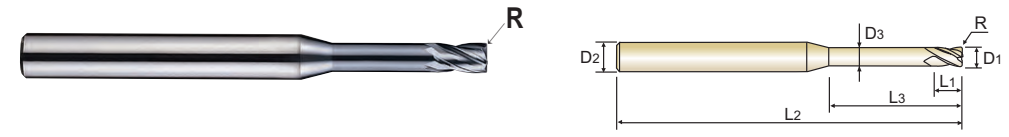
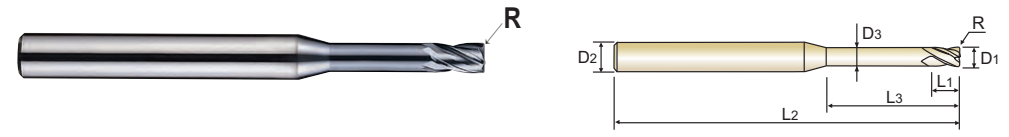
PLAIN SHANK GMF21 SERIES

CARBIDE, 4 FLUTE CORNER RADIUS WITH NECK

CARBIDE, 4 FLUTE CORNER RADIUS WITH NECK

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D1<math>\leq 1/8</math>, 30° Helix Unit : Inch

D1<math>\leq 1/8</math>, 30° Helix Unit : Inch

EDP No.	Corner Radius	Mill Diameter	Shank Diameter	Length of Cut	Length Below Shank	Overall Length	Neck Diameter
	R	D <sub>1</sub>	D <sub>2</sub>	L <sub>1</sub>	L <sub>3</sub>	L <sub>2</sub>	D <sub>3</sub>
<a href="#">GMF21928</a>	R.008	5/64	3/16	1/8	5/16	2	.076
<a href="#">GMF21929</a>	R.008	5/64	3/16	1/8	3/8	2	.076
<a href="#">GMF21930</a>	R.008	5/64	3/16	1/8	1/2	2	.076
<a href="#">GMF21931</a>	R.012	5/64	3/16	1/8	1/4	2	.076
<a href="#">GMF21932</a>	R.012	5/64	3/16	1/8	5/16	2	.076
<a href="#">GMF21933</a>	R.012	5/64	3/16	1/8	3/8	2	.076
<a href="#">GMF21934</a>	R.012	5/64	3/16	1/8	1/2	2	.076
<a href="#">GMF21935</a>	R.020	5/64	3/16	1/8	1/4	2	.076
<a href="#">GMF21936</a>	R.020	5/64	3/16	1/8	5/16	2	.076
<a href="#">GMF21937</a>	R.020	5/64	3/16	1/8	3/8	2	.076
<a href="#">GMF21938</a>	R.020	5/64	3/16	1/8	1/2	2	.076
<a href="#">GMF21008</a>	R.004	1/8	1/4	3/16	5/16	2	.119
<a href="#">GMF21939</a>	R.004	1/8	1/4	3/16	3/8	2	.119
<a href="#">GMF21940</a>	R.004	1/8	1/4	3/16	1/2	2	.119
<a href="#">GMF21941</a>	R.004	1/8	1/4	3/16	5/8	2-3/8	.119
<a href="#">GMF21942</a>	R.008	1/8	1/4	3/16	3/8	2	.119
<a href="#">GMF21943</a>	R.008	1/8	1/4	3/16	1/2	2	.119
<a href="#">GMF21944</a>	R.008	1/8	1/4	3/16	5/8	2-3/8	.119
<a href="#">GMF21945</a>	R.008	1/8	1/4	3/16	3/4	2-3/8	.119
<a href="#">GMF21946</a>	R.012	1/8	1/4	3/16	5/16	2	.119
<a href="#">GMF21947</a>	R.012	1/8	1/4	3/16	3/8	2	.119
<a href="#">GMF21948</a>	R.012	1/8	1/4	3/16	1/2	2	.119
<a href="#">GMF21949</a>	R.012	1/8	1/4	3/16	5/8	2-3/8	.119
<a href="#">GMF21950</a>	R.012	1/8	1/4	3/16	3/4	2-3/8	.119
<a href="#">GMF21951</a>	R.020	1/8	1/4	3/16	5/16	2	.119
<a href="#">GMF21952</a>	R.020	1/8	1/4	3/16	3/8	2	.119
<a href="#">GMF21953</a>	R.020	1/8	1/4	3/16	1/2	2	.119
<a href="#">GMF21954</a>	R.020	1/8	1/4	3/16	5/8	2-3/8	.119
<a href="#">GMF21955</a>	R.020	1/8	1/4	3/16	3/4	2-3/8	.119
<a href="#">GMF21956</a>	R.020	1/8	1/4	3/16	1	2-3/4	.119

EDP No.	Corner Radius	Mill Diameter	Shank Diameter	Length of Cut	Length Below Shank	Overall Length	Neck Diameter
	R	D <sub>1</sub>	D <sub>2</sub>	L <sub>1</sub>	L <sub>3</sub>	L <sub>2</sub>	D <sub>3</sub>
<a href="#">GMF21999</a>	R.030	1/8	1/4	3/16	5/16	2	.119
<a href="#">GMF21801</a>	R.030	1/8	1/4	3/16	3/8	2	.119
<a href="#">GMF21802</a>	R.030	1/8	1/4	3/16	1/2	2	.119
<a href="#">GMF21803</a>	R.030	1/8	1/4	3/16	5/8	2-3/8	.119
<a href="#">GMF21804</a>	R.030	1/8	1/4	3/16	3/4	2-3/8	.119
<a href="#">GMF21805</a>	R.030	1/8	1/4	3/16	1	2-3/4	.119
<a href="#">GMF21957</a>	R.040	1/8	1/4	3/16	5/16	2	.119
<a href="#">GMF21958</a>	R.040	1/8	1/4	3/16	3/8	2	.119
<a href="#">GMF21959</a>	R.040	1/8	1/4	3/16	1/2	2	.119
<a href="#">GMF21960</a>	R.040	1/8	1/4	3/16	5/8	2-3/8	.119
<a href="#">GMF21012</a>	R.004	3/16	1/4	1/4	3/8	2	.181
<a href="#">GMF21961</a>	R.004	3/16	1/4	1/4	1/2	2	.181
<a href="#">GMF21962</a>	R.004	3/16	1/4	1/4	5/8	2-3/8	.181
<a href="#">GMF21963</a>	R.004	3/16	1/4	1/4	3/4	2-3/8	.181
<a href="#">GMF21964</a>	R.008	3/16	1/4	1/4	3/8	2	.181
<a href="#">GMF21965</a>	R.008	3/16	1/4	1/4	1/2	2	.181
<a href="#">GMF21966</a>	R.008	3/16	1/4	1/4	5/8	2-3/8	.181
<a href="#">GMF21967</a>	R.008	3/16	1/4	1/4	3/4	2-3/8	.181
<a href="#">GMF21968</a>	R.008	3/16	1/4	1/4	1	2-3/4	.181
<a href="#">GMF21969</a>	R.012	3/16	1/4	1/4	3/8	2	.181
<a href="#">GMF21970</a>	R.012	3/16	1/4	1/4	1/2	2	.181
<a href="#">GMF21971</a>	R.012	3/16	1/4	1/4	5/8	2-3/8	.181
<a href="#">GMF21972</a>	R.012	3/16	1/4	1/4	3/4	2-3/8	.181
<a href="#">GMF21973</a>	R.012	3/16	1/4	1/4	1	2-3/4	.181
<a href="#">GMF21974</a>	R.020	3/16	1/4	1/4	3/8	2	.181
<a href="#">GMF21975</a>	R.020	3/16	1/4	1/4	1/2	2	.181
<a href="#">GMF21976</a>	R.020	3/16	1/4	1/4	5/8	2-3/8	.181
<a href="#">GMF21977</a>	R.020	3/16	1/4	1/4	3/4	2-3/8	.181
<a href="#">GMF21978</a>	R.020	3/16	1/4	1/4	1	2-3/4	.181
<a href="#">GMF21806</a>	R.030	3/16	1/4	1/4	3/8	2	.181

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◎ : Excellent ○ : Good

◎ : Excellent ○ : Good

ISO	P										M				K					
	Non-alloy steel					Low alloy steel					High alloyed steel, and tool steel		Stainless steel		Grey cast iron	Nodular cast iron	Malleable cast iron			
Material Description	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRC	13	25	28	32	30	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend	◎	◎	◎	◎	◎	○	◎	◎	◎	○	◎	○	○	○	○	○	○	○	○	○

ISO	N					S					H										
	Aluminum-wrought alloy		Aluminum-cast, alloyed		Copper and Copper Alloys (Bronze / Brass)	Non Metallic Materials		Heat Resistant Super Alloys			Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron						
Material Description	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRC	21	22	23	24	25	26	27	28	29	30	15	30	25	38	34	40	40	55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	○	○	○	○	○	○	○	○	◎	◎	○

ISO	P										M				K						
	Non-alloy steel					Low alloy steel					High alloyed steel, and tool steel		Stainless steel		Grey cast iron	Nodular cast iron	Malleable cast iron				
Material Description	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
HRC	13	25	28	32	30	10	29	32	38	15	35	15	23	10	10	26	3	25		21	
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230	
Recommend	◎	◎	◎	◎	◎	○	◎	◎	◎	○	◎	○	○	○	○	○	○	○	○	○	○

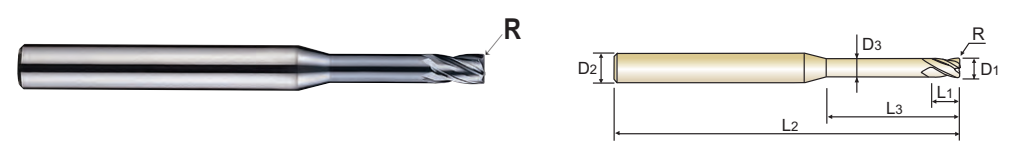
ISO	N					S					H										
	Aluminum-wrought alloy		Aluminum-cast, alloyed		Copper and Copper Alloys (Bronze / Brass)	Non Metallic Materials		Heat Resistant Super Alloys			Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron						
Material Description	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRC	21	22	23	24	25	26	27	28	29	30	15	30	25	38	34	40	40	55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	○	○	○	○	○	○	○	○	◎	◎	○

# YG 4G MILL END MILLS

PLAIN SHANK GMF21 SERIES

## CARBIDE, 4 FLUTE CORNER RADIUS WITH NECK

- ▶ New coating and new tool geometry gives outstanding cutting performance and wear resistance.
- ▶ Excellent performance when cutting steels, up to HRC55
- ▶ Due to Multiple Helix on 1/8" and over diameter end mills, vibration is minimized and tool life increased.
- ▶ 4 flute series has new designs to reduce vibrations



CARBIDE 4 27°/30° ±.0008 PLAIN p.C284-C285

D1<math>\phi</math>1/8, 30° Helix

Unit : Inch

EDP No.	Corner Radius	Mill Diameter	Shank Diameter	Length of Cut	Length Below Shank	Overall Length	Neck Diameter
	R	D <sub>1</sub>	D <sub>2</sub>	L <sub>1</sub>	L <sub>3</sub>	L <sub>2</sub>	D <sub>3</sub>
<a href="#">GMF21807</a>	R.030	3/16	1/4	1/4	1/2	2	.181
<a href="#">GMF21808</a>	R.030	3/16	1/4	1/4	5/8	2-3/8	.181
<a href="#">GMF21809</a>	R.030	3/16	1/4	1/4	3/4	2-3/8	.181
<a href="#">GMF21810</a>	R.030	3/16	1/4	1/4	1	2-3/4	.181
<a href="#">GMF21979</a>	R.040	3/16	1/4	1/4	3/8	2	.181
<a href="#">GMF21980</a>	R.040	3/16	1/4	1/4	1/2	2	.181
<a href="#">GMF21981</a>	R.040	3/16	1/4	1/4	5/8	2-3/8	.181
<a href="#">GMF21982</a>	R.040	3/16	1/4	1/4	3/4	2-3/8	.181
<a href="#">GMF21983</a>	R.040	3/16	1/4	1/4	1	2-3/4	.181
<a href="#">GMF21016</a>	R.012	1/4	1/4	3/8	3/4	2-3/8	.244
<a href="#">GMF21984</a>	R.020	1/4	1/4	3/8	3/4	2-3/8	.244
<a href="#">GMF21811</a>	R.030	1/4	1/4	3/8	3/4	2-3/8	.244
<a href="#">GMF21985</a>	R.040	1/4	1/4	3/8	3/4	2-3/8	.244
<a href="#">GMF21020</a>	R.008	5/16	5/16	1/2	1	2-3/4	.300
<a href="#">GMF21986</a>	R.012	5/16	5/16	1/2	1	2-3/4	.300
<a href="#">GMF21987</a>	R.020	5/16	5/16	1/2	1	2-3/4	.300
<a href="#">GMF21988</a>	R.040	5/16	5/16	1/2	1	2-3/4	.300
<a href="#">GMF21989</a>	R.020	5/16	5/16	3/4	1-3/8	4	.300
<a href="#">GMF21812</a>	R.030	5/16	5/16	1/2	1	2-3/4	.300
<a href="#">GMF21813</a>	R.030	5/16	5/16	3/4	1-3/8	4	.300
<a href="#">GMF21024</a>	R.020	3/8	3/8	5/8	1-3/16	3	.363
<a href="#">GMF21990</a>	R.040	3/8	3/8	5/8	1-3/16	3	.363
<a href="#">GMF21991</a>	R.060	3/8	3/8	5/8	1-3/16	3	.363
<a href="#">GMF21992</a>	R.020	3/8	3/8	1	1-1/2	4	.363
<a href="#">GMF21814</a>	R.030	3/8	3/8	5/8	1-3/16	3	.363
<a href="#">GMF21815</a>	R.030	3/8	3/8	1	1-1/2	4	.363
<a href="#">GMF21032</a>	R.020	1/2	1/2	11/16	1-1/4	3-1/8	.488
<a href="#">GMF21816</a>	R.030	1/2	1/2	11/16	1-1/4	3-1/8	.488
<a href="#">GMF21817</a>	R.030	1/2	1/2	1-3/16	1-3/4	4-1/4	.488
<a href="#">GMF21993</a>	R.040	1/2	1/2	11/16	1-1/4	3-1/8	.488

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◎ : Excellent ○ : Good

ISO	P										M				K					
	Non-alloy steel					Low alloy steel					High alloyed steel, and tool steel		Stainless steel		Grey cast iron		Nodular cast iron		Malleable cast iron	
Material Description	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc	13	25	28	32	30	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend	○	◎	◎	◎	◎	○	◎	◎	◎	○	◎	○	○	○	○	○	○	○	○	○

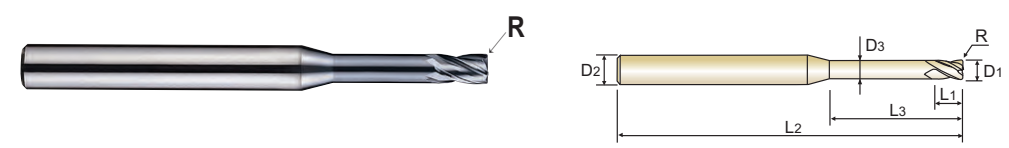
ISO	N				S						H										
	Aluminum-wrought alloy		Aluminum-cast, alloyed		Copper and Copper Alloys (Bronze / Brass)		Non Metallic Materials		Heat Resistant Super Alloys		Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron						
Material Description	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc	60	100	75	90	130	110	90	100			15	30	25	38	34		55	60	42	55	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend	○	◎	◎	◎	◎	○	◎	◎	◎	◎	○	○	○	○	○	○	○	○	○	◎	○

# YG 4G MILL END MILLS

PLAIN SHANK GMF21 SERIES

## CARBIDE, 4 FLUTE CORNER RADIUS WITH NECK

- ▶ New coating and new tool geometry gives outstanding cutting performance and wear resistance.
- ▶ Excellent performance when cutting steels, up to HRC55
- ▶ Due to Multiple Helix on 1/8" and over diameter end mills, vibration is minimized and tool life increased.
- ▶ 4 flute series has new designs to reduce vibrations



CARBIDE 4 27°/30° ±.0008 PLAIN p.C284-C285

D1<math>\phi</math>1/8, 30° Helix

Unit : Inch

EDP No.	Corner Radius	Mill Diameter	Shank Diameter	Length of Cut	Length Below Shank	Overall Length	Neck Diameter
	R	D <sub>1</sub>	D <sub>2</sub>	L <sub>1</sub>	L <sub>3</sub>	L <sub>2</sub>	D <sub>3</sub>
<a href="#">GMF21994</a>	R.060	1/2	1/2	11/16	1-1/4	3-1/8	.488
<a href="#">GMF21995</a>	R.080	1/2	1/2	11/16	1-1/4	3-1/8	.488
<a href="#">GMF21996</a>	R.020	1/2	1/2	1-3/16	1-3/4	4-1/4	.488
<a href="#">GMF21040</a>	R.020	5/8	5/8	3/4	1-3/8	4	.613
<a href="#">GMF21818</a>	R.030	5/8	5/8	3/4	1-3/8	4	.613
<a href="#">GMF21997</a>	R.040	5/8	5/8	3/4	1-3/8	4	.613
<a href="#">GMF21048</a>	R.020	3/4	3/4	1	1-1/2	4	.738
<a href="#">GMF21819</a>	R.030	3/4	3/4	1	1-1/2	4	.738
<a href="#">GMF21998</a>	R.040	3/4	3/4	1	1-1/2	4	.738

Mill Dia. Tolerance (Inch)	Corner Radius Tolerance (Inch)	Shank Dia. Tolerance
0~.0012	±.0008	h5

◎ : Excellent ○ : Good

ISO	P										M				K						
	Non-alloy steel					Low alloy steel					High alloyed steel, and tool steel		Stainless steel		Grey cast iron		Nodular cast iron		Malleable cast iron		
Material Description	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
HRc	13	25	28	32	30	10	29	32	38	15	35	15	23	10	10	26	3	25		21	
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230	
Recommend	○	◎	◎	◎	◎	○	◎	◎	◎	○	◎	○	○	○	○	○	○	○	○	○	○

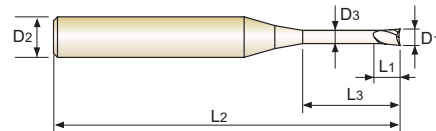
ISO	N				S						H										
	Aluminum-wrought alloy		Aluminum-cast, alloyed		Copper and Copper Alloys (Bronze / Brass)		Non Metallic Materials		Heat Resistant Super Alloys		Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron						
Material Description	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc	60	100	75	90	130	110	90	100			15	30	25	38	34		55	60	42	55	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend	○	◎	◎	◎	◎	○	◎	◎	◎	◎	○	○	○	○	○	○	○	○	○	◎	○



PLAIN SHANK GMF22 SERIES

CARBIDE, 2 FLUTE WITH NECK

- ▶ New coating and new tool geometry gives outstanding cutting performance and wear resistance.
- ▶ Excellent performance when cutting steels, up to HRC55
- ▶ Due to Multiple Helix on 1/8" and over diameter end mills, vibration is minimized and tool life increased.
- ▶ For 1/32" and under 1/32" diameter sizes, double neck increases tool rigidity and minimizes vibration.
- ▶ Excellent for Rib Processing of various depths



Unit : Inch

EDP No.	Mill Diameter	Shank Diameter	Length of Cut	Length Below Shank	Overall Length	Neck Diameter
	D1	D2	L1	L3	L2	D3
GMF22901	.008	3/16	.010	3/64	1-1/2	.006
GMF22902	.015	3/16	1/32	3/64	1-1/2	.013
GMF22903	.015	3/16	1/32	5/64	1-1/2	.013
GMF22904	.015	3/16	1/32	1/8	1-1/2	.013
GMF22905	.015	3/16	1/32	5/32	1-1/2	.013
GMF22906	.015	3/16	1/32	3/16	1-1/2	.013
GMF22907	.020	3/16	1/32	5/64	1-3/4	.018
GMF22908	.020	3/16	1/32	1/8	1-3/4	.018
GMF22909	.020	3/16	1/32	5/32	1-3/4	.018
GMF22910	.020	3/16	1/32	3/16	1-3/4	.018
GMF22911	.020	3/16	1/32	1/4	1-3/4	.018
GMF22912	.024	3/16	1/32	5/64	1-3/4	.022
GMF22913	.024	3/16	1/32	1/8	1-3/4	.022
GMF22914	.024	3/16	1/32	5/32	1-3/4	.022
GMF22915	.024	3/16	1/32	3/16	1-3/4	.022
GMF22916	.024	3/16	1/32	1/4	1-3/4	.022
GMF22917	.024	3/16	1/32	5/16	1-3/4	.022
GMF22918	.024	3/16	1/32	3/8	1-3/4	.022
GMF22002	1/32	3/16	3/64	5/64	1-3/4	.029
GMF22919	1/32	3/16	3/64	1/8	1-3/4	.029
GMF22920	1/32	3/16	3/64	5/32	1-3/4	.029
GMF22921	1/32	3/16	3/64	3/16	1-3/4	.029
GMF22922	1/32	3/16	3/64	1/4	1-3/4	.029
GMF22923	1/32	3/16	3/64	5/16	1-3/4	.029
GMF22924	1/32	3/16	3/64	3/8	1-3/4	.029
GMF22003	3/64	3/16	1/16	1/8	2	.044
GMF22925	3/64	3/16	1/16	5/32	2	.044
GMF22926	3/64	3/16	1/16	3/16	2	.044
GMF22927	3/64	3/16	1/16	1/4	2	.044
GMF22928	3/64	3/16	1/16	5/16	2	.044

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◎ : Excellent ○ : Good

ISO	P										M				K						
	Non-alloy steel					Low alloy steel					High alloyed steel, and tool steel				Stainless steel		Grey cast iron		Nodular cast iron		Malleable cast iron
Material Description	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
HRC	13	25	28	32	30	10	29	32	38	15	35	15	23	10	10	26	3	25		21	
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230	
Recommend	○	○	◎	◎	◎	○	◎	◎	◎	○	◎	○	○	○	○	○	○	○	○	○	

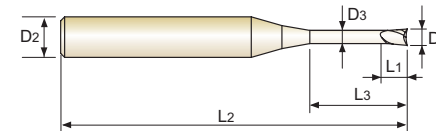
ISO	N					S					H											
	Aluminum-wrought alloy		Aluminum-cast, alloyed		Copper and Copper Alloys (Bronze / Brass)	Non Metallic Materials		Heat Resistant Super Alloys			Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron							
Material Description	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	
HRC	21	22	23	24	25	26	27	28	29	30	15	30	25	38	34	40	55	60	42	55	55	
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550	
Recommend	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○



PLAIN SHANK GMF22 SERIES

CARBIDE, 2 FLUTE WITH NECK

- ▶ New coating and new tool geometry gives outstanding cutting performance and wear resistance.
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- ▶ For 1/32" and under 1/32" diameter sizes, double neck increases tool rigidity and minimizes vibration.
- ▶ Excellent for Rib Processing of various depths



Unit : Inch

EDP No.	Mill Diameter	Shank Diameter	Length of Cut	Length Below Shank	Overall Length	Neck Diameter
	D1	D2	L1	L3	L2	D3
GMF22929	3/64	3/16	1/16	3/8	2	.044
GMF22930	3/64	3/16	1/16	1/2	2	.044
GMF22931	3/64	3/16	1/16	9/16	2	.044
GMF22932	3/64	3/16	1/16	5/8	2	.044
GMF22933	3/64	3/16	1/16	3/4	2	.044
GMF22004	1/16	3/16	3/32	5/32	2	.060
GMF22934	1/16	3/16	3/32	1/4	2	.060
GMF22935	1/16	3/16	3/32	5/16	2	.060
GMF22936	1/16	3/16	3/32	3/8	2	.060
GMF22937	1/16	3/16	3/32	1/2	2	.060
GMF22938	1/16	3/16	3/32	9/16	2	.060
GMF22939	1/16	3/16	3/32	5/8	2	.060
GMF22940	1/16	3/16	3/32	3/4	2	.060
GMF22005	5/64	3/16	1/8	1/4	2	.076
GMF22941	5/64	3/16	1/8	5/16	2	.076
GMF22942	5/64	3/16	1/8	3/8	2	.076
GMF22943	5/64	3/16	1/8	1/2	2	.076
GMF22944	5/64	3/16	1/8	9/16	2	.076
GMF22945	5/64	3/16	1/8	5/8	2	.076
GMF22946	5/64	3/16	1/8	3/4	2	.076
GMF22006	3/32	3/16	5/32	5/16	2	.089
GMF22947	3/32	3/16	5/32	1/2	2	.089
GMF22948	3/32	3/16	5/32	5/8	2	.089
GMF22949	3/32	3/16	5/32	3/4	2	.089
GMF22008	1/8	1/4	3/16	5/16	2	.119
GMF22950	1/8	1/4	3/16	3/8	2	.119
GMF22951	1/8	1/4	3/16	1/2	2	.119
GMF22952	1/8	1/4	3/16	9/16	2-3/8	.119
GMF22953	1/8	1/4	3/16	5/8	2-3/8	.119
GMF22954	1/8	1/4	3/16	11/16	2-3/8	.119

▶ NEXT PAGE

◎ : Excellent ○ : Good

ISO	P										M				K						
	Non-alloy steel					Low alloy steel					High alloyed steel, and tool steel				Stainless steel		Grey cast iron		Nodular cast iron		Malleable cast iron
Material Description	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
HRC	13	25	28	32	30	10	29	32	38	15	35	15	23	10	10	26	3	25		21	
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230	
Recommend	○	○	◎	◎	◎	○	◎	◎	◎	○	◎	○	○	○	○	○	○	○	○	○	

ISO	N					S					H											
	Aluminum-wrought alloy		Aluminum-cast, alloyed		Copper and Copper Alloys (Bronze / Brass)	Non Metallic Materials		Heat Resistant Super Alloys			Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron							
Material Description	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	
HRC	21	22	23	24	25	26	27	28	29	30	15	30	25	38	34	40	55	60	42	55	55	
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550	
Recommend	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○

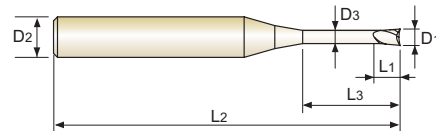


# YG 4G MILL END MILLS

PLAIN SHANK GMF22 SERIES

## CARBIDE, 2 FLUTE WITH NECK

- ▶ New coating and new tool geometry gives outstanding cutting performance and wear resistance.
- ▶ Excellent performance when cutting steels, up to HRC55
- ▶ Due to Multiple Helix on 1/8" and over diameter end mills, vibration is minimized and tool life increased.
- ▶ For 1/32" and under 1/32" diameter sizes, double neck increases tool rigidity and minimizes vibration.
- ▶ Excellent for Rib Processing of various depths



EDP No.	Mill Diameter	Shank Diameter	Length of Cut	Length Below Shank	Overall Length	Neck Diameter
	D1	D2	L1	L3	L2	D3
GMF22955	1/8	1/4	3/16	3/4	2-3/8	.119
GMF22956	1/8	1/4	3/16	1	2-3/4	.119
GMF22012	3/16	1/4	1/4	3/8	2	.181
GMF22957	3/16	1/4	1/4	1/2	2	.181
GMF22958	3/16	1/4	1/4	5/8	2-3/8	.181
GMF22959	3/16	1/4	1/4	11/16	2-3/8	.181
GMF22960	3/16	1/4	1/4	3/4	2-3/8	.181
GMF22961	3/16	1/4	1/4	1	2-3/4	.181
GMF22962	3/16	1/4	1/4	1-3/16	2-3/4	.181
GMF22013	13/64	1/4	5/16	3/4	2-3/8	.197
GMF22963	13/64	1/4	5/16	1-3/16	2-3/4	.197
GMF22964	13/64	1/4	5/16	1-3/8	3	.197
GMF22965	13/64	1/4	5/16	1-1/2	3-1/8	.197
GMF22966	13/64	1/4	5/16	2	3-1/2	.197
GMF22016	1/4	1/4	3/8	5/8	2-3/8	.244
GMF22967	1/4	1/4	3/8	3/4	2-3/8	.244
GMF22968	1/4	1/4	3/8	1-3/16	2-3/4	.244
GMF22020	5/16	5/16	1/2	1	2-3/4	.300
GMF22024	3/8	3/8	5/8	1-3/16	3	.363
GMF22969	3/8	3/8	5/8	1-3/4	4	.363
GMF22032	1/2	1/2	3/4	1-3/8	3-1/8	.488
GMF22970	1/2	1/2	3/4	2	4-1/4	.488

Size	Mill Dia. Tolerance (Inch)	Shank Dia. Tolerance
up to Ø1/4	0~-.0005	h5
over Ø1/4	0~-.0006	

◎ : Excellent ○ : Good

ISO	P										M				K					
	Non-alloy steel					Low alloy steel					High alloyed steel, and tool steel				Stainless steel		Grey cast iron	Nodular cast iron	Malleable cast iron	
Material Description	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc	13	25	28	32	30	10	29	32	38	15	35	15	23	10	10	26	3	25	130	21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend	○	○	◎	◎	◎	○	◎	◎	◎	◎	○	◎	○	○	○	○	○	○	○	○

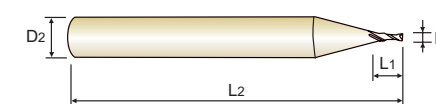
ISO	N					S					H										
	Aluminum-wrought alloy		Aluminum-cast, alloyed		Copper and Copper Alloys (Bronze / Brass)	Non Metallic Materials			Heat Resistant Super Alloys		Titanium Alloys	Hardened steel	Chilled Cast Iron	Hardened Cast Iron							
Material Description	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc	60	100	75	90	130	110	90	100			15	30	25	38	34	400 Rm	1050 Rm	55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○

# YG 4G MILL END MILLS

PLAIN SHANK GMF23 SERIES

## CARBIDE, 2 FLUTE

- ▶ New coating and new tool geometry gives outstanding cutting performance and wear resistance.
- ▶ Excellent performance when cutting steels, up to HRC55
- ▶ Sharp End tooth geometry allows more efficient cutting



Unit : Inch

EDP No.	Mill Diameter	Shank Diameter	Length of Cut	Overall Length
	D1	D2	L1	L2
GMF23901	.004	3/16	.008	1-1/2
GMF23902	.008	3/16	1/64	1-1/2
GMF23903	.012	3/16	1/32	1-1/2
GMF23904	.015	3/16	1/32	1-1/2
GMF23905	.020	3/16	3/64	1-1/2
GMF23906	.024	3/16	3/64	1-1/2
GMF23907	.028	3/16	1/16	1-1/2
GMF23908	.031	3/16	1/16	1-1/2
GMF23909	.035	3/16	5/64	1-1/2
GMF23910	.040	1/4	3/32	2
GMF23911	.047	1/4	1/8	2
GMF23004	1/16	1/4	5/32	2
GMF23005	5/64	1/4	1/4	2
GMF23006	3/32	1/4	1/4	2
GMF23008	1/8	1/4	5/16	2
GMF23009	9/64	1/4	3/8	2
GMF23012	3/16	1/4	3/8	2
GMF23013	13/64	1/4	5/8	2-3/8
GMF23016	1/4	1/4	5/8	2-3/8
GMF23017	17/64	5/16	11/16	2-3/8
GMF23018	9/32	5/16	3/4	2-3/8
GMF23020	5/16	5/16	3/4	2-3/4
GMF23022	11/32	3/8	7/8	2-3/4
GMF23023	23/64	3/8	7/8	2-3/4
GMF23024	3/8	3/8	1	3
GMF23026	13/32	1/2	1	3
GMF23028	7/16	1/2	1-3/16	3
GMF23032	1/2	1/2	1-3/16	3-1/8
GMF23036	9/16	9/16	1-3/8	4
GMF23912	9/16	5/8	1-3/8	4
GMF23040	5/8	5/8	1-1/2	4
GMF23048	3/4	3/4	1-3/4	4

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◎ : Excellent ○ : Good

ISO	P										M				K					
	Non-alloy steel					Low alloy steel					High alloyed steel, and tool steel				Stainless steel		Grey cast iron	Nodular cast iron	Malleable cast iron	
Material Description	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc	13	25	28	32	30	10	29	32	38	15	35	15	23	10	10	26	3	25	130	21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend	○	○	◎	◎	◎	○	◎	◎	◎	◎	○	◎	○	○	○	○	○	○	○	○

ISO	N					S					H										
	Aluminum-wrought alloy		Aluminum-cast, alloyed		Copper and Copper Alloys (Bronze / Brass)	Non Metallic Materials			Heat Resistant Super Alloys		Titanium Alloys	Hardened steel	Chilled Cast Iron	Hardened Cast Iron							
Material Description	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc	60	100	75	90	130	110	90	100			15	30	25	38	34	400 Rm	1050 Rm	55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○



PLAIN SHANK GMF23 SERIES

**CARBIDE, 2 FLUTE (3/16 SHANK)**

- ▶ New coating and new tool geometry gives outstanding cutting performance and wear resistance.
- ▶ Excellent performance when cutting steels, up to HRC55
- ▶ Sharp End tooth geometry allows more efficient cutting



Unit : Inch

EDP No.	Mill Diameter	Shank Diameter	Length of Cut	Overall Length
	D1	D2	L1	L2
<a href="#">GMF23913</a>	.040	3/16	3/32	2
<a href="#">GMF23914</a>	.047	3/16	1/8	2
<a href="#">GMF23915</a>	.050	3/16	1/8	2
<a href="#">GMF23916</a>	.055	3/16	5/32	2
<a href="#">GMF23917</a>	.060	3/16	5/32	2
<a href="#">GMF23918</a>	.063	3/16	5/32	2
<a href="#">GMF23919</a>	.070	3/16	3/16	2
<a href="#">GMF23920</a>	.079	3/16	1/4	2
<a href="#">GMF23921</a>	.087	3/16	1/4	2
<a href="#">GMF23922</a>	.094	3/16	1/4	2
<a href="#">GMF23923</a>	.098	3/16	5/16	2
<a href="#">GMF23924</a>	.102	3/16	5/16	2
<a href="#">GMF23925</a>	.106	3/16	5/16	2
<a href="#">GMF23926</a>	.110	3/16	5/16	2
<a href="#">GMF23927</a>	.120	3/16	5/16	2

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Size	Mill Dia. Tolerance (Inch)	Shank Dia. Tolerance
up to Ø1/4	0~- .0005	h5
over Ø1/4	0~- .0006	

◎ : Excellent ○ : Good

ISO	P										M				K											
	Non-alloy steel					Low alloy steel					High alloyed steel, and tool steel				Stainless steel		Grey cast iron		Nodular cast iron		Malleable cast iron					
Material Description	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20						
VDI 3323																										
HRc	13	25	28	32	38	10	29	32	38	15	35	15	23	10	10	26	3	25								
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230						
Recommend	○	○	◎	◎	◎	○	◎	◎	◎	○	◎			○	○	○	○	○	○	○	○					

ISO	N					S					H														
	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys			Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron							
Material Description	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41				
VDI 3323																									
HRc	21	22	23	24	25	26	27	28	29	30	15	30	25	38	34	40	55	60	42	55					
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550				
Recommend																		○	◎	◎	○				



PLAIN SHANK GMF23 SERIES

**CARBIDE, 2 FLUTE (1/8 Shank)**

- ▶ New coating and new tool geometry gives outstanding cutting performance and wear resistance.
- ▶ Excellent performance when cutting steels, up to HRC55
- ▶ Sharp End tooth geometry allows more efficient cutting



Unit : Inch

EDP No.	Mill Diameter	Shank Diameter	Length of Cut	Overall Length
	D1	D2	L1	L2
<a href="#">GMF23928</a>	.004	1/8	.008	1-1/2
<a href="#">GMF23929</a>	.008	1/8	1/64	1-1/2
<a href="#">GMF23930</a>	.012	1/8	1/32	1-1/2
<a href="#">GMF23931</a>	.015	1/8	1/32	1-1/2
<a href="#">GMF23932</a>	.020	1/8	3/64	1-1/2
<a href="#">GMF23933</a>	.024	1/8	3/64	1-1/2
<a href="#">GMF23934</a>	.028	1/8	1/16	1-1/2
<a href="#">GMF23935</a>	.031	1/8	1/16	1-1/2
<a href="#">GMF23936</a>	.035	1/8	5/64	1-1/2
<a href="#">GMF23937</a>	.040	1/8	3/32	2
<a href="#">GMF23938</a>	.047	1/8	1/8	2
<a href="#">GMF23939</a>	.060	1/8	5/32	2
<a href="#">GMF23940</a>	.079	1/8	1/4	2
<a href="#">GMF23941</a>	.098	1/8	1/4	2
<a href="#">GMF23942</a>	.120	1/8	5/16	2

Size	Mill Dia. Tolerance (Inch)	Shank Dia. Tolerance
up to Ø1/4	0~- .0005	h5
over Ø1/4	0~- .0006	

◎ : Excellent ○ : Good

ISO	P										M				K											
	Non-alloy steel					Low alloy steel					High alloyed steel, and tool steel				Stainless steel		Grey cast iron		Nodular cast iron		Malleable cast iron					
Material Description	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20						
VDI 3323																										
HRc	13	25	28	32	38	10	29	32	38	15	35	15	23	10	10	26	3	25								
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230						
Recommend	○	○	◎	◎	◎	○	◎	◎	◎	○	◎			○	○	○	○	○	○	○	○					

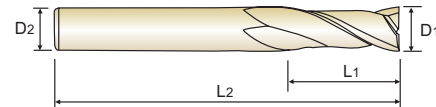
ISO	N					S					H														
	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys			Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron							
Material Description	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41				
VDI 3323																									
HRc	21	22	23	24	25	26	27	28	29	30	15	30	25	38	34	40	55	60	42	55					
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550				
Recommend																		○	◎	◎	○				



PLAIN SHANK GMF24 SERIES

CARBIDE, 2 FLUTE LONG LENGTH

- ▶ New coating and new tool geometry gives outstanding cutting performance and wear resistance.
- ▶ Excellent performance when cutting steels, up to HRc55
- ▶ Various length of cut and overall length end mills.



Unit : Inch

EDP No.	Mill Diameter	Shank Diameter	Length of Cut	Overall Length
	D1	D2	L1	L2
<a href="#">GMF24003</a>	3/64	1/4	1/8	2-3/8
<a href="#">GMF24901</a>	3/64	1/4	5/32	2-3/8
<a href="#">GMF24902</a>	3/64	1/4	1/4	2-3/8
<a href="#">GMF24903</a>	3/64	1/4	5/16	2-3/8
<a href="#">GMF24904</a>	3/64	1/4	3/8	2-3/8
<a href="#">GMF24004</a>	1/16	1/4	1/4	2-3/8
<a href="#">GMF24905</a>	1/16	1/4	5/16	2-3/8
<a href="#">GMF24906</a>	1/16	1/4	3/8	2-3/8
<a href="#">GMF24907</a>	1/16	1/4	1/2	2-3/8
<a href="#">GMF24908</a>	1/16	1/4	5/8	2-3/8
<a href="#">GMF24005</a>	5/64	1/4	5/16	2-3/8
<a href="#">GMF24909</a>	5/64	1/4	3/8	2-3/8
<a href="#">GMF24910</a>	5/64	1/4	1/2	2-3/8
<a href="#">GMF24911</a>	5/64	1/4	5/8	2-3/8
<a href="#">GMF24006</a>	3/32	1/4	5/8	2-3/8
<a href="#">GMF24008</a>	1/8	1/4	3/8	2-3/4
<a href="#">GMF24912</a>	1/8	1/4	1/2	2-3/4
<a href="#">GMF24913</a>	1/8	1/4	5/8	2-3/4
<a href="#">GMF24914</a>	1/8	1/4	3/4	2-3/4
<a href="#">GMF24915</a>	1/8	1/4	1	2-3/4
<a href="#">GMF24012</a>	3/16	1/4	1/2	2-3/4
<a href="#">GMF24916</a>	3/16	1/4	5/8	2-3/4
<a href="#">GMF24917</a>	3/16	1/4	3/4	2-3/4
<a href="#">GMF24918</a>	3/16	1/4	1	2-3/4
<a href="#">GMF24919</a>	3/16	1/4	1-3/16	2-3/4
<a href="#">GMF24013</a>	13/64	1/4	3/4	2-3/4
<a href="#">GMF24920</a>	13/64	1/4	1	2-3/4
<a href="#">GMF24921</a>	13/64	1/4	1-3/16	3-1/8

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◎ : Excellent ○ : Good

ISO	P										M				K					
	Non-alloy steel					Low alloy steel					High alloyed steel, and tool steel				Stainless steel		Grey cast iron		Nodular cast iron	Malleable cast iron
Material Description	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
VDI 3323																				
HRc	13	25	28	32	38	10	29	32	38	15	35	15	23	10	10	26	3	25	21	
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend	○	○	◎	◎	◎	○	◎	◎	◎	○	◎	○	○	○	○	○	○	○	○	○

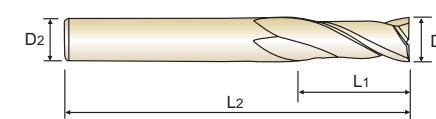
ISO	N					S					H										
	Aluminum-wrought alloy		Aluminum-cast, alloyed		Copper and Copper Alloys (Bronze / Brass)	Non Metallic Materials		Heat Resistant Super Alloys			Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron						
Material Description	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
VDI 3323																					
HRc	60	100	75	90	130	110	90	100			15	30	25	38	34	400 Rm	1050 Rm	55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○



PLAIN SHANK GMF24 SERIES

CARBIDE, 2 FLUTE LONG LENGTH

- ▶ New coating and new tool geometry gives outstanding cutting performance and wear resistance.
- ▶ Excellent performance when cutting steels, up to HRc55
- ▶ Various length of cut and overall length end mills.



Unit : Inch

EDP No.	Mill Diameter	Shank Diameter	Length of Cut	Overall Length
	D1	D2	L1	L2
<a href="#">GMF24922</a>	13/64	1/4	1-1/2	4
<a href="#">GMF24016</a>	1/4	1/4	5/8	2-3/8
<a href="#">GMF24923</a>	1/4	1/4	5/8	3-1/8
<a href="#">GMF24924</a>	1/4	1/4	3/4	2-3/4
<a href="#">GMF24925</a>	1/4	1/4	3/4	3-1/2
<a href="#">GMF24926</a>	1/4	1/4	1	3
<a href="#">GMF24927</a>	1/4	1/4	1-3/16	3-1/8
<a href="#">GMF24928</a>	1/4	1/4	1-3/16	4
<a href="#">GMF24929</a>	1/4	1/4	1-3/16	6
<a href="#">GMF24930</a>	1/4	1/4	1-3/8	3-1/2
<a href="#">GMF24931</a>	1/4	1/4	1-1/2	3-1/2
<a href="#">GMF24932</a>	1/4	1/4	1-3/4	6
<a href="#">GMF24020</a>	5/16	5/16	1	3-1/8
<a href="#">GMF24933</a>	5/16	5/16	1-3/16	3-1/8
<a href="#">GMF24934</a>	5/16	5/16	1-3/8	3-1/2
<a href="#">GMF24935</a>	5/16	5/16	1-1/2	3-1/2
<a href="#">GMF24936</a>	5/16	5/16	1-1/2	4-1/2
<a href="#">GMF24937</a>	5/16	5/16	1-3/4	4
<a href="#">GMF24938</a>	5/16	5/16	2	4
<a href="#">GMF24024</a>	3/8	3/8	1-3/16	3-1/8
<a href="#">GMF24939</a>	3/8	3/8	1-3/16	4
<a href="#">GMF24940</a>	3/8	3/8	1-3/8	3-1/2
<a href="#">GMF24941</a>	3/8	3/8	1-1/2	3-1/2
<a href="#">GMF24942</a>	3/8	3/8	1-1/2	4-1/2
<a href="#">GMF24943</a>	3/8	3/8	1-3/4	4
<a href="#">GMF24944</a>	3/8	3/8	2	4
<a href="#">GMF24945</a>	3/8	3/8	2-3/8	4-1/4
<a href="#">GMF24032</a>	1/2	1/2	1-3/8	3-1/2

▶ NEXT PAGE

◎ : Excellent ○ : Good

ISO	P										M				K					
	Non-alloy steel					Low alloy steel					High alloyed steel, and tool steel				Stainless steel		Grey cast iron		Nodular cast iron	Malleable cast iron
Material Description	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
VDI 3323																				
HRc	13	25	28	32	38	10	29	32	38	15	35	15	23	10	10	26	3	25	21	
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend	○	○	◎	◎	◎	○	◎	◎	◎	○	◎	○	○	○	○	○	○	○	○	○

ISO	N					S					H										
	Aluminum-wrought alloy		Aluminum-cast, alloyed		Copper and Copper Alloys (Bronze / Brass)	Non Metallic Materials		Heat Resistant Super Alloys			Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron						
Material Description	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
VDI 3323																					
HRc	60	100	75	90	130	110	90	100			15	30	25	38	34	400 Rm	1050 Rm	55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○





PLAIN SHANK GMF24 SERIES

CARBIDE, 2 FLUTE LONG LENGTH

- ▶ New coating and new tool geometry gives outstanding cutting performance and wear resistance.
- ▶ Excellent performance when cutting steels, up to HRc55
- ▶ Various length of cut and overall length end mills.



EDP No.	Mill Diameter	Shank Diameter	Length of Cut	Overall Length
	D1	D2	L1	L2
<a href="#">GMF24946</a>	1/2	1/2	1-1/2	4
<a href="#">GMF24947</a>	1/2	1/2	1-1/2	4-1/2
<a href="#">GMF24948</a>	1/2	1/2	1-3/4	5
<a href="#">GMF24949</a>	1/2	1/2	2	4
<a href="#">GMF24950</a>	1/2	1/2	2-1/8	4-1/4
<a href="#">GMF24951</a>	1/2	1/2	2-3/8	4-1/4
<a href="#">GMF24952</a>	1/2	1/2	2-3/8	6
<a href="#">GMF24040</a>	5/8	5/8	1-1/2	6
<a href="#">GMF24048</a>	3/4	3/4	3-1/2	8
<a href="#">GMF24953</a>	3/4	3/4	4-1/4	8

Mill Dia. Tolerance (Inch)	Shank Dia. Tolerance
0~-0.0012	h5

◎ : Excellent ○ : Good

ISO	P										M				K					
	Non-alloy steel					Low alloy steel					High alloyed steel, and tool steel		Stainless steel		Grey cast iron		Nodular cast iron		Malleable cast iron	
Material Description	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc	13	25	28	32	30	10	29	32	38	15	35	15	23	10	10	26	3	25	3	21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend	○	○	◎	◎	◎	○	◎	◎	◎	◎	○	◎	◎	◎	○	○	○	○	○	○

ISO	N					S					H										
	Aluminum-wrought alloy		Aluminum-cast, alloyed		Copper and Copper Alloys (Bronze / Brass)	Non Metallic Materials		Heat Resistant Super Alloys			Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron						
Material Description	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc	60	100	75	90	130	110	90	100			15	30	25	38	34	40	40	55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○



PLAIN SHANK GMF25 SERIES

CARBIDE, 4 FLUTE

- ▶ New coating and new tool geometry gives outstanding cutting performance and wear resistance.
- ▶ Excellent performance when cutting steels, up to HRc55
- ▶ Due to Multiple Helix on 1/8" and over diameter end mills, vibration will be minimized and tool life increased.



D1<D1/8, 30° Helix

EDP No.	Mill Diameter	Shank Diameter	Length of Cut	Overall Length
	D1	D2	L1	L2
<a href="#">GMF25003</a>	3/64	1/4	3/32	2
<a href="#">GMF25004</a>	1/16	1/4	5/32	2
<a href="#">GMF25005</a>	5/64	1/4	1/4	2
<a href="#">GMF25006</a>	3/32	1/4	1/4	2
<a href="#">GMF25008</a>	1/8	1/4	5/16	2
<a href="#">GMF25009</a>	9/64	1/4	3/8	2
<a href="#">GMF25012</a>	3/16	1/4	3/8	2
<a href="#">GMF25013</a>	13/64	1/4	5/8	2-3/8
<a href="#">GMF25014</a>	7/32	1/4	5/8	2-3/8
<a href="#">GMF25016</a>	1/4	1/4	5/8	2-3/8
<a href="#">GMF25017</a>	17/64	5/16	11/16	2-3/8
<a href="#">GMF25018</a>	9/32	5/16	3/4	2-3/8
<a href="#">GMF25019</a>	19/64	5/16	3/4	2-3/8
<a href="#">GMF25020</a>	5/16	5/16	3/4	2-3/4
<a href="#">GMF25022</a>	11/32	3/8	7/8	2-3/4
<a href="#">GMF25023</a>	23/64	3/8	7/8	2-3/4
<a href="#">GMF25024</a>	3/8	3/8	1	3
<a href="#">GMF25028</a>	7/16	1/2	1-3/16	3
<a href="#">GMF25032</a>	1/2	1/2	1-3/16	3-1/8
<a href="#">GMF25036</a>	9/16	9/16	1-3/8	4
<a href="#">GMF25901</a>	9/16	5/8	1-3/8	4
<a href="#">GMF25040</a>	5/8	5/8	1-1/2	4
<a href="#">GMF25044</a>	11/16	5/8	1-3/4	4
<a href="#">GMF25048</a>	3/4	3/4	1-3/4	4

Mill Dia. Tolerance (Inch)	Shank Dia. Tolerance
0~-0.0012	h5

◎ : Excellent ○ : Good

ISO	P										M				K					
	Non-alloy steel					Low alloy steel					High alloyed steel, and tool steel		Stainless steel		Grey cast iron		Nodular cast iron		Malleable cast iron	
Material Description	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc	13	25	28	32	30	10	29	32	38	15	35	15	23	10	10	26	3	25	3	21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend	○	○	◎	◎	◎	○	◎	◎	◎	◎	○	◎	◎	◎	○	○	○	○	○	○

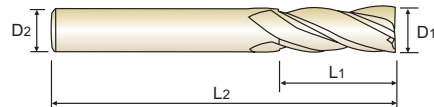
ISO	N					S					H										
	Aluminum-wrought alloy		Aluminum-cast, alloyed		Copper and Copper Alloys (Bronze / Brass)	Non Metallic Materials		Heat Resistant Super Alloys			Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron						
Material Description	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc	60	100	75	90	130	110	90	100			15	30	25	38	34	40	40	55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○



PLAIN SHANK **GMF26** SERIES

**CARBIDE, 4 FLUTE**

- ▶ New coating and new tool geometry gives outstanding cutting performance and wear resistance.
  - ▶ Excellent performance when cutting steels, up to HRC55
  - ▶ Due to Multiple Helix on 1/8" and over diameter end mills, vibration will be minimized and tool life increased.
  - ▶ Due to gash land geometry used at end tooth, heavy duty cutting can be achieved.
- Various length products Available

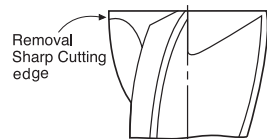


D1<math>\phi</math>1/8, 38° Helix

Unit : Inch

EDP No.	Mill Diameter	Shank Diameter	Length of Cut	Overall Length
	D1	D2	L1	L2
<a href="#">GMF26003</a>	3/64	1/4	3/32	2
<a href="#">GMF26004</a>	1/16	1/4	5/32	2
<a href="#">GMF26005</a>	5/64	1/4	1/4	2
<a href="#">GMF26006</a>	3/32	1/4	1/4	2
<a href="#">GMF26008</a>	1/8	1/4	5/16	2
<a href="#">GMF26012</a>	3/16	1/4	3/8	2
<a href="#">GMF26013</a>	13/64	1/4	5/8	2-3/8
<a href="#">GMF26016</a>	1/4	1/4	5/8	2-3/8
<a href="#">GMF26020</a>	5/16	5/16	3/4	2-3/4
<a href="#">GMF26024</a>	3/8	3/8	1	3
<a href="#">GMF26032</a>	1/2	1/2	1-3/16	3-1/8
<a href="#">GMF26040</a>	5/8	5/8	1-1/4	4
<a href="#">GMF26048</a>	3/4	3/4	1-3/4	4

Mill Dia. Tolerance (Inch)	Shank Dia. Tolerance
0--.0012	h5



◎ : Excellent ○ : Good

ISO Material Description	P										M				K							
	Non-alloy steel					Low alloy steel					High alloyed steel, and tool steel				Stainless steel		Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
HRc	13	25	28	32	38	10	29	32	38	15	35	15	23	10	10	26	3	25	3	25	130	21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230		
Recommend	○	○	◎	◎	◎	○	◎	◎	◎	○	◎	○	○	○	○	○	○	○	○	○	○	○

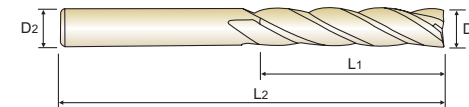
ISO Material Description	N					S					H										
	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys			Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron			
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34	55	60	60	42	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend											○	○	○	○	○	○	○	○	◎	○	○



PLAIN SHANK **GMF27** SERIES

**CARBIDE, 4 FLUTE LONG LENGTH**

- ▶ New coating and new tool geometry gives outstanding cutting performance and wear resistance.
- ▶ Excellent performance when cutting steels, up to HRC55
- ▶ Various length of cut and overall length products available



p.C300-C303

Unit : Inch

EDP No.	Mill Diameter	Shank Diameter	Length of Cut	Overall Length
	D1	D2	L1	L2
<a href="#">GMF27003</a>	3/64	1/4	1/8	2-3/8
<a href="#">GMF27901</a>	3/64	1/4	5/32	2-3/8
<a href="#">GMF27902</a>	3/64	1/4	3/16	2-3/8
<a href="#">GMF27903</a>	3/64	1/4	1/4	2-3/8
<a href="#">GMF27004</a>	1/16	1/4	1/4	2-3/8
<a href="#">GMF27005</a>	5/64	1/4	5/16	2-3/8
<a href="#">GMF27904</a>	5/64	1/4	3/8	2-3/8
<a href="#">GMF27905</a>	5/64	1/4	1/2	2-3/8
<a href="#">GMF27906</a>	5/64	1/4	9/16	2-3/8
<a href="#">GMF27006</a>	3/32	1/4	3/8	2-3/8
<a href="#">GMF27907</a>	3/32	1/4	1/2	2-3/8
<a href="#">GMF27008</a>	1/8	1/4	3/8	2-3/4
<a href="#">GMF27908</a>	1/8	1/4	1/2	2-3/4
<a href="#">GMF27909</a>	1/8	1/4	5/8	2-3/4
<a href="#">GMF27910</a>	1/8	1/4	3/4	2-3/4
<a href="#">GMF27911</a>	1/8	1/4	1	2-3/4
<a href="#">GMF27912</a>	1/8	1/4	1-3/16	2-3/4
<a href="#">GMF27012</a>	3/16	1/4	1/2	2-3/4
<a href="#">GMF27913</a>	3/16	1/4	5/8	2-3/4
<a href="#">GMF27914</a>	3/16	1/4	3/4	2-3/4
<a href="#">GMF27915</a>	3/16	1/4	1	2-3/4
<a href="#">GMF27916</a>	3/16	1/4	1-3/16	2-3/4
<a href="#">GMF27013</a>	13/64	1/4	3/4	2-3/4
<a href="#">GMF27917</a>	13/64	1/4	1	2-3/4
<a href="#">GMF27918</a>	13/64	1/4	1-3/16	3-1/8
<a href="#">GMF27016</a>	1/4	1/4	5/8	2-3/8
<a href="#">GMF27919</a>	1/4	1/4	3/4	2-3/4
<a href="#">GMF27920</a>	1/4	1/4	3/4	3-1/2

▶ NEXT PAGE

◎ : Excellent ○ : Good

ISO Material Description	P										M				K							
	Non-alloy steel					Low alloy steel					High alloyed steel, and tool steel				Stainless steel		Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
HRc	13	25	28	32	38	10	29	32	38	15	35	15	23	10	10	26	3	25	3	25	130	21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230		
Recommend	○	○	◎	◎	◎	○	◎	◎	◎	○	◎	○	○	○	○	○	○	○	○	○	○	○

ISO Material Description	N					S					H										
	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys			Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron			
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34	55	60	60	42	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend											○	○	○	○	○	○	○	○	◎	○	○



PLAIN SHANK GMF27 SERIES

CARBIDE, 4 FLUTE LONG LENGTH

- ▶ New coating and new tool geometry gives outstanding cutting performance and wear resistance.
- ▶ Excellent performance when cutting steels, up to HRC55
- ▶ Various length of cut and overall length products available



EDP No.	Mill Diameter	Shank Diameter	Length of Cut	Overall Length
	D1	D2	L1	L2
<a href="#">GMF27921</a>	1/4	1/4	1	3
<a href="#">GMF27922</a>	1/4	1/4	1-3/16	3-1/8
<a href="#">GMF27923</a>	1/4	1/4	1-3/16	4
<a href="#">GMF27924</a>	1/4	1/4	1-3/8	3-1/2
<a href="#">GMF27925</a>	1/4	1/4	1-1/2	3-1/2
<a href="#">GMF27926</a>	1/4	1/4	1-1/2	4-1/2
<a href="#">GMF27927</a>	1/4	1/4	1-3/4	6
<a href="#">GMF27020</a>	5/16	5/16	1	3-1/8
<a href="#">GMF27928</a>	5/16	5/16	1-3/16	3-1/8
<a href="#">GMF27929</a>	5/16	5/16	1-3/8	3-1/2
<a href="#">GMF27930</a>	5/16	5/16	1-1/2	3-1/2
<a href="#">GMF27931</a>	5/16	5/16	1-3/4	4
<a href="#">GMF27932</a>	5/16	5/16	2	4
<a href="#">GMF27933</a>	5/16	5/16	2	6
<a href="#">GMF27024</a>	3/8	3/8	1-3/16	3-1/8
<a href="#">GMF27934</a>	3/8	3/8	1-3/16	4
<a href="#">GMF27935</a>	3/8	3/8	1-3/8	3-1/2
<a href="#">GMF27936</a>	3/8	3/8	1-1/2	3-1/2
<a href="#">GMF27937</a>	3/8	3/8	1-3/4	4
<a href="#">GMF27938</a>	3/8	3/8	2	4
<a href="#">GMF27032</a>	1/2	1/2	1-3/8	3-1/2
<a href="#">GMF27939</a>	1/2	1/2	1-1/2	4
<a href="#">GMF27940</a>	1/2	1/2	1-3/4	5
<a href="#">GMF27941</a>	1/2	1/2	2	4
<a href="#">GMF27942</a>	1/2	1/2	2-1/8	4-1/4
<a href="#">GMF27943</a>	1/2	1/2	2-3/8	4-1/4
<a href="#">GMF27944</a>	1/2	1/2	2-3/8	6
<a href="#">GMF27036</a>	9/16	5/8	2	4-1/4

▶ NEXT PAGE

◎ : Excellent ○ : Good

ISO	P										M				K					
	Non-alloy steel					Low alloy steel					High alloyed steel, and tool steel				Stainless steel		Grey cast iron	Nodular cast iron	Malleable cast iron	
Material Description	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc	13	25	28	32	30	10	29	32	38	15	35	15	23	10	10	26	3	25	3	21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend	○	○	◎	◎	◎	○	◎	◎	◎	○	◎	○	○	○	○	○	○	○	○	○

ISO	N				S						H										
	Aluminum-wrought alloy		Aluminum-cast, alloyed		Copper and Copper Alloys (Bronze / Brass)		Non Metallic Materials		Heat Resistant Super Alloys		Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron						
Material Description	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc	60	100	75	90	130	110	90	100			15	30	25	38	34	40	55	55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○



PLAIN SHANK GMF27 SERIES

CARBIDE, 4 FLUTE LONG LENGTH

- ▶ New coating and new tool geometry gives outstanding cutting performance and wear resistance.
- ▶ Excellent performance when cutting steels, up to HRC55
- ▶ Various length of cut and overall length products available



EDP No.	Mill Diameter	Shank Diameter	Length of Cut	Overall Length
	D1	D2	L1	L2
<a href="#">GMF27040</a>	5/8	5/8	2	4-1/4
<a href="#">GMF27945</a>	5/8	5/8	2-3/8	4-1/2
<a href="#">GMF27946</a>	5/8	5/8	2-3/4	5
<a href="#">GMF27947</a>	5/8	5/8	2-3/4	6
<a href="#">GMF27048</a>	3/4	3/4	2-3/8	5
<a href="#">GMF27948</a>	3/4	3/4	3-1/2	8
<a href="#">GMF27064</a>	1	1	3-1/2	6

Mill Dia. Tolerance (Inch)	Shank Dia. Tolerance
0~- .0012	h5

◎ : Excellent ○ : Good

ISO	P										M				K					
	Non-alloy steel					Low alloy steel					High alloyed steel, and tool steel				Stainless steel		Grey cast iron	Nodular cast iron	Malleable cast iron	
Material Description	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc	13	25	28	32	30	10	29	32	38	15	35	15	23	10	10	26	3	25	3	21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend	○	○	◎	◎	◎	○	◎	◎	◎	○	◎	○	○	○	○	○	○	○	○	○

ISO	N				S						H										
	Aluminum-wrought alloy		Aluminum-cast, alloyed		Copper and Copper Alloys (Bronze / Brass)		Non Metallic Materials		Heat Resistant Super Alloys		Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron						
Material Description	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc	60	100	75	90	130	110	90	100			15	30	25	38	34	40	55	55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○



**CARBIDE, 4 FLUTE WITH NECK**

- ▶ New coating and new tool geometry gives outstanding cutting performance and wear resistance.
- ▶ Excellent performance when cutting steels, up to HRC55
- ▶ Many more various effective lengths and overall lengths than previous standard products.



Unit : Inch

EDP No.	Mill Diameter D <sub>1</sub>	Shank Diameter D <sub>2</sub>	Length of Cut L <sub>1</sub>	Length Below Shank L <sub>3</sub>	Overall Length L <sub>2</sub>	Neck Diameter D <sub>3</sub>
<a href="#">GMF28003</a>	3/64	3/16	1/16	5/32	2	.044
<a href="#">GMF28901</a>	3/64	3/16	1/16	3/16	2	.044
<a href="#">GMF28902</a>	3/64	3/16	1/16	1/4	2	.044
<a href="#">GMF28903</a>	3/64	3/16	1/16	5/16	2	.044
<a href="#">GMF28004</a>	1/16	3/16	3/32	1/4	2	.060
<a href="#">GMF28904</a>	1/16	3/16	3/32	5/16	2	.060
<a href="#">GMF28905</a>	1/16	3/16	3/32	3/8	2	.060
<a href="#">GMF28906</a>	1/16	3/16	3/32	1/2	2	.060
<a href="#">GMF28907</a>	1/16	3/16	3/32	5/8	2	.060
<a href="#">GMF28005</a>	5/64	3/16	1/8	5/16	2	.076
<a href="#">GMF28908</a>	5/64	3/16	1/8	3/8	2	.076
<a href="#">GMF28909</a>	5/64	3/16	1/8	1/2	2	.076
<a href="#">GMF28910</a>	5/64	3/16	1/8	5/8	2	.076
<a href="#">GMF28008</a>	1/8	1/4	3/16	3/8	2	.119
<a href="#">GMF28911</a>	1/8	1/4	3/16	1/2	2	.119
<a href="#">GMF28912</a>	1/8	1/4	3/16	5/8	2-3/8	.119
<a href="#">GMF28913</a>	1/8	1/4	3/16	3/4	2-3/8	.119
<a href="#">GMF28914</a>	1/8	1/4	3/16	1-3/16	2-3/4	.119
<a href="#">GMF28012</a>	3/16	1/4	1/4	1/2	2	.181
<a href="#">GMF28915</a>	3/16	1/4	1/4	5/8	2-3/8	.181
<a href="#">GMF28916</a>	3/16	1/4	1/4	3/4	2-3/8	.181
<a href="#">GMF28917</a>	3/16	1/4	1/4	1-3/16	2-3/4	.181
<a href="#">GMF28918</a>	3/16	1/4	1/4	1-1/2	3-1/8	.181
<a href="#">GMF28013</a>	13/64	1/4	5/16	3/4	2-3/8	.197
<a href="#">GMF28919</a>	13/64	1/4	5/16	1-1/2	3-1/8	.197
<a href="#">GMF28016</a>	1/4	1/4	3/8	5/8	2-3/8	.244
<a href="#">GMF28920</a>	1/4	1/4	3/8	1-3/16	2-3/4	.244
<a href="#">GMF28020</a>	5/16	5/16	1/2	1	2-3/4	.300

▶ NEXT PAGE

◎ : Excellent ○ : Good

ISO	P										M				K						
	Non-alloy steel					Low alloy steel					High alloyed steel, and tool steel				Stainless steel		Grey cast iron		Nodular cast iron		Malleable cast iron
Material Description	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
HRc	13	25	28	32	38	10	29	32	38	15	35	15	23	10	10	26	3	25		21	
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230	
Recommend	○	○	◎	◎	◎	○	◎	◎	◎	○	◎	○	○	○	○	○	○	○	○	○	

ISO	N					S					H										
	Aluminum-wrought alloy		Aluminum-cast, alloyed		Copper and Copper Alloys (Bronze / Brass)	Non Metallic Materials		Heat Resistant Super Alloys			Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron						
Material Description	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc	60	100	75	90	130	110	90	100			15	30	25	38	34		55	60	42	55	
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend																		○	◎	○	○

**CARBIDE, 4 FLUTE WITH NECK**

- ▶ New coating and new tool geometry gives outstanding cutting performance and wear resistance.
- ▶ Excellent performance when cutting steels, up to HRC55
- ▶ Many more various effective lengths and overall lengths than previous standard products.



Unit : Inch

EDP No.	Mill Diameter D <sub>1</sub>	Shank Diameter D <sub>2</sub>	Length of Cut L <sub>1</sub>	Length Below Shank L <sub>3</sub>	Overall Length L <sub>2</sub>	Neck Diameter D <sub>3</sub>
<a href="#">GMF28921</a>	5/16	5/16	1/2	1-5/8	4	.300
<a href="#">GMF28024</a>	3/8	3/8	5/8	1-3/16	3	.363
<a href="#">GMF28922</a>	3/8	3/8	5/8	1-3/4	4	.363
<a href="#">GMF28032</a>	1/2	1/2	3/4	1-3/8	3-1/8	.488
<a href="#">GMF28923</a>	1/2	1/2	3/4	2	4-1/4	.488

Mill Dia. Tolerance (Inch)	Shank Dia. Tolerance
0~-.0012	h5

◎ : Excellent ○ : Good

ISO	P										M				K						
	Non-alloy steel					Low alloy steel					High alloyed steel, and tool steel				Stainless steel		Grey cast iron		Nodular cast iron		Malleable cast iron
Material Description	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
HRc	13	25	28	32	38	10	29	32	38	15	35	15	23	10	10	26	3	25		21	
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230	
Recommend	○	○	◎	◎	◎	○	◎	◎	◎	○	◎	○	○	○	○	○	○	○	○	○	○

ISO	N					S					H										
	Aluminum-wrought alloy		Aluminum-cast, alloyed		Copper and Copper Alloys (Bronze / Brass)	Non Metallic Materials		Heat Resistant Super Alloys			Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron						
Material Description	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc	60	100	75	90	130	110	90	100			15	30	25	38	34		55	60	42	55	
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend																		○	◎	○	○



PLAIN SHANK **GMF29** SERIES

**CARBIDE, 6 FLUTE 45° HELIX**

- ▶ New coating and new tool geometry gives outstanding cutting performance and wear resistance.
- ▶ Excellent performance when cutting steels, up to HRc55
- ▶ Due to 45 helix angle, better surface finish can be achieved when side cutting.
- ▶ Various effective length and overall length products.



Unit : Inch

EDP No.	Mill Diameter	Shank Diameter	Length of Cut	Overall Length
	D1	D2	L1	L2
<a href="#">GMF29016</a>	1/4	1/4	5/8	2-3/8
<a href="#">GMF29901</a>	1/4	1/4	1-3/16	3-1/8
<a href="#">GMF29020</a>	5/16	5/16	3/4	2-3/4
<a href="#">GMF29902</a>	5/16	5/16	1-1/2	3-1/2
<a href="#">GMF29024</a>	3/8	3/8	1	3
<a href="#">GMF29903</a>	3/8	3/8	1-1/2	3-1/2
<a href="#">GMF29032</a>	1/2	1/2	1-3/16	3-1/8
<a href="#">GMF29904</a>	1/2	1/2	2	4
<a href="#">GMF29040</a>	5/8	5/8	1-1/2	4
<a href="#">GMF29905</a>	5/8	5/8	2-3/8	4-1/2
<a href="#">GMF29048</a>	3/4	3/4	1-3/4	4
<a href="#">GMF29906</a>	3/4	3/4	2-3/8	4-1/2

Mill Dia. Tolerance (Inch)	Shank Dia. Tolerance
0~-.0012	h5

◎ : Excellent ○ : Good

ISO	P										M				K					
	Non-alloy steel					Low alloy steel					High alloyed steel, and tool steel		Stainless steel		Grey cast iron	Nodular cast iron	Malleable cast iron			
Material Description	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc	13	25	28	32	35	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend	○	○	◎	◎	◎	○	◎	◎	◎	○	◎	○	○	○	○	○	○	○	○	○

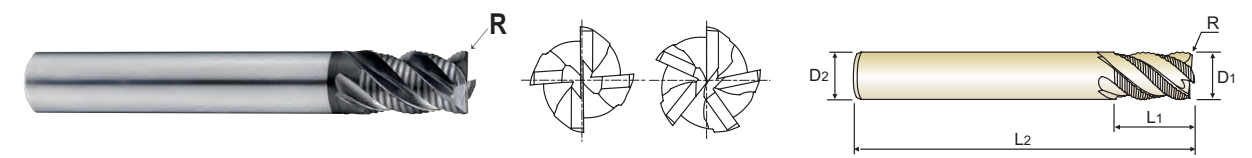
ISO	N					S					H										
	Aluminum-wrought alloy		Aluminum-cast, alloyed		Copper and Copper Alloys (Bronze / Brass)	Non Metallic Materials		Heat Resistant Super Alloys			Titanium Alloys	Hardened steel	Chilled Cast Iron	Hardened Cast Iron							
Material Description	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HB	60	100	75	90	130	110	90	100			15	30	25	38	34	400 Rm	1050 Rm	55	60	42	55
Recommend	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○



PLAIN SHANK **G907** SERIES  
FLAT SHANK **G928** SERIES

**CARBIDE, 4&5 FLUTE STUB LENGTH ROUGHING CORNER RADIUS - FINE**

- ▶ Unique flute design for excellent chip evacuation and vibration reduction.
- ▶ Optimal roughing tooth profile to reduce cutting forces.
- ▶ Special tool geometry for high feed rate and heavy cutting.
- ▶ Strong end tooth design for plunge and pocket milling.
- ▶ Custom engineered coating to allow long tool life and excellent chip evacuation.



Unit : Inch

EDP No.	Corner Radius	Mill Diameter	Shank Diameter	Length of Cut	Overall Length	No. of Flute
	R	D1	D2	L1	L2	
PLAIN	FLAT					
<a href="#">G90716</a>	-	R.020	1/4	1/4	3/8	2
<a href="#">G90720</a>	-	R.020	5/16	5/16	7/16	2
<a href="#">G90724</a>	<a href="#">G92824</a>	R.020	3/8	3/8	1/2	2-1/4
<a href="#">G90732</a>	<a href="#">G92832</a>	R.020	1/2	1/2	5/8	2-1/2
<a href="#">G90740</a>	<a href="#">G92840</a>	R.040	5/8	5/8	3/4	3
<a href="#">G90748</a>	<a href="#">G92848</a>	R.040	3/4	3/4	1	3-1/4
<a href="#">G90764</a>	<a href="#">G92864</a>	R.040	1	1	1-1/4	4

Mill Dia. Tolerance (Inch)	Shank Dia. Tolerance
0~.002	h5

◎ : Excellent ○ : Good

ISO	P										M				K					
	Non-alloy steel					Low alloy steel					High alloyed steel, and tool steel		Stainless steel		Grey cast iron	Nodular cast iron	Malleable cast iron			
Material Description	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc	13	25	28	32	35	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend	○	○	◎	◎	◎	○	◎	◎	◎	○	◎	○	○	○	◎	◎	◎	◎	◎	◎

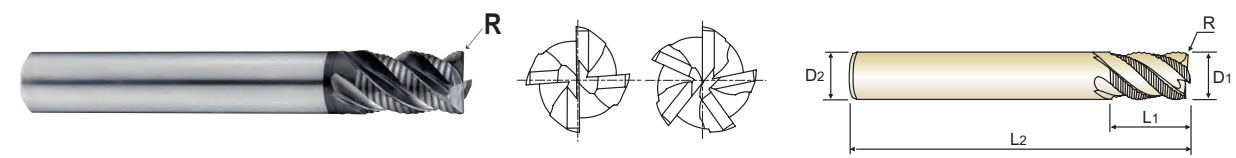
  

ISO	N					S					H										
	Aluminum-wrought alloy		Aluminum-cast, alloyed		Copper and Copper Alloys (Bronze / Brass)	Non Metallic Materials		Heat Resistant Super Alloys			Titanium Alloys	Hardened steel	Chilled Cast Iron	Hardened Cast Iron							
Material Description	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HB	60	100	75	90	130	110	90	100			15	30	25	38	34	400 Rm	1050 Rm	55	60	42	55
Recommend	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○



**CARBIDE, 4&5 FLUTE REGULAR LENGTH ROUGHING  
CORNER RADIUS - FINE**

- ▶ Unique flute design for excellent chip evacuation and vibration reduction.
- ▶ Optimal roughing tooth profile to reduce cutting forces.
- ▶ Special tool geometry for high feed rate and heavy cutting.
- ▶ Strong end tooth design for plunge and pocket milling.
- ▶ Custom engineered coating to all ng tool life and excellent chip evacuation.



5 Flute, 44°/44.5°/45° Unit : Inch

EDP No.	Corner Radius	Mill Diameter	Shank Diameter	Length of Cut		Overall Length	No. of Flute
				L1	L2		
PLAIN	FLAT	R	D1	D2	L1	L2	
<b>G90816</b>	-	R.020	1/4	1/4	5/8	2-1/2	4
<b>G90820</b>	-	R.020	5/16	5/16	3/4	2-1/2	4
<b>G90824</b>	<b>G92924</b>	R.020	3/8	3/8	7/8	2-1/2	4
<b>G90832</b>	<b>G92932</b>	R.020	1/2	1/2	1	3	4
<b>G90840</b>	<b>G92940</b>	R.040	5/8	5/8	1-1/4	3-1/2	5
<b>G90848</b>	<b>G92948</b>	R.040	3/4	3/4	1-5/8	4	5
<b>G90864</b>	<b>G92964</b>	R.040	1	1	1-3/4	4-1/4	5

Mill Dia. Tolerance (Inch)	Shank Dia. Tolerance
0~-.002	h5

◎ : Excellent ○ : Good

ISO	P										M				K						
	Non-alloy steel					Low alloy steel					High alloyed steel, and tool steel				Stainless steel		Grey cast iron		Nodular cast iron		Malleable cast iron
Material Description	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
HRc	13	25	28	32	30	10	29	32	38	15	35	15	23	10	10	26	3	25	3	25	
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230	
Recommend	○	○	◎	◎	◎	○	◎	◎	◎	○	◎	○	○	○	◎	◎	◎	◎	◎	◎	

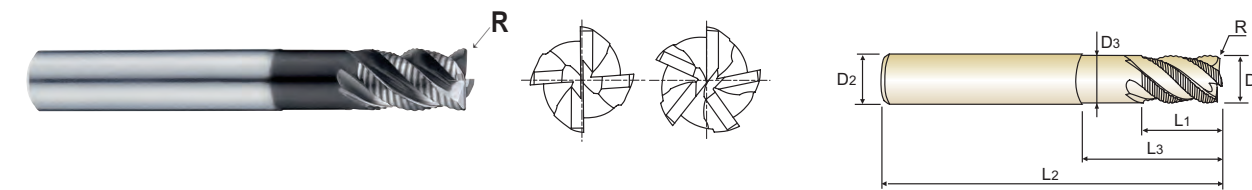
  

ISO	N					S					H										
	Aluminum-wrought alloy		Aluminum-cast, alloyed		Copper and Copper Alloys (Bronze / Brass)	Non Metallic Materials		Heat Resistant Super Alloys			Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron						
Material Description	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc	21	22	23	24	25	26	27	28	29	30	15	30	25	38	34	55	60	55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend	○	○	○	○	○	○	○	○			○	○	○	○	○			◎	◎	◎	◎



**CARBIDE, MULTI FLUTE EXTENDED REACH ROUGHING  
CORNER RADIUS - FINE**

- ▶ Unique flute design for excellent chip evacuation and vibration reduction.
- ▶ Optimal roughing tooth profile to reduce cutting forces.
- ▶ Special tool geometry for high feed rate and heavy cutting.
- ▶ Strong end tooth design for plunge and pocket milling.
- ▶ Custom engineered coating to allow long tool life and excellent chip evacuation.



5 Flute, 44°/44.5°/45° Unit : Inch

EDP No.	Corner Radius	Mill Diameter	Shank Diameter	Length of Cut	Length Below Shank	Overall Length	Neck Diameter	No. of Flute	
									PLAIN
<b>G90916</b>	-	R.020	1/4	1/4	3/8	7/8	2-1/2	.230	4
<b>G90920</b>	-	R.020	5/16	5/16	7/16	1	2-1/2	.292	4
<b>G90924</b>	<b>G93024</b>	R.020	3/8	3/8	1/2	1	2-3/4	.355	4
<b>G90932</b>	<b>G93032</b>	R.020	1/2	1/2	5/8	1-1/4	3-1/4	.480	4
<b>G90940</b>	<b>G93040</b>	R.040	5/8	5/8	3/4	2	4	.605	5
<b>G90948</b>	<b>G93048</b>	R.040	3/4	3/4	1	2-3/8	4-1/2	.718	5

Mill Dia. Tolerance (Inch)	Shank Dia. Tolerance
0~-.002	h5

◎ : Excellent ○ : Good

ISO	P										M				K						
	Non-alloy steel					Low alloy steel					High alloyed steel, and tool steel				Stainless steel		Grey cast iron		Nodular cast iron		Malleable cast iron
Material Description	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
HRc	13	25	28	32	30	10	29	32	38	15	35	15	23	10	10	26	3	25	3	25	
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230	
Recommend	○	○	◎	◎	◎	○	◎	◎	◎	○	◎	○	○	○	◎	◎	◎	◎	◎	◎	

ISO	N					S					H										
	Aluminum-wrought alloy		Aluminum-cast, alloyed		Copper and Copper Alloys (Bronze / Brass)	Non Metallic Materials		Heat Resistant Super Alloys			Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron						
Material Description	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc	21	22	23	24	25	26	27	28	29	30	15	30	25	38	34	55	60	55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend	○	○	○	○	○	○	○	○			○	○	○	○	○			◎	◎	◎	◎

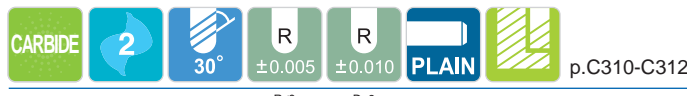
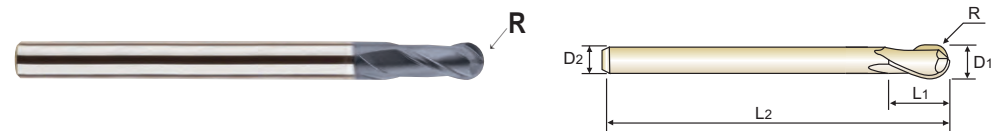




PLAIN SHANK SEMD98 SERIES

**CARBIDE, 2 FLUTE BALL NOSE (Short, Regular, Long Shank)**

- ▶ Due to new coating and new tool geometry, outstanding cutting ability and wear resistance.
- ▶ Due to unique ball nose geometry and cutting edges, cutting force decreased, and wear resistance increased.
- ▶ Excellent performance when cutting prehardened steels, up to HRC55 which are used for molds & dies.



◇ Call for Availability

EDP No.	Radius of Ball Nose	Mill Diameter	Shank Diameter	Length of Cut	Overall Length	Remark
	R	D1	D2	L1	L2	
SEMD98001S	R0.05	0.1	4	0.1	40	Short
SEMD98001	R0.05	0.1	4	0.2	40	Regular
SEMD980013S	R0.05	0.1	3	0.2	40	3mm Shank
SEMD980015S	R0.075	0.15	4	0.15	40	Short
SEMD980015	R0.075	0.15	4	0.3	40	Regular
SEMD9800153S	R0.075	0.15	3	0.3	40	3mm Shank
SEMD98002S	R0.1	0.2	4	0.2	40	Short
SEMD98002	R0.1	0.2	4	0.4	40	Regular
SEMD980023S	R0.1	0.2	3	0.4	40	3mm Shank
SEMD98003S	R0.15	0.3	4	0.3	40	Short
SEMD98003	R0.15	0.3	4	0.6	40	Regular
SEMD980033S	R0.15	0.3	3	0.6	40	3mm Shank
SEMD98004S	R0.2	0.4	4	0.4	40	Short
SEMD98004	R0.2	0.4	4	0.8	40	Regular
SEMD980043S	R0.2	0.4	3	0.8	40	3mm Shank
SEMD98005S	R0.25	0.5	4	0.5	40	Short
SEMD98005	R0.25	0.5	4	1.0	40	Regular
SEMD980053S	R0.25	0.5	3	1.0	40	3mm Shank
SEMD98006S	R0.3	0.6	4	0.6	40	Short
SEMD98006	R0.3	0.6	4	1.2	40	Regular
SEMD980063S	R0.3	0.6	3	1.2	40	3mm Shank
SEMD98007S	R0.35	0.7	4	0.7	40	Short
SEMD98007	R0.35	0.7	4	1.4	40	Regular
SEMD980073S	R0.35	0.7	3	1.4	40	3mm Shank
SEMD98008S	R0.4	0.8	4	0.8	40	Short
SEMD98008	R0.4	0.8	4	1.6	40	Regular
SEMD980083S	R0.4	0.8	3	1.6	40	3mm Shank
SEMD98009S	R0.45	0.9	4	0.9	40	Short

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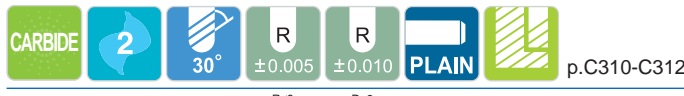
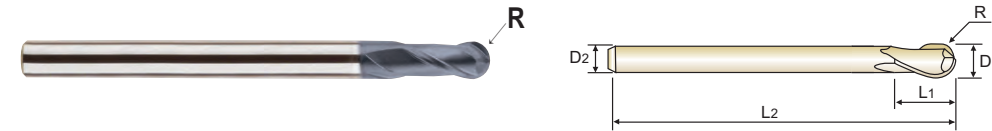
ISO	P										M				K					
	Non-alloy steel					Low alloy steel					High alloyed steel, and tool steel				Stainless steel		Grey cast iron		Nodular cast iron	Malleable cast iron
Material Description	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc	13	25	28	32	30	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend	○	○	○	◎	◎	○	◎	◎	◎	○	◎	○	◎	◎	○	○	○	○	○	○



PLAIN SHANK SEMD98 SERIES

**CARBIDE, 2 FLUTE BALL NOSE (Short, Regular, Long Shank)**

- ▶ Due to new coating and new tool geometry, outstanding cutting ability and wear resistance.
- ▶ Due to unique ball nose geometry and cutting edges, cutting force decreased, and wear resistance increased.
- ▶ Excellent performance when cutting prehardened steels, up to HRC55 which are used for molds & dies.



◇ Call for Availability

EDP No.	Radius of Ball Nose	Mill Diameter	Shank Diameter	Length of Cut	Overall Length	Remark
	R	D1	D2	L1	L2	
SEMD98009	R0.45	0.9	4	1.8	40	Regular
SEMD980093S	R0.45	0.9	3	1.8	40	3mm Shank
SEMD9801004Q	R0.5	1.0	6	1.5	40	Short
SEMD980103S	R0.5	1.0	3	2.5	50	3mm Shank
SEMD980104S	R0.5	1.0	4	2.5	50	Regular
SEMD98010	R0.5	1.0	6	2.5	50	Regular
SEMD9801007Q	R0.5	1.0	6	2.5	70	Long Shank
SEMD9801010Q	R0.5	1.0	6	2.5	100	Long Shank
SEMD9801204Q	R0.6	1.2	6	2	40	Short
SEMD980123S	R0.6	1.2	3	3	50	3mm Shank
SEMD980124S	R0.6	1.2	4	3	50	Regular
SEMD98012	R0.6	1.2	6	3	50	Regular
SEMD9801207Q	R0.6	1.2	6	3	70	Long Shank
SEMD9801210Q	R0.6	1.2	6	3	100	Long Shank
SEMD9801504Q	R0.75	1.5	6	2.5	40	Short
SEMD980153S	R0.75	1.5	3	4	50	3mm Shank
SEMD980154S	R0.75	1.5	4	4	50	Regular
SEMD98015	R0.75	1.5	6	4	50	Regular
SEMD9801507Q	R0.75	1.5	6	4	70	Long Shank
SEMD9801510Q	R0.75	1.5	6	4	100	Long Shank
SEMD9802004Q	R1.0	2.0	6	3	40	Short
SEMD980203S	R1.0	2.0	3	5	50	3mm Shank
SEMD980204S	R1.0	2.0	4	5	50	Regular
SEMD98020	R1.0	2.0	6	5	50	Regular
SEMD9802008Q	R1.0	2.0	6	5	80	Long Shank
SEMD9802010Q	R1.0	2.0	6	5	100	Long Shank
SEMD9802504Q	R1.25	2.5	6	4	40	Short
SEMD980253S	R1.25	2.5	3	6	60	3mm Shank

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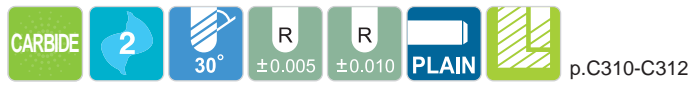
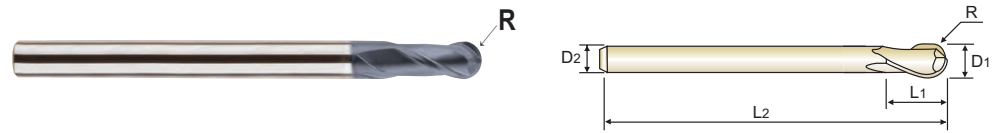
ISO	P										M				K					
	Non-alloy steel					Low alloy steel					High alloyed steel, and tool steel				Stainless steel		Grey cast iron		Nodular cast iron	Malleable cast iron
Material Description	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc	13	25	28	32	30	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend	○	○	○	◎	◎	○	◎	◎	◎	○	◎	○	◎	◎	○	○	○	○	○	○



PLAIN SHANK SEMD98 SERIES

**CARBIDE, 2 FLUTE BALL NOSE (Short, Regular, Long Shank)**

- ▶ Due to new coating and new tool geometry, outstanding cutting ability and wear resistance.
- ▶ Due to unique ball nose geometry and cutting edges, cutting force decreased, and wear resistance increased.
- ▶ Excellent performance when cutting prehardened steels, up to HRC55 which are used for molds & dies.



◇ Call for Availability

EDP No.	Radius of Ball Nose	Mill Diameter	Shank Diameter	Length of Cut	Overall Length	Remark
	R	D1	D2	L1	L2	
SEMD980254S	R1.25	2.5	4	6	60	Regular
SEMD98025	R1.25	2.5	6	6	60	Regular
SEMD98025080	R1.25	2.5	6	6	80	Long Shank
SEMD98025100	R1.25	2.5	6	6	100	Long Shank
SEMD98030040	R1.5	3.0	6	4.5	40	Short
SEMD980303S	R1.5	3.0	3	6	60	3mm Shank
SEMD980304S	R1.5	3.0	4	6	60	Regular
SEMD98030	R1.5	3.0	6	6	60	Regular
SEMD98030080	R1.5	3.0	6	6	80	Long Shank
SEMD98030100	R1.5	3.0	6	6	100	Long Shank
SEMD98035	R1.75	3.5	6	8	70	-
SEMD98040050	R2.0	4.0	6	6	50	Short
SEMD980404S	R2.0	4.0	4	8	70	Regular
SEMD98040	R2.0	4.0	6	8	70	Regular
SEMD980401004S	R2.0	4.0	4	8	100	Long Shank
SEMD980401204S	R2.0	4.0	4	8	120	Long Shank
SEMD98040100	R2.0	4.0	6	8	100	Long Shank
SEMD98040120	R2.0	4.0	6	8	120	Long Shank
SEMD98045	R2.25	4.5	6	9	80	-
SEMD98050060	R2.5	5.0	6	7.5	60	Short
SEMD98050	R2.5	5.0	6	10	80	Regular
SEMD980505S	R2.5	5.0	5	10	80	5mm Shank
SEMD98055	R2.75	5.5	6	11	90	-
SEMD98060050	R3.0	6.0	6	9	50	Short
SEMD98060060	R3.0	6.0	6	9	60	Short
SEMD98060080	R3.0	6.0	6	9	80	Short
SEMD98060	R3.0	6.0	6	12	90	Regular
SEMD98060110	R3.0	6.0	6	12	110	Long Shank

▶ NEXT PAGE

◎: Excellent ○: Good

ISO Material Description	P										M				K					
	Non-alloy steel					Low alloy steel					High alloyed steel, and tool steel				Stainless steel		Grey cast iron	Nodular cast iron	Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc	13	25	28	32	30	10	29	32	38	15	35	15	23	10	10	26	3	25	21	21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend	○	○	○	◎	◎	○	◎	◎	◎	○	◎	○	◎	○	○	○	○	○	○	○

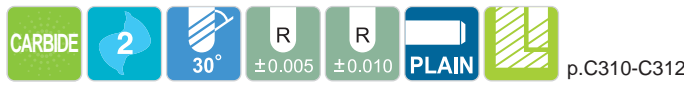
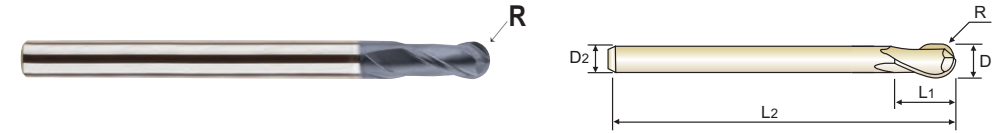
ISO Material Description	N					S					H										
	Aluminum-wrought alloy		Aluminum-cast, alloyed		Copper and Copper Alloys (Bronze / Brass)	Heat Resistant Super Alloys			Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron								
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HB	60	100	75	90	130	110	90	100			15	30	25	38	34	400 Rm	1050 Rm	55	60	42	55
Recommend	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○



PLAIN SHANK SEMD98 SERIES

**CARBIDE, 2 FLUTE BALL NOSE (Short, Regular, Long Shank)**

- ▶ Due to new coating and new tool geometry, outstanding cutting ability and wear resistance.
- ▶ Due to unique ball nose geometry and cutting edges, cutting force decreased, and wear resistance increased.
- ▶ Excellent performance when cutting prehardened steels, up to HRC55 which are used for molds & dies.



◇ Call for Availability

EDP No.	Radius of Ball Nose	Mill Diameter	Shank Diameter	Length of Cut	Overall Length	Remark
	R	D1	D2	L1	L2	
SEMD98060130	R3.0	6.0	6	12	130	Long Shank
SEMD98060150	R3.0	6.0	6	12	150	Long Shank
SEMD98065	R3.25	6.5	8	13	90	-
SEMD98070	R3.5	7.0	8	14	90	-
SEMD98080050	R4.0	8.0	8	12	50	Short
SEMD98080060	R4.0	8.0	8	12	60	Short
SEMD98080080	R4.0	8.0	8	12	80	Short
SEMD98080090	R4.0	8.0	8	12	90	Short
SEMD98080	R4.0	8.0	8	14	100	Regular
SEMD98080130	R4.0	8.0	8	14	130	Long Shank
SEMD98080150	R4.0	8.0	8	14	150	Long Shank
SEMD98085	R4.25	8.5	10	16	100	-
SEMD98090	R4.5	9.0	10	18	100	-
SEMD98100050	R5.0	10.0	10	15	50	Short
SEMD98100060	R5.0	10.0	10	15	60	Short
SEMD98100080	R5.0	10.0	10	15	80	Short
SEMD98100090	R5.0	10.0	10	15	90	Short
SEMD98100	R5.0	10.0	10	18	100	Regular
SEMD98100130	R5.0	10.0	10	18	130	Long Shank
SEMD98100150	R5.0	10.0	10	18	150	Long Shank
SEMD98100180	R5.0	10.0	10	18	180	Long Shank
SEMD98100200	R5.0	10.0	10	18	200	Long Shank
SEMD98110	R5.5	11.0	12	20	100	-
SEMD98120060	R6.0	12.0	12	18	60	Short
SEMD98120080	R6.0	12.0	12	18	80	Short
SEMD98120090	R6.0	12.0	12	18	90	Short
SEMD98120100	R6.0	12.0	12	18	100	Short
SEMD98120	R6.0	12.0	12	22	110	Regular

▶ NEXT PAGE

◎: Excellent ○: Good

ISO Material Description	P										M				K					
	Non-alloy steel					Low alloy steel					High alloyed steel, and tool steel				Stainless steel		Grey cast iron	Nodular cast iron	Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc	13	25	28	32	30	10	29	32	38	15	35	15	23	10	10	26	3	25	21	21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend	○	○	○	◎	◎	○	◎	◎	◎	○	◎	○	◎	○	○	○	○	○	○	○

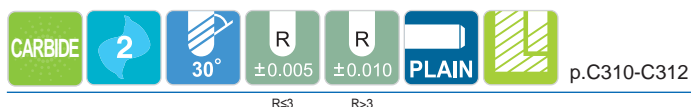
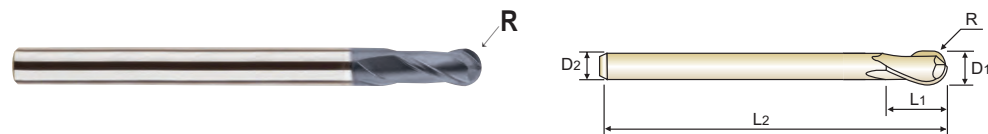
ISO Material Description	N					S					H										
	Aluminum-wrought alloy		Aluminum-cast, alloyed		Copper and Copper Alloys (Bronze / Brass)	Heat Resistant Super Alloys			Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron								
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HB	60	100	75	90	130	110	90	100			15	30	25	38	34	400 Rm	1050 Rm	55	60	42	55
Recommend	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○

# YG 4G MILL END MILLS

PLAIN SHANK SEMD98 SERIES

## CARBIDE, 2 FLUTE BALL NOSE (Short, Regular, Long Shank)

- ▶ Due to new coating and new tool geometry, outstanding cutting ability and wear resistance.
- ▶ Due to unique ball nose geometry and cutting edges, cutting force decreased, and wear resistance increased.
- ▶ Excellent performance when cutting prehardened steels, up to HRc55 which are used for molds & dies.



Call for Availability

Unit : mm

EDP No.	Radius of Ball Nose	Mill Diameter	Shank Diameter	Length of Cut	Overall Length	Remark
	R	D1	D2	L1	L2	
SEMD98120130	R6.0	12.0	12	22	130	Long Shank
SEMD98120150	R6.0	12.0	12	22	150	Long Shank
SEMD98120180	R6.0	12.0	12	22	180	Long Shank
SEMD98120220	R6.0	12.0	12	22	200	Long Shank
SEMD98130	R6.5	13.0	12	24	100	-
SEMD98140	R7.0	14.0	12	26	100	Regular
SEMD9814014S	R7.0	14.0	14	26	100	-
SEMD9814016S	R7.0	14.0	16	26	100	-
SEMD98150	R7.5	15.0	16	28	140	-
SEMD98160100	R8.0	16.0	16	24	100	Short
SEMD98160130	R8.0	16.0	16	24	130	Short
SEMD98160	R8.0	16.0	16	30	150	Regular
SEMD98160180	R8.0	16.0	16	30	180	Long Shank
SEMD98160200	R8.0	16.0	16	30	200	Long Shank
SEMD98180	R9.0	18.0	16	34	150	Regular
SEMD9818018S	R9.0	18.0	18	34	150	-
SEMD98200100	R10.0	20.0	20	30	100	Short
SEMD98200130	R10.0	20.0	20	30	130	Short
SEMD98200	R10.0	20.0	20	38	150	Regular
SEMD98200200	R10.0	20.0	20	38	200	Long Shank
SEMD98250120	R12.5	25.0	25	50	120	Short
SEMD98250	R12.5	25.0	25	50	180	Regular

Size	Radius Tolerance (mm)	Mill Dia. Tolerance (mm)	Shank Dia. Tolerance
up to R3	±0.005	0~-0.012	h5
over R3	±0.010	0~-0.015	

◎ : Excellent ○ : Good

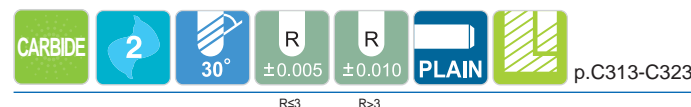
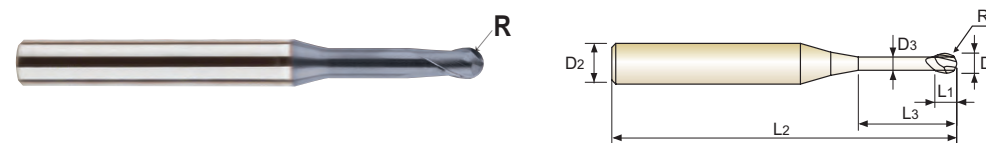
ISO Material Description	P										M				K			H		
	Non-alloy steel					Low alloy steel					High alloyed steel, and tool steel				Stainless steel		Grey cast iron		Nodular cast iron	Malleable cast iron
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc	13	25	28	32	30	10	29	32	38	15	35	15	23	10	10	26	3	25	3	21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend	○	○	○	◎	◎	○	◎	◎	◎	○	◎	○	◎	○	○	○	○	○	○	○

# YG 4G MILL END MILLS

PLAIN SHANK SEM846 SERIES

## CARBIDE, 2 FLUTE LONG NECK BALL NOSE

- ▶ Due to new coating and new tool geometry, outstanding cutting ability and wear resistance.
- ▶ Due to unique ball nose geometry and cutting edges, cutting force decreased, and wear resistance increased.
- ▶ Excellent performance when cutting prehardened steels, up to HRc55 which are used for molds & dies.



Call for Availability

Unit : mm

EDP No.	Radius of Ball Nose	Mill Diameter	Shank Diameter	Length of Cut	Length Below Shank	Overall Length	Neck Diameter
	R	D1	D2	L1	L3	L2	D3
SEM846001002	R0.05	0.1	4	0.1	0.2	40	0.085
SEM846001003	R0.05	0.1	4	0.1	0.3	40	0.085
SEM846001005	R0.05	0.1	4	0.1	0.5	40	0.085
SEM84600101	R0.05	0.1	4	0.1	1	40	0.085
SEM846002005	R0.1	0.2	4	0.2	0.5	40	0.17
SEM84600201	R0.1	0.2	4	0.2	1	40	0.17
SEM846002015	R0.1	0.2	4	0.2	1.5	40	0.17
SEM84600202	R0.1	0.2	4	0.2	2	40	0.17
SEM84600203	R0.1	0.2	4	0.2	3	40	0.17
SEM84600301	R0.15	0.3	4	0.3	1	40	0.27
SEM846003015	R0.15	0.3	4	0.3	1.5	40	0.27
SEM84600302	R0.15	0.3	4	0.3	2	40	0.27
SEM846003025	R0.15	0.3	4	0.3	2.5	40	0.27
SEM84600303	R0.15	0.3	4	0.3	3	40	0.27
SEM84600304	R0.15	0.3	4	0.3	4	40	0.27
SEM84600305	R0.15	0.3	4	0.3	5	40	0.27
SEM84600401	R0.2	0.4	4	0.4	1	40	0.37
SEM846004015	R0.2	0.4	4	0.4	1.5	40	0.37
SEM84600402	R0.2	0.4	4	0.4	2	40	0.37
SEM846004025	R0.2	0.4	4	0.4	2.5	40	0.37
SEM84600403	R0.2	0.4	4	0.4	3	40	0.37
SEM84600404	R0.2	0.4	4	0.4	4	40	0.37
SEM84600405	R0.2	0.4	4	0.4	5	40	0.37
SEM84600406	R0.2	0.4	4	0.4	6	40	0.37
SEM84600408	R0.2	0.4	4	0.4	8	40	0.37
SEM84600410	R0.2	0.4	4	0.4	10	40	0.37
SEM84600501	R0.25	0.5	4	0.5	1	45	0.45
SEM846005015	R0.25	0.5	4	0.5	1.5	45	0.45

▶ NEXT PAGE

◎ : Excellent ○ : Good

ISO Material Description	P										M				K			H		
	Non-alloy steel					Low alloy steel					High alloyed steel, and tool steel				Stainless steel		Grey cast iron		Nodular cast iron	Malleable cast iron
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc	13	25	28	32	30	10	29	32	38	15	35	15	23	10	10	26	3	25	3	21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend	○	○	○	◎	◎	○	◎	◎	◎	○	◎	○	◎	○	○	○	○	○	○	○



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PLAIN SHANK SEM846 SERIES



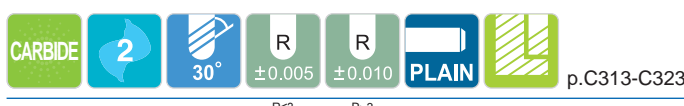
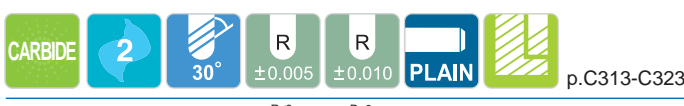
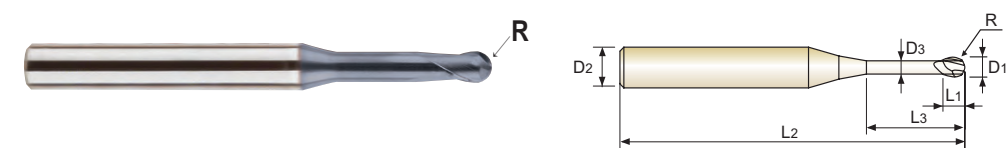
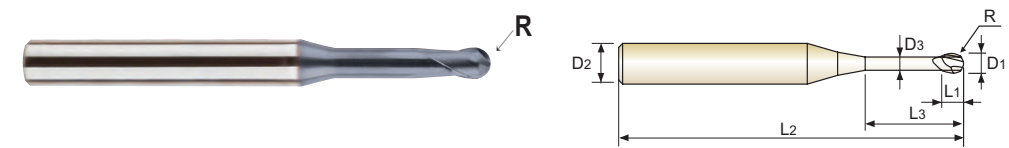
PLAIN SHANK SEM846 SERIES

CARBIDE, 2 FLUTE LONG NECK BALL NOSE

CARBIDE, 2 FLUTE LONG NECK BALL NOSE

- ▶ Due to new coating and new tool geometry, outstanding cutting ability and wear resistance.
- ▶ Due to unique ball nose geometry and cutting edges, cutting force decreased, and wear resistance increased.
- ▶ Excellent performance when cutting prehardened steels, up to HRc55 which are used for molds & dies.

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Call for Availability

Call for Availability

EDP No.	Radius of Ball Nose	Mill Diameter	Shank Diameter	Length of Cut	Length Below Shank	Overall Length	Neck Diameter
	R	D1	D2	L1	L3	L2	D3
SEM84600502	R0.25	0.5	4	0.5	2	45	0.45
SEM846005025	R0.25	0.5	4	0.5	2.5	45	0.45
SEM84600503	R0.25	0.5	4	0.5	3	45	0.45
SEM84600504	R0.25	0.5	4	0.5	4	45	0.45
SEM84600505	R0.25	0.5	4	0.5	5	45	0.45
SEM84600506	R0.25	0.5	4	0.5	6	45	0.45
SEM84600508	R0.25	0.5	4	0.5	8	45	0.45
SEM84600510	R0.25	0.5	4	0.5	10	45	0.45
SEM84600512	R0.25	0.5	4	0.5	12	45	0.45
SEM84600514	R0.25	0.5	4	0.5	14	45	0.45
SEM84600516	R0.25	0.5	4	0.5	16	45	0.45
SEM84600601	R0.3	0.6	4	0.6	1	45	0.55
SEM84600602	R0.3	0.6	4	0.6	2	45	0.55
SEM84600603	R0.3	0.6	4	0.6	3	45	0.55
SEM84600604	R0.3	0.6	4	0.6	4	45	0.55
SEM84600605	R0.3	0.6	4	0.6	5	45	0.55
SEM84600606	R0.3	0.6	4	0.6	6	45	0.55
SEM84600608	R0.3	0.6	4	0.6	8	45	0.55
SEM84600610	R0.3	0.6	4	0.6	10	45	0.55
SEM84600612	R0.3	0.6	4	0.6	12	45	0.55
SEM84600614	R0.3	0.6	4	0.6	14	45	0.55
SEM84600616	R0.3	0.6	4	0.6	16	45	0.55
SEM84600702	R0.35	0.7	4	0.7	2	45	0.65
SEM84600704	R0.35	0.7	4	0.7	4	45	0.65
SEM84600706	R0.35	0.7	4	0.7	6	45	0.65
SEM84600708	R0.35	0.7	4	0.7	8	45	0.65
SEM84600710	R0.35	0.7	4	0.7	10	45	0.65
SEM84600712	R0.35	0.7	4	0.7	12	45	0.65

EDP No.	Radius of Ball Nose	Mill Diameter	Shank Diameter	Length of Cut	Length Below Shank	Overall Length	Neck Diameter
	R	D1	D2	L1	L3	L2	D3
SEM84600801	R0.4	0.8	4	0.8	1	45	0.75
SEM84600802	R0.4	0.8	4	0.8	2	45	0.75
SEM84600803	R0.4	0.8	4	0.8	3	45	0.75
SEM84600804	R0.4	0.8	4	0.8	4	45	0.75
SEM84600805	R0.4	0.8	4	0.8	5	45	0.75
SEM84600806	R0.4	0.8	4	0.8	6	45	0.75
SEM84600808	R0.4	0.8	4	0.8	8	45	0.75
SEM84600810	R0.4	0.8	4	0.8	10	45	0.75
SEM84600812	R0.4	0.8	4	0.8	12	45	0.75
SEM84600814	R0.4	0.8	4	0.8	14	45	0.75
SEM84600816	R0.4	0.8	4	0.8	16	45	0.75
SEM84600820	R0.4	0.8	4	0.8	20	45	0.75
SEM84600904	R0.45	0.9	4	0.9	4	45	0.85
SEM84600906	R0.45	0.9	4	0.9	6	45	0.85
SEM84600908	R0.45	0.9	4	0.9	8	45	0.85
SEM84600910	R0.45	0.9	4	0.9	10	45	0.85
SEM84601002	R0.5	1.0	4	1	2	50	0.95
SEM84601003	R0.5	1.0	4	1	3	50	0.95
SEM84601004	R0.5	1.0	4	1	4	50	0.95
SEM84601005	R0.5	1.0	4	1	5	50	0.95
SEM84601006	R0.5	1.0	4	1	6	50	0.95
SEM84601007	R0.5	1.0	4	1	7	50	0.95
SEM84601008	R0.5	1.0	4	1	8	50	0.95
SEM84601009	R0.5	1.0	4	1	9	50	0.95
SEM84601010	R0.5	1.0	4	1	10	50	0.95
SEM84601012	R0.5	1.0	4	1	12	50	0.95
SEM84601014	R0.5	1.0	4	1	14	50	0.95
SEM84601016	R0.5	1.0	4	1	16	50	0.95

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◎: Excellent ○: Good

ISO Material Description	P										M				K					
	Non-alloy steel					Low alloy steel					High alloyed steel, and tool steel				Stainless steel		Grey cast iron		Nodular cast iron	Malleable cast iron
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend	○	○	○	◎	◎	○	◎	◎	◎	○	◎	○	○	○	○	○	○	○	○	○

ISO Material Description	N										S					H					
	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)					Non Metallic Materials		Heat Resistant Super Alloys			Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron	
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend											○	○	○	○	○	○	○	○	○	○	○

◎: Excellent ○: Good

ISO Material Description	P										M				K					
	Non-alloy steel					Low alloy steel					High alloyed steel, and tool steel				Stainless steel		Grey cast iron		Nodular cast iron	Malleable cast iron
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend	○	○	○	◎	◎	○	◎	◎	◎	○	◎	○	○	○	○	○	○	○	○	○

ISO Material Description	N										S					H					
	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)					Non Metallic Materials		Heat Resistant Super Alloys			Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron	
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend											○	○	○	○	○	○	○	○	○	○	○

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# YG 4G MILL END MILLS

PLAIN SHANK SEM846 SERIES

# YG 4G MILL END MILLS

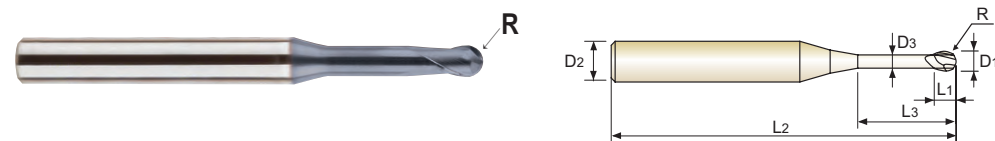
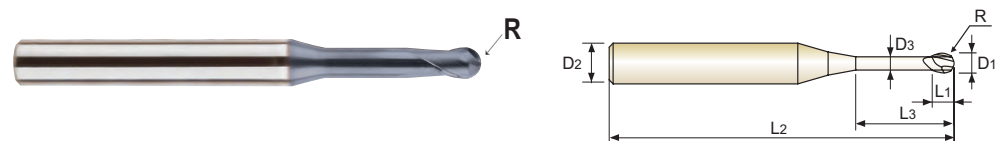
PLAIN SHANK SEM846 SERIES

## CARBIDE, 2 FLUTE LONG NECK BALL NOSE

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CARBIDE 2 30° ±0.005 ±0.010 PLAIN p.C313-C323

CARBIDE 2 30° ±0.005 ±0.010 PLAIN p.C313-C323

Call for Availability

Call for Availability

EDP No.	Radius of Ball Nose	Mill Diameter	Shank Diameter	Length of Cut	Length Below Shank	Overall Length	Neck Diameter
	R	D1	D2	L1	L3	L2	D3
SEM84601018	R0.5	1.0	4	1	18	50	0.95
SEM84601020	R0.5	1.0	4	1	20	50	0.95
SEM84601022	R0.5	1.0	4	1	22	60	0.95
SEM84601026	R0.5	1.0	4	1	26	60	0.95
SEM84601030	R0.5	1.0	4	1	30	70	0.95
SEM84601040	R0.5	1.0	4	1	40	80	0.95
SEM84601050	R0.5	1.0	4	1	50	100	0.95
SEM84601204	R0.6	1.2	4	1.2	4	50	1.15
SEM84601206	R0.6	1.2	4	1.2	6	50	1.15
SEM84601208	R0.6	1.2	4	1.2	8	50	1.15
SEM84601210	R0.6	1.2	4	1.2	10	50	1.15
SEM84601212	R0.6	1.2	4	1.2	12	50	1.15
SEM84601216	R0.6	1.2	4	1.2	16	50	1.15
SEM84601220	R0.6	1.2	4	1.2	20	50	1.15
SEM84601226	R0.6	1.2	4	1.2	26	60	1.15
SEM84601406	R0.7	1.4	4	1.4	6	50	1.35
SEM84601408	R0.7	1.4	4	1.4	8	50	1.35
SEM84601410	R0.7	1.4	4	1.4	10	50	1.35
SEM84601412	R0.7	1.4	4	1.4	12	50	1.35
SEM84601416	R0.7	1.4	4	1.4	16	50	1.35
SEM84601503	R0.75	1.5	4	1.5	3	50	1.45
SEM84601504	R0.75	1.5	4	1.5	4	50	1.45
SEM84601505	R0.75	1.5	4	1.5	5	50	1.45
SEM84601506	R0.75	1.5	4	1.5	6	50	1.45
SEM84601507	R0.75	1.5	4	1.5	7	50	1.45
SEM84601508	R0.75	1.5	4	1.5	8	50	1.45
SEM84601510	R0.75	1.5	4	1.5	10	50	1.45
SEM84601512	R0.75	1.5	4	1.5	12	50	1.45

EDP No.	Radius of Ball Nose	Mill Diameter	Shank Diameter	Length of Cut	Length Below Shank	Overall Length	Neck Diameter
	R	D1	D2	L1	L3	L2	D3
SEM84601514	R0.75	1.5	4	1.5	14	50	1.45
SEM84601516	R0.75	1.5	4	1.5	16	50	1.45
SEM84601518	R0.75	1.5	4	1.5	18	50	1.45
SEM84601520	R0.75	1.5	4	1.5	20	50	1.45
SEM84601522	R0.75	1.5	4	1.5	22	60	1.45
SEM84601526	R0.75	1.5	4	1.5	26	60	1.45
SEM84601530	R0.75	1.5	4	1.5	30	70	1.45
SEM84601535	R0.75	1.5	4	1.5	35	70	1.45
SEM84601540	R0.75	1.5	4	1.5	40	80	1.45
SEM84601604	R0.8	1.6	4	1.6	4	50	1.55
SEM84601606	R0.8	1.6	4	1.6	6	50	1.55
SEM84601608	R0.8	1.6	4	1.6	8	50	1.55
SEM84601610	R0.8	1.6	4	1.6	10	50	1.55
SEM84601612	R0.8	1.6	4	1.6	12	50	1.55
SEM84601616	R0.8	1.6	4	1.6	16	50	1.55
SEM84601620	R0.8	1.6	4	1.6	20	50	1.55
SEM84601804	R0.9	1.8	4	1.8	4	50	1.75
SEM84601806	R0.9	1.8	4	1.8	6	50	1.75
SEM84601808	R0.9	1.8	4	1.8	8	50	1.75
SEM84601810	R0.9	1.8	4	1.8	10	50	1.75
SEM84601812	R0.9	1.8	4	1.8	12	50	1.75
SEM84601816	R0.9	1.8	4	1.8	16	50	1.75
SEM84601820	R0.9	1.8	4	1.8	20	50	1.75
SEM84602004	R1.0	2.0	4	2	4	50	1.95
SEM84602006	R1.0	2.0	4	2	6	50	1.95
SEM84602008	R1.0	2.0	4	2	8	50	1.95
SEM84602010	R1.0	2.0	4	2	10	50	1.95
SEM84602012	R1.0	2.0	4	2	12	50	1.95

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◎: Excellent ○: Good

◎: Excellent ○: Good

ISO Material Description	P										M				K					
	Non-alloy steel					Low alloy steel					High alloyed steel, and tool steel				Stainless steel		Grey cast iron	Nodular cast iron		Malleable cast iron
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend	○	○	○	◎	◎	○	◎	◎	◎	○	◎	○	○	○	○	○	○	○	○	○

ISO Material Description	N										S					H					
	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)					Non Metallic Materials		Heat Resistant Super Alloys			Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron	
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend																		○	◎	○	○

ISO Material Description	P										M				K						
	Non-alloy steel					Low alloy steel					High alloyed steel, and tool steel				Stainless steel		Grey cast iron	Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21	
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230	
Recommend	○	○	○	◎	◎	○	◎	◎	◎	○	◎	○	○	○	○	○	○	○	○	○	○

ISO Material Description	N										S					H					
	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)					Non Metallic Materials		Heat Resistant Super Alloys			Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron	
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend																		○	◎	○	○

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# YG 4G MILL END MILLS

PLAIN SHANK SEM846 SERIES

# YG 4G MILL END MILLS

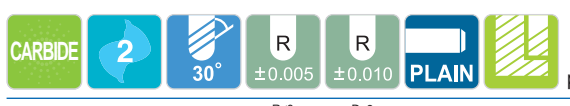
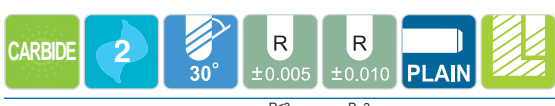
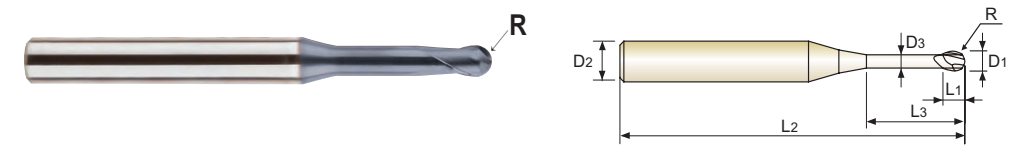
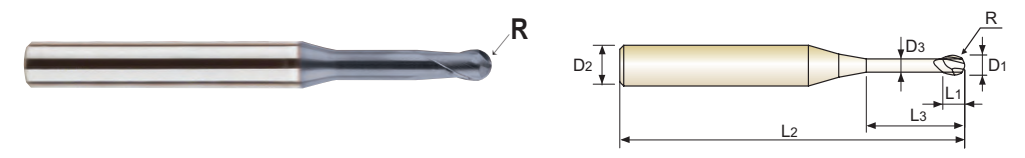
PLAIN SHANK SEM846 SERIES

## CARBIDE, 2 FLUTE LONG NECK BALL NOSE

## CARBIDE, 2 FLUTE LONG NECK BALL NOSE

- ▶ Due to new coating and new tool geometry, outstanding cutting ability and wear resistance.
- ▶ Due to unique ball nose geometry and cutting edges, cutting force decreased, and wear resistance increased.
- ▶ Excellent performance when cutting prehardened steels, up to HRC55 which are used for molds & dies.

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Call for Availability

Call for Availability

EDP No.	Radius of Ball Nose	Mill Diameter	Shank Diameter	Length of Cut	Length Below Shank	Overall Length	Neck Diameter
	R	D1	D2	L1	L3	L2	D3
SEM84602014	R1.0	2.0	4	2	14	50	1.95
SEM84602016	R1.0	2.0	4	2	16	50	1.95
SEM84602018	R1.0	2.0	4	2	18	50	1.95
SEM84602020	R1.0	2.0	4	2	20	50	1.95
SEM84602022	R1.0	2.0	4	2	22	60	1.95
SEM84602026	R1.0	2.0	4	2	26	60	1.95
SEM84602030	R1.0	2.0	4	2	30	70	1.95
SEM84602035	R1.0	2.0	4	2	35	70	1.95
SEM84602040	R1.0	2.0	4	2	40	80	1.95
SEM84602045	R1.0	2.0	4	2	45	90	1.95
SEM84602050	R1.0	2.0	4	2	50	100	1.95
SEM84602060	R1.0	2.0	4	2	60	110	1.95
SEM84602508	R1.25	2.5	4	2.5	8	50	2.40
SEM84602510	R1.25	2.5	4	2.5	10	50	2.40
SEM84602512	R1.25	2.5	4	2.5	12	50	2.40
SEM84602516	R1.25	2.5	4	2.5	16	50	2.40
SEM84602520	R1.25	2.5	4	2.5	20	50	2.40
SEM84602522	R1.25	2.5	4	2.5	22	60	2.40
SEM84602526	R1.25	2.5	4	2.5	26	60	2.40
SEM84602530	R1.25	2.5	4	2.5	30	70	2.40
SEM84602535	R1.25	2.5	4	2.5	35	70	2.40
SEM84602540	R1.25	2.5	4	2.5	40	80	2.40
SEM84602545	R1.25	2.5	4	2.5	45	90	2.40
SEM84602550	R1.25	2.5	4	2.5	50	100	2.40
SEM84603006	R1.5	3.0	6	3	6	50	2.85
SEM84603008	R1.5	3.0	6	3	8	50	2.85
SEM84603010	R1.5	3.0	6	3	10	50	2.85
SEM84603012	R1.5	3.0	6	3	12	50	2.85

EDP No.	Radius of Ball Nose	Mill Diameter	Shank Diameter	Length of Cut	Length Below Shank	Overall Length	Neck Diameter
	R	D1	D2	L1	L3	L2	D3
SEM84603014	R1.5	3.0	6	3	14	60	2.85
SEM84603016	R1.5	3.0	6	3	16	60	2.85
SEM84603018	R1.5	3.0	6	3	18	60	2.85
SEM84603020	R1.5	3.0	6	3	20	60	2.85
SEM84603022	R1.5	3.0	6	3	22	65	2.85
SEM84603026	R1.5	3.0	6	3	26	65	2.85
SEM84603030	R1.5	3.0	6	3	30	70	2.85
SEM84603035	R1.5	3.0	6	3	35	70	2.85
SEM84603040	R1.5	3.0	6	3	40	80	2.85
SEM84603045	R1.5	3.0	6	3	45	90	2.85
SEM84603050	R1.5	3.0	6	3	50	100	2.85
SEM84603060	R1.5	3.0	6	3	60	100	2.85
SEM84604008	R2.0	4.0	6	4	8	50	3.85
SEM84604010	R2.0	4.0	6	4	10	50	3.85
SEM84604012	R2.0	4.0	6	4	12	50	3.85
SEM84604014	R2.0	4.0	6	4	14	60	3.85
SEM84604016	R2.0	4.0	6	4	16	60	3.85
SEM84604018	R2.0	4.0	6	4	18	60	3.85
SEM84604020	R2.0	4.0	6	4	20	60	3.85
SEM84604022	R2.0	4.0	6	4	22	65	3.85
SEM84604026	R2.0	4.0	6	4	26	65	3.85
SEM84604030	R2.0	4.0	6	4	30	70	3.85
SEM84604035	R2.0	4.0	6	4	35	70	3.85
SEM84604040	R2.0	4.0	6	4	40	80	3.85
SEM84604045	R2.0	4.0	6	4	45	90	3.85
SEM84604050	R2.0	4.0	6	4	50	100	3.85
SEM84604055	R2.0	4.0	6	4	55	100	3.85
SEM84604060	R2.0	4.0	6	4	60	100	3.85

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◎: Excellent ○: Good

ISO Material Description	P										M				K					
	Non-alloy steel					Low alloy steel					High alloyed steel, and tool steel				Stainless steel		Grey cast iron	Nodular cast iron		Malleable cast iron
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRC	13	25	28	32	30	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend	○	○	○	◎	◎	○	◎	◎	◎	○	◎				○	○	○	○	○	○

ISO Material Description	N										S					H					
	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)					Non Metallic Materials		Heat Resistant Super Alloys			Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron	
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRC											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend																		○	◎	○	○

◎: Excellent ○: Good

ISO Material Description	P										M				K					
	Non-alloy steel					Low alloy steel					High alloyed steel, and tool steel				Stainless steel		Grey cast iron	Nodular cast iron		Malleable cast iron
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRC	13	25	28	32	30	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend	○	○	○	◎	◎	○	◎	◎	◎	○	◎				○	○	○	○	○	○

ISO Material Description	N										S					H					
	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)					Non Metallic Materials		Heat Resistant Super Alloys			Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron	
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRC											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend																		○	◎	○	○



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PLAIN SHANK SEM846 SERIES



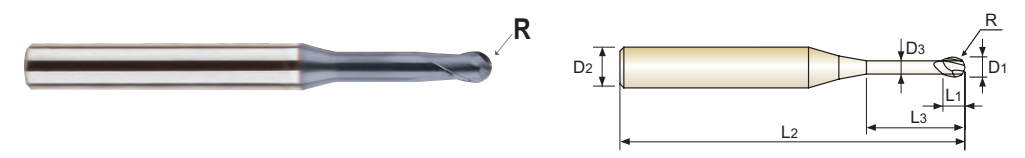
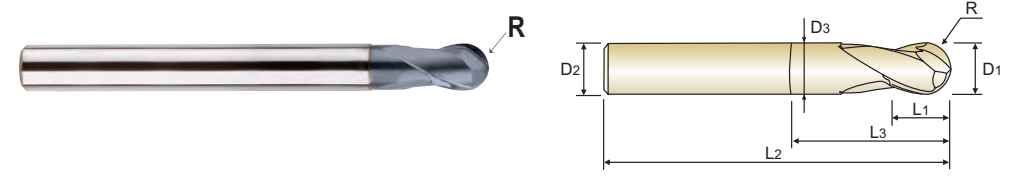
PLAIN SHANK SEM846 SERIES

**CARBIDE, 2 FLUTE LONG NECK BALL NOSE**

**CARBIDE, 2 FLUTE LONG NECK BALL NOSE (6mm shank)**

- ▶ Due to new coating and new tool geometry, outstanding cutting ability and wear resistance.
- ▶ Due to unique ball nose geometry and cutting edges, cutting force decreased, and wear resistance increased.
- ▶ Excellent performance when cutting prehardened steels, up to HRc55 which are used for molds & dies.

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CARBIDE 2 30° ±0.005 ±0.010 PLAIN p.C313-C323

CARBIDE 2 30° ±0.005 PLAIN p.C313-C323

◇ Call for Availability

◇ Call for Availability

EDP No.	Radius of Ball Nose	Mill Diameter	Shank Diameter	Length of Cut	Length Below Shank	Overall Length	Neck Diameter
	R	D <sub>1</sub>	D <sub>2</sub>	L <sub>1</sub>	L <sub>3</sub>	L <sub>2</sub>	D <sub>3</sub>
SEM84605015	R2.5	5.0	6	6	15	60	4.85
SEM84605020	R2.5	5.0	6	6	20	60	4.85
SEM84605026	R2.5	5.0	6	6	26	65	4.85
SEM84605030	R2.5	5.0	6	6	30	70	4.85
SEM84605035	R2.5	5.0	6	6	35	70	4.85
SEM84605040	R2.5	5.0	6	6	40	80	4.85
SEM84605045	R2.5	5.0	6	6	45	90	4.85
SEM84605050	R2.5	5.0	6	6	50	100	4.85
SEM84605055	R2.5	5.0	6	6	55	100	4.85
SEM84605060	R2.5	5.0	6	6	60	100	4.85
SEM84606020	R3.0	6.0	6	8	20	60	5.85
SEM84606030	R3.0	6.0	6	8	30	60	5.85
SEM84606020090	R3.0	6.0	6	12	20	90	5.85
SEM84606030090	R3.0	6.0	6	12	30	90	5.85
SEM84608025	R4.0	8.0	8	10	25	70	7.70
SEM84608035	R4.0	8.0	8	10	35	70	7.70
SEM84608025100	R4.0	8.0	8	14	25	100	7.70
SEM84608035100	R4.0	8.0	8	14	35	100	7.70
SEM84610030	R5.0	10.0	10	12	30	75	9.70
SEM84610040	R5.0	10.0	10	12	40	75	9.70
SEM84610030100	R5.0	10.0	10	18	30	100	9.70
SEM84610040100	R5.0	10.0	10	18	40	100	9.70
SEM84612032	R6.0	12.0	12	14	32	80	11.70
SEM84612045	R6.0	12.0	12	14	45	80	11.70
SEM84612032110	R6.0	12.0	12	22	32	110	11.70
SEM84612045110	R6.0	12.0	12	22	45	110	11.70

EDP No.	Radius of Ball Nose	Mill Diameter	Shank Diameter	Length of Cut	Length Below Shank	Overall Length	Neck Diameter
	R	D <sub>1</sub>	D <sub>2</sub>	L <sub>1</sub>	L <sub>3</sub>	L <sub>2</sub>	D <sub>3</sub>
SEM846005016S	R0.25	0.5	6	0.5	1	45	0.45
SEM846005026S	R0.25	0.5	6	0.5	2	45	0.45
SEM846005046S	R0.25	0.5	6	0.5	4	45	0.45
SEM846006016S	R0.3	0.6	6	0.6	1	45	0.55
SEM846006026S	R0.3	0.6	6	0.6	2	45	0.55
SEM846006036S	R0.3	0.6	6	0.6	3	45	0.55
SEM846006046S	R0.3	0.6	6	0.6	4	45	0.55
SEM846006056S	R0.3	0.6	6	0.6	5	45	0.55
SEM846006066S	R0.3	0.6	6	0.6	6	45	0.55
SEM846006086S	R0.3	0.6	6	0.6	8	45	0.55
SEM846006106S	R0.3	0.6	6	0.6	10	45	0.55
SEM846006126S	R0.3	0.6	6	0.6	12	45	0.55
SEM846006146S	R0.3	0.6	6	0.6	14	45	0.55
SEM846006166S	R0.3	0.6	6	0.6	16	45	0.55
SEM846008016S	R0.4	0.8	6	0.8	1	45	0.75
SEM846008026S	R0.4	0.8	6	0.8	2	45	0.75
SEM846008036S	R0.4	0.8	6	0.8	3	45	0.75
SEM846008046S	R0.4	0.8	6	0.8	4	45	0.75
SEM846008056S	R0.4	0.8	6	0.8	5	45	0.75
SEM846008066S	R0.4	0.8	6	0.8	6	45	0.75
SEM846008086S	R0.4	0.8	6	0.8	8	45	0.75
SEM846008106S	R0.4	0.8	6	0.8	10	45	0.75
SEM846008126S	R0.4	0.8	6	0.8	12	45	0.75
SEM846008146S	R0.4	0.8	6	0.8	14	45	0.75
SEM846008166S	R0.4	0.8	6	0.8	16	45	0.75
SEM846008206S	R0.4	0.8	6	0.8	20	45	0.75
SEM846010026S	R0.5	1.0	6	1	2	50	0.95
SEM846010036S	R0.5	1.0	6	1	3	50	0.95

Size	Radius Tolerance (mm)	Mill Dia. Tolerance (mm)	Shank Dia. Tolerance
up to R3	±0.005	0~-0.012	h5
over R3	±0.010	0~-0.015	

◎: Excellent ○: Good

▶ NEXT PAGE

◎: Excellent ○: Good

ISO Material Description	P										M				K			H			
	Non-alloy steel					Low alloy steel					High alloyed steel, and tool steel				Stainless steel		Grey cast iron	Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
HRc	13	25	28	32	30	10	29	32	38	15	35	15	23	10	10	26	3	25	21	21	
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230	
Recommend	○	○	○	◎	◎	○	◎	◎	◎	○	◎	○	○	○	○	○	○	○	○	○	○

ISO Material Description	N										S					H					
	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)					Non Metallic Materials		Heat Resistant Super Alloys			Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron	
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend																		○	◎	◎	○

ISO Material Description	P										M				K			H			
	Non-alloy steel					Low alloy steel					High alloyed steel, and tool steel				Stainless steel		Grey cast iron	Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
HRc	13	25	28	32	30	10	29	32	38	15	35	15	23	10	10	26	3	25	21	21	
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230	
Recommend	○	○	○	◎	◎	○	◎	◎	◎	○	◎	○	○	○	○	○	○	○	○	○	○

ISO Material Description	N										S					H					
	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)					Non Metallic Materials		Heat Resistant Super Alloys			Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron	
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend																		○	◎	◎	○

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PLAIN SHANK SEM846 SERIES



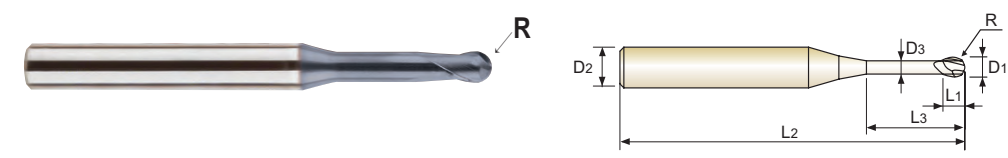
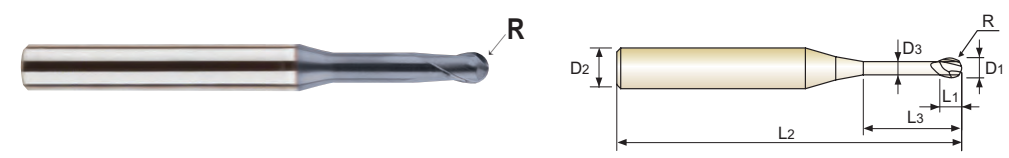
PLAIN SHANK SEM846 SERIES

**CARBIDE, 2 FLUTE LONG NECK BALL NOSE (6mm shank)**

**CARBIDE, 2 FLUTE LONG NECK BALL NOSE (6mm shank)**

- ▶ Due to new coating and new tool geometry, outstanding cutting ability and wear resistance.
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◇ Call for Availability



◇ Call for Availability

Unit : mm

EDP No.	Radius of Ball Nose	Mill Diameter	Shank Diameter	Length of Cut	Length Below Shank	Overall Length	Neck Diameter
	R	D1	D2	L1	L3	L2	D3
SEM846010046S	R0.5	1.0	6	1	4	50	0.95
SEM846010056S	R0.5	1.0	6	1	5	50	0.95
SEM846010066S	R0.5	1.0	6	1	6	50	0.95
SEM846010076S	R0.5	1.0	6	1	7	50	0.95
SEM846010086S	R0.5	1.0	6	1	8	50	0.95
SEM846010096S	R0.5	1.0	6	1	9	50	0.95
SEM846010106S	R0.5	1.0	6	1	10	50	0.95
SEM846010126S	R0.5	1.0	6	1	12	50	0.95
SEM846010146S	R0.5	1.0	6	1	14	50	0.95
SEM846010166S	R0.5	1.0	6	1	16	50	0.95
SEM846010186S	R0.5	1.0	6	1	18	50	0.95
SEM846010206S	R0.5	1.0	6	1	20	50	0.95
SEM846010226S	R0.5	1.0	6	1	22	60	0.95
SEM846010266S	R0.5	1.0	6	1	26	60	0.95
SEM846010306S	R0.5	1.0	6	1	30	70	0.95
SEM846015036S	R0.75	1.5	6	1.5	3	50	1.45
SEM846015046S	R0.75	1.5	6	1.5	4	50	1.45
SEM846015066S	R0.75	1.5	6	1.5	6	50	1.45
SEM846015086S	R0.75	1.5	6	1.5	8	50	1.45
SEM846015106S	R0.75	1.5	6	1.5	10	50	1.45
SEM846015126S	R0.75	1.5	6	1.5	12	50	1.45
SEM846015146S	R0.75	1.5	6	1.5	14	50	1.45
SEM846015166S	R0.75	1.5	6	1.5	16	50	1.45
SEM846015186S	R0.75	1.5	6	1.5	18	50	1.45
SEM846015206S	R0.75	1.5	6	1.5	20	50	1.45
SEM846015226S	R0.75	1.5	6	1.5	22	60	1.45
SEM846015266S	R0.75	1.5	6	1.5	26	60	1.45
SEM846015306S	R0.75	1.5	6	1.5	30	70	1.45

Unit : mm

EDP No.	Radius of Ball Nose	Mill Diameter	Shank Diameter	Length of Cut	Length Below Shank	Overall Length	Neck Diameter
	R	D1	D2	L1	L3	L2	D3
SEM846015356S	R0.75	1.5	6	1.5	35	70	1.45
SEM846015406S	R0.75	1.5	6	1.5	40	80	1.45
SEM846020046S	R1.0	2.0	6	2	4	50	1.95
SEM846020066S	R1.0	2.0	6	2	6	50	1.95
SEM846020086S	R1.0	2.0	6	2	8	50	1.95
SEM846020106S	R1.0	2.0	6	2	10	50	1.95
SEM846020126S	R1.0	2.0	6	2	12	50	1.95
SEM846020146S	R1.0	2.0	6	2	14	50	1.95
SEM846020166S	R1.0	2.0	6	2	16	50	1.95
SEM846020186S	R1.0	2.0	6	2	18	50	1.95
SEM846020206S	R1.0	2.0	6	2	20	50	1.95
SEM846020226S	R1.0	2.0	6	2	22	60	1.95
SEM846020266S	R1.0	2.0	6	2	26	60	1.95
SEM846020306S	R1.0	2.0	6	2	30	70	1.95
SEM846020356S	R1.0	2.0	6	2	35	70	1.95
SEM846020406S	R1.0	2.0	6	2	40	80	1.95
SEM846020456S	R1.0	2.0	6	2	45	90	1.95
SEM846020506S	R1.0	2.0	6	2	50	100	1.95

Mill Dia. Tolerance (mm)	Radius Tolerance (mm)	Shank Dia. Tolerance
0~-0.012	±0.005	h5

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◎ : Excellent ○ : Good

ISO Material Description	P										M				K					
	Non-alloy steel					Low alloy steel					High alloyed steel, and tool steel				Stainless steel		Grey cast iron	Nodular cast iron		Malleable cast iron
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc	13	25	28	32	30	10	29	32	38	15	35	15	23	10	10	26	3	25	21	21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend	○	○	○	◎	◎	○	◎	◎	◎	◎	◎	◎	◎	◎	○	○	○	○	○	○

ISO Material Description	N										S					H					
	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)					Non Metallic Materials		Heat Resistant Super Alloys			Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron	
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc	60	100	75	90	130	110	90	100			15	30	25	38	34	400 Rm	1050 Rm	55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend																		○	◎	◎	○

ISO Material Description	P										M				K					
	Non-alloy steel					Low alloy steel					High alloyed steel, and tool steel				Stainless steel		Grey cast iron	Nodular cast iron		Malleable cast iron
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc	13	25	28	32	30	10	29	32	38	15	35	15	23	10	10	26	3	25	21	21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend	○	○	○	◎	◎	○	◎	◎	◎	◎	◎	◎	◎	◎	○	○	○	○	○	○

ISO Material Description	N										S					H					
	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)					Non Metallic Materials		Heat Resistant Super Alloys			Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron	
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc	60	100	75	90	130	110	90	100			15	30	25	38	34	400 Rm	1050 Rm	55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend																		○	◎	◎	○

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PLAIN SHANK SEMD99 SERIES



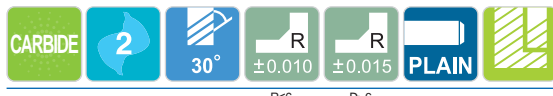
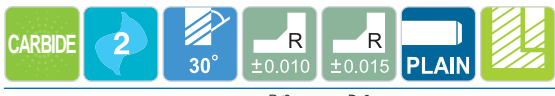
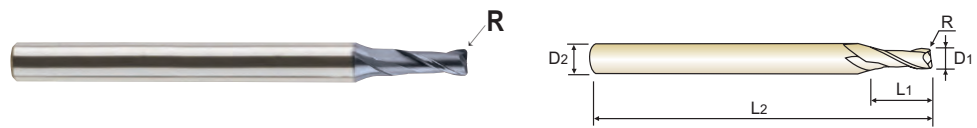
PLAIN SHANK SEMD99 SERIES

**CARBIDE, 2 FLUTE CORNER RADIUS (Short, Regular, Long Shank)**

**CARBIDE, 2 FLUTE CORNER RADIUS (Short, Regular, Long Shank)**

- ▶ Due to new coating and new tool geometry, outstanding cutting ability and wear resistance.
- ▶ Excellent for cutting prehardened steels, carbon steels, alloy steels of molds and dies, up to HRc55 and machine parts.
- ▶ Available aashort, regular and long shank end mills.
- ▶ Available various corner radius end mills, from 0.02 mm to 5.0mm corner radius.

- ▶ Due to new coating and new tool geometry, outstanding cutting ability and wear resistance.
- ▶ Excellent for cutting prehardened steels, carbon steels, alloy steels of molds and dies, up to HRc55 and machine parts.
- ▶ Available short, regular and long shank end mills.
- ▶ Available various corner radius end mills, from 0.02 mm to 5.0mm corner radius.



p.C324-C325 ◆ Call for Availability

p.C324-C325 ◆ Call for Availability

EDP No.	Corner Radius	Mill Diameter	Shank Diameter	Length of Cut	Overall Length	Remark
	R	D1	D2	L1	L2	
SEMD99002002	R0.02	0.2	4	0.4	40	-
SEMD99002005	R0.05	0.2	4	0.4	40	-
SEMD99003002	R0.02	0.3	4	0.6	40	-
SEMD99003005	R0.05	0.3	4	0.6	40	-
SEMD99004005	R0.05	0.4	4	0.8	40	-
SEMD9900401	R0.1	0.4	4	0.8	40	-
SEMD99005005	R0.05	0.5	4	1.0	40	-
SEMD9900501	R0.1	0.5	4	1.0	40	-
SEMD99006005	R0.05	0.6	4	1.2	40	-
SEMD9900601	R0.1	0.6	4	1.2	40	-
SEMD9900602	R0.2	0.6	4	1.2	40	-
SEMD99007005	R0.05	0.7	4	1.4	40	-
SEMD9900701	R0.1	0.7	4	1.4	40	-
SEMD9900702	R0.2	0.7	4	1.4	40	-
SEMD99008005	R0.05	0.8	4	1.6	40	-
SEMD9900801	R0.1	0.8	4	1.6	40	-
SEMD9900802	R0.2	0.8	4	1.6	40	-
SEMD99009005	R0.05	0.9	4	1.8	40	-
SEMD9900901	R0.1	0.9	4	1.8	40	-
SEMD99010005	R0.05	1.0	6	2.5	50	-
SEMD9901001	R0.1	1.0	6	2.5	50	-
SEMD9901002	R0.2	1.0	6	2.5	50	-
SEMD9901003	R0.3	1.0	6	2.5	50	-
SEMD99012005	R0.05	1.2	6	3	50	-
SEMD9901201	R0.1	1.2	6	3	50	-
SEMD9901202	R0.2	1.2	6	3	50	-
SEMD9901203	R0.3	1.2	6	3	50	-
SEMD99015005	R0.05	1.5	6	4	50	-

EDP No.	Corner Radius	Mill Diameter	Shank Diameter	Length of Cut	Overall Length	Remark
	R	D1	D2	L1	L2	
SEMD9901501	R0.1	1.5	6	4	50	-
SEMD9901502	R0.2	1.5	6	4	50	-
SEMD9901503	R0.3	1.5	6	4	50	-
SEMD9901505	R0.5	1.5	6	4	50	-
SEMD9902001	R0.1	2.0	6	6	50	-
SEMD9902002	R0.2	2.0	6	6	50	-
SEMD9902003	R0.3	2.0	6	6	50	-
SEMD9902005	R0.5	2.0	6	6	50	-
SEMD9902501	R0.1	2.5	6	7	60	-
SEMD9902502	R0.2	2.5	6	7	60	-
SEMD9902503	R0.3	2.5	6	7	60	-
SEMD9902505	R0.5	2.5	6	7	60	-
SEMD9903001	R0.1	3.0	6	8	60	-
SEMD9903002	R0.2	3.0	6	8	60	-
SEMD9903003	R0.3	3.0	6	8	60	-
SEMD9903005	R0.5	3.0	6	8	60	-
SEMD9903010	R1.0	3.0	6	8	60	-
SEMD9903501	R0.1	3.5	6	10	70	-
SEMD9903502	R0.2	3.5	6	10	70	-
SEMD9903503	R0.3	3.5	6	10	70	-
SEMD9903505	R0.5	3.5	6	10	70	-
SEMD99040014S	R0.1	4.0	4	10	70	4mm Shank
SEMD99040024S	R0.2	4.0	4	10	70	4mm Shank
SEMD99040034S	R0.3	4.0	4	10	70	4mm Shank
SEMD99040054S	R0.5	4.0	4	10	70	4mm Shank
SEMD99040104S	R1.0	4.0	4	10	70	4mm Shank
SEMD99040011004S	R0.1	4.0	4	10	100	4mm Shank
SEMD99040021004S	R0.2	4.0	4	10	100	4mm Shank

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◎: Excellent ○: Good

ISO	P										M				K					
	Non-alloy steel					Low alloy steel					High alloyed steel, and tool steel				Stainless steel		Grey cast iron		Nodular cast iron	Malleable cast iron
Material Description	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
VDI 3323																				
HRc	13	25	28	32	30	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend	○	○	◎	◎	◎	○	◎	◎	◎	○	◎	○	○	○	○	○	○	○	○	○

ISO	N										S					H					
	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)					Non Metallic Materials		Heat Resistant Super Alloys			Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron	
Material Description	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
VDI 3323																					
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend																		○	◎	◎	○

◎: Excellent ○: Good

ISO	P										M				K					
	Non-alloy steel					Low alloy steel					High alloyed steel, and tool steel				Stainless steel		Grey cast iron		Nodular cast iron	Malleable cast iron
Material Description	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
VDI 3323																				
HRc	13	25	28	32	30	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend	○	○	◎	◎	◎	○	◎	◎	◎	○	◎	○	○	○	○	○	○	○	○	○

ISO	N										S					H					
	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)					Non Metallic Materials		Heat Resistant Super Alloys			Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron	
Material Description	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
VDI 3323																					
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend																		○	◎	◎	○



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# YG 4G MILL END MILLS

PLAIN SHANK SEMD99 SERIES

# YG 4G MILL END MILLS

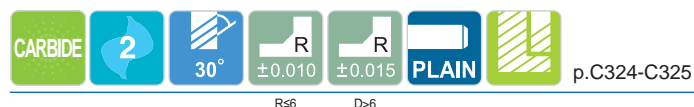
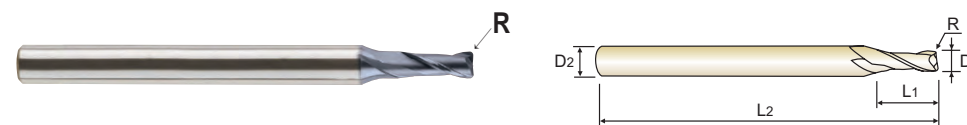
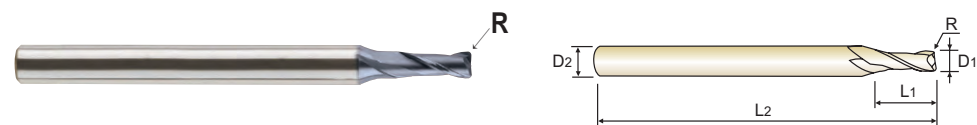
PLAIN SHANK SEMD99 SERIES

## CARBIDE, 2 FLUTE CORNER RADIUS (Short, Regular, Long Shank)

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- ▶ Available short, regular and long shank end mills.
- ▶ Available various corner radius end mills, from 0.02 mm to 5.0mm corner radius.

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p.C324-C325

p.C324-C325

◇ Call for Availability

◇ Call for Availability

EDP No.	Corner Radius	Mill Diameter	Shank Diameter	Length of Cut	Overall Length	Remark
	R	D1	D2	L1	L2	
SEMD99040031004S	R0.3	4.0	4	10	100	4mm Shank
SEMD99040051004S	R0.5	4.0	4	10	100	4mm Shank
SEMD99040101004S	R1.0	4.0	4	10	100	4mm Shank
SEMD9904001	R0.1	4.0	6	10	70	Regular
SEMD9904002	R0.2	4.0	6	10	70	Regular
SEMD9904003	R0.3	4.0	6	10	70	Regular
SEMD9904005	R0.5	4.0	6	10	70	Regular
SEMD9904010	R1.0	4.0	6	10	70	Regular
SEMD9904501	R0.1	4.5	6	11	80	-
SEMD9904502	R0.2	4.5	6	11	80	-
SEMD9904503	R0.3	4.5	6	11	80	-
SEMD9904505	R0.5	4.5	6	11	80	-
SEMD9905001	R0.1	5.0	6	13	90	-
SEMD9905002	R0.2	5.0	6	13	90	-
SEMD9905003	R0.3	5.0	6	13	90	-
SEMD9905005	R0.5	5.0	6	13	90	-
SEMD9905010	R1.0	5.0	6	13	90	-
SEMD9905501	R0.1	5.5	6	13	90	-
SEMD9905502	R0.2	5.5	6	13	90	-
SEMD9905503	R0.3	5.5	6	13	90	-
SEMD9905505	R0.5	5.5	6	13	90	-
SEMD9905510	R1.0	5.5	6	13	90	-
SEMD9906002060	R0.2	6.0	6	15	60	Short
SEMD9906003060	R0.3	6.0	6	15	60	Short
SEMD9906005060	R0.5	6.0	6	15	60	Short
SEMD9906010060	R1.0	6.0	6	15	60	Short
SEMD9906001	R0.1	6.0	6	15	90	Regular
SEMD9906002	R0.2	6.0	6	15	90	Regular

EDP No.	Corner Radius	Mill Diameter	Shank Diameter	Length of Cut	Overall Length	Remark
	R	D1	D2	L1	L2	
SEMD9906003	R0.3	6.0	6	15	90	Regular
SEMD9906005	R0.5	6.0	6	15	90	Regular
SEMD9906010	R1.0	6.0	6	15	90	Regular
SEMD9906015	R1.5	6.0	6	15	90	Regular
SEMD9906020	R2.0	6.0	6	15	90	Regular
SEMD9906005110	R0.5	6.0	6	15	110	Long Shank
SEMD9906010110	R1.0	6.0	6	15	110	Long Shank
SEMD9906005130	R0.5	6.0	6	15	130	Long Shank
SEMD9906010130	R1.0	6.0	6	15	130	Long Shank
SEMD9907001	R0.1	7.0	8	16	90	-
SEMD9907002	R0.2	7.0	8	16	90	-
SEMD9907003	R0.3	7.0	8	16	90	-
SEMD9907005	R0.5	7.0	8	16	90	-
SEMD9907010	R1.0	7.0	8	16	90	-
SEMD9907020	R2.0	7.0	8	16	90	-
SEMD9908003070	R0.3	8.0	8	20	70	Short
SEMD9908005070	R0.5	8.0	8	20	70	Short
SEMD9908010070	R1.0	8.0	8	20	70	Short
SEMD9908001	R0.1	8.0	8	20	100	Regular
SEMD9908002	R0.2	8.0	8	20	100	Regular
SEMD9908003	R0.3	8.0	8	20	100	Regular
SEMD9908005	R0.5	8.0	8	20	100	Regular
SEMD9908010	R1.0	8.0	8	20	100	Regular
SEMD9908015	R1.5	8.0	8	20	100	Regular
SEMD9908020	R2.0	8.0	8	20	100	Regular
SEMD9908025	R2.5	8.0	8	20	100	Regular
SEMD9908030	R3.0	8.0	8	20	100	Regular
SEMD9908005120	R0.5	8.0	8	20	120	Long Shank

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◎: Excellent ○: Good

ISO	P										M				K					
	Non-alloy steel					Low alloy steel					High alloyed steel, and tool steel				Stainless steel		Grey cast iron	Nodular cast iron	Malleable cast iron	
Material Description	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc	13	25	28	32	30	10	29	32	38	15	35	15	23	10	10	26	3	25	21	21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend	○	○	◎	◎	◎	○	◎	◎	◎	○	◎	○	◎	◎	○	○	○	○	○	○

ISO	N					S					H										
	Aluminum-wrought alloy		Aluminum-cast, alloyed		Copper and Copper Alloys (Bronze / Brass)	Non Metallic Materials			Heat Resistant Super Alloys		Titanium Alloys	Hardened steel	Chilled Cast Iron	Hardened Cast Iron							
Material Description	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc	60	100	75	90	130	110	90	100			15	30	25	38	34	400 Rm	1050 Rm	55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○

◎: Excellent ○: Good

ISO	P										M				K					
	Non-alloy steel					Low alloy steel					High alloyed steel, and tool steel				Stainless steel		Grey cast iron	Nodular cast iron	Malleable cast iron	
Material Description	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc	13	25	28	32	30	10	29	32	38	15	35	15	23	10	10	26	3	25	21	21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend	○	○	◎	◎	◎	○	◎	◎	◎	○	◎	○	◎	◎	○	○	○	○	○	○

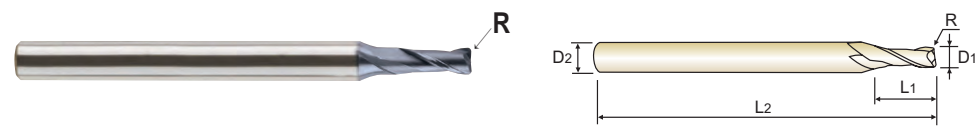
ISO	N					S					H										
	Aluminum-wrought alloy		Aluminum-cast, alloyed		Copper and Copper Alloys (Bronze / Brass)	Non Metallic Materials			Heat Resistant Super Alloys		Titanium Alloys	Hardened steel	Chilled Cast Iron	Hardened Cast Iron							
Material Description	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc	60	100	75	90	130	110	90	100			15	30	25	38	34	400 Rm	1050 Rm	55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○



PLAIN SHANK SEMD99 SERIES

**CARBIDE, 2 FLUTE CORNER RADIUS (Short, Regular, Long Shank)**

- ▶ Due to new coating and new tool geometry, outstanding cutting ability and wear resistance.
- ▶ Excellent for cutting prehardened steels, carbon steels, alloy steels of molds and dies, up to HRc55 and machine parts.
- ▶ Available short, regular and long shank end mills.
- ▶ Available various corner radius end mills, from 0.02 mm to 5.0mm corner radius.



p.C324-C325

◇ Call for Availability

EDP No.	Corner Radius	Mill Diameter	Shank Diameter	Length of Cut	Overall Length	Remark
	R	D1	D2	L1	L2	
SEMD9908010120	R1.0	8.0	8	20	120	Long Shank
SEMD9908015150	R0.5	8.0	8	20	150	Long Shank
SEMD9908010150	R1.0	8.0	8	20	150	Long Shank
SEMD9910003075	R0.3	10.0	10	25	75	Short
SEMD9910005075	R0.5	10.0	10	25	75	Short
SEMD9910010075	R1.0	10.0	10	25	75	Short
SEMD9910001	R0.1	10.0	10	25	100	Regular
SEMD9910002	R0.2	10.0	10	25	100	Regular
SEMD9910003	R0.3	10.0	10	25	100	Regular
SEMD9910005	R0.5	10.0	10	25	100	Regular
SEMD9910010	R1.0	10.0	10	25	100	Regular
SEMD9910015	R1.5	10.0	10	25	100	Regular
SEMD9910020	R2.0	10.0	10	25	100	Regular
SEMD9910025	R2.5	10.0	10	25	100	Regular
SEMD9910030	R3.0	10.0	10	25	100	Regular
SEMD9910040	R4.0	10.0	10	25	100	Regular
SEMD9910005130	R0.5	10.0	10	25	130	Long Shank
SEMD9910010130	R1.0	10.0	10	25	130	Long Shank
SEMD9910005150	R0.5	10.0	10	25	150	Long Shank
SEMD9910010150	R1.0	10.0	10	25	150	Long Shank
SEMD9911002	R0.2	11.0	12	25	110	-
SEMD9911003	R0.3	11.0	12	25	110	-
SEMD9911005	R0.5	11.0	12	25	110	-
SEMD9911010	R1.0	11.0	12	25	110	-
SEMD9911020	R2.0	11.0	12	25	110	-
SEMD9912003080	R0.3	12.0	12	30	80	Short
SEMD9912005080	R0.5	12.0	12	30	80	Short
SEMD9912010080	R1.0	12.0	12	30	80	Short

▶ NEXT PAGE

◎: Excellent ○: Good

ISO	P										M				K					
	Non-alloy steel					Low alloy steel					High alloyed steel, and tool steel				Stainless steel		Grey cast iron	Nodular cast iron	Malleable cast iron	
Material Description	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc	13	25	28	32	30	10	29	32	38	15	35	15	23	10	10	26	3	25	21	21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend	○	○	◎	◎	◎	○	◎	◎	◎	○	◎	○	○	○	○	○	○	○	○	○

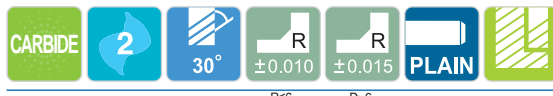
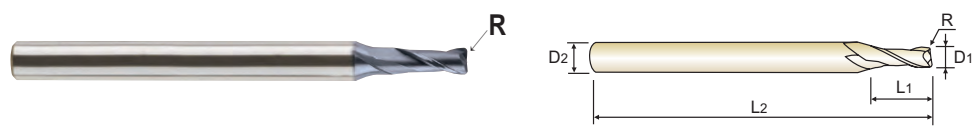
ISO	N					S					H										
	Aluminum-wrought alloy		Aluminum-cast, alloyed		Copper and Copper Alloys (Bronze / Brass)	Non Metallic Materials		Heat Resistant Super Alloys			Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron						
Material Description	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc	60	100	75	90	130	110	90	100			15	30	25	38	34	400 Rm	1050 Rm	55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○



PLAIN SHANK SEMD99 SERIES

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p.C324-C325

◇ Call for Availability

EDP No.	Corner Radius	Mill Diameter	Shank Diameter	Length of Cut	Overall Length	Remark
	R	D1	D2	L1	L2	
SEMD9912001	R0.1	12.0	12	30	110	Regular
SEMD9912002	R0.2	12.0	12	30	110	Regular
SEMD9912003	R0.3	12.0	12	30	110	Regular
SEMD9912005	R0.5	12.0	12	30	110	Regular
SEMD9912010	R1.0	12.0	12	30	110	Regular
SEMD9912015	R1.5	12.0	12	30	110	Regular
SEMD9912020	R2.0	12.0	12	30	110	Regular
SEMD9912025	R2.5	12.0	12	30	110	Regular
SEMD9912030	R3.0	12.0	12	30	110	Regular
SEMD9912040	R4.0	12.0	12	30	110	Regular
SEMD9912050	R5.0	12.0	12	30	110	Regular
SEMD9912005130	R0.5	12.0	12	30	130	Long Shank
SEMD9912010130	R1.0	12.0	12	30	130	Long Shank
SEMD9912005150	R0.5	12.0	12	30	150	Long Shank
SEMD9912010150	R1.0	12.0	12	30	150	Long Shank
SEMD9914005	R0.5	14.0	16	35	150	-
SEMD9914010	R1.0	14.0	16	35	150	-
SEMD9914020	R2.0	14.0	16	35	150	-
SEMD9916005	R0.5	16.0	16	32	150	-
SEMD9916010	R1.0	16.0	16	32	150	-
SEMD9916015	R1.5	16.0	16	32	150	-
SEMD9916020	R2.0	16.0	16	32	150	-
SEMD9920005	R0.5	20.0	20	38	150	-
SEMD9920010	R1.0	20.0	20	38	150	-
SEMD9920015	R1.5	20.0	20	38	150	-
SEMD9920020	R2.0	20.0	20	38	150	-

Size	Corner Radius Tolerance (mm)	Mill Dia. Tolerance (mm)	Shank Dia. Tolerance
up to Ø6	±0.010	0~-0.012	h5
over Ø6	±0.015	0~-0.015	

◎: Excellent ○: Good

ISO	P										M				K					
	Non-alloy steel					Low alloy steel					High alloyed steel, and tool steel				Stainless steel		Grey cast iron	Nodular cast iron	Malleable cast iron	
Material Description	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc	13	25	28	32	30	10	29	32	38	15	35	15	23	10	10	26	3	25	21	21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend	○	○	◎	◎	◎	○	◎	◎	◎	○	◎	○	○	○	○	○	○	○	○	○

ISO	N					S					H										
	Aluminum-wrought alloy		Aluminum-cast, alloyed		Copper and Copper Alloys (Bronze / Brass)	Non Metallic Materials		Heat Resistant Super Alloys			Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron						
Material Description	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc	60	100	75	90	130	110	90	100			15	30	25	38	34	400 Rm	1050 Rm	55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○

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PLAIN SHANK SEME61 SERIES



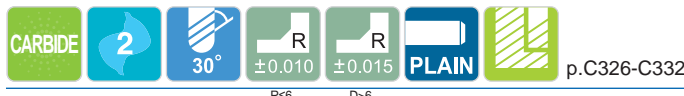
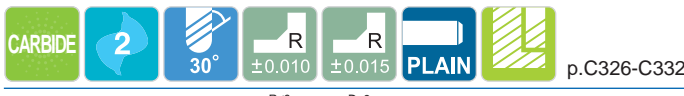
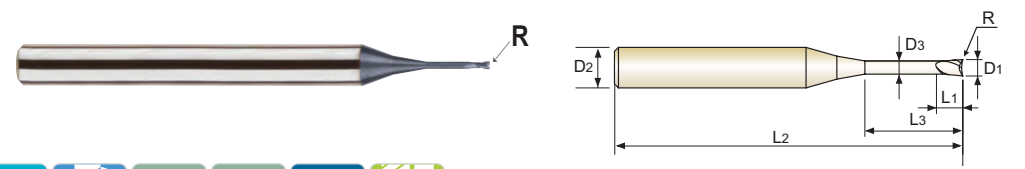
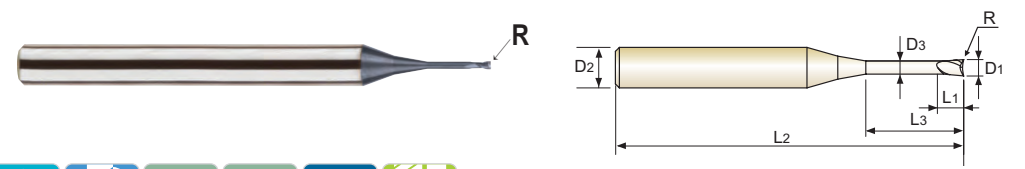
PLAIN SHANK SEME61 SERIES

**CARBIDE, 2 FLUTE LONG NECK CORNER RADIUS**

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◇ Call for Availability

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EDP No.	Corner Radius R	Mill Diameter D1	Shank Diameter D2	Length of Cut L1	Length Below Shank L3	Overall Length L2	Neck Diameter D3	Remark
SEME61002002005	R0.02	0.2	4	0.3	0.5	40	0.17	-
SEME6100200201	R0.02	0.2	4	0.3	1	40	0.17	-
SEME61002002015	R0.02	0.2	4	0.3	1.5	40	0.17	-
SEME6100200202	R0.02	0.2	4	0.3	2	40	0.17	-
SEME61002005005	R0.05	0.2	4	0.3	0.5	40	0.17	-
SEME6100200501	R0.05	0.2	4	0.3	1	40	0.17	-
SEME61002005015	R0.05	0.2	4	0.3	1.5	40	0.17	-
SEME6100200502	R0.05	0.2	4	0.3	2	40	0.17	-
SEME6100300201	R0.02	0.3	4	0.5	1	40	0.27	-
SEME6100300202	R0.02	0.3	4	0.5	2	40	0.27	-
SEME6100300203	R0.02	0.3	4	0.5	3	40	0.27	-
SEME6100300501	R0.05	0.3	4	0.5	1	40	0.27	-
SEME6100300502	R0.05	0.3	4	0.5	2	40	0.27	-
SEME6100300503	R0.05	0.3	4	0.5	3	40	0.27	-
SEME6100400501	R0.05	0.4	4	0.6	1	40	0.37	-
SEME61004005015	R0.05	0.4	4	0.6	1.5	40	0.37	-
SEME6100400502	R0.05	0.4	4	0.6	2	40	0.37	-
SEME61004005025	R0.05	0.4	4	0.6	2.5	40	0.37	-
SEME6100400503	R0.05	0.4	4	0.6	3	40	0.37	-
SEME6100400504	R0.05	0.4	4	0.6	4	40	0.37	-
SEME610040101	R0.1	0.4	4	0.6	1	40	0.37	-
SEME6100401015	R0.1	0.4	4	0.6	1.5	40	0.37	-
SEME610040102	R0.1	0.4	4	0.6	2	40	0.37	-
SEME6100401025	R0.1	0.4	4	0.6	2.5	40	0.37	-
SEME610040103	R0.1	0.4	4	0.6	3	40	0.37	-
SEME610040104	R0.1	0.4	4	0.6	4	40	0.37	-
SEME6100500501	R0.05	0.5	4	0.7	1	45	0.45	-
SEME61005005015	R0.05	0.5	4	0.7	1.5	45	0.45	-

EDP No.	Corner Radius R	Mill Diameter D1	Shank Diameter D2	Length of Cut L1	Length Below Shank L3	Overall Length L2	Neck Diameter D3	Remark
SEME6100500502	R0.05	0.5	4	0.7	2	45	0.45	-
SEME61005005025	R0.05	0.5	4	0.7	2.5	45	0.45	-
SEME6100500503	R0.05	0.5	4	0.7	3	45	0.45	-
SEME6100500504	R0.05	0.5	4	0.7	4	45	0.45	-
SEME6100500505	R0.05	0.5	4	0.7	5	45	0.45	-
SEME6100500506	R0.05	0.5	4	0.7	6	45	0.45	-
SEME610050101	R0.1	0.5	4	0.7	1	45	0.45	-
SEME6100501015	R0.1	0.5	4	0.7	1.5	45	0.45	-
SEME610050102	R0.1	0.5	4	0.7	2	45	0.45	-
SEME6100501025	R0.1	0.5	4	0.7	2.5	45	0.45	-
SEME610050103	R0.1	0.5	4	0.7	3	45	0.45	-
SEME610050104	R0.1	0.5	4	0.7	4	45	0.45	-
SEME610050105	R0.1	0.5	4	0.7	5	45	0.45	-
SEME610050106	R0.1	0.5	4	0.7	6	45	0.45	-
SEME6100600502	R0.05	0.6	4	0.9	2	45	0.55	-
SEME6100600503	R0.05	0.6	4	0.9	3	45	0.55	-
SEME6100600504	R0.05	0.6	4	0.9	4	45	0.55	-
SEME6100600506	R0.05	0.6	4	0.9	6	45	0.55	-
SEME6100600508	R0.05	0.6	4	0.9	8	45	0.55	-
SEME6100600510	R0.05	0.6	4	0.9	10	45	0.55	-
SEME610060102	R0.1	0.6	4	0.9	2	45	0.55	-
SEME610060103	R0.1	0.6	4	0.9	3	45	0.55	-
SEME610060104	R0.1	0.6	4	0.9	4	45	0.55	-
SEME610060106	R0.1	0.6	4	0.9	6	45	0.55	-
SEME610060108	R0.1	0.6	4	0.9	8	45	0.55	-
SEME610060110	R0.1	0.6	4	0.9	10	45	0.55	-
SEME610060202	R0.2	0.6	4	0.9	2	45	0.55	-
SEME610060203	R0.2	0.6	4	0.9	3	45	0.55	-

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◎ : Excellent ○ : Good

◎ : Excellent ○ : Good

ISO Material Description	P										M				K					
	Non-alloy steel					Low alloy steel					High alloyed steel, and tool steel				Stainless steel		Grey cast iron		Nodular cast iron	Malleable cast iron
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc	13	25	28	32	30	10	29	32	38	15	35	15	23	10	10	26	3	25	21	21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend	○	○	◎	◎	◎	○	◎	◎	◎	○	◎	○	○	○	○	○	○	○	○	○

ISO Material Description	N					S					H										
	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys			Titanium Alloys	Hardened steel	Chilled Cast Iron	Hardened Cast Iron				
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○

ISO Material Description	P										M				K					
	Non-alloy steel					Low alloy steel					High alloyed steel, and tool steel				Stainless steel		Grey cast iron		Nodular cast iron	Malleable cast iron
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc	13	25	28	32	30	10	29	32	38	15	35	15	23	10	10	26	3	25	21	21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend	○	○	◎	◎	◎	○	◎	◎	◎	○	◎	○	○	○	○	○	○	○	○	○

ISO Material Description	N					S					H										
	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys			Titanium Alloys	Hardened steel	Chilled Cast Iron	Hardened Cast Iron				
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○



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# YG 4G MILL END MILLS

PLAIN SHANK SEME61 SERIES

# YG 4G MILL END MILLS

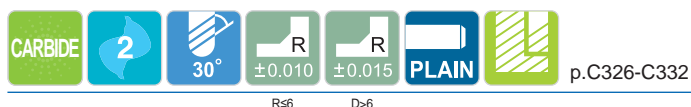
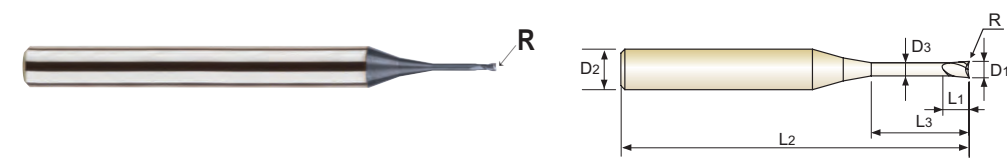
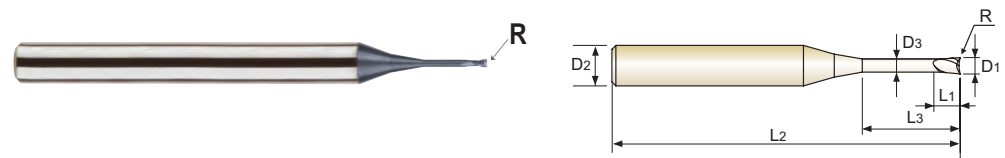
PLAIN SHANK SEME61 SERIES

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Call for Availability

Call for Availability

EDP No.	Corner Radius	Mill Diameter	Shank Diameter	Length of Cut	Length Below Shank	Overall Length	Neck Diameter	Remark
	R	D1	D2	L1	L3	L2	D3	
SEME610060204	R0.2	0.6	4	0.9	4	45	0.55	-
SEME610060206	R0.2	0.6	4	0.9	6	45	0.55	-
SEME610060208	R0.2	0.6	4	0.9	8	45	0.55	-
SEME610060210	R0.2	0.6	4	0.9	10	45	0.55	-
SEME6100700502	R0.05	0.7	4	1.2	2	45	0.65	-
SEME6100700504	R0.05	0.7	4	1.2	4	45	0.65	-
SEME6100700506	R0.05	0.7	4	1.2	6	45	0.65	-
SEME6100700508	R0.05	0.7	4	1.2	8	45	0.65	-
SEME6100700510	R0.05	0.7	4	1.2	10	45	0.65	-
SEME610070102	R0.1	0.7	4	1.2	2	45	0.65	-
SEME610070104	R0.1	0.7	4	1.2	4	45	0.65	-
SEME610070106	R0.1	0.7	4	1.2	6	45	0.65	-
SEME610070108	R0.1	0.7	4	1.2	8	45	0.65	-
SEME610070110	R0.1	0.7	4	1.2	10	45	0.65	-
SEME610070202	R0.2	0.7	4	1.2	2	45	0.65	-
SEME610070204	R0.2	0.7	4	1.2	4	45	0.65	-
SEME610070206	R0.2	0.7	4	1.2	6	45	0.65	-
SEME610070208	R0.2	0.7	4	1.2	8	45	0.65	-
SEME610070210	R0.2	0.7	4	1.2	10	45	0.65	-
SEME6100800502	R0.05	0.8	4	1.2	2	45	0.75	-
SEME6100800503	R0.05	0.8	4	1.2	3	45	0.75	-
SEME6100800504	R0.05	0.8	4	1.2	4	45	0.75	-
SEME6100800506	R0.05	0.8	4	1.2	6	45	0.75	-
SEME6100800508	R0.05	0.8	4	1.2	8	45	0.75	-
SEME6100800510	R0.05	0.8	4	1.2	10	45	0.75	-
SEME610080102	R0.1	0.8	4	1.2	2	45	0.75	-
SEME610080103	R0.1	0.8	4	1.2	3	45	0.75	-
SEME610080104	R0.1	0.8	4	1.2	4	45	0.75	-

EDP No.	Corner Radius	Mill Diameter	Shank Diameter	Length of Cut	Length Below Shank	Overall Length	Neck Diameter	Remark
	R	D1	D2	L1	L3	L2	D3	
SEME610080106	R0.1	0.8	4	1.2	6	45	0.75	-
SEME610080108	R0.1	0.8	4	1.2	8	45	0.75	-
SEME610080110	R0.1	0.8	4	1.2	10	45	0.75	-
SEME610080202	R0.2	0.8	4	1.2	2	45	0.75	-
SEME610080203	R0.2	0.8	4	1.2	3	45	0.75	-
SEME610080204	R0.2	0.8	4	1.2	4	45	0.75	-
SEME610080206	R0.2	0.8	4	1.2	6	45	0.75	-
SEME610080208	R0.2	0.8	4	1.2	8	45	0.75	-
SEME610080210	R0.2	0.8	4	1.2	10	45	0.75	-
SEME6101000503	R0.05	1.0	4	1.5	3	50	0.95	-
SEME6101000504	R0.05	1.0	4	1.5	4	50	0.95	-
SEME6101000506	R0.05	1.0	4	1.5	6	50	0.95	-
SEME6101000508	R0.05	1.0	4	1.5	8	50	0.95	-
SEME6101000510	R0.05	1.0	4	1.5	10	50	0.95	-
SEME6101000512	R0.05	1.0	4	1.5	12	50	0.95	-
SEME6101000514	R0.05	1.0	4	1.5	14	50	0.95	-
SEME6101000516	R0.05	1.0	4	1.5	16	50	0.95	-
SEME6101000520	R0.05	1.0	4	1.5	20	50	0.95	-
SEME610100103	R0.1	1.0	4	1.5	3	50	0.95	-
SEME610100104	R0.1	1.0	4	1.5	4	50	0.95	-
SEME610100106	R0.1	1.0	4	1.5	6	50	0.95	-
SEME610100108	R0.1	1.0	4	1.5	8	50	0.95	-
SEME610100110	R0.1	1.0	4	1.5	10	50	0.95	-
SEME610100112	R0.1	1.0	4	1.5	12	50	0.95	-
SEME610100114	R0.1	1.0	4	1.5	14	50	0.95	-
SEME610100116	R0.1	1.0	4	1.5	16	50	0.95	-
SEME610100120	R0.1	1.0	4	1.5	20	50	0.95	-
SEME610100203	R0.2	1.0	4	1.5	3	50	0.95	-

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ISO	P										M				K					
	Non-alloy steel					Low alloy steel					High alloyed steel, and tool steel				Stainless steel		Grey cast iron	Nodular cast iron	Malleable cast iron	
Material Description	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc	13	25	28	32	30	10	29	32	38	15	35	15	23	10	10	26	3	25	3	21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend	○	○	◎	◎	◎	○	◎	◎	◎	◎	○	◎	◎	◎	○	○	○	○	○	○

ISO	P										M				K					
	Non-alloy steel					Low alloy steel					High alloyed steel, and tool steel				Stainless steel		Grey cast iron	Nodular cast iron	Malleable cast iron	
Material Description	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc	13	25	28	32	30	10	29	32	38	15	35	15	23	10	10	26	3	25	3	21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend	○	○	◎	◎	◎	○	◎	◎	◎	◎	○	◎	◎	◎	○	○	○	○	○	○

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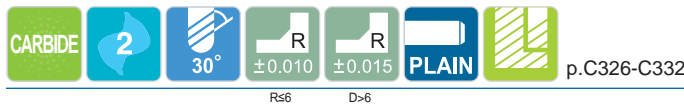
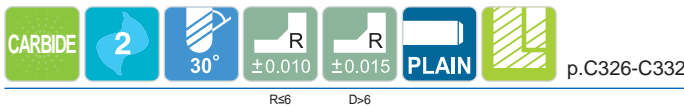
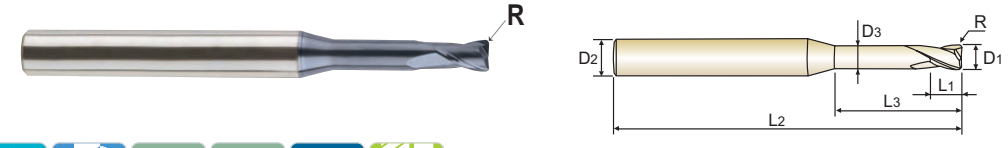
PLAIN SHANK SEME61 SERIES

CARBIDE, 2 FLUTE LONG NECK CORNER RADIUS

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Excellent for cutting prehardened steels, carbon steels, alloy steels of molds and dies, up to HRc55 and machine parts.
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Call for Availability

Call for Availability

Table with 9 columns: EDP No., Corner Radius, Mill Diameter, Shank Diameter, Length of Cut, Length Below Shank, Overall Length, Neck Diameter, Remark. Lists various SEME61 series end mill models and their specifications.

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ISO material compatibility chart for SEME61 series end mills, showing suitability for various materials like Non-alloy steel, Low alloy steel, Stainless steel, etc.

ISO material compatibility chart for SEME61 series end mills, showing suitability for various materials like Non-alloy steel, Low alloy steel, Stainless steel, etc.

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PLAIN SHANK SEME61 SERIES



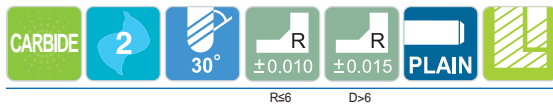
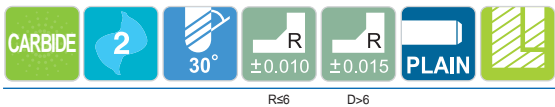
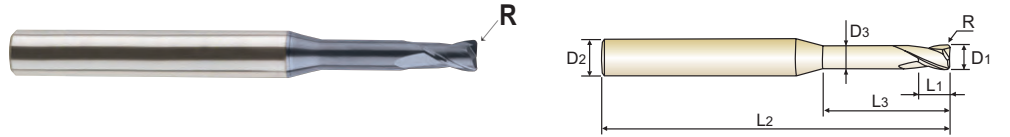
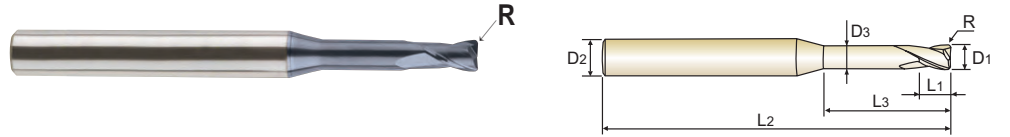
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EDP No.	Corner Radius	Mill Diameter	Shank Diameter	Length of Cut	Length Below Shank	Overall Length	Neck Diameter	Remark
	R	D1	D2	L1	L3	L2	D3	
SEME6101500520	R0.05	1.5	4	2.3	20	50	1.45	-
SEME6101500522	R0.05	1.5	4	2.3	22	60	1.45	-
SEME6101500526	R0.05	1.5	4	2.3	26	60	1.45	-
SEME610150104	R0.1	1.5	4	2.3	4	50	1.45	-
SEME610150106	R0.1	1.5	4	2.3	6	50	1.45	-
SEME610150108	R0.1	1.5	4	2.3	8	50	1.45	-
SEME610150110	R0.1	1.5	4	2.3	10	50	1.45	-
SEME610150112	R0.1	1.5	4	2.3	12	50	1.45	-
SEME610150114	R0.1	1.5	4	2.3	14	50	1.45	-
SEME610150116	R0.1	1.5	4	2.3	16	50	1.45	-
SEME610150120	R0.1	1.5	4	2.3	20	50	1.45	-
SEME610150122	R0.1	1.5	4	2.3	22	60	1.45	-
SEME610150126	R0.1	1.5	4	2.3	26	60	1.45	-
SEME610150204	R0.2	1.5	4	2.3	4	50	1.45	-
SEME610150206	R0.2	1.5	4	2.3	6	50	1.45	-
SEME610150208	R0.2	1.5	4	2.3	8	50	1.45	-
SEME610150210	R0.2	1.5	4	2.3	10	50	1.45	-
SEME610150212	R0.2	1.5	4	2.3	12	50	1.45	-
SEME610150214	R0.2	1.5	4	2.3	14	50	1.45	-
SEME610150216	R0.2	1.5	4	2.3	16	50	1.45	-
SEME610150220	R0.2	1.5	4	2.3	20	50	1.45	-
SEME610150222	R0.2	1.5	4	2.3	22	60	1.45	-
SEME610150226	R0.2	1.5	4	2.3	26	60	1.45	-
SEME610150304	R0.3	1.5	4	2.3	4	50	1.45	-
SEME610150306	R0.3	1.5	4	2.3	6	50	1.45	-
SEME610150308	R0.3	1.5	4	2.3	8	50	1.45	-
SEME610150310	R0.3	1.5	4	2.3	10	50	1.45	-
SEME610150312	R0.3	1.5	4	2.3	12	50	1.45	-

EDP No.	Corner Radius	Mill Diameter	Shank Diameter	Length of Cut	Length Below Shank	Overall Length	Neck Diameter	Remark
	R	D1	D2	L1	L3	L2	D3	
SEME610150314	R0.3	1.5	4	2.3	14	50	1.45	-
SEME610150316	R0.3	1.5	4	2.3	16	50	1.45	-
SEME610150320	R0.3	1.5	4	2.3	20	50	1.45	-
SEME610150322	R0.3	1.5	4	2.3	22	60	1.45	-
SEME610150326	R0.3	1.5	4	2.3	26	60	1.45	-
SEME610150504	R0.5	1.5	4	2.3	4	50	1.45	-
SEME610150506	R0.5	1.5	4	2.3	6	50	1.45	-
SEME610150508	R0.5	1.5	4	2.3	8	50	1.45	-
SEME610150510	R0.5	1.5	4	2.3	10	50	1.45	-
SEME610150512	R0.5	1.5	4	2.3	12	50	1.45	-
SEME610150514	R0.5	1.5	4	2.3	14	50	1.45	-
SEME610150516	R0.5	1.5	4	2.3	16	50	1.45	-
SEME610150520	R0.5	1.5	4	2.3	20	50	1.45	-
SEME610150522	R0.5	1.5	4	2.3	22	60	1.45	-
SEME610150526	R0.5	1.5	4	2.3	26	60	1.45	-
SEME610200106	R0.1	2.0	4	3	6	50	1.95	-
SEME610200108	R0.1	2.0	4	3	8	50	1.95	-
SEME610200110	R0.1	2.0	4	3	10	50	1.95	-
SEME610200112	R0.1	2.0	4	3	12	50	1.95	-
SEME610200114	R0.1	2.0	4	3	14	50	1.95	-
SEME610200116	R0.1	2.0	4	3	16	50	1.95	-
SEME610200120	R0.1	2.0	4	3	20	50	1.95	-
SEME610200122	R0.1	2.0	4	3	22	60	1.95	-
SEME610200126	R0.1	2.0	4	3	26	60	1.95	-
SEME610200130	R0.1	2.0	4	3	30	70	1.95	-
SEME610200206	R0.2	2.0	4	3	6	50	1.95	-
SEME610200208	R0.2	2.0	4	3	8	50	1.95	-
SEME610200210	R0.2	2.0	4	3	10	50	1.95	-

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ISO	P										M				K					
	Non-alloy steel					Low alloy steel					High alloyed steel, and tool steel				Stainless steel		Grey cast iron	Nodular cast iron		Malleable cast iron
Material Description	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc	13	25	28	32	30	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend	○	○	◎	◎	◎	○	◎	◎	◎	○	◎	○	○	○	○	○	○	○	○	○

ISO	N					S					H											
	Aluminum-wrought alloy		Aluminum-cast, alloyed		Copper and Copper Alloys (Bronze / Brass)	Heat Resistant Super Alloys			Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron									
Material Description	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	
HRc	60	100	75	90	130	110	90	100			15	30	25	38	34	40	55	60	42	55	55	
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550	
Recommend	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○

ISO	P										M				K						
	Non-alloy steel					Low alloy steel					High alloyed steel, and tool steel				Stainless steel		Grey cast iron	Nodular cast iron		Malleable cast iron	
Material Description	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
HRc	13	25	28	32	30	10	29	32	38	15	35	15	23	10	10	26	3	25		21	
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230	
Recommend	○	○	◎	◎	◎	○	◎	◎	◎	○	◎	○	○	○	○	○	○	○	○	○	○

ISO	N					S					H											
	Aluminum-wrought alloy		Aluminum-cast, alloyed		Copper and Copper Alloys (Bronze / Brass)	Heat Resistant Super Alloys			Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron									
Material Description	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	
HRc	60	100	75	90	130	110	90	100			15	30	25	38	34	40	55	60	42	55	55	
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550	
Recommend	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○



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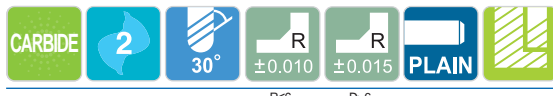
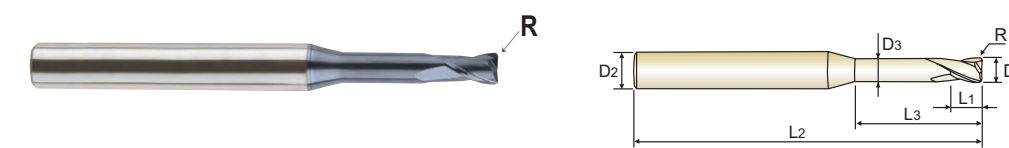
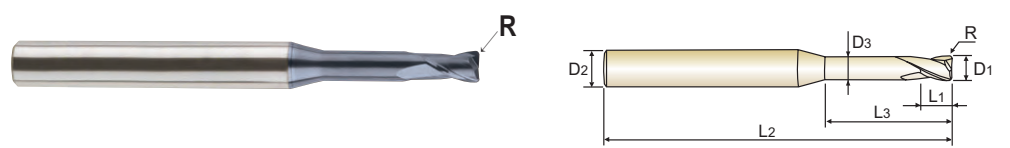
PLAIN SHANK SEME61 SERIES

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EDP No.	Corner Radius	Mill Diameter	Shank Diameter	Length of Cut	Length Below Shank	Overall Length	Neck Diameter	Remark
	R	D1	D2	L1	L3	L2	D3	
SEME610200212	R0.2	2.0	4	3	12	50	1.95	-
SEME610200214	R0.2	2.0	4	3	14	50	1.95	-
SEME610200216	R0.2	2.0	4	3	16	50	1.95	-
SEME610200220	R0.2	2.0	4	3	20	50	1.95	-
SEME610200222	R0.2	2.0	4	3	22	60	1.95	-
SEME610200226	R0.2	2.0	4	3	26	60	1.95	-
SEME610200230	R0.2	2.0	4	3	30	70	1.95	-
SEME610200306	R0.3	2.0	4	3	6	50	1.95	-
SEME610200308	R0.3	2.0	4	3	8	50	1.95	-
SEME610200310	R0.3	2.0	4	3	10	50	1.95	-
SEME610200312	R0.3	2.0	4	3	12	50	1.95	-
SEME610200314	R0.3	2.0	4	3	14	50	1.95	-
SEME610200316	R0.3	2.0	4	3	16	50	1.95	-
SEME610200320	R0.3	2.0	4	3	20	50	1.95	-
SEME610200322	R0.3	2.0	4	3	22	60	1.95	-
SEME610200326	R0.3	2.0	4	3	26	60	1.95	-
SEME610200330	R0.3	2.0	4	3	30	70	1.95	-
SEME610200506	R0.5	2.0	4	3	6	50	1.95	-
SEME610200508	R0.5	2.0	4	3	8	50	1.95	-
SEME610200510	R0.5	2.0	4	3	10	50	1.95	-
SEME610200512	R0.5	2.0	4	3	12	50	1.95	-
SEME610200514	R0.5	2.0	4	3	14	50	1.95	-
SEME610200516	R0.5	2.0	4	3	16	50	1.95	-
SEME610200520	R0.5	2.0	4	3	20	50	1.95	-
SEME610200522	R0.5	2.0	4	3	22	60	1.95	-
SEME610200526	R0.5	2.0	4	3	26	60	1.95	-
SEME610200530	R0.5	2.0	4	3	30	70	1.95	-
SEME610250108	R0.1	2.5	4	4	8	50	2.40	-

EDP No.	Corner Radius	Mill Diameter	Shank Diameter	Length of Cut	Length Below Shank	Overall Length	Neck Diameter	Remark
	R	D1	D2	L1	L3	L2	D3	
SEME610250110	R0.1	2.5	4	4	10	50	2.40	-
SEME610250112	R0.1	2.5	4	4	12	50	2.40	-
SEME610250114	R0.1	2.5	4	4	14	50	2.40	-
SEME610250116	R0.1	2.5	4	4	16	50	2.40	-
SEME610250120	R0.1	2.5	4	4	20	50	2.40	-
SEME610250126	R0.1	2.5	4	4	26	60	2.40	-
SEME610250130	R0.1	2.5	4	4	30	70	2.40	-
SEME610250208	R0.2	2.5	4	4	8	50	2.40	-
SEME610250210	R0.2	2.5	4	4	10	50	2.40	-
SEME610250212	R0.2	2.5	4	4	12	50	2.40	-
SEME610250214	R0.2	2.5	4	4	14	50	2.40	-
SEME610250216	R0.2	2.5	4	4	16	50	2.40	-
SEME610250220	R0.2	2.5	4	4	20	50	2.40	-
SEME610250226	R0.2	2.5	4	4	26	60	2.40	-
SEME610250230	R0.2	2.5	4	4	30	70	2.40	-
SEME610250308	R0.3	2.5	4	4	8	50	2.40	-
SEME610250310	R0.3	2.5	4	4	10	50	2.40	-
SEME610250312	R0.3	2.5	4	4	12	50	2.40	-
SEME610250314	R0.3	2.5	4	4	14	50	2.40	-
SEME610250316	R0.3	2.5	4	4	16	50	2.40	-
SEME610250320	R0.3	2.5	4	4	20	50	2.40	-
SEME610250326	R0.3	2.5	4	4	26	60	2.40	-
SEME610250330	R0.3	2.5	4	4	30	70	2.40	-
SEME610250508	R0.5	2.5	6	4	8	50	2.40	-
SEME610250510	R0.5	2.5	6	4	10	50	2.40	-
SEME610250512	R0.5	2.5	6	4	12	50	2.40	-
SEME610250514	R0.5	2.5	6	4	14	50	2.40	-
SEME610250516	R0.5	2.5	6	4	16	50	2.40	-

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ISO	P										M				K					
	Non-alloy steel					Low alloy steel					High alloyed steel, and tool steel				Stainless steel		Grey cast iron		Nodular cast iron	Malleable cast iron
Material Description	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
VDI 3323																				
HRc	13	25	28	32	38	10	29	32	38	15	35	15	23	10	10	26	3	25	21	
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend	○	○	◎	◎	◎	○	◎	◎	◎	○	◎	○	○	○	○	○	○	○	○	○

ISO	P										M				K					
	Non-alloy steel					Low alloy steel					High alloyed steel, and tool steel				Stainless steel		Grey cast iron		Nodular cast iron	Malleable cast iron
Material Description	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
VDI 3323																				
HRc	13	25	28	32	38	10	29	32	38	15	35	15	23	10	10	26	3	25	21	
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend	○	○	◎	◎	◎	○	◎	◎	◎	○	◎	○	○	○	○	○	○	○	○	○

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PLAIN SHANK SEME61 SERIES

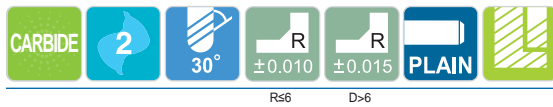
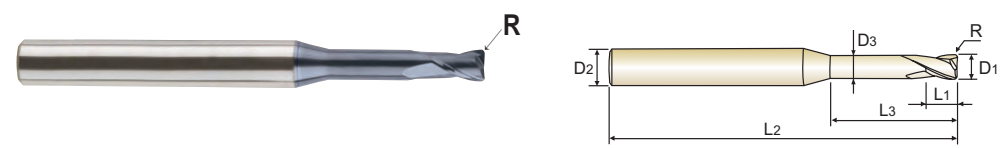
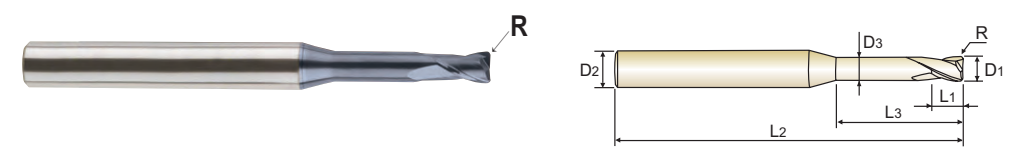
PLAIN SHANK SEME61 SERIES

### CARBIDE, 2 FLUTE LONG NECK CORNER RADIUS

### CARBIDE, 2 FLUTE LONG NECK CORNER RADIUS

- ▶ Due to new coating and new tool geometry, outstanding cutting ability and wear resistance.
- ▶ Excellent for cutting prehardened steels, carbon steels, alloy steels of molds and dies, up to HRC55 and machine parts.
- ▶ Available various products like regular length and long shank end mills etc.
- ▶ Available various corner radius end mills, from min. 0.02mm corner radius to max. 2.0 mm corner radius.
- ▶ Available more various effective length and overall length end mills than previous standard products.

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Call for Availability

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EDP No.	Corner Radius	Mill Diameter	Shank Diameter	Length of Cut	Length Below Shank	Overall Length	Neck Diameter	Remark
	R	D1	D2	L1	L3	L2	D3	
SEME610250520	R0.5	2.5	6	4	20	50	2.40	-
SEME610250526	R0.5	2.5	6	4	26	60	2.40	-
SEME610250530	R0.5	2.5	6	4	30	70	2.40	-
SEME610300108	R0.1	3.0	6	4.5	8	50	2.85	-
SEME610300110	R0.1	3.0	6	4.5	10	50	2.85	-
SEME610300112	R0.1	3.0	6	4.5	12	50	2.85	-
SEME610300114	R0.1	3.0	6	4.5	14	60	2.85	-
SEME610300116	R0.1	3.0	6	4.5	16	60	2.85	-
SEME610300120	R0.1	3.0	6	4.5	20	60	2.85	-
SEME610300126	R0.1	3.0	6	4.5	26	65	2.85	-
SEME610300130	R0.1	3.0	6	4.5	30	70	2.85	-
SEME610300135	R0.1	3.0	6	4.5	35	70	2.85	-
SEME610300140	R0.1	3.0	6	4.5	40	80	2.85	-
SEME610300208	R0.2	3.0	6	4.5	8	50	2.85	-
SEME610300210	R0.2	3.0	6	4.5	10	50	2.85	-
SEME610300212	R0.2	3.0	6	4.5	12	50	2.85	-
SEME610300214	R0.2	3.0	6	4.5	14	60	2.85	-
SEME610300216	R0.2	3.0	6	4.5	16	60	2.85	-
SEME610300220	R0.2	3.0	6	4.5	20	60	2.85	-
SEME610300226	R0.2	3.0	6	4.5	26	65	2.85	-
SEME610300230	R0.2	3.0	6	4.5	30	70	2.85	-
SEME610300235	R0.2	3.0	6	4.5	35	70	2.85	-
SEME610300240	R0.2	3.0	6	4.5	40	80	2.85	-
SEME610300308	R0.3	3.0	6	4.5	8	50	2.85	-
SEME610300310	R0.3	3.0	6	4.5	10	50	2.85	-
SEME610300312	R0.3	3.0	6	4.5	12	50	2.85	-
SEME610300314	R0.3	3.0	6	4.5	14	60	2.85	-
SEME610300316	R0.3	3.0	6	4.5	16	60	2.85	-

EDP No.	Corner Radius	Mill Diameter	Shank Diameter	Length of Cut	Length Below Shank	Overall Length	Neck Diameter	Remark
	R	D1	D2	L1	L3	L2	D3	
SEME610300320	R0.3	3.0	6	4.5	20	60	2.85	-
SEME610300326	R0.3	3.0	6	4.5	26	65	2.85	-
SEME610300330	R0.3	3.0	6	4.5	30	70	2.85	-
SEME610300335	R0.3	3.0	6	4.5	35	70	2.85	-
SEME610300340	R0.3	3.0	6	4.5	40	80	2.85	-
SEME610300508	R0.5	3.0	6	4.5	8	50	2.85	-
SEME610300510	R0.5	3.0	6	4.5	10	50	2.85	-
SEME610300512	R0.5	3.0	6	4.5	12	50	2.85	-
SEME610300514	R0.5	3.0	6	4.5	14	60	2.85	-
SEME610300516	R0.5	3.0	6	4.5	16	60	2.85	-
SEME610300520	R0.5	3.0	6	4.5	20	60	2.85	-
SEME610300526	R0.5	3.0	6	4.5	26	65	2.85	-
SEME610300530	R0.5	3.0	6	4.5	30	70	2.85	-
SEME610300535	R0.5	3.0	6	4.5	35	70	2.85	-
SEME610300540	R0.5	3.0	6	4.5	40	80	2.85	-
SEME610301008	R1.0	3.0	6	4.5	8	50	2.85	-
SEME610301010	R1.0	3.0	6	4.5	10	50	2.85	-
SEME610301012	R1.0	3.0	6	4.5	12	50	2.85	-
SEME610301014	R1.0	3.0	6	4.5	14	60	2.85	-
SEME610301016	R1.0	3.0	6	4.5	16	60	2.85	-
SEME610301020	R1.0	3.0	6	4.5	20	60	2.85	-
SEME610301026	R1.0	3.0	6	4.5	26	65	2.85	-
SEME610301030	R1.0	3.0	6	4.5	30	70	2.85	-
SEME610301035	R1.0	3.0	6	4.5	35	70	2.85	-
SEME610301040	R1.0	3.0	6	4.5	40	80	2.85	-
SEME610400110	R0.1	4.0	6	6	10	50	3.85	-
SEME610400112	R0.1	4.0	6	6	12	50	3.85	-
SEME610400114	R0.1	4.0	6	6	14	60	3.85	-

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ISO	P										M				K					
	Non-alloy steel					Low alloy steel					High alloyed steel, and tool steel				Stainless steel		Grey cast iron	Nodular cast iron		Malleable cast iron
Material Description	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
VDI 3323																				
HRC	13	25	28	32	38	10	29	32	38	15	35	15	23	10	10	26	3	25	21	
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend	○	○	◎	◎	◎	○	◎	◎	◎	○	◎	○	○	○	○	○	○	○	○	○

ISO	P										M				K					
	Non-alloy steel					Low alloy steel					High alloyed steel, and tool steel				Stainless steel		Grey cast iron	Nodular cast iron		Malleable cast iron
Material Description	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
VDI 3323																				
HRC	13	25	28	32	38	10	29	32	38	15	35	15	23	10	10	26	3	25	21	
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend	○	○	◎	◎	◎	○	◎	◎	◎	○	◎	○	○	○	○	○	○	○	○	○

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# YG 4G MILL END MILLS

PLAIN SHANK SEME61 SERIES

# YG 4G MILL END MILLS

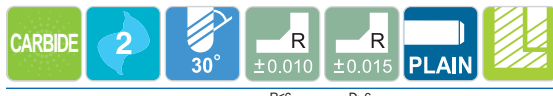
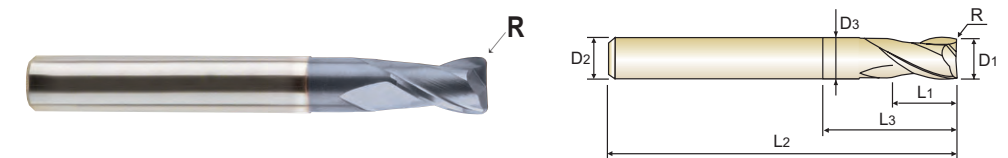
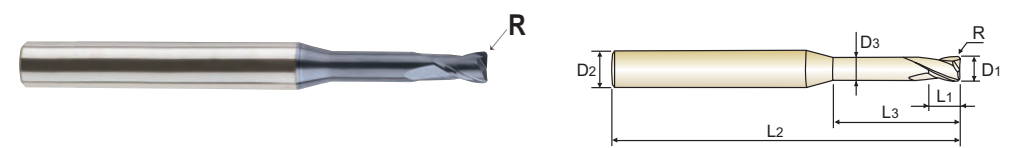
PLAIN SHANK SEME61 SERIES

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Call for Availability

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EDP No.	Corner Radius	Mill Diameter	Shank Diameter	Length of Cut	Length Below Shank	Overall Length	Neck Diameter	Remark
	R	D1	D2	L1	L3	L2	D3	
SEME610400116	R0.1	4.0	6	6	16	60	3.85	-
SEME610400120	R0.1	4.0	6	6	20	60	3.85	-
SEME610400126	R0.1	4.0	6	6	26	65	3.85	-
SEME610400130	R0.1	4.0	6	6	30	70	3.85	-
SEME610400135	R0.1	4.0	6	6	35	70	3.85	-
SEME610400140	R0.1	4.0	6	6	40	80	3.85	-
SEME610400145	R0.1	4.0	6	6	45	90	3.85	-
SEME610400150	R0.1	4.0	6	6	50	100	3.85	-
SEME610400210	R0.2	4.0	6	6	10	50	3.85	-
SEME610400212	R0.2	4.0	6	6	12	50	3.85	-
SEME610400214	R0.2	4.0	6	6	14	60	3.85	-
SEME610400216	R0.2	4.0	6	6	16	60	3.85	-
SEME610400220	R0.2	4.0	6	6	20	60	3.85	-
SEME610400226	R0.2	4.0	6	6	26	65	3.85	-
SEME610400230	R0.2	4.0	6	6	30	70	3.85	-
SEME610400235	R0.2	4.0	6	6	35	70	3.85	-
SEME610400240	R0.2	4.0	6	6	40	80	3.85	-
SEME610400245	R0.2	4.0	6	6	45	90	3.85	-
SEME610400250	R0.2	4.0	6	6	50	100	3.85	-
SEME610400310	R0.3	4.0	6	6	10	50	3.85	-
SEME610400312	R0.3	4.0	6	6	12	50	3.85	-
SEME610400314	R0.3	4.0	6	6	14	50	3.85	-
SEME610400316	R0.3	4.0	6	6	16	50	3.85	-
SEME610400320	R0.3	4.0	6	6	20	50	3.85	-
SEME610400326	R0.3	4.0	6	6	26	65	3.85	-
SEME610400330	R0.3	4.0	6	6	30	70	3.85	-
SEME610400335	R0.3	4.0	6	6	35	70	3.85	-
SEME610400340	R0.3	4.0	6	6	40	80	3.85	-

EDP No.	Corner Radius	Mill Diameter	Shank Diameter	Length of Cut	Length Below Shank	Overall Length	Neck Diameter	Remark
	R	D1	D2	L1	L3	L2	D3	
SEME610400345	R0.3	4.0	6	6	45	90	3.85	-
SEME610400350	R0.3	4.0	6	6	50	100	3.85	-
SEME610400510	R0.5	4.0	6	6	10	50	3.85	-
SEME610400512	R0.5	4.0	6	6	12	50	3.85	-
SEME610400514	R0.5	4.0	6	6	14	60	3.85	-
SEME610400516	R0.5	4.0	6	6	16	60	3.85	-
SEME610400520	R0.5	4.0	6	6	20	60	3.85	-
SEME610400526	R0.5	4.0	6	6	26	65	3.85	-
SEME610400530	R0.5	4.0	6	6	30	70	3.85	-
SEME610400535	R0.5	4.0	6	6	35	70	3.85	-
SEME610400540	R0.5	4.0	6	6	40	80	3.85	-
SEME610400545	R0.5	4.0	6	6	45	90	3.85	-
SEME610400550	R0.5	4.0	6	6	50	100	3.85	-
SEME610401010	R1.0	4.0	6	6	10	50	3.85	-
SEME610401012	R1.0	4.0	6	6	12	50	3.85	-
SEME610401014	R1.0	4.0	6	6	14	60	3.85	-
SEME610401016	R1.0	4.0	6	6	16	60	3.85	-
SEME610401020	R1.0	4.0	6	6	20	60	3.85	-
SEME610401026	R1.0	4.0	6	6	26	65	3.85	-
SEME610401030	R1.0	4.0	6	6	30	70	3.85	-
SEME610401035	R1.0	4.0	6	6	35	70	3.85	-
SEME610401040	R1.0	4.0	6	6	40	80	3.85	-
SEME610401045	R1.0	4.0	6	6	45	90	3.85	-
SEME610401050	R1.0	4.0	6	6	50	100	3.85	-
SEME6105001	R0.1	5.0	6	8	15	60	4.85	-
SEME6105002	R0.2	5.0	6	8	15	60	4.85	-
SEME6105003	R0.3	5.0	6	8	15	60	4.85	-
SEME6105005	R0.5	5.0	6	8	15	60	4.85	-

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ISO	P										M				K					
	Non-alloy steel					Low alloy steel					High alloyed steel, and tool steel				Stainless steel		Grey cast iron		Nodular cast iron	Malleable cast iron
Material Description	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc	13	25	28	32	30	10	29	32	38	15	35	15	23	10	10	26	3	25	21	21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend	○	○	◎	◎	◎	○	◎	◎	◎	○	◎	○	○	○	○	○	○	○	○	○

ISO	N					S					H											
	Aluminum-wrought alloy		Aluminum-cast, alloyed		Copper and Copper Alloys (Bronze / Brass)	Non Metallic Materials			Heat Resistant Super Alloys		Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron							
Material Description	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	
HRc	60	100	75	90	130	110	90	100			15	30	25	38	34	40	55	60	42	55	55	
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550	
Recommend	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○

ISO	P										M				K						
	Non-alloy steel					Low alloy steel					High alloyed steel, and tool steel				Stainless steel		Grey cast iron		Nodular cast iron	Malleable cast iron	
Material Description	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
HRc	13	25	28	32	30	10	29	32	38	15	35	15	23	10	10	26	3	25	21	21	
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230	
Recommend	○	○	◎	◎	◎	○	◎	◎	◎	○	◎	○	○	○	○	○	○	○	○	○	○

ISO	N					S					H											
	Aluminum-wrought alloy		Aluminum-cast, alloyed		Copper and Copper Alloys (Bronze / Brass)	Non Metallic Materials			Heat Resistant Super Alloys		Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron							
Material Description	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	
HRc	60	100	75	90	130	110	90	100			15	30	25	38	34	40	55	60	42	55	55	
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550	
Recommend	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○



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PLAIN SHANK SEME61 SERIES



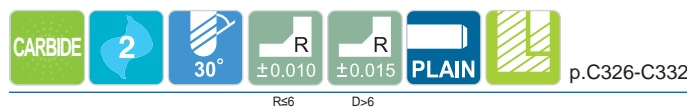
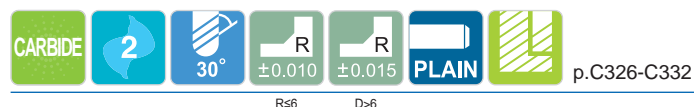
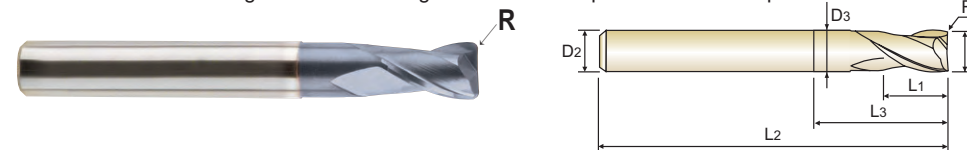
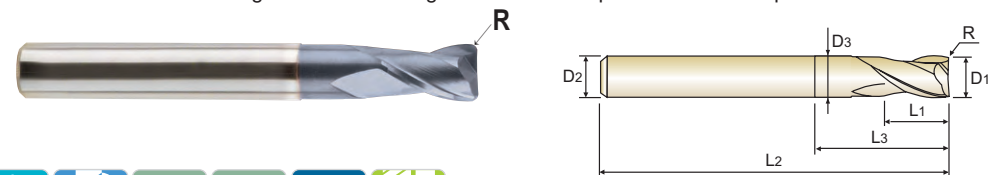
PLAIN SHANK SEME61 SERIES

CARBIDE, 2 FLUTE LONG NECK CORNER RADIUS

CARBIDE, 2 FLUTE LONG NECK CORNER RADIUS

- ▶ Due to new coating and new tool geometry, outstanding cutting ability and wear resistance.
- ▶ Excellent for cutting prehardened steels, carbon steels, alloy steels of molds and dies, up to HRc55 and machine parts.
- ▶ Available various products like regular length and long shank end mills etc.
- ▶ Available various corner radius end mills, from min. 0.02mm corner radius to max. 2.0 mm corner radius.
- ▶ Available more various effective length and overall length end mills than previous standard products.

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Call for Availability

Call for Availability

EDP No.	Corner Radius	Mill Diameter	Shank Diameter	Length of Cut	Length Below Shank	Overall Length	Neck Diameter	Remark
	R	D1	D2	L1	L3	L2	D3	
SEME6105010	R1.0	5.0	6	8	15	60	4.85	-
SEME6105015	R1.5	5.0	6	8	15	60	4.85	-
SEME6105020	R2.0	5.0	6	8	15	60	4.85	-
SEME6106001	R0.1	6.0	6	9	20	60	5.85	Regular
SEME6106002	R0.2	6.0	6	9	20	60	5.85	Regular
SEME6106003	R0.3	6.0	6	9	20	60	5.85	Regular
SEME6106005	R0.5	6.0	6	9	20	60	5.85	Regular
SEME6106010	R1.0	6.0	6	9	20	60	5.85	Regular
SEME6106015	R1.5	6.0	6	9	20	60	5.85	Regular
SEME6106020	R2.0	6.0	6	9	20	60	5.85	Regular
SEME6106003090	R0.3	6.0	6	15	30	90	5.85	Long Shank
SEME6106005090	R0.5	6.0	6	15	30	90	5.85	Long Shank
SEME6106010090	R1.0	6.0	6	15	30	90	5.85	Long Shank
SEME6108001	R0.1	8.0	8	12	25	70	7.70	Regular
SEME6108002	R0.2	8.0	8	12	25	70	7.70	Regular
SEME6108003	R0.3	8.0	8	12	25	70	7.70	Regular
SEME6108005	R0.5	8.0	8	12	25	70	7.70	Regular
SEME6108010	R1.0	8.0	8	12	25	70	7.70	Regular
SEME6108015	R1.5	8.0	8	12	25	70	7.70	Regular
SEME6108020	R2.0	8.0	8	12	25	70	7.70	Regular
SEME6108003100	R0.3	8.0	8	20	35	100	7.70	Long Shank
SEME6108005100	R0.5	8.0	8	20	35	100	7.70	Long Shank
SEME6108010100	R1.0	8.0	8	20	35	100	7.70	Long Shank
SEME6110001	R0.1	10.0	10	15	30	75	9.70	Regular
SEME6110002	R0.2	10.0	10	15	30	75	9.70	Regular
SEME6110003	R0.3	10.0	10	15	30	75	9.70	Regular
SEME6110005	R0.5	10.0	10	15	30	75	9.70	Regular
SEME6110010	R1.0	10.0	10	15	30	75	9.70	Regular

EDP No.	Corner Radius	Mill Diameter	Shank Diameter	Length of Cut	Length Below Shank	Overall Length	Neck Diameter	Remark
	R	D1	D2	L1	L3	L2	D3	
SEME6110015	R1.5	10.0	10	15	30	75	9.70	Regular
SEME6110020	R2.0	10.0	10	15	30	75	9.70	Regular
SEME6110003100	R0.3	10.0	10	25	40	100	9.70	Long Shank
SEME6110005100	R0.5	10.0	10	25	40	100	9.70	Long Shank
SEME6110010100	R1.0	10.0	10	25	40	100	9.70	Long Shank
SEME6112002	R0.2	12.0	12	18	32	80	11.70	Regular
SEME6112003	R0.3	12.0	12	18	32	80	11.70	Regular
SEME6112005	R0.5	12.0	12	18	32	80	11.70	Regular
SEME6112010	R1.0	12.0	12	18	32	80	11.70	Regular
SEME6112015	R1.5	12.0	12	18	32	80	11.70	Regular
SEME6112020	R2.0	12.0	12	18	32	80	11.70	Regular
SEME6112003110	R0.3	12.0	12	30	50	110	11.70	Long Shank
SEME6112005110	R0.5	12.0	12	30	50	110	11.70	Long Shank
SEME6112010110	R1.0	12.0	12	30	50	110	11.70	Long Shank
SEME6116005	R0.5	16.0	16	20	35	100	15.70	Regular
SEME6116010	R1.0	16.0	16	20	35	100	15.70	Regular
SEME6116005150	R0.5	16.0	16	35	50	150	15.70	Long Shank
SEME6116010150	R1.0	16.0	16	35	50	150	15.70	Long Shank
SEME6120005	R0.5	20.0	20	25	40	100	19.70	Regular
SEME6120010	R1.0	20.0	20	25	40	100	19.70	Regular
SEME6120005150	R0.5	20.0	20	40	55	150	19.70	Long Shank
SEME6120010150	R1.0	20.0	20	40	55	150	19.70	Long Shank

Size	Corner Radius Tolerance (mm)	Mill Dia. Tolerance (mm)	Shank Dia. Tolerance
up to Ø6	±0.010	0~-0.012	h5
over Ø6	±0.015	0~-0.015	

▶ NEXT PAGE

◎: Excellent ○: Good

ISO Material Description	P										M				K						
	Non-alloy steel					Low alloy steel					High alloyed steel, and tool steel				Stainless steel		Grey cast iron		Nodular cast iron		Malleable cast iron
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
HRc	13	25	28	32	30	10	29	32	38	15	35	15	23	10	10	26	3	25	21	21	
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230	
Recommend	○	○	◎	◎	◎	○	◎	◎	◎	○	◎	○	◎	○	○	○	○	○	○	○	

ISO Material Description	P										M				K						
	Non-alloy steel					Low alloy steel					High alloyed steel, and tool steel				Stainless steel		Grey cast iron		Nodular cast iron		Malleable cast iron
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
HRc	13	25	28	32	30	10	29	32	38	15	35	15	23	10	10	26	3	25	21	21	
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230	
Recommend	○	○	◎	◎	◎	○	◎	◎	◎	○	◎	○	◎	○	○	○	○	○	○	○	

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PLAIN SHANK SEME01 SERIES

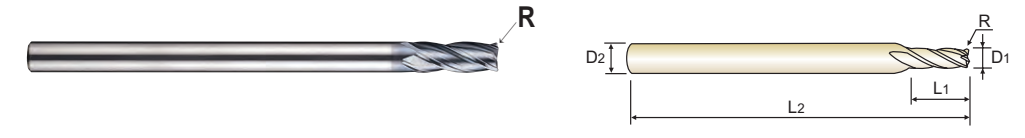
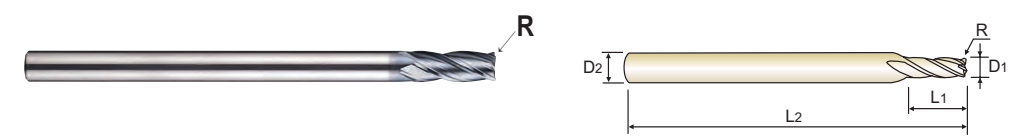
PLAIN SHANK SEME01 SERIES

CARBIDE, 4 FLUTE CORNER RADIUS (Short, Regular, Long Shank)

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- ▶ Due to new coating and new tool geometry, outstanding cutting ability and wear resistance.
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Call for Availability

Call for Availability

EDP No.	Corner Radius	Mill Diameter	Shank Diameter	Length of Cut	Overall Length	Remark
	R	D1	D2	L1	L2	
SEME01010005	R0.05	1.0	6	2.5	50	-
SEME01010001	R0.1	1.0	6	2.5	50	-
SEME01010002	R0.2	1.0	6	2.5	50	-
SEME01010003	R0.3	1.0	6	2.5	50	-
SEME01012005	R0.05	1.2	6	3	50	-
SEME01012001	R0.1	1.2	6	3	50	-
SEME01012002	R0.2	1.2	6	3	50	-
SEME01012003	R0.3	1.2	6	3	50	-
SEME01015005	R0.05	1.5	6	4	50	-
SEME01015001	R0.1	1.5	6	4	50	-
SEME01015002	R0.2	1.5	6	4	50	-
SEME01015003	R0.3	1.5	6	4	50	-
SEME01015005	R0.5	1.5	6	4	50	-
SEME01020001	R0.1	2.0	6	6	50	-
SEME01020002	R0.2	2.0	6	6	50	-
SEME01020003	R0.3	2.0	6	6	50	-
SEME01020005	R0.5	2.0	6	6	50	-
SEME01025001	R0.1	2.5	6	7	60	-
SEME01025002	R0.2	2.5	6	7	60	-
SEME01025003	R0.3	2.5	6	7	60	-
SEME01025005	R0.5	2.5	6	7	60	-
SEME01030001	R0.1	3.0	6	8	60	-
SEME01030002	R0.2	3.0	6	8	60	-
SEME01030003	R0.3	3.0	6	8	60	-
SEME01030005	R0.5	3.0	6	8	60	-
SEME01030010	R1.0	3.0	6	8	60	-
SEME01035001	R0.1	3.5	6	10	70	-
SEME01035002	R0.2	3.5	6	10	70	-

EDP No.	Corner Radius	Mill Diameter	Shank Diameter	Length of Cut	Overall Length	Remark
	R	D1	D2	L1	L2	
SEME01035003	R0.3	3.5	6	10	70	-
SEME01035005	R0.5	3.5	6	10	70	-
SEME01040014S	R0.1	4.0	4	10	70	4mm Shank
SEME01040024S	R0.2	4.0	4	10	70	4mm Shank
SEME01040034S	R0.3	4.0	4	10	70	4mm Shank
SEME01040054S	R0.5	4.0	4	10	70	4mm Shank
SEME01040104S	R1.0	4.0	4	10	70	4mm Shank
SEME01040011004S	R0.1	4.0	4	10	100	4mm Shank
SEME01040021004S	R0.2	4.0	4	10	100	4mm Shank
SEME01040031004S	R0.3	4.0	4	10	100	4mm Shank
SEME01040051004S	R0.5	4.0	4	10	100	4mm Shank
SEME01040101004S	R1.0	4.0	4	10	100	4mm Shank
SEME01040001	R0.1	4.0	6	10	70	Regular
SEME01040002	R0.2	4.0	6	10	70	Regular
SEME01040003	R0.3	4.0	6	10	70	Regular
SEME01040005	R0.5	4.0	6	10	70	Regular
SEME01040010	R1.0	4.0	6	10	70	Regular
SEME01045001	R0.1	4.5	6	11	80	-
SEME01045002	R0.2	4.5	6	11	80	-
SEME01045003	R0.3	4.5	6	11	80	-
SEME01045005	R0.5	4.5	6	11	80	-
SEME01050001	R0.1	5.0	6	13	90	-
SEME01050002	R0.2	5.0	6	13	90	-
SEME01050003	R0.3	5.0	6	13	90	-
SEME01050005	R0.5	5.0	6	13	90	-
SEME01050010	R1.0	5.0	6	13	90	-
SEME01055001	R0.1	5.5	6	13	90	-
SEME01055002	R0.2	5.5	6	13	90	-

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◎: Excellent ○: Good

ISO Material Description	P										M				K						
	Non-alloy steel					Low alloy steel					High alloyed steel, and tool steel				Stainless steel		Grey cast iron		Nodular cast iron		Malleable cast iron
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
HRC	13	25	28	32	30	10	29	32	38	15	35	15	23	10	10	26	3	25	21	21	
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230	
Recommend	○	○	◎	◎	◎	○	◎	◎	◎	○	◎	○	○	○	○	○	○	○	○	○	

ISO Material Description	N					S					H										
	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)		Non Metallic Materials			Heat Resistant Super Alloys		Titanium Alloys	Hardened steel	Chilled Cast Iron	Hardened Cast Iron					
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRC	21	22	23	24	25	26	27	28	29	30	15	30	25	38	34	36	37	55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○

◎: Excellent ○: Good

ISO Material Description	P										M				K						
	Non-alloy steel					Low alloy steel					High alloyed steel, and tool steel				Stainless steel		Grey cast iron		Nodular cast iron		Malleable cast iron
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
HRC	13	25	28	32	30	10	29	32	38	15	35	15	23	10	10	26	3	25	21	21	
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230	
Recommend	○	○	◎	◎	◎	○	◎	◎	◎	○	◎	○	○	○	○	○	○	○	○	○	

ISO Material Description	N					S					H										
	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)		Non Metallic Materials			Heat Resistant Super Alloys		Titanium Alloys	Hardened steel	Chilled Cast Iron	Hardened Cast Iron					
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRC	21	22	23	24	25	26	27	28	29	30	15	30	25	38	34	36	37	55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○

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# YG 4G MILL END MILLS

PLAIN SHANK SEME01 SERIES

# YG 4G MILL END MILLS

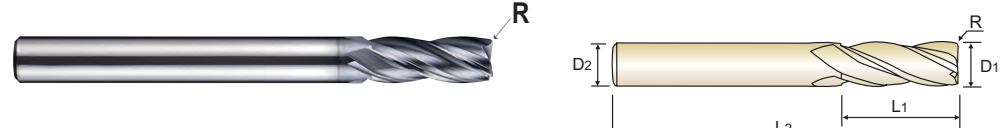
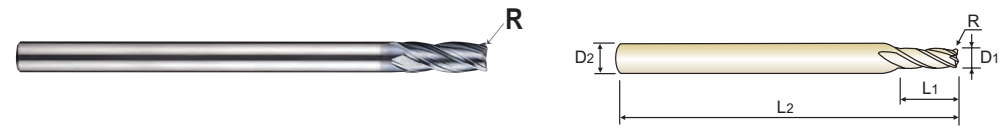
PLAIN SHANK SEME01 SERIES

## CARBIDE, 4 FLUTE CORNER RADIUS (Short, Regular, Long Shank)

## CARBIDE, 4 FLUTE CORNER RADIUS (Short, Regular, Long Shank)

- ▶ Due to new coating and new tool geometry, outstanding cutting ability and wear resistance.
- ▶ Excellent performance when cutting prehardened steels, up to HRC55 which are used for molds & dies.
- ▶ Due to Multiple Helix for 3.0mm and over 3.0mm diameter end mills, vibration can be minimized at cutting, and wear of cutting tool can be decreased too.
- ▶ Available various products like short, regular and long shank end mills etc.

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CARBIDE 4 27°/30° ±0.02 PLAIN p.C333-C334

CARBIDE 4 27°/30° ±0.02 PLAIN p.C333-C334

Call for Availability

Call for Availability

EDP No.	Corner Radius	Mill Diameter	Shank Diameter	Length of Cut	Overall Length	Remark
	R	D1	D2	L1	L2	
SEME0105503	R0.3	5.5	6	13	90	-
SEME0105505	R0.5	5.5	6	13	90	-
SEME0105510	R1.0	5.5	6	13	90	-
SEME0106001060	R0.1	6.0	6	15	60	Short
SEME0106002060	R0.2	6.0	6	15	60	Short
SEME0106001	R0.1	6.0	6	15	90	Regular
SEME0106002	R0.2	6.0	6	15	90	Regular
SEME0106003	R0.3	6.0	6	15	90	Regular
SEME0106005	R0.5	6.0	6	15	90	Regular
SEME0106010	R1.0	6.0	6	15	90	Regular
SEME0106015	R1.5	6.0	6	15	90	Regular
SEME0106020	R2.0	6.0	6	15	90	Regular
SEME0106005110	R0.5	6.0	6	15	110	Long Shank
SEME0106010110	R1.0	6.0	6	15	110	Long Shank
SEME0106005130	R0.5	6.0	6	15	130	Long Shank
SEME0106010130	R1.0	6.0	6	15	130	Long Shank
SEME0107001	R0.1	7.0	8	16	90	-
SEME0107002	R0.2	7.0	8	16	90	-
SEME0107003	R0.3	7.0	8	16	90	-
SEME0107005	R0.5	7.0	8	16	90	-
SEME0107010	R1.0	7.0	8	16	90	-
SEME0107020	R2.0	7.0	8	16	90	-
SEME0108003070	R0.3	8.0	8	20	70	Short
SEME0108005070	R0.5	8.0	8	20	70	Short
SEME0108010070	R1.0	8.0	8	20	70	Short
SEME0108001	R0.1	8.0	8	20	100	Regular
SEME0108002	R0.2	8.0	8	20	100	Regular
SEME0108003	R0.3	8.0	8	20	100	Regular

EDP No.	Corner Radius	Mill Diameter	Shank Diameter	Length of Cut	Overall Length	Remark
	R	D1	D2	L1	L2	
SEME0108005	R0.5	8.0	8	20	100	Regular
SEME0108010	R1.0	8.0	8	20	100	Regular
SEME0108015	R1.5	8.0	8	20	100	Regular
SEME0108020	R2.0	8.0	8	20	100	Regular
SEME0108025	R2.5	8.0	8	20	100	Regular
SEME0108030	R3.0	8.0	8	20	100	Regular
SEME0108005120	R0.5	8.0	8	20	120	Long Shank
SEME0108010120	R1.0	8.0	8	20	120	Long Shank
SEME0108005150	R0.5	8.0	8	20	150	Long Shank
SEME0108010150	R1.0	8.0	8	20	150	Long Shank
SEME0110003075	R0.3	10.0	10	25	75	Short
SEME0110005075	R0.5	10.0	10	25	75	Short
SEME0110010075	R1.0	10.0	10	25	75	Short
SEME0110001	R0.1	10.0	10	25	100	Regular
SEME0110002	R0.2	10.0	10	25	100	Regular
SEME0110003	R0.3	10.0	10	25	100	Regular
SEME0110005	R0.5	10.0	10	25	100	Regular
SEME0110010	R1.0	10.0	10	25	100	Regular
SEME0110015	R1.5	10.0	10	25	100	Regular
SEME0110020	R2.0	10.0	10	25	100	Regular
SEME0110025	R2.5	10.0	10	25	100	Regular
SEME0110030	R3.0	10.0	10	25	100	Regular
SEME0110040	R4.0	10.0	10	25	100	Regular
SEME0110005130	R0.5	10.0	10	22	130	Long Shank
SEME0110010130	R1.0	10.0	10	22	130	Long Shank
SEME0110005150	R0.5	10.0	10	22	150	Long Shank
SEME0110010150	R1.0	10.0	10	22	150	Long Shank
SEME0111002	R0.2	11.0	12	25	110	-

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◎: Excellent ○: Good

ISO	P										M				K						
	Non-alloy steel					Low alloy steel					High alloyed steel, and tool steel				Stainless steel		Grey cast iron		Nodular cast iron		Malleable cast iron
Material Description	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
HRC	13	25	28	32	30	10	29	32	38	15	35	15	23	10	10	26	3	25	21	21	
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230	
Recommend	○	○	◎	◎	◎	○	◎	◎	◎	○	◎	○	○	○	○	○	○	○	○	○	

ISO	N					S					H										
	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys			Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron			
Material Description	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRC	21	22	23	24	25	26	27	28	29	30	15	30	25	38	34	36	37	55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○

◎: Excellent ○: Good

ISO	P										M				K						
	Non-alloy steel					Low alloy steel					High alloyed steel, and tool steel				Stainless steel		Grey cast iron		Nodular cast iron		Malleable cast iron
Material Description	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
HRC	13	25	28	32	30	10	29	32	38	15	35	15	23	10	10	26	3	25	21	21	
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230	
Recommend	○	○	◎	◎	◎	○	◎	◎	◎	○	◎	○	○	○	○	○	○	○	○	○	○

ISO	N					S					H										
	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys			Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron			
Material Description	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRC	21	22	23	24	25	26	27	28	29	30	15	30	25	38	34	36	37	55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○

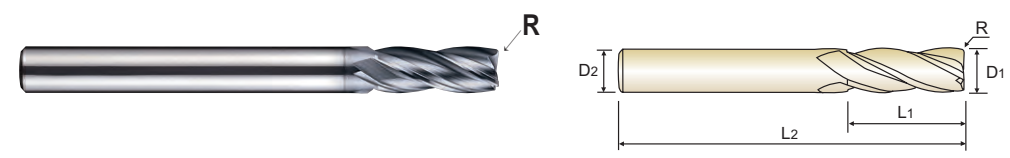




PLAIN SHANK SEME01 SERIES

### CARBIDE, 4 FLUTE CORNER RADIUS (Short, Regular, Long Shank)

- ▶ Due to new coating and new tool geometry, outstanding cutting ability and wear resistance.
- ▶ Excellent performance when cutting prehardened steels, up to HRC55 which are used for molds & dies.
- ▶ Due to Multiple Helix for 3.0mm and over 3.0mm diameter end mills, vibration can be minimized at cutting, and wear of cutting tool can be decreased too.
- ▶ Available various products like short, regular and long shank end mills etc.



CARBIDE 4 27°/30° ±0.02 PLAIN p.C333-C334

◇ Call for Availability

EDP No.	Corner Radius	Mill Diameter	Shank Diameter	Length of Cut	Overall Length	Remark
	R	D1	D2	L1	L2	
SEME0111003	R0.3	11.0	12	25	110	-
SEME0111005	R0.5	11.0	12	25	110	-
SEME0111010	R1.0	11.0	12	25	110	-
SEME0111020	R2.0	11.0	12	25	110	-
SEME0112003080	R0.3	12.0	12	30	80	Short
SEME0112005080	R0.5	12.0	12	30	80	Short
SEME0112010080	R1.0	12.0	12	30	80	Short
SEME0112001	R0.1	12.0	12	30	110	Regular
SEME0112002	R0.2	12.0	12	30	110	Regular
SEME0112003	R0.3	12.0	12	30	110	Regular
SEME0112005	R0.5	12.0	12	30	110	Regular
SEME0112010	R1.0	12.0	12	30	110	Regular
SEME0112015	R1.5	12.0	12	30	110	Regular
SEME0112020	R2.0	12.0	12	30	110	Regular
SEME0112025	R2.5	12.0	12	30	110	Regular
SEME0112030	R3.0	12.0	12	30	110	Regular
SEME0112040	R4.0	12.0	12	30	110	Regular
SEME0112050	R5.0	12.0	12	30	110	Regular
SEME0112005130	R0.5	12.0	12	30	130	Long Shank
SEME0112010130	R1.0	12.0	12	30	130	Long Shank
SEME0112005150	R0.5	12.0	12	30	130	Long Shank
SEME0112010150	R1.0	12.0	12	30	130	Long Shank
SEME0114005	R0.5	14.0	16	35	150	-
SEME0114010	R1.0	14.0	16	35	150	-
SEME0114020	R2.0	14.0	16	35	150	-
SEME0116005	R0.5	16.0	16	32	150	-
SEME0116010	R1.0	16.0	16	32	150	-
SEME0116015	R1.5	16.0	16	32	150	-

▶ NEXT PAGE

◎: Excellent ○: Good

ISO Material Description	P										M				K						
	Non-alloy steel					Low alloy steel					High alloyed steel, and tool steel				Stainless steel		Grey cast iron		Nodular cast iron		Malleable cast iron
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
HRC	13	25	28	32	30	10	29	32	38	15	35	15	23	10	10	26	3	25	21	21	
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230	
Recommend	○	○	◎	○	○	◎	◎	◎	◎	○	◎	○	○	○	○	○	○	○	○	○	

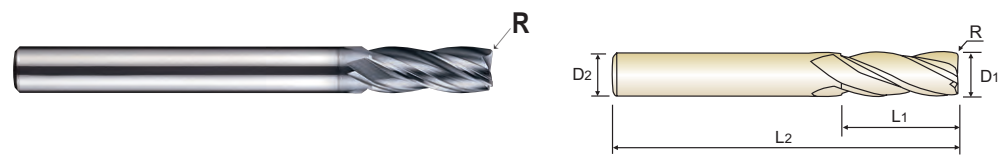
ISO Material Description	N					S					H										
	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys			Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron			
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRC	21	22	23	24	25	26	27	28	29	30	15	30	25	38	34	36	37	55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○



PLAIN SHANK SEME01 SERIES

### CARBIDE, 4 FLUTE CORNER RADIUS (Short, Regular, Long Shank)

- ▶ Due to new coating and new tool geometry, outstanding cutting ability and wear resistance.
- ▶ Excellent performance when cutting prehardened steels, up to HRC55 which are used for molds & dies.
- ▶ Due to Multiple Helix for 3.0mm and over 3.0mm diameter end mills, vibration can be minimized at cutting, and wear of cutting tool can be decreased too.
- ▶ Available various products like short, regular and long shank end mills etc.



CARBIDE 4 27°/30° ±0.02 PLAIN p.C333-C334

◇ Call for Availability

EDP No.	Corner Radius	Mill Diameter	Shank Diameter	Length of Cut	Overall Length	Remark
	R	D1	D2	L1	L2	
SEME0116020	R2.0	16.0	16	32	150	-
SEME0120005	R0.5	20.0	20	38	150	-
SEME0120010	R1.0	20.0	20	38	150	-
SEME0120015	R1.5	20.0	20	38	150	-
SEME0120020	R2.0	20.0	20	38	150	-

Mill Dia. Tolerance (mm)	Corner Radius Tolerance (mm)	Shank Dia. Tolerance
0~-0.03	±0.02	h5

◎: Excellent ○: Good

ISO Material Description	P										M				K						
	Non-alloy steel					Low alloy steel					High alloyed steel, and tool steel				Stainless steel		Grey cast iron		Nodular cast iron		Malleable cast iron
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
HRC	13	25	28	32	30	10	29	32	38	15	35	15	23	10	10	26	3	25	21	21	
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230	
Recommend	○	○	◎	◎	◎	○	◎	◎	◎	○	◎	○	○	○	○	○	○	○	○	○	

ISO Material Description	N					S					H										
	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys			Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron			
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRC	21	22	23	24	25	26	27	28	29	30	15	30	25	38	34	36	37	55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○

HSS

HSS

# YG 4G MILL END MILLS

# YG 4G MILL END MILLS

PLAIN SHANK SEME64 SERIES

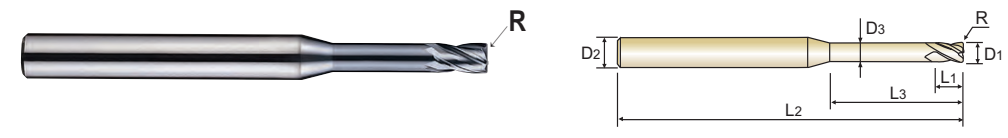
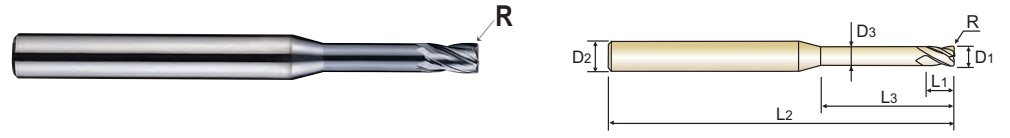
PLAIN SHANK SEME64 SERIES

## CARBIDE, 4 FLUTE LONG NECK CORNER RADIUS

## CARBIDE, 4 FLUTE LONG NECK CORNER RADIUS

- ▶ Due to new coating and new tool geometry, outstanding cutting ability and wear resistance.
- ▶ Excellent performance when cutting prehardened steels, up to HRC55 which are used for molds & dies.
- ▶ Due to Multiple Helix for 3.0mm and over 3.0mm diameter end mills, vibration can be minimized at cutting, and wear of cutting tool can be decreased too.

- ▶ Due to new coating and new tool geometry, outstanding cutting ability and wear resistance.
- ▶ Excellent performance when cutting prehardened steels, up to HRC55 which are used for molds & dies.
- ▶ Due to Multiple Helix for 3.0mm and over 3.0mm diameter end mills, vibration can be minimized at cutting, and wear of cutting tool can be decreased too.



CARBIDE 4 27°/30° ±0.02 PLAIN p.C335-C339

CARBIDE 4 27°/30° ±0.02 PLAIN p.C335-C339

Call for Availability

Call for Availability

EDP No.	Corner Radius R	Mill Diameter D1	Shank Diameter D2	Length of Cut L1	Length Below Shank L3	Overall Length L2	Neck Diameter D3	Remark
SEME6401000503	R0.05	1.0	4	1.5	3	50	0.95	-
SEME6401000504	R0.05	1.0	4	1.5	4	50	0.95	-
SEME6401000506	R0.05	1.0	4	1.5	6	50	0.95	-
SEME6401000508	R0.05	1.0	4	1.5	8	50	0.95	-
SEME6401000510	R0.05	1.0	4	1.5	10	50	0.95	-
SEME6401000512	R0.05	1.0	4	1.5	12	50	0.95	-
SEME6401000514	R0.05	1.0	4	1.5	14	50	0.95	-
SEME6401000516	R0.05	1.0	4	1.5	16	50	0.95	-
SEME6401000520	R0.05	1.0	4	1.5	20	50	0.95	-
SEME640100103	R0.1	1.0	4	1.5	3	50	0.95	-
SEME640100104	R0.1	1.0	4	1.5	4	50	0.95	-
SEME640100106	R0.1	1.0	4	1.5	6	50	0.95	-
SEME640100108	R0.1	1.0	4	1.5	8	50	0.95	-
SEME640100110	R0.1	1.0	4	1.5	10	50	0.95	-
SEME640100112	R0.1	1.0	4	1.5	12	50	0.95	-
SEME640100114	R0.1	1.0	4	1.5	14	50	0.95	-
SEME640100116	R0.1	1.0	4	1.5	16	50	0.95	-
SEME640100120	R0.1	1.0	4	1.5	20	50	0.95	-
SEME640100203	R0.2	1.0	4	1.5	3	50	0.95	-
SEME640100204	R0.2	1.0	4	1.5	4	50	0.95	-
SEME640100206	R0.2	1.0	4	1.5	6	50	0.95	-
SEME640100208	R0.2	1.0	4	1.5	8	50	0.95	-
SEME640100210	R0.2	1.0	4	1.5	10	50	0.95	-
SEME640100212	R0.2	1.0	4	1.5	12	50	0.95	-
SEME640100214	R0.2	1.0	4	1.5	14	50	0.95	-
SEME640100216	R0.2	1.0	4	1.5	16	50	0.95	-
SEME640100220	R0.2	1.0	4	1.5	20	50	0.95	-
SEME640100303	R0.3	1.0	4	1.5	3	50	0.95	-

EDP No.	Corner Radius R	Mill Diameter D1	Shank Diameter D2	Length of Cut L1	Length Below Shank L3	Overall Length L2	Neck Diameter D3	Remark
SEME640100304	R0.3	1.0	4	1.5	4	50	0.95	-
SEME640100306	R0.3	1.0	4	1.5	6	50	0.95	-
SEME640100308	R0.3	1.0	4	1.5	8	50	0.95	-
SEME640100310	R0.3	1.0	4	1.5	10	50	0.95	-
SEME640100312	R0.3	1.0	4	1.5	12	50	0.95	-
SEME640100314	R0.3	1.0	4	1.5	14	50	0.95	-
SEME640100316	R0.3	1.0	4	1.5	16	50	0.95	-
SEME640100320	R0.3	1.0	4	1.5	20	50	0.95	-
SEME6401200503	R0.05	1.2	4	1.8	3	50	1.15	-
SEME6401200504	R0.05	1.2	4	1.8	4	50	1.15	-
SEME6401200506	R0.05	1.2	4	1.8	6	50	1.15	-
SEME6401200508	R0.05	1.2	4	1.8	8	50	1.15	-
SEME6401200510	R0.05	1.2	4	1.8	10	50	1.15	-
SEME6401200512	R0.05	1.2	4	1.8	12	50	1.15	-
SEME6401200516	R0.05	1.2	4	1.8	16	50	1.15	-
SEME6401200520	R0.05	1.2	4	1.8	20	50	1.15	-
SEME640120103	R0.1	1.2	4	1.8	3	50	1.15	-
SEME640120104	R0.1	1.2	4	1.8	4	50	1.15	-
SEME640120106	R0.1	1.2	4	1.8	6	50	1.15	-
SEME640120108	R0.1	1.2	4	1.8	8	50	1.15	-
SEME640120110	R0.1	1.2	4	1.8	10	50	1.15	-
SEME640120112	R0.1	1.2	4	1.8	12	50	1.15	-
SEME640120116	R0.1	1.2	4	1.8	16	50	1.15	-
SEME640120120	R0.1	1.2	4	1.8	20	50	1.15	-
SEME640120203	R0.2	1.2	4	1.8	3	50	1.15	-
SEME640120204	R0.2	1.2	4	1.8	4	50	1.15	-
SEME640120206	R0.2	1.2	4	1.8	6	50	1.15	-
SEME640120208	R0.2	1.2	4	1.8	8	50	1.15	-

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◎: Excellent ○: Good

ISO Material Description	P										M				K						
	Non-alloy steel					Low alloy steel					High alloyed steel, and tool steel				Stainless steel		Grey cast iron		Nodular cast iron		Malleable cast iron
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
HRc	13	25	28	32	30	10	29	32	38	15	35	15	23	10	10	26	3	25	21	21	
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230	
Recommend	○	◎	◎	◎	◎	○	◎	◎	◎	○	◎	○	○	○	○	○	○	○	○	○	

ISO Material Description	N					S					H										
	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)		Non Metallic Materials		Heat Resistant Super Alloys			Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron				
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc	15	30	25	38	34	15	30	25	38	34	36	37	55	60	42	55	55	60	42	55	
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○

◎: Excellent ○: Good

ISO Material Description	P										M				K						
	Non-alloy steel					Low alloy steel					High alloyed steel, and tool steel				Stainless steel		Grey cast iron		Nodular cast iron		Malleable cast iron
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
HRc	13	25	28	32	30	10	29	32	38	15	35	15	23	10	10	26	3	25	21	21	
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230	
Recommend	○	◎	◎	◎	◎	○	◎	◎	◎	○	◎	○	○	○	○	○	○	○	○	○	

ISO Material Description	N					S					H										
	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)		Non Metallic Materials		Heat Resistant Super Alloys			Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron				
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc	15	30	25	38	34	15	30	25	38	34	36	37	55	60	42	55	55	60	42	55	
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○

HSS

HSS



PLAIN SHANK SEME64 SERIES

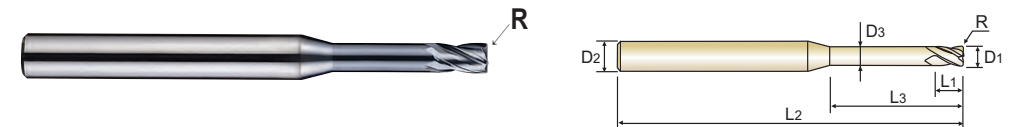
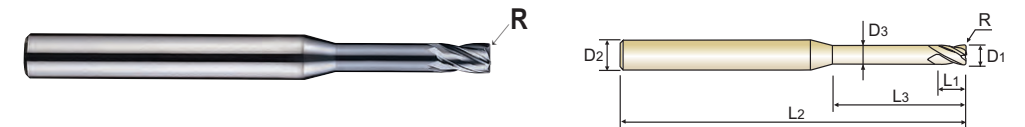
PLAIN SHANK SEME64 SERIES

### CARBIDE, 4 FLUTE LONG NECK CORNER RADIUS

### CARBIDE, 4 FLUTE LONG NECK CORNER RADIUS

- ▶ Due to new coating and new tool geometry, outstanding cutting ability and wear resistance.
- ▶ Excellent performance when cutting prehardened steels, up to HRC55 which are used for molds & dies.
- ▶ Due to Multiple Helix for 3.0mm and over 3.0mm diameter end mills, vibration can be minimized at cutting, and wear of cutting tool can be decreased too.

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Call for Availability

Call for Availability

EDP No.	Corner Radius R	Mill Diameter D1	Shank Diameter D2	Length of Cut L1	Length Below Shank L3	Overall Length L2	Neck Diameter D3	Remark
SEME640120210	R0.2	1.2	4	1.8	10	50	1.15	-
SEME640120212	R0.2	1.2	4	1.8	12	50	1.15	-
SEME640120216	R0.2	1.2	4	1.8	16	50	1.15	-
SEME640120220	R0.2	1.2	4	1.8	20	50	1.15	-
SEME640120303	R0.3	1.2	4	1.8	3	50	1.15	-
SEME640120304	R0.3	1.2	4	1.8	4	50	1.15	-
SEME640120306	R0.3	1.2	4	1.8	6	50	1.15	-
SEME640120308	R0.3	1.2	4	1.8	8	50	1.15	-
SEME640120310	R0.3	1.2	4	1.8	10	50	1.15	-
SEME640120312	R0.3	1.2	4	1.8	12	50	1.15	-
SEME640120316	R0.3	1.2	4	1.8	16	50	1.15	-
SEME640120320	R0.3	1.2	4	1.8	20	50	1.15	-
SEME6401500504	R0.05	1.5	4	2.3	4	50	1.45	-
SEME6401500506	R0.05	1.5	4	2.3	6	50	1.45	-
SEME6401500508	R0.05	1.5	4	2.3	8	50	1.45	-
SEME6401500510	R0.05	1.5	4	2.3	10	50	1.45	-
SEME6401500512	R0.05	1.5	4	2.3	12	50	1.45	-
SEME6401500514	R0.05	1.5	4	2.3	14	50	1.45	-
SEME6401500516	R0.05	1.5	4	2.3	16	50	1.45	-
SEME6401500520	R0.05	1.5	4	2.3	20	50	1.45	-
SEME6401500522	R0.05	1.5	4	2.3	22	60	1.45	-
SEME6401500526	R0.05	1.5	4	2.3	26	60	1.45	-
SEME640150104	R0.1	1.5	4	2.3	4	50	1.45	-
SEME640150106	R0.1	1.5	4	2.3	6	50	1.45	-
SEME640150108	R0.1	1.5	4	2.3	8	50	1.45	-
SEME640150110	R0.1	1.5	4	2.3	10	50	1.45	-
SEME640150112	R0.1	1.5	4	2.3	12	50	1.45	-
SEME640150114	R0.1	1.5	4	2.3	14	50	1.45	-

EDP No.	Corner Radius R	Mill Diameter D1	Shank Diameter D2	Length of Cut L1	Length Below Shank L3	Overall Length L2	Neck Diameter D3	Remark
SEME640150116	R0.1	1.5	4	2.3	16	50	1.45	-
SEME640150120	R0.1	1.5	4	2.3	20	50	1.45	-
SEME640150122	R0.1	1.5	4	2.3	22	60	1.45	-
SEME640150126	R0.1	1.5	4	2.3	26	60	1.45	-
SEME640150204	R0.2	1.5	4	2.3	4	50	1.45	-
SEME640150206	R0.2	1.5	4	2.3	6	50	1.45	-
SEME640150208	R0.2	1.5	4	2.3	8	50	1.45	-
SEME640150210	R0.2	1.5	4	2.3	10	50	1.45	-
SEME640150212	R0.2	1.5	4	2.3	12	50	1.45	-
SEME640150214	R0.2	1.5	4	2.3	14	50	1.45	-
SEME640150216	R0.2	1.5	4	2.3	16	50	1.45	-
SEME640150220	R0.2	1.5	4	2.3	20	50	1.45	-
SEME640150222	R0.2	1.5	4	2.3	22	60	1.45	-
SEME640150226	R0.2	1.5	4	2.3	26	60	1.45	-
SEME640150304	R0.3	1.5	4	2.3	4	50	1.45	-
SEME640150306	R0.3	1.5	4	2.3	6	50	1.45	-
SEME640150308	R0.3	1.5	4	2.3	8	50	1.45	-
SEME640150310	R0.3	1.5	4	2.3	10	50	1.45	-
SEME640150312	R0.3	1.5	4	2.3	12	50	1.45	-
SEME640150314	R0.3	1.5	4	2.3	14	50	1.45	-
SEME640150316	R0.3	1.5	4	2.3	16	50	1.45	-
SEME640150320	R0.3	1.5	4	2.3	20	50	1.45	-
SEME640150322	R0.3	1.5	4	2.3	22	60	1.45	-
SEME640150326	R0.3	1.5	4	2.3	26	60	1.45	-
SEME640150504	R0.5	1.5	4	2.3	4	50	1.45	-
SEME640150506	R0.5	1.5	4	2.3	6	50	1.45	-
SEME640150508	R0.5	1.5	4	2.3	8	50	1.45	-
SEME640150510	R0.5	1.5	4	2.3	10	50	1.45	-

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◎: Excellent ○: Good

ISO Material Description	P										M				K			H		
	Non-alloy steel					Low alloy steel					High alloyed steel, and tool steel				Stainless steel		Grey cast iron		Nodular cast iron	Malleable cast iron
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc	13	25	28	32	30	10	29	32	38	15	35	15	23	10	10	26	3	25	3	21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend	○	◎	◎	◎	◎	○	◎	◎	◎	○	◎	○	○	○	○	○	○	○	○	○

ISO Material Description	N					S					H										
	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)		Non Metallic Materials		Heat Resistant Super Alloys			Titanium Alloys	Hardened steel	Chilled Cast Iron	Hardened Cast Iron					
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc	15	30	25	38	34	15	30	25	38	34	36	37	55	60	42	55	60	42	55	40	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○

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ISO Material Description	P										M				K			H		
	Non-alloy steel					Low alloy steel					High alloyed steel, and tool steel				Stainless steel		Grey cast iron		Nodular cast iron	Malleable cast iron
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc	13	25	28	32	30	10	29	32	38	15	35	15	23	10	10	26	3	25	3	21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend	○	◎	◎	◎	◎	○	◎	◎	◎	○	◎	○	○	○	○	○	○	○	○	○

ISO Material Description	N					S					H										
	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)		Non Metallic Materials		Heat Resistant Super Alloys			Titanium Alloys	Hardened steel	Chilled Cast Iron	Hardened Cast Iron					
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc	15	30	25	38	34	15	30	25	38	34	36	37	55	60	42	55	60	42	55	40	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○

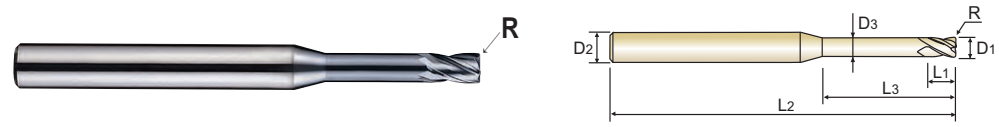




PLAIN SHANK SEME64 SERIES

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CARBIDE 4 27°/30° ±0.02 PLAIN p.C335-C339

◇ Call for Availability

EDP No.	Corner Radius R	Mill Diameter D1	Shank Diameter D2	Length of Cut L1	Length Below Shank L3	Overall Length L2	Neck Diameter D3	Remark
SEME640150512	R0.5	1.5	4	2.3	12	50	1.45	-
SEME640150514	R0.5	1.5	4	2.3	14	50	1.45	-
SEME640150516	R0.5	1.5	4	2.3	16	50	1.45	-
SEME640150520	R0.5	1.5	4	2.3	20	50	1.45	-
SEME640150522	R0.5	1.5	4	2.3	22	60	1.45	-
SEME640150526	R0.5	1.5	4	2.3	26	60	1.45	-
SEME640200106	R0.1	2.0	4	3	6	50	1.95	-
SEME640200108	R0.1	2.0	4	3	8	50	1.95	-
SEME640200110	R0.1	2.0	4	3	10	50	1.95	-
SEME640200112	R0.1	2.0	4	3	12	50	1.95	-
SEME640200114	R0.1	2.0	4	3	14	50	1.95	-
SEME640200116	R0.1	2.0	4	3	16	50	1.95	-
SEME640200120	R0.1	2.0	4	3	20	50	1.95	-
SEME640200122	R0.1	2.0	4	3	22	60	1.95	-
SEME640200126	R0.1	2.0	4	3	26	60	1.95	-
SEME640200130	R0.1	2.0	4	3	30	70	1.95	-
SEME640200206	R0.2	2.0	4	3	6	50	1.95	-
SEME640200208	R0.2	2.0	4	3	8	50	1.95	-
SEME640200210	R0.2	2.0	4	3	10	50	1.95	-
SEME640200212	R0.2	2.0	4	3	12	50	1.95	-
SEME640200214	R0.2	2.0	4	3	14	50	1.95	-
SEME640200216	R0.2	2.0	4	3	16	50	1.95	-
SEME640200220	R0.2	2.0	4	3	20	50	1.95	-
SEME640200222	R0.2	2.0	4	3	22	60	1.95	-
SEME640200226	R0.2	2.0	4	3	26	60	1.95	-
SEME640200230	R0.2	2.0	4	3	30	70	1.95	-
SEME640200306	R0.3	2.0	4	3	6	50	1.95	-
SEME640200308	R0.3	2.0	4	3	8	50	1.95	-

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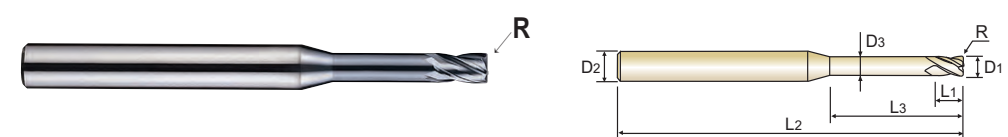
ISO	P										M				K					
	Non-alloy steel					Low alloy steel					High alloyed steel, and tool steel				Stainless steel		Grey cast iron	Nodular cast iron	Malleable cast iron	
Material Description	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc	13	25	28	32	30	10	29	32	38	15	35	15	23	10	10	26	3	25	3	21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend	○	◎	◎	◎	◎	○	◎	◎	◎	○	◎	○	○	○	○	○	○	○	○	○



PLAIN SHANK SEME64 SERIES

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CARBIDE 4 27°/30° ±0.02 PLAIN p.C335-C339

◇ Call for Availability

EDP No.	Corner Radius R	Mill Diameter D1	Shank Diameter D2	Length of Cut L1	Length Below Shank L3	Overall Length L2	Neck Diameter D3	Remark
SEME640200310	R0.3	2.0	4	3	10	50	1.95	-
SEME640200312	R0.3	2.0	4	3	12	50	1.95	-
SEME640200314	R0.3	2.0	4	3	14	50	1.95	-
SEME640200316	R0.3	2.0	4	3	16	50	1.95	-
SEME640200320	R0.3	2.0	4	3	20	50	1.95	-
SEME640200322	R0.3	2.0	4	3	22	60	1.95	-
SEME640200326	R0.3	2.0	4	3	26	60	1.95	-
SEME640200330	R0.3	2.0	4	3	30	70	1.95	-
SEME640200506	R0.5	2.0	4	3	6	50	1.95	-
SEME640200508	R0.5	2.0	4	3	8	50	1.95	-
SEME640200510	R0.5	2.0	4	3	10	50	1.95	-
SEME640200512	R0.5	2.0	4	3	12	50	1.95	-
SEME640200514	R0.5	2.0	4	3	14	50	1.95	-
SEME640200516	R0.5	2.0	4	3	16	50	1.95	-
SEME640200520	R0.5	2.0	4	3	20	50	1.95	-
SEME640200522	R0.5	2.0	4	3	22	60	1.95	-
SEME640200526	R0.5	2.0	4	3	26	60	1.95	-
SEME640200530	R0.5	2.0	4	3	30	70	1.95	-
SEME640250108	R0.1	2.5	4	4	8	50	2.40	-
SEME640250110	R0.1	2.5	4	4	10	50	2.40	-
SEME640250112	R0.1	2.5	4	4	12	50	2.40	-
SEME640250114	R0.1	2.5	4	4	14	50	2.40	-
SEME640250116	R0.1	2.5	4	4	16	50	2.40	-
SEME640250120	R0.1	2.5	4	4	20	50	2.40	-
SEME640250126	R0.1	2.5	4	4	26	60	2.40	-
SEME640250130	R0.1	2.5	4	4	30	70	2.40	-
SEME640250208	R0.2	2.5	4	4	8	50	2.40	-
SEME640250210	R0.2	2.5	4	4	10	50	2.40	-

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ISO	P										M				K					
	Non-alloy steel					Low alloy steel					High alloyed steel, and tool steel				Stainless steel		Grey cast iron	Nodular cast iron	Malleable cast iron	
Material Description	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc	13	25	28	32	30	10	29	32	38	15	35	15	23	10	10	26	3	25	3	21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend	○	◎	◎	◎	◎	○	◎	◎	◎	○	◎	○	○	○	○	○	○	○	○	○

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PLAIN SHANK SEME64 SERIES

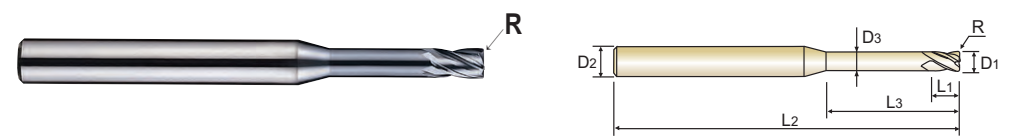
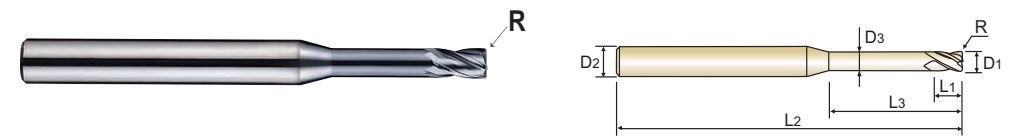
PLAIN SHANK SEME64 SERIES

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CARBIDE 4 27°/30° ±0.02 PLAIN p.C335-C339

CARBIDE 4 27°/30° ±0.02 PLAIN p.C335-C339

◇ Call for Availability

◇ Call for Availability

EDP No.	Corner Radius	Mill Diameter	Shank Diameter	Length of Cut	Length Below Shank	Overall Length	Neck Diameter	Remark
	R	D1	D2	L1	L3	L2	D3	
SEME640250212	R0.2	2.5	4	4	12	50	2.40	-
SEME640250214	R0.2	2.5	4	4	14	50	2.40	-
SEME640250216	R0.2	2.5	4	4	16	50	2.40	-
SEME640250220	R0.2	2.5	4	4	20	50	2.40	-
SEME640250226	R0.2	2.5	4	4	26	60	2.40	-
SEME640250230	R0.2	2.5	4	4	30	70	2.40	-
SEME640250308	R0.3	2.5	4	4	8	50	2.40	-
SEME640250310	R0.3	2.5	4	4	10	50	2.40	-
SEME640250312	R0.3	2.5	4	4	12	50	2.40	-
SEME640250314	R0.3	2.5	4	4	14	50	2.40	-
SEME640250316	R0.3	2.5	4	4	16	50	2.40	-
SEME640250320	R0.3	2.5	4	4	20	50	2.40	-
SEME640250326	R0.3	2.5	4	4	26	60	2.40	-
SEME640250330	R0.3	2.5	4	4	30	70	2.40	-
SEME640250508	R0.5	2.5	4	4	8	50	2.40	-
SEME640250510	R0.5	2.5	4	4	10	50	2.40	-
SEME640250512	R0.5	2.5	4	4	12	50	2.40	-
SEME640250514	R0.5	2.5	4	4	14	50	2.40	-
SEME640250516	R0.5	2.5	4	4	16	50	2.40	-
SEME640250520	R0.5	2.5	4	4	20	50	2.40	-
SEME640250526	R0.5	2.5	4	4	26	60	2.40	-
SEME640250530	R0.5	2.5	4	4	30	70	2.40	-
SEME640300108	R0.1	3.0	6	4.5	8	50	2.85	-
SEME640300110	R0.1	3.0	6	4.5	10	50	2.85	-
SEME640300112	R0.1	3.0	6	4.5	12	50	2.85	-
SEME640300114	R0.1	3.0	6	4.5	14	60	2.85	-
SEME640300116	R0.1	3.0	6	4.5	16	60	2.85	-
SEME640300120	R0.1	3.0	6	4.5	20	60	2.85	-

EDP No.	Corner Radius	Mill Diameter	Shank Diameter	Length of Cut	Length Below Shank	Overall Length	Neck Diameter	Remark
	R	D1	D2	L1	L3	L2	D3	
SEME640300126	R0.1	3.0	6	4.5	26	65	2.85	-
SEME640300130	R0.1	3.0	6	4.5	30	70	2.85	-
SEME640300135	R0.1	3.0	6	4.5	35	70	2.85	-
SEME640300140	R0.1	3.0	6	4.5	40	80	2.85	-
SEME640300208	R0.2	3.0	6	4.5	8	50	2.85	-
SEME640300210	R0.2	3.0	6	4.5	10	50	2.85	-
SEME640300212	R0.2	3.0	6	4.5	12	50	2.85	-
SEME640300214	R0.2	3.0	6	4.5	14	60	2.85	-
SEME640300216	R0.2	3.0	6	4.5	16	60	2.85	-
SEME640300220	R0.2	3.0	6	4.5	20	60	2.85	-
SEME640300226	R0.2	3.0	6	4.5	26	65	2.85	-
SEME640300230	R0.2	3.0	6	4.5	30	70	2.85	-
SEME640300235	R0.2	3.0	6	4.5	35	70	2.85	-
SEME640300240	R0.2	3.0	6	4.5	40	80	2.85	-
SEME640300308	R0.3	3.0	6	4.5	8	50	2.85	-
SEME640300310	R0.3	3.0	6	4.5	10	50	2.85	-
SEME640300312	R0.3	3.0	6	4.5	12	50	2.85	-
SEME640300314	R0.3	3.0	6	4.5	14	60	2.85	-
SEME640300316	R0.3	3.0	6	4.5	16	60	2.85	-
SEME640300320	R0.3	3.0	6	4.5	20	60	2.85	-
SEME640300326	R0.3	3.0	6	4.5	26	65	2.85	-
SEME640300330	R0.3	3.0	6	4.5	30	70	2.85	-
SEME640300335	R0.3	3.0	6	4.5	35	70	2.85	-
SEME640300340	R0.3	3.0	6	4.5	40	80	2.85	-
SEME640300508	R0.5	3.0	6	4.5	8	50	2.85	-
SEME640300510	R0.5	3.0	6	4.5	10	50	2.85	-
SEME640300512	R0.5	3.0	6	4.5	12	50	2.85	-
SEME640300514	R0.5	3.0	6	4.5	14	60	2.85	-

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ISO	P										M				K						
	Non-alloy steel					Low alloy steel					High alloyed steel, and tool steel				Stainless steel		Grey cast iron		Nodular cast iron		Malleable cast iron
Material Description	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
HRC	13	25	28	32	30	10	29	32	38	15	35	15	23	10	10	26	3	25	21	21	
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230	
Recommend	○	◎	◎	◎	○	◎	◎	◎	◎	○	◎	○	○	○	○	○	○	○	○	○	

ISO	N					S					H										
	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)		Non Metallic Materials		Heat Resistant Super Alloys			Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron				
Material Description	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRC	21	22	23	24	25	26	27	28	29	30	15	30	25	38	34	36	37	55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend																		○	◎	○	○

◎: Excellent ○: Good

ISO	P										M				K						
	Non-alloy steel					Low alloy steel					High alloyed steel, and tool steel				Stainless steel		Grey cast iron		Nodular cast iron		Malleable cast iron
Material Description	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
HRC	13	25	28	32	30	10	29	32	38	15	35	15	23	10	10	26	3	25	21	21	
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230	
Recommend	○	◎	◎	◎	○	◎	◎	◎	◎	○	◎	○	○	○	○	○	○	○	○	○	○

ISO	N					S					H										
	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)		Non Metallic Materials		Heat Resistant Super Alloys			Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron				
Material Description	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRC	21	22	23	24	25	26	27	28	29	30	15	30	25	38	34	36	37	55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend																		○	◎	○	○

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PLAIN SHANK SEME64 SERIES

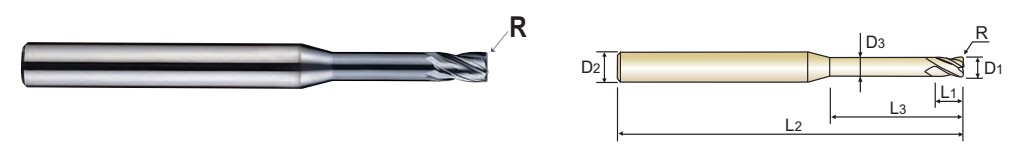
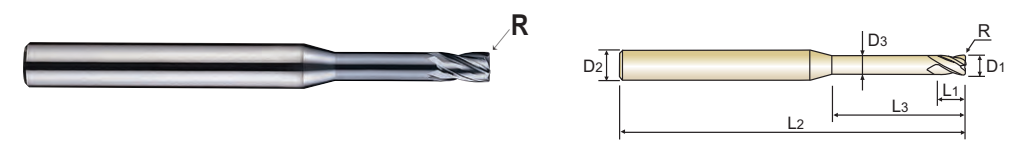
PLAIN SHANK SEME64 SERIES

### CARBIDE, 4 FLUTE LONG NECK CORNER RADIUS

### CARBIDE, 4 FLUTE LONG NECK CORNER RADIUS

- ▶ Due to new coating and new tool geometry, outstanding cutting ability and wear resistance.
- ▶ Excellent performance when cutting prehardened steels, up to HRC55 which are used for molds & dies.
- ▶ Due to Multiple Helix for 3.0mm and over 3.0mm diameter end mills, vibration can be minimized at cutting, and wear of cutting tool can be decreased too.

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Call for Availability

Call for Availability

EDP No.	Corner Radius R	Mill Diameter D1	Shank Diameter D2	Length of Cut L1	Length Below Shank L3	Overall Length L2	Neck Diameter D3	Remark
SEME640300516	R0.5	3.0	6	4.5	16	60	2.85	-
SEME640300520	R0.5	3.0	6	4.5	20	60	2.85	-
SEME640300526	R0.5	3.0	6	4.5	26	65	2.85	-
SEME640300530	R0.5	3.0	6	4.5	30	70	2.85	-
SEME640300535	R0.5	3.0	6	4.5	35	70	2.85	-
SEME640300540	R0.5	3.0	6	4.5	40	80	2.85	-
SEME640301008	R1.0	3.0	6	4.5	8	50	2.85	-
SEME640301010	R1.0	3.0	6	4.5	10	50	2.85	-
SEME640301012	R1.0	3.0	6	4.5	12	50	2.85	-
SEME640301014	R1.0	3.0	6	4.5	14	60	2.85	-
SEME640301016	R1.0	3.0	6	4.5	16	60	2.85	-
SEME640301020	R1.0	3.0	6	4.5	20	60	2.85	-
SEME640301026	R1.0	3.0	6	4.5	26	65	2.85	-
SEME640301030	R1.0	3.0	6	4.5	30	70	2.85	-
SEME640301035	R1.0	3.0	6	4.5	35	70	2.85	-
SEME640301040	R1.0	3.0	6	4.5	40	80	2.85	-
SEME640400110	R0.1	4.0	6	6	10	50	3.85	-
SEME640400112	R0.1	4.0	6	6	12	50	3.85	-
SEME640400114	R0.1	4.0	6	6	14	60	3.85	-
SEME640400116	R0.1	4.0	6	6	16	60	3.85	-
SEME640400120	R0.1	4.0	6	6	20	60	3.85	-
SEME640400126	R0.1	4.0	6	6	26	65	3.85	-
SEME640400130	R0.1	4.0	6	6	30	70	3.85	-
SEME640400135	R0.1	4.0	6	6	35	70	3.85	-
SEME640400140	R0.1	4.0	6	6	40	80	3.85	-
SEME640400145	R0.1	4.0	6	6	45	90	3.85	-
SEME640400150	R0.1	4.0	6	6	50	100	3.85	-
SEME640400210	R0.2	4.0	6	6	10	50	3.85	-

EDP No.	Corner Radius R	Mill Diameter D1	Shank Diameter D2	Length of Cut L1	Length Below Shank L3	Overall Length L2	Neck Diameter D3	Remark
SEME640400212	R0.2	4.0	6	6	12	50	3.85	-
SEME640400214	R0.2	4.0	6	6	14	60	3.85	-
SEME640400216	R0.2	4.0	6	6	16	60	3.85	-
SEME640400220	R0.2	4.0	6	6	20	60	3.85	-
SEME640400226	R0.2	4.0	6	6	26	65	3.85	-
SEME640400230	R0.2	4.0	6	6	30	70	3.85	-
SEME640400235	R0.2	4.0	6	6	35	70	3.85	-
SEME640400240	R0.2	4.0	6	6	40	80	3.85	-
SEME640400245	R0.2	4.0	6	6	45	90	3.85	-
SEME640400250	R0.2	4.0	6	6	50	100	3.85	-
SEME640400310	R0.3	4.0	6	6	10	50	3.85	-
SEME640400312	R0.3	4.0	6	6	12	50	3.85	-
SEME640400314	R0.3	4.0	6	6	14	60	3.85	-
SEME640400316	R0.3	4.0	6	6	16	60	3.85	-
SEME640400320	R0.3	4.0	6	6	20	60	3.85	-
SEME640400326	R0.3	4.0	6	6	26	65	3.85	-
SEME640400330	R0.3	4.0	6	6	30	70	3.85	-
SEME640400335	R0.3	4.0	6	6	35	70	3.85	-
SEME640400340	R0.3	4.0	6	6	40	80	3.85	-
SEME640400345	R0.3	4.0	6	6	45	90	3.85	-
SEME640400350	R0.3	4.0	6	6	50	100	3.85	-
SEME640400510	R0.5	4.0	6	6	10	50	3.85	-
SEME640400512	R0.5	4.0	6	6	12	50	3.85	-
SEME640400514	R0.5	4.0	6	6	14	60	3.85	-
SEME640400516	R0.5	4.0	6	6	16	60	3.85	-
SEME640400520	R0.5	4.0	6	6	20	60	3.85	-
SEME640400526	R0.5	4.0	6	6	26	65	3.85	-
SEME640400530	R0.5	4.0	6	6	30	70	3.85	-

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ISO	P										M				K			H		
	Non-alloy steel					Low alloy steel					High alloyed steel, and tool steel				Stainless steel		Grey cast iron	Nodular cast iron		Malleable cast iron
Material Description	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
VDI 3323																				
HRC	13	25	28	32	30	10	29	32	38	35	15	23	10	10	26	3	25	21	21	
HB	125	190	250	270	300	180	275	300	350	200	200	240	180	180	260	160	250	130	230	
Recommend	○	◎	◎	◎	◎	○	◎	◎	◎	◎	○	◎	◎	○	◎	○	◎	○	◎	

ISO	N					S					H										
	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys			Titanium Alloys	Hardened steel	Chilled Cast Iron	Hardened Cast Iron				
Material Description	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
VDI 3323																					
HRC											15	30	25	38	34	55	60	42	42	55	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend	○	◎	◎	◎	◎	○	◎	◎	◎	◎	○	◎	◎	◎	◎	○	◎	○	◎	◎	◎

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ISO	P										M				K			H		
	Non-alloy steel					Low alloy steel					High alloyed steel, and tool steel				Stainless steel		Grey cast iron	Nodular cast iron		Malleable cast iron
Material Description	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
VDI 3323																				
HRC	13	25	28	32	30	10	29	32	38	35	15	23	10	10	26	3	25	21	21	
HB	125	190	250	270	300	180	275	300	350	200	200	240	180	180	260	160	250	130	230	
Recommend	○	◎	◎	◎	◎	○	◎	◎	◎	◎	○	◎	◎	○	◎	○	◎	○	◎	

ISO	N					S					H										
	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys			Titanium Alloys	Hardened steel	Chilled Cast Iron	Hardened Cast Iron				
Material Description	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
VDI 3323																					
HRC											15	30	25	38	34	55	60	42	42	55	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend	○	◎	◎	◎	◎	○	◎	◎	◎	◎	○	◎	◎	◎	◎	○	◎	○	◎	◎	◎



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PLAIN SHANK SEME64 SERIES



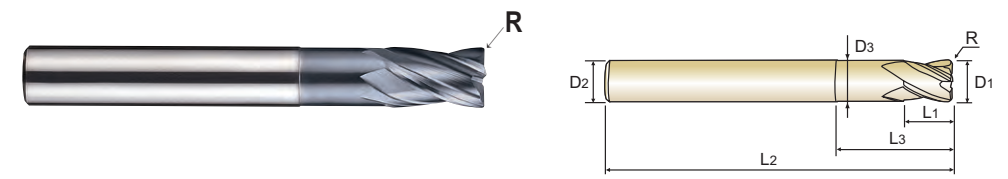
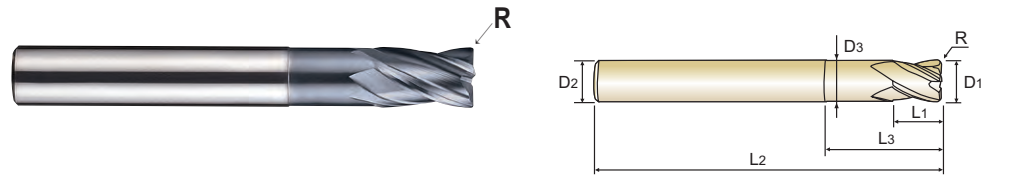
PLAIN SHANK SEME64 SERIES

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Call for Availability

Call for Availability

EDP No.	Corner Radius R	Mill Diameter D1	Shank Diameter D2	Length of Cut L1	Length Below Shank L3	Overall Length L2	Neck Diameter D3	Remark
SEME640400535	R0.5	4.0	6	6	35	70	3.85	-
SEME640400540	R0.5	4.0	6	6	40	80	3.85	-
SEME640400545	R0.5	4.0	6	6	45	90	3.85	-
SEME640400550	R0.5	4.0	6	6	50	100	3.85	-
SEME640401010	R1.0	4.0	6	6	10	50	3.85	-
SEME640401012	R1.0	4.0	6	6	12	50	3.85	-
SEME640401014	R1.0	4.0	6	6	14	60	3.85	-
SEME640401016	R1.0	4.0	6	6	16	60	3.85	-
SEME640401020	R1.0	4.0	6	6	20	60	3.85	-
SEME640401026	R1.0	4.0	6	6	26	65	3.85	-
SEME640401030	R1.0	4.0	6	6	30	70	3.85	-
SEME640401035	R1.0	4.0	6	6	35	70	3.85	-
SEME640401040	R1.0	4.0	6	6	40	80	3.85	-
SEME640401045	R1.0	4.0	6	6	45	90	3.85	-
SEME640401050	R1.0	4.0	6	6	50	100	3.85	-
SEME6405001	R0.1	5.0	6	8	15	60	4.85	-
SEME6405002	R0.2	5.0	6	8	15	60	4.85	-
SEME6405003	R0.3	5.0	6	8	15	60	4.85	-
SEME6405005	R0.5	5.0	6	8	15	60	4.85	-
SEME6405010	R1.0	5.0	6	8	15	60	4.85	-
SEME6405015	R1.5	5.0	6	8	15	60	4.85	-
SEME6405020	R2.0	5.0	6	8	15	60	4.85	-
SEME6406001	R0.1	6.0	6	9	20	60	5.85	Regular
SEME6406002	R0.2	6.0	6	9	20	60	5.85	Regular
SEME6406003	R0.3	6.0	6	9	20	60	5.85	Regular
SEME6406005	R0.5	6.0	6	9	20	60	5.85	Regular
SEME6406010	R1.0	6.0	6	9	20	60	5.85	Regular
SEME6406015	R1.5	6.0	6	9	20	60	5.85	Regular

EDP No.	Corner Radius R	Mill Diameter D1	Shank Diameter D2	Length of Cut L1	Length Below Shank L3	Overall Length L2	Neck Diameter D3	Remark
SEME6406020	R2.0	6.0	6	9	20	60	5.85	Regular
SEME6406003090	R0.3	6.0	6	15	30	90	5.85	Long Shank
SEME6406005090	R0.5	6.0	6	15	30	90	5.85	Long Shank
SEME6406010090	R1.0	6.0	6	15	30	90	5.85	Long Shank
SEME6408001	R0.1	8.0	8	12	25	70	7.70	Regular
SEME6408002	R0.2	8.0	8	12	25	70	7.70	Regular
SEME6408003	R0.3	8.0	8	12	25	70	7.70	Regular
SEME6408005	R0.5	8.0	8	12	25	70	7.70	Regular
SEME6408010	R1.0	8.0	8	12	25	70	7.70	Regular
SEME6408015	R1.5	8.0	8	12	25	70	7.70	Regular
SEME6408020	R2.0	8.0	8	12	25	70	7.70	Regular
SEME6408003100	R0.3	8.0	8	20	35	100	7.70	Long Shank
SEME6408005100	R0.5	8.0	8	20	35	100	7.70	Long Shank
SEME6408010100	R1.0	8.0	8	20	35	100	8.70	Long Shank
SEME6410001	R0.1	10.0	10	15	30	75	9.70	Regular
SEME6410002	R0.2	10.0	10	15	30	75	9.70	Regular
SEME6410003	R0.3	10.0	10	15	30	75	9.70	Regular
SEME6410005	R0.5	10.0	10	15	30	75	9.70	Regular
SEME6410010	R1.0	10.0	10	15	30	75	9.70	Regular
SEME6410015	R1.5	10.0	10	15	30	75	9.70	Regular
SEME6410020	R2.0	10.0	10	15	30	75	9.70	Regular
SEME6410003100	R0.3	10.0	10	25	40	100	9.70	Long Shank
SEME6410005100	R0.5	10.0	10	25	40	100	9.70	Long Shank
SEME6410010100	R1.0	10.0	10	25	40	100	9.70	Long Shank
SEME6412002	R0.2	12.0	12	18	32	80	11.70	Regular
SEME6412003	R0.3	12.0	12	18	32	80	11.70	Regular
SEME6412005	R0.5	12.0	12	18	32	80	11.70	Regular
SEME6412010	R1.0	12.0	12	18	32	80	11.70	Regular

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ISO	P										M				K			H		
	Non-alloy steel					Low alloy steel					High alloyed steel, and tool steel				Stainless steel		Grey cast iron	Nodular cast iron		Malleable cast iron
Material Description	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
VDI 3323																				
HRC	13	25	28	32	30	10	29	32	38	15	35	15	23	10	10	26	3	25	21	
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend	○	◎	◎	◎	◎	○	◎	◎	◎	○	◎	○	○	○	○	○	○	○	○	○

ISO	P										M				K			H		
	Non-alloy steel					Low alloy steel					High alloyed steel, and tool steel				Stainless steel		Grey cast iron	Nodular cast iron		Malleable cast iron
Material Description	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
VDI 3323																				
HRC	13	25	28	32	30	10	29	32	38	15	35	15	23	10	10	26	3	25	21	
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend	○	◎	◎	◎	◎	○	◎	◎	◎	○	◎	○	○	○	○	○	○	○	○	○

HSS

HSS

# YG 4G MILL END MILLS

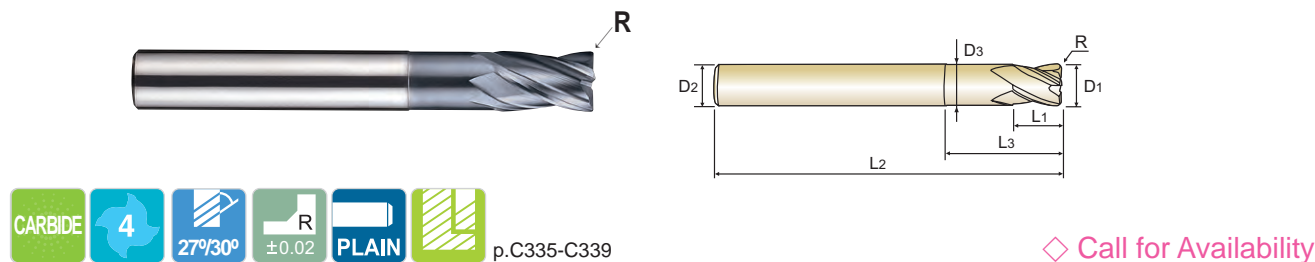
PLAIN SHANK SEME64 SERIES

# YG 4G MILL END MILLS

PLAIN SHANK SEME35 SERIES

## CARBIDE, 4 FLUTE LONG NECK CORNER RADIUS

- ▶ Due to new coating and new tool geometry, outstanding cutting ability and wear resistance.
- ▶ Excellent performance when cutting prehardened steels, up to HRC55 which are used for molds & dies.
- ▶ Due to Multiple Helix for 3.0mm and over 3.0mm diameter end mills, vibration can be minimized at cutting, and wear of cutting tool can be decreased too.



◇ Call for Availability

EDP No.	Corner Radius R	Mill Diameter D1	Shank Diameter D2	Length of Cut L1	Length Below Shank L3	Overall Length L2	Neck Diameter D3	Remark
SEME6412015	R1.5	12.0	12	18	32	80	11.70	Regular
SEME6412020	R2.0	12.0	12	18	32	80	11.70	Regular
SEME6412003110	R0.3	12.0	12	30	50	110	11.70	Long Shank
SEME6412005110	R0.5	12.0	12	30	50	110	11.70	Long Shank
SEME6412010110	R1.0	12.0	12	30	50	110	11.70	Long Shank
SEME6416005	R0.5	16.0	16	20	35	100	15.70	Regular
SEME6416010	R1.0	16.0	16	20	35	100	15.70	Regular
SEME6416005150	R0.5	16.0	20	35	50	150	15.70	Long Shank
SEME6416010150	R1.0	16.0	20	35	50	150	15.70	Long Shank
SEME641600515020	R0.5	16.0	20	35	50	150	15.70	Long Shank
SEME641601015020	R1.0	16.0	20	35	50	150	15.70	Long Shank
SEME6420005	R0.5	20.0	20	25	40	100	19.70	Regular
SEME6420010	R1.0	20.0	20	25	40	100	19.70	Regular
SEME6420005150	R0.5	20.0	20	40	55	150	19.70	Long Shank
SEME6420010150	R1.0	20.0	20	40	55	150	19.70	Long Shank

Mill Dia. Tolerance (mm)	Corner Radius Tolerance (mm)	Shank Dia. Tolerance
0~-0.03	±0.02	h5

◎ : Excellent ○ : Good

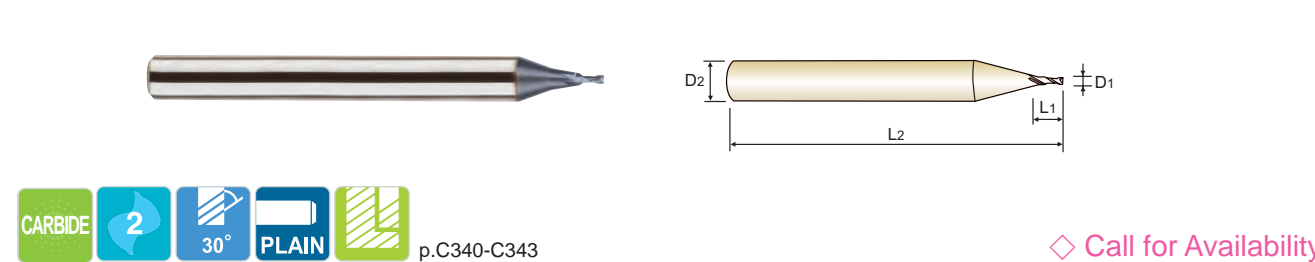
ISO	P										M				K									
	Non-alloy steel					Low alloy steel					High alloyed steel, and tool steel				Stainless steel		Grey cast iron		Nodular cast iron		Malleable cast iron			
Material Description	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
HRc	13	25	28	32	30	10	29	32	38	15	35	15	23	10	10	26	3	25	3	25	15	15	15	15
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230	130	130	130	130
Recommend	○	◎	◎	◎	◎	○	◎	◎	◎	○	◎	○	○	○	○	○	○	○	○	○	○	○	○	○

ISO	N										S					H							
	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron			
Material Description	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43
HRc	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550	550	550
Recommend	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○

## CARBIDE, 2 FLUTE

- ▶ Due to new coating and new tool geometry, outstanding cutting ability and wear resistance.
- ▶ Excellent performance when cutting prehardened steels, up to HRC55 which are used for molds & dies.
- ▶ Due to sharp edge geometry at end tooth, cutting ability at working is increased.



◇ Call for Availability

EDP No.	Mill Diameter D1	Shank Diameter D2	Length of Cut L1	Overall Length L2
SEME35001	0.1	4	0.2	40
SEME350015	0.15	4	0.3	40
SEME35002	0.2	4	0.4	40
SEME350025	0.25	4	0.5	40
SEME35003	0.3	4	0.6	40
SEME350035	0.35	4	0.7	40
SEME35004	0.4	4	0.8	40
SEME350045	0.45	4	0.9	40
SEME35005	0.5	4	1.0	40
SEME350055	0.55	4	1.1	40
SEME35006	0.6	4	1.2	40
SEME350065	0.65	4	1.3	40
SEME35007	0.7	4	1.4	40
SEME350075	0.75	4	1.5	40
SEME35008	0.8	4	1.6	40
SEME350085	0.85	4	1.7	40
SEME35009	0.9	4	1.8	40
SEME350095	0.95	4	2	40
SEME35010	1.0	6	2.5	50
SEME35012	1.2	6	3	50

▶ NEXT PAGE

◎ : Excellent ○ : Good

ISO	P										M				K									
	Non-alloy steel					Low alloy steel					High alloyed steel, and tool steel				Stainless steel		Grey cast iron		Nodular cast iron		Malleable cast iron			
Material Description	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
HRc	13	25	28	32	30	10	29	32	38	15	35	15	23	10	10	26	3	25	3	25	15	15	15	15
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230	130	130	130	130
Recommend	○	◎	◎	◎	◎	○	◎	◎	◎	○	◎	○	○	○	○	○	○	○	○	○	○	○	○	○

ISO	N										S					H							
	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron			
Material Description	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43
HRc	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550	550	550
Recommend	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○



PLAIN SHANK SEME35 SERIES

CARBIDE, 2 FLUTE

- ▶ Due to new coating and new tool geometry, outstanding cutting ability and wear resistance.
- ▶ Excellent performance when cutting prehardened steels, up to HRC55 which are used for molds & dies.
- ▶ Due to sharp edge geometry at end tooth, cutting ability at working is increased.



Call for Availability

EDP No.	Mill Diameter	Shank Diameter	Length of Cut	Overall Length
	D1	D2	L1	L2
SEME35015	1.5	6	4	50
SEME35020	2.0	6	6	50
SEME35025	2.5	6	7	50
SEME35030	3.0	6	8	50
SEME35035	3.5	6	10	50
SEME35040	4.0	6	10	50
SEME35045	4.5	6	14	50
SEME35050	5.0	6	15	60
SEME35055	5.5	6	15	60
SEME35060	6.0	6	15	60
SEME35065	6.5	8	18	60
SEME35070	7.0	8	20	60
SEME35075	7.5	8	20	60
SEME35080	8.0	8	20	70
SEME35085	8.5	10	22	70
SEME35090	9.0	10	22	70
SEME35095	9.5	10	24	70
SEME35100	10.0	10	25	75
SEME35105	10.5	12	26	75
SEME35110	11.0	12	30	75
SEME35115	11.5	12	30	80
SEME35120	12.0	12	30	80
SEME35130	13.0	12	35	100
SEME3514012S	14.0	12	35	100
SEME3514014S	14.0	14	35	100
SEME35140	14.0	16	35	100
SEME35150	15.0	16	38	100

▶ NEXT PAGE

◎: Excellent ○: Good

ISO Material Description	P										M				K			H		
	Non-alloy steel					Low alloy steel					High alloyed steel, and tool steel				Stainless steel		Grey cast iron		Nodular cast iron	Malleable cast iron
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25	21	21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend	○	○	◎	◎	◎	○	◎	◎	◎	○	◎	○	○	○	○	○	○	○	○	○

ISO Material Description	N					S					H										
	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)		Non Metallic Materials			Heat Resistant Super Alloys		Titanium Alloys	Hardened steel	Chilled Cast Iron	Hardened Cast Iron					
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34	36	37	55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend																		○	◎	○	○



PLAIN SHANK SEME35 SERIES

CARBIDE, 2 FLUTE

- ▶ Due to new coating and new tool geometry, outstanding cutting ability and wear resistance.
- ▶ Excellent performance when cutting prehardened steels, up to HRC55 which are used for molds & dies.
- ▶ Due to sharp edge geometry at end tooth, cutting ability at working is increased.



Call for Availability

EDP No.	Mill Diameter	Shank Diameter	Length of Cut	Overall Length
	D1	D2	L1	L2
SEME35160	16.0	16	40	100
SEME35170	17.0	16	42	100
SEME35180	18.0	16	45	100
SEME3518018S	18.0	18	45	100
SEME35190	19.0	20	45	100
SEME35200	20.0	20	45	100
SEME35210	21.0	20	45	100
SEME35220	22.0	20	45	100
SEME35230	23.0	25	50	120
SEME35240	24.0	25	50	120
SEME35250	25.0	25	50	120

▶ NEXT PAGE

Size	Mill Dia. Tolerance (mm)	Shank Dia. Tolerance
up to Ø6	0~-0.012	h5
over Ø6	0~-0.015	

◎: Excellent ○: Good

ISO Material Description	P										M				K			H		
	Non-alloy steel					Low alloy steel					High alloyed steel, and tool steel				Stainless steel		Grey cast iron		Nodular cast iron	Malleable cast iron
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25	21	21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend	○	○	◎	◎	◎	○	◎	◎	◎	○	◎	○	○	○	○	○	○	○	○	○

ISO Material Description	N					S					H										
	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)		Non Metallic Materials			Heat Resistant Super Alloys		Titanium Alloys	Hardened steel	Chilled Cast Iron	Hardened Cast Iron					
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34	36	37	55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend																		○	◎	○	○





PLAIN SHANK SEME35 SERIES

**CARBIDE, 2 FLUTE (0.1mm a Unit / 4mm Shank)**

- ▶ Due to new coating and new tool geometry, outstanding cutting ability and wear resistance.
- ▶ Excellent performance when cutting prehardened steels, up to HRC55 which are used for molds & dies.
- ▶ Due to sharp edge geometry at end tooth, cutting ability at working is increased.



◇ Call for Availability

EDP No.	Mill Diameter	Shank Diameter	Length of Cut	Overall Length
	D1	D2	L1	L2
SEME350104S	1.0	1.0	2.5	50
SEME350114S	1.1	1.1	3	50
SEME350124S	1.2	1.2	3	50
SEME350134S	1.3	1.3	3	50
SEME350144S	1.4	1.4	4	50
SEME350154S	1.5	1.5	4	50
SEME350164S	1.6	1.6	4	50
SEME350174S	1.7	1.7	4	50
SEME350184S	1.8	1.8	5	50
SEME350194S	1.9	1.9	5	50
SEME350204S	2.0	2.0	6	50
SEME350214S	2.1	2.1	6	50
SEME350224S	2.2	2.2	6	50
SEME350234S	2.3	2.3	6	50
SEME350244S	2.4	2.4	6	50
SEME350254S	2.5	2.5	8	50
SEME350264S	2.6	2.6	8	50
SEME350274S	2.7	2.7	8	50
SEME350284S	2.8	2.8	8	50
SEME350294S	2.9	2.9	8	50
SEME350304S	3.0	3.0	8	50
SEME350354S	3.5	3.5	10	50
SEME350404S	4.0	4.0	10	50
SEME350404S08Q	4.0	4.0	10	80

▶ NEXT PAGE

Mill Dia. Tolerance (mm)	Shank Dia. Tolerance
0~-0.012	h5

ISO	P										M				K			H			
Material Description	Non-alloy steel					Low alloy steel					High alloyed steel, and tool steel				Stainless steel		Grey cast iron		Nodular cast iron	Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
HRc	13	25	28	32	30	10	29	32	38	15	35	15	23	10	10	26	3	25	21	21	
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230	
Recommend	○	○	◎	◎	◎	○	◎	◎	◎	○	◎	○	◎	○	○	○	○	○	○	○	



PLAIN SHANK SEME35 SERIES

**CARBIDE, 2 FLUTE (3mm Shank)**

- ▶ Due to new coating and new tool geometry, outstanding cutting ability and wear resistance.
- ▶ Excellent performance when cutting prehardened steels, up to HRC55 which are used for molds & dies.
- ▶ Due to sharp edge geometry at end tooth, cutting ability at working is increased.



◇ Call for Availability

EDP No.	Mill Diameter	Shank Diameter	Length of Cut	Overall Length
	D1	D2	L1	L2
SEME350013S	0.1	3	0.2	40
SEME350023S	0.2	3	0.4	40
SEME350033S	0.3	3	0.6	40
SEME350043S	0.4	3	0.8	40
SEME350053S	0.5	3	1.0	40
SEME350063S	0.6	3	1.2	40
SEME350073S	0.7	3	1.4	40
SEME350083S	0.8	3	1.6	40
SEME350093S	0.9	3	1.8	40
SEME350103S	1.0	3	2.5	50
SEME350123S	1.2	3	3	50
SEME350153S	1.5	3	4	50
SEME350203S	2.0	3	6	50
SEME350253S	2.5	3	7	50
SEME350303S	3.0	3	8	50

Mill Dia. Tolerance (mm)	Shank Dia. Tolerance
0~-0.012	h5

ISO	P										M				K			H			
Material Description	Non-alloy steel					Low alloy steel					High alloyed steel, and tool steel				Stainless steel		Grey cast iron		Nodular cast iron	Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
HRc	13	25	28	32	30	10	29	32	38	15	35	15	23	10	10	26	3	25	21	21	
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230	
Recommend	○	○	◎	◎	◎	○	◎	◎	◎	○	◎	○	◎	○	○	○	○	○	○	○	



PLAIN SHANK SEME70 SERIES

CARBIDE, 2 FLUTE LONG LENGTH

- ▶ Due to new coating and new tool geometry, outstanding cutting ability and wear resistance.
- ▶ Excellent performance when cutting prehardened steels, up to HRc55 which are used for molds & dies.
- ▶ Available various length of cut and overall length end mills.



Call for Availability

Unit : mm

EDP No.	Mill Diameter	Shank Diameter	Length of Cut	Overall Length
	D1	D2	L1	L2
SEME7001003	1.0	6	3	60
SEME7001004	1.0	6	4	60
SEME7001005	1.0	6	5	60
SEME7001006	1.0	6	6	60
SEME7001007	1.0	6	7	60
SEME7001008	1.0	6	8	60
SEME7001010	1.0	6	10	60
SEME7001012	1.0	6	12	60
SEME7001204	1.2	6	4	60
SEME7001206	1.2	6	6	60
SEME7001208	1.2	6	8	60
SEME7001210	1.2	6	10	60
SEME7001212	1.2	6	12	60
SEME7001506	1.5	6	6	60
SEME7001508	1.5	6	8	60
SEME7001510	1.5	6	10	60
SEME7001512	1.5	6	12	60
SEME7001514	1.5	6	14	60
SEME7001516	1.5	6	16	60
SEME7002008	2.0	6	8	60
SEME7002010	2.0	6	10	60
SEME7002012	2.0	6	12	60
SEME7002014	2.0	6	14	60
SEME7002016	2.0	6	16	60
SEME7002510	2.5	6	10	60
SEME7002512	2.5	6	12	60
SEME7002516	2.5	6	16	60
SEME7002520	2.5	6	20	60

▶ NEXT PAGE

◎ : Excellent ○ : Good

ISO Material Description	P										M				K			H		
	Non-alloy steel					Low alloy steel					High alloyed steel, and tool steel				Stainless steel		Grey cast iron		Nodular cast iron	Malleable cast iron
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25	21	21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend	○	○	◎	◎	◎	○	◎	◎	◎	○	◎	○	○	○	○	○	○	○	○	○

ISO Material Description	N					S					H										
	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)		Non Metallic Materials			Heat Resistant Super Alloys		Titanium Alloys	Hardened steel	Chilled Cast Iron	Hardened Cast Iron					
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34	36	37	55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend																○		◎		○	



PLAIN SHANK SEME70 SERIES

CARBIDE, 2 FLUTE LONG LENGTH

- ▶ Due to new coating and new tool geometry, outstanding cutting ability and wear resistance.
- ▶ Excellent performance when cutting prehardened steels, up to HRc55 which are used for molds & dies.
- ▶ Available various length of cut and overall length end mills.



Call for Availability

Unit : mm

EDP No.	Mill Diameter	Shank Diameter	Length of Cut	Overall Length
	D1	D2	L1	L2
SEME7002526	2.5	6	26	60
SEME70030163S	3.0	3	16	100
SEME7003010	3.0	6	10	70
SEME7003012	3.0	6	12	70
SEME7003014	3.0	6	14	70
SEME7003016	3.0	6	16	70
SEME7003020	3.0	6	20	70
SEME7003026	3.0	6	26	70
SEME7003030	3.0	6	30	70
SEME70040204S	4.0	4	20	100
SEME7004012	4.0	6	12	70
SEME7004016	4.0	6	16	70
SEME7004020	4.0	6	20	70
SEME7004026	4.0	6	26	70
SEME7004030	4.0	6	30	70
SEME7005020	5.0	6	20	70
SEME7005025	5.0	6	25	70
SEME7005025100	5.0	6	25	100
SEME7005030	5.0	6	30	80
SEME7005035	5.0	6	35	90
SEME7005040	5.0	6	40	100
SEME7006015	6.0	6	15	60
SEME7006015080	6.0	6	15	80
SEME7006020	6.0	6	20	70
SEME7006020090	6.0	6	20	90
SEME7006025	6.0	6	25	75
SEME7006030	6.0	6	30	80
SEME7006030100	6.0	6	30	100

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◎ : Excellent ○ : Good

ISO Material Description	P										M				K			H		
	Non-alloy steel					Low alloy steel					High alloyed steel, and tool steel				Stainless steel		Grey cast iron		Nodular cast iron	Malleable cast iron
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25	21	21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend	○	○	◎	◎	◎	○	◎	◎	◎	○	◎	○	○	○	○	○	○	○	○	○

ISO Material Description	N					S					H										
	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)		Non Metallic Materials			Heat Resistant Super Alloys		Titanium Alloys	Hardened steel	Chilled Cast Iron	Hardened Cast Iron					
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34	36	37	55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend																○		◎		○	

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**YG 4G MILL END MILLS**

PLAIN SHANK SEME70 SERIES

**YG 4G MILL END MILLS**

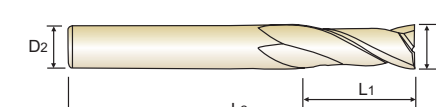
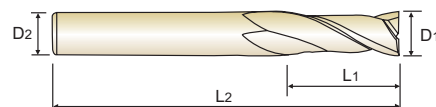
PLAIN SHANK SEME70 SERIES

**CARBIDE, 2 FLUTE LONG LENGTH**

**CARBIDE, 2 FLUTE LONG LENGTH**

- ▶ Due to new coating and new tool geometry, outstanding cutting ability and wear resistance.
- ▶ Excellent performance when cutting prehardened steels, up to HRc55 which are used for molds & dies.
- ▶ Available various length of cut and overall length end mills.

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Call for Availability

Call for Availability

EDP No.	Mill Diameter	Shank Diameter	Length of Cut	Overall Length
	D1	D2	L1	L2
SEME7006030150	6.0	6	30	150
SEME7006035	6.0	6	35	90
SEME7006040	6.0	6	40	90
SEME7006040120	6.0	6	40	120
SEME7006045	6.0	6	45	150
SEME7008025	8.0	8	25	80
SEME7008030	8.0	8	30	80
SEME7008030100	8.0	8	30	100
SEME7008035	8.0	8	35	90
SEME7008040	8.0	8	40	90
SEME7008040120	8.0	8	40	120
SEME7008040150	8.0	8	40	150
SEME7008045	8.0	8	45	100
SEME7008050	8.0	8	50	100
SEME7008050150	8.0	8	50	150
SEME7010030	10.0	10	30	80
SEME7010030100	10.0	10	30	100
SEME7010035	10.0	10	35	90
SEME7010040	10.0	10	40	90
SEME7010040120	10.0	10	40	120
SEME7010045	10.0	10	45	100
SEME7010050	10.0	10	50	100
SEME7010050150	10.0	10	50	150
SEME7010050200	10.0	10	50	200
SEME7010055	10.0	10	55	150
SEME7010060	10.0	10	60	110
SEME7010060200	10.0	10	60	200
SEME7012035	12.0	12	35	90

EDP No.	Mill Diameter	Shank Diameter	Length of Cut	Overall Length
	D1	D2	L1	L2
SEME7012040	12.0	12	40	100
SEME7012040120	12.0	12	40	120
SEME7012045	12.0	12	45	130
SEME7012050	12.0	12	50	100
SEME7012050150	12.0	12	50	150
SEME7012055	12.0	12	55	110
SEME7012060	12.0	12	60	110
SEME7012060150	12.0	12	60	150
SEME7012060200	12.0	12	60	200
SEME7012065	12.0	12	65	150
SEME7012070	12.0	12	70	120
SEME7012070200	12.0	12	70	200
SEME7014050	14.0	16	50	110
SEME7014060	14.0	16	60	150
SEME7016040	16.0	16	40	150
SEME7016050	16.0	16	50	110
SEME7016050150	16.0	16	50	150
SEME7016060	16.0	16	60	120
SEME7016070	16.0	16	70	130
SEME7016070150	16.0	16	70	150
SEME7016070200	16.0	16	70	200
SEME7016080	16.0	16	80	150
SEME7016090	16.0	16	90	150
SEME70160110	16.0	16	110	200
SEME70160120	16.0	16	120	250
SEME7018050	18.0	20	50	120
SEME7018070	18.0	20	70	130
SEME70180100	18.0	20	100	200

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◎ : Excellent ○ : Good

◎ : Excellent ○ : Good

ISO	P										M				K			H		
	Non-alloy steel					Low alloy steel					High alloyed steel and tool steel				Stainless steel		Grey cast iron		Nodular cast iron	Malleable cast iron
Material Description	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc	13	25	28	32	30	10	29	32	38	15	35	15	23	10	10	26	3	25	21	21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend	○	○	◎	◎	◎	○	◎	◎	◎	○	◎	○	○	○	○	○	○	○	○	○

ISO	N					S					H										
	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)		Non Metallic Materials		Heat Resistant Super Alloys			Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron				
Material Description	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc	21	22	23	24	25	26	27	28	29	30	15	30	25	38	34	36	37	55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○

ISO	P										M				K			H			
	Non-alloy steel					Low alloy steel					High alloyed steel and tool steel				Stainless steel		Grey cast iron		Nodular cast iron	Malleable cast iron	
Material Description	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
HRc	13	25	28	32	30	10	29	32	38	15	35	15	23	10	10	26	3	25	21	21	
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230	
Recommend	○	○	◎	◎	◎	○	◎	◎	◎	○	◎	○	○	○	○	○	○	○	○	○	○

ISO	N					S					H										
	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)		Non Metallic Materials		Heat Resistant Super Alloys			Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron				
Material Description	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
VDI 3323	21	22	23	24	25	26	27	28	29	30	15	30	25	38	34	36	37	55	60	42	55
HRc	21	22	23	24	25	26	27	28	29	30	15	30	25	38	34	36	37	55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○





PLAIN SHANK SEME70 SERIES

### CARBIDE, 2 FLUTE LONG LENGTH

- ▶ Due to new coating and new tool geometry, outstanding cutting ability and wear resistance.
- ▶ Excellent performance when cutting prehardened steels, up to HRC55 which are used for molds & dies.
- ▶ Available various length of cut and overall length end mills.



Call for Availability

EDP No.	Mill Diameter	Shank Diameter	Length of Cut	Overall Length
	D1	D2	L1	L2
SEME7020050	20.0	20	50	110
SEME7020050150	20.0	20	50	150
SEME7020060	20.0	20	60	130
SEME7020070	20.0	20	70	130
SEME7020080	20.0	20	80	150
SEME7020090	20.0	20	90	150
SEME7020090200	20.0	20	90	200
SEME70200110	20.0	20	110	200
SEME70200120	20.0	20	120	250
SEME7022075	22.0	20	75	150
SEME70220110	22.0	20	110	200
SEME7025070	25.0	25	70	150
SEME7025090	25.0	25	90	150
SEME70250110	25.0	25	110	200
SEME70250120	25.0	25	120	250

Mill Dia. Tolerance (mm)	Shank Dia. Tolerance
0~-0.03	h5

◎ : Excellent ○ : Good

ISO Material Description	P										M				K						
	Non-alloy steel					Low alloy steel					High alloyed steel, and tool steel				Stainless steel		Grey cast iron		Nodular cast iron		Malleable cast iron
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
HRc	13	25	28	32	32	10	29	32	38	15	35	15	23	10	10	26	3	25	130	21	
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230	
Recommend	○	○	◎	◎	◎	○	◎	◎	◎	○	◎	○	○	○	○	○	○	○	○	○	

ISO Material Description	N										S					H					
	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys			Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron			
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc	60	100	75	90	130	110	90	100			15	30	25	38	34	36	37	55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend																		○	◎	○	○



PLAIN SHANK SEM845 SERIES

### CARBIDE, 2 FLUTE LONG NECK

- ▶ Due to new coating and new tool geometry, outstanding cutting ability and wear resistance.
- ▶ Excellent for cutting prehardened steels, carbon steels, alloy steels of molds and dies, up to HRC55 and machine parts.
- ▶ For 1.0mm and under 1.0mm diameter sizes, designed double neck for increasing tool rigidity and minimizing vibration at working.
- ▶ Available various rib processing due to supplying various effective length and overall length products.



Call for Availability

EDP No.	Mill Diameter	Shank Diameter	Length of Cut	Length Below Shank	Overall Length	Neck Diameter
	D1	D2	L1	L3	L2	D3
SEM845001003	0.1	4	0.15	0.3	40	0.085
SEM845001005	0.1	4	0.15	0.5	40	0.085
SEM84500101	0.1	4	0.15	1	40	0.085
SEM845002005	0.2	4	0.3	0.5	40	0.17
SEM84500201	0.2	4	0.3	1	40	0.17
SEM845002015	0.2	4	0.3	1.5	40	0.17
SEM84500202	0.2	4	0.3	2	40	0.17
SEM84500301	0.3	4	0.5	1	40	0.27
SEM845003015	0.3	4	0.5	1.5	40	0.27
SEM84500302	0.3	4	0.5	2	40	0.27
SEM845003025	0.3	4	0.5	2.5	40	0.27
SEM84500303	0.3	4	0.5	3	40	0.27
SEM84500304	0.3	4	0.5	4	40	0.27
SEM84500305	0.3	4	0.5	5	40	0.27
SEM84500401	0.4	4	0.6	1	40	0.37
SEM845004015	0.4	4	0.6	1.5	40	0.37
SEM84500402	0.4	4	0.6	2	40	0.37
SEM845004025	0.4	4	0.6	2.5	40	0.37
SEM84500403	0.4	4	0.6	3	40	0.37
SEM84500404	0.4	4	0.6	4	40	0.37
SEM84500405	0.4	4	0.6	5	40	0.37
SEM84500406	0.4	4	0.6	6	40	0.37
SEM84500408	0.4	4	0.6	8	40	0.37
SEM84500410	0.4	4	0.6	10	40	0.37
SEM84500501	0.5	4	0.7	1	45	0.45
SEM845005015	0.5	4	0.7	1.5	45	0.45
SEM84500502	0.5	4	0.7	2	45	0.45
SEM845005025	0.5	4	0.7	2.5	45	0.45

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◎ : Excellent ○ : Good

ISO Material Description	P										M				K						
	Non-alloy steel					Low alloy steel					High alloyed steel, and tool steel				Stainless steel		Grey cast iron		Nodular cast iron		Malleable cast iron
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
HRc	13	25	28	32	32	10	29	32	38	15	35	15	23	10	10	26	3	25	130	21	
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230	
Recommend	○	○	◎	◎	◎	○	◎	◎	◎	○	◎	○	○	○	○	○	○	○	○	○	

ISO Material Description	N										S					H					
	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys			Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron			
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc	60	100	75	90	130	110	90	100			15	30	25	38	34	36	37	55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend																		○	◎	○	○

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# YG 4G MILL END MILLS

# YG 4G MILL END MILLS

PLAIN SHANK SEM845 SERIES

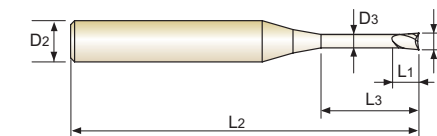
PLAIN SHANK SEM845 SERIES

## CARBIDE, 2 FLUTE LONG NECK

## CARBIDE, 2 FLUTE LONG NECK

- ▶ Due to new coating and new tool geometry, outstanding cutting ability and wear resistance.
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- ▶ For 1.0mm and under 1.0mm diameter sizes, designed double neck for increasing tool rigidity and minimizing vibration at working.
- ▶ Available various rib processing due to supplying various effective length and overall length products.

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- ▶ Available various rib processing due to supplying various effective length and overall length products.



Call for Availability

Call for Availability

Unit : mm

Unit : mm

EDP No.	Mill Diameter	Shank Diameter	Length of Cut	Length Below Shank	Overall Length	Neck Diameter
	D1	D2	L1	L3	L2	D3
SEM84500503	0.5	4	0.7	3	45	0.45
SEM84500504	0.5	4	0.7	4	45	0.45
SEM84500505	0.5	4	0.7	5	45	0.45
SEM84500506	0.5	4	0.7	6	45	0.45
SEM84500508	0.5	4	0.7	8	45	0.45
SEM84500510	0.5	4	0.7	10	45	0.45
SEM84500512	0.5	4	0.7	12	45	0.45
SEM84500514	0.5	4	0.7	14	45	0.45
SEM84500516	0.5	4	0.7	16	45	0.45
SEM84500602	0.6	4	0.9	2	45	0.55
SEM84500603	0.6	4	0.9	3	45	0.55
SEM84500604	0.6	4	0.9	4	45	0.55
SEM84500605	0.6	4	0.9	5	45	0.55
SEM84500606	0.6	4	0.9	6	45	0.55
SEM84500608	0.6	4	0.9	8	45	0.55
SEM84500610	0.6	4	0.9	10	45	0.55
SEM84500612	0.6	4	0.9	12	45	0.55
SEM84500614	0.6	4	0.9	14	45	0.55
SEM84500616	0.6	4	0.9	16	45	0.55
SEM84500702	0.7	4	1.2	2	45	0.65
SEM84500704	0.7	4	1.2	4	45	0.65
SEM84500706	0.7	4	1.2	6	45	0.65
SEM84500708	0.7	4	1.2	8	45	0.65
SEM84500710	0.7	4	1.2	10	45	0.65
SEM84500712	0.7	4	1.2	12	45	0.65
SEM84500802	0.8	4	1.2	2	45	0.75
SEM84500803	0.8	4	1.2	3	45	0.75
SEM84500804	0.8	4	1.2	4	45	0.75

EDP No.	Mill Diameter	Shank Diameter	Length of Cut	Length Below Shank	Overall Length	Neck Diameter
	D1	D2	L1	L3	L2	D3
SEM84500805	0.8	4	1.2	5	45	0.75
SEM84500806	0.8	4	1.2	6	45	0.75
SEM84500808	0.8	4	1.2	8	45	0.75
SEM84500810	0.8	4	1.2	10	45	0.75
SEM84500812	0.8	4	1.2	12	45	0.75
SEM84500814	0.8	4	1.2	14	45	0.75
SEM84500816	0.8	4	1.2	16	45	0.75
SEM84500820	0.8	4	1.2	20	45	0.75
SEM84500906	0.9	4	1.3	6	45	0.85
SEM84500908	0.9	4	1.3	8	45	0.85
SEM84500910	0.9	4	1.3	10	45	0.85
SEM84501002	1.0	4	1.5	2	50	0.95
SEM84501003	1.0	4	1.5	3	50	0.95
SEM84501004	1.0	4	1.5	4	50	0.95
SEM84501005	1.0	4	1.5	5	50	0.95
SEM84501006	1.0	4	1.5	6	50	0.95
SEM84501007	1.0	4	1.5	7	50	0.95
SEM84501008	1.0	4	1.5	8	50	0.95
SEM84501010	1.0	4	1.5	10	50	0.95
SEM84501012	1.0	4	1.5	12	50	0.95
SEM84501014	1.0	4	1.5	14	50	0.95
SEM84501016	1.0	4	1.5	16	50	0.95
SEM84501018	1.0	4	1.5	18	50	0.95
SEM84501020	1.0	4	1.5	20	50	0.95
SEM84501022	1.0	4	1.5	22	60	0.95
SEM84501026	1.0	4	1.5	26	60	0.95
SEM84501030	1.0	4	1.5	30	70	0.95
SEM84501040	1.0	4	1.5	40	80	0.95

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◎ : Excellent ○ : Good

◎ : Excellent ○ : Good

ISO	P										M				K			H		
	Non-alloy steel					Low alloy steel					High alloyed steel, and tool steel				Stainless steel		Grey cast iron		Nodular cast iron	Malleable cast iron
Material Description	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc	13	25	28	32	30	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend	○	○	◎	◎	◎	○	◎	◎	◎	○	◎	○	○	○	○	○	○	○	○	○

ISO	N					S					H										
	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys			Titanium Alloys	Hardened steel	Chilled Cast Iron	Hardened Cast Iron				
Material Description	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc	60	100	75	90	130	110	90	100			15	30	25	38	34	400 Rm	1050 Rm	55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○

ISO	P										M				K			H			
	Non-alloy steel					Low alloy steel					High alloyed steel, and tool steel				Stainless steel		Grey cast iron		Nodular cast iron	Malleable cast iron	
Material Description	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
HRc	13	25	28	32	30	10	29	32	38	15	35	15	23	10	10	26	3	25		21	
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230	
Recommend	○	○	◎	◎	◎	○	◎	◎	◎	○	◎	○	○	○	○	○	○	○	○	○	○

ISO	N					S					H										
	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys			Titanium Alloys	Hardened steel	Chilled Cast Iron	Hardened Cast Iron				
Material Description	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc	60	100	75	90	130	110	90	100			15	30	25	38	34	400 Rm	1050 Rm	55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○

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PLAIN SHANK SEM845 SERIES

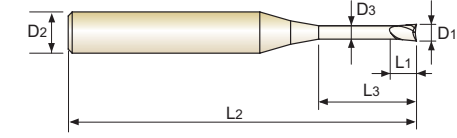
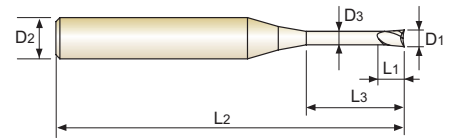
PLAIN SHANK SEM845 SERIES

CARBIDE, 2 FLUTE LONG NECK

CARBIDE, 2 FLUTE LONG NECK

- ▶ Due to new coating and new tool geometry, outstanding cutting ability and wear resistance.
- ▶ Excellent for cutting prehardened steels, carbon steels, alloy steels of molds and dies, up to HRc55 and machine parts.
- ▶ For 1.0mm and under 1.0mm diameter sizes, designed double neck for increasing tool rigidity and minimizing vibration at working.
- ▶ Available various rib processing due to supplying various effective length and overall length products.

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Call for Availability

Call for Availability

EDP No.	Mill Diameter	Shank Diameter	Length of Cut	Length Below Shank	Overall Length	Neck Diameter
	D1	D2	L1	L3	L2	D3
SEM84501050	1.0	4	1.5	50	100	0.95
SEM84501204	1.2	4	1.8	4	50	1.15
SEM84501206	1.2	4	1.8	6	50	1.15
SEM84501208	1.2	4	1.8	8	50	1.15
SEM84501210	1.2	4	1.8	10	50	1.15
SEM84501212	1.2	4	1.8	12	50	1.15
SEM84501214	1.2	4	1.8	14	50	1.15
SEM84501216	1.2	4	1.8	16	50	1.15
SEM84501220	1.2	4	1.8	20	50	1.15
SEM84501226	1.2	4	1.8	26	60	1.15
SEM84501230	1.2	4	1.8	30	70	1.15
SEM84501406	1.4	4	2.1	6	50	1.35
SEM84501408	1.4	4	2.1	8	50	1.35
SEM84501410	1.4	4	2.1	10	50	1.35
SEM84501414	1.4	4	2.1	14	50	1.35
SEM84501416	1.4	4	2.1	16	50	1.35
SEM84501420	1.4	4	2.1	20	50	1.35
SEM84501504	1.5	4	2.3	4	50	1.45
SEM84501505	1.5	4	2.3	5	50	1.45
SEM84501506	1.5	4	2.3	6	50	1.45
SEM84501507	1.5	4	2.3	7	50	1.45
SEM84501508	1.5	4	2.3	8	50	1.45
SEM84501510	1.5	4	2.3	10	50	1.45
SEM84501512	1.5	4	2.3	12	50	1.45
SEM84501514	1.5	4	2.3	14	50	1.45
SEM84501516	1.5	4	2.3	16	50	1.45
SEM84501518	1.5	4	2.3	18	50	1.45
SEM84501520	1.5	4	2.3	20	50	1.45

EDP No.	Mill Diameter	Shank Diameter	Length of Cut	Length Below Shank	Overall Length	Neck Diameter
	D1	D2	L1	L3	L2	D3
SEM84501522	1.5	4	2.3	22	60	1.45
SEM84501526	1.5	4	2.3	26	60	1.45
SEM84501530	1.5	4	2.3	30	70	1.45
SEM84501608	1.6	4	2.3	8	50	1.55
SEM84501610	1.6	4	2.3	10	50	1.55
SEM84501612	1.6	4	2.3	12	50	1.55
SEM84501616	1.6	4	2.3	16	50	1.55
SEM84501620	1.6	4	2.3	20	50	1.55
SEM84501808	1.8	4	2.7	8	50	1.75
SEM84501810	1.8	4	2.7	10	50	1.75
SEM84501812	1.8	4	2.7	12	50	1.75
SEM84501816	1.8	4	2.7	16	50	1.75
SEM84501820	1.8	4	2.7	20	50	1.75
SEM84502006	2.0	4	3	6	50	1.95
SEM84502008	2.0	4	3	8	50	1.95
SEM84502010	2.0	4	3	10	50	1.95
SEM84502012	2.0	4	3	12	50	1.95
SEM84502014	2.0	4	3	14	50	1.95
SEM84502016	2.0	4	3	16	50	1.95
SEM84502018	2.0	4	3	18	50	1.95
SEM84502020	2.0	4	3	20	50	1.95
SEM84502022	2.0	4	3	22	60	1.95
SEM84502026	2.0	4	3	26	60	1.95
SEM84502030	2.0	4	3	30	70	1.95
SEM84502035	2.0	4	3	35	70	1.95
SEM84502040	2.0	4	3	40	80	1.95
SEM84502045	2.0	4	3	45	90	1.95
SEM84502050	2.0	4	3	50	100	1.95

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◎: Excellent ○: Good

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ISO	P										M				K			H		
	Non-alloy steel					Low alloy steel					High alloyed steel, and tool steel				Stainless steel		Grey cast iron		Nodular cast iron	Malleable cast iron
Material Description	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
VDI 3323																				
HRc	13	25	28	32	30	10	29	32	38	15	35	15	23	10	10	26	3	25	21	
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend	○	○	◎	◎	◎	○	◎	◎	◎	○	◎	○	○	○	○	○	○	○	○	○

ISO	P										M				K			H		
	Non-alloy steel					Low alloy steel					High alloyed steel, and tool steel				Stainless steel		Grey cast iron		Nodular cast iron	Malleable cast iron
Material Description	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
VDI 3323																				
HRc	13	25	28	32	30	10	29	32	38	15	35	15	23	10	10	26	3	25	21	
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend	○	○	◎	◎	◎	○	◎	◎	◎	○	◎	○	○	○	○	○	○	○	○	○



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**YG 4G MILL END MILLS**

PLAIN SHANK SEM845 SERIES

**YG 4G MILL END MILLS**

PLAIN SHANK SEM845 SERIES

**CARBIDE, 2 FLUTE LONG NECK**

**CARBIDE, 2 FLUTE LONG NECK**

- ▶ Due to new coating and new tool geometry, outstanding cutting ability and wear resistance.
- ▶ Excellent for cutting prehardened steels, carbon steels, alloy steels of molds and dies, up to HRc55 and machine parts.
- ▶ For 1.0mm and under 1.0mm diameter sizes, designed double neck for increasing tool rigidity and minimizing vibration at working.
- ▶ Available various rib processing due to supplying various effective length and overall length products.

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◇ Call for Availability

◇ Call for Availability

Unit : mm

EDP No.	Mill Diameter	Shank Diameter	Length of Cut	Length Below Shank	Overall Length	Neck Diameter
	D1	D2	L1	L3	L2	D3
SEM84502060	2.0	4	3	60	110	1.95
SEM84502508	2.5	4	4	8	50	2.40
SEM84502510	2.5	4	4	10	50	2.40
SEM84502512	2.5	4	4	12	50	2.40
SEM84502514	2.5	4	4	14	50	2.40
SEM84502516	2.5	4	4	16	50	2.40
SEM84502518	2.5	4	4	18	50	2.40
SEM84502520	2.5	4	4	20	50	2.40
SEM84502522	2.5	4	4	22	60	2.40
SEM84502526	2.5	4	4	26	60	2.40
SEM84502530	2.5	4	4	30	70	2.40
SEM84502535	2.5	4	4	35	70	2.40
SEM84502540	2.5	4	4	40	80	2.40
SEM84502545	2.5	4	4	45	90	2.40
SEM84502550	2.5	4	4	50	100	2.40
SEM84503006	3.0	6	4.5	6	50	2.85
SEM84503008	3.0	6	4.5	8	50	2.85
SEM84503010	3.0	6	4.5	10	50	2.85
SEM84503012	3.0	6	4.5	12	50	2.85
SEM84503014	3.0	6	4.5	14	60	2.85
SEM84503016	3.0	6	4.5	16	60	2.85
SEM84503018	3.0	6	4.5	18	60	2.85
SEM84503020	3.0	6	4.5	20	60	2.85
SEM84503022	3.0	6	4.5	22	65	2.85
SEM84503026	3.0	6	4.5	26	65	2.85
SEM84503030	3.0	6	4.5	30	70	2.85
SEM84503035	3.0	6	4.5	35	70	2.85
SEM84503040	3.0	6	4.5	40	80	2.85

Unit : mm

EDP No.	Mill Diameter	Shank Diameter	Length of Cut	Length Below Shank	Overall Length	Neck Diameter
	D1	D2	L1	L3	L2	D3
SEM84503045	3.0	6	4.5	45	90	2.85
SEM84503050	3.0	6	4.5	50	100	2.85
SEM84503060	3.0	6	4.5	60	100	2.85
SEM84504008	4.0	6	6	8	50	3.85
SEM84504010	4.0	6	6	10	50	3.85
SEM84504012	4.0	6	6	12	50	3.85
SEM84504014	4.0	6	6	14	60	3.85
SEM84504016	4.0	6	6	16	60	3.85
SEM84504018	4.0	6	6	18	60	3.85
SEM84504020	4.0	6	6	20	60	3.85
SEM84504022	4.0	6	6	22	65	3.85
SEM84504026	4.0	6	6	26	65	3.85
SEM84504030	4.0	6	6	30	70	3.85
SEM84504035	4.0	6	6	35	70	3.85
SEM84504040	4.0	6	6	40	80	3.85
SEM84504045	4.0	6	6	45	90	3.85
SEM84504050	4.0	6	6	50	100	3.85
SEM84504060	4.0	6	6	60	100	3.85
SEM84505016	5.0	6	8	16	60	4.85
SEM84505020	5.0	6	8	20	60	4.85
SEM84505026	5.0	6	8	26	65	4.85
SEM84505030	5.0	6	8	30	70	4.85
SEM84505035	5.0	6	8	35	75	4.85
SEM84505040	5.0	6	8	40	80	4.85
SEM84505050	5.0	6	8	50	90	4.85
SEM84505060	5.0	6	8	60	100	4.85
SEM84506015	6.0	6	9	15	60	5.85
SEM84506020	6.0	6	9	20	60	5.85

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◎ : Excellent ○ : Good

◎ : Excellent ○ : Good

ISO	P										M				K			H		
	Non-alloy steel					Low alloy steel					High alloyed steel, and tool steel				Stainless steel		Grey cast iron	Nodular cast iron		Malleable cast iron
Material Description	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
VDI 3323																				
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend	○	○	◎	◎	◎	○	◎	◎	◎	○	◎	○	○	○	○	○	○	○	○	○

ISO	N					S					H										
	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys			Titanium Alloys	Hardened steel	Chilled Cast Iron	Hardened Cast Iron				
Material Description	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
VDI 3323																					
HRc											15	30	25	38	34	36	37	55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend																		○	◎	◎	○

ISO	P										M				K			H			
	Non-alloy steel					Low alloy steel					High alloyed steel, and tool steel				Stainless steel		Grey cast iron	Nodular cast iron		Malleable cast iron	
Material Description	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
VDI 3323																					
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21	
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230	
Recommend	○	○	◎	◎	◎	○	◎	◎	◎	○	◎	○	○	○	○	○	○	○	○	○	○

ISO	N					S					H										
	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys			Titanium Alloys	Hardened steel	Chilled Cast Iron	Hardened Cast Iron				
Material Description	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
VDI 3323																					
HRc											15	30	25	38	34	36	37	55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend																		○	◎	◎	○

# YG 4G MILL END MILLS

PLAIN SHANK SEM845 SERIES

## CARBIDE, 2 FLUTE LONG NECK

- ▶ Due to new coating and new tool geometry, outstanding cutting ability and wear resistance.
- ▶ Excellent for cutting prehardened steels, carbon steels, alloy steels of molds and dies, up to HRc55 and machine parts.
- ▶ For 1.0mm and under 1.0mm diameter sizes, designed double neck for increasing tool rigidity and minimizing vibration at working.
- ▶ Available various rib processing due to supplying various effective length and overall length products.



CARBIDE 2 30° PLAIN p.C351-C362

◇ Call for Availability

EDP No.	Mill Diameter	Shank Diameter	Length of Cut	Length Below Shank	Overall Length	Neck Diameter
	D1	D2	L1	L3	L2	D3
SEM84506030	6.0	6	9	30	70	5.85
SEM84506032	6.0	6	9	32	90	5.85
SEM84508025	8.0	8	12	25	70	7.70
SEM84508030	8.0	8	12	30	80	7.70
SEM84508042	8.0	8	12	42	100	7.70
SEM84510030	10.0	10	15	30	75	9.70
SEM84510035	10.0	10	15	35	80	9.70
SEM84510045	10.0	10	15	45	100	9.70
SEM84512035	12.0	12	20	35	80	11.70
SEM84512040	12.0	12	20	40	90	11.70
SEM84512050	12.0	12	20	50	110	11.70

Size	Mill Dia. Tolerance (mm)	Shank Dia. Tolerance
up to Ø6	0~-0.012	h5
over Ø6	0~-0.015	

◎ : Excellent ○ : Good

ISO Material Description	P										M				K						
	Non-alloy steel					Low alloy steel					High alloyed steel, and tool steel				Stainless steel		Grey cast iron		Nodular cast iron		Malleable cast iron
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
HRc	13	25	28	32	30	10	29	32	38	15	35	15	23	10	10	26	3	25	3	25	
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230	
Recommend	○	○	◎	◎	◎	○	◎	◎	◎	○	◎	○	○	○	○	○	○	○	○	○	

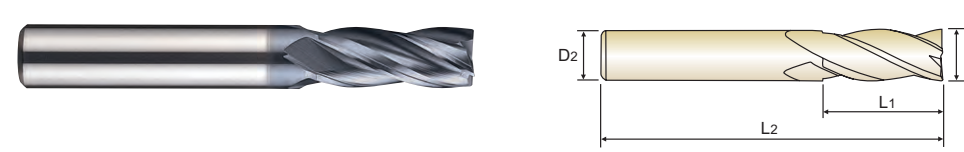
ISO Material Description	N					S					H										
	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys			Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron			
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc	21	22	23	24	25	26	27	28	29	30	15	30	25	38	34	36	37	55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	◎	○

# YG 4G MILL END MILLS

PLAIN SHANK SEME36 SERIES

## CARBIDE, 4 FLUTE

- ▶ Due to new coating and new tool geometry, outstanding cutting ability and wear resistance.
- ▶ Excellent for cutting prehardened steels, carbon steels, alloy steels of molds and dies, up to HRc55 and machine parts.
- ▶ Due to Multiple Helix for 3.0mm and over 3.0mm diameter end mills, vibration can be minimized at cutting, and wear of cutting tool can be decreased too.



CARBIDE 4 27°/30° PLAIN p.C363-C365

◇ Call for Availability

EDP No.	Mill Diameter	Shank Diameter	Length of Cut	Overall Length
	D1	D2	L1	L2
SEME36008	0.8	4	1.6	40
SEME36009	0.9	4	1.8	40
SEME36010	1.0	6	2.5	50
SEME36012	1.2	6	3	50
SEME36015	1.5	6	4	50
SEME36020	2.0	6	6	50
SEME36025	2.5	6	7	50
SEME36030	3.0	6	8	50
SEME36035	3.5	6	10	50
SEME36040	4.0	6	10	50
SEME36045	4.5	6	14	50
SEME36050	5.0	6	15	60
SEME36055	5.5	6	15	60
SEME36060	6.0	6	15	60
SEME36065	6.5	8	18	60
SEME36070	7.0	8	20	60
SEME36075	7.5	8	20	60
SEME36080	8.0	8	20	70
SEME36085	8.5	10	22	70
SEME36090	9.0	10	22	70
SEME36095	9.5	10	24	70
SEME36100	10.0	10	25	75
SEME36105	10.5	12	26	75
SEME36110	11.0	12	30	75

▶ NEXT PAGE

◎ : Excellent ○ : Good

ISO Material Description	P										M				K						
	Non-alloy steel					Low alloy steel					High alloyed steel, and tool steel				Stainless steel		Grey cast iron		Nodular cast iron		Malleable cast iron
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
HRc	13	25	28	32	30	10	29	32	38	15	35	15	23	10	10	26	3	25	3	25	
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230	
Recommend	○	○	◎	◎	◎	○	◎	◎	◎	○	◎	○	○	○	○	○	○	○	○	○	

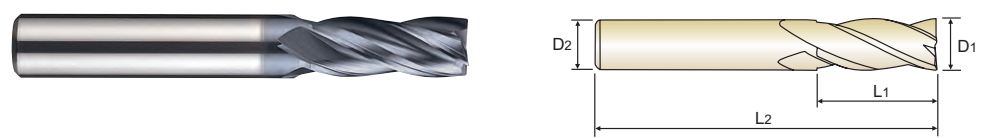
ISO Material Description	N					S					H										
	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys			Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron			
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc	21	22	23	24	25	26	27	28	29	30	15	30	25	38	34	36	37	55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	◎	○

# YG 4G MILL END MILLS

PLAIN SHANK SEME36 SERIES

## CARBIDE, 4 FLUTE

- ▶ Due to new coating and new tool geometry, outstanding cutting ability and wear resistance.
- ▶ Excellent for cutting prehardened steels, carbon steels, alloy steels of molds and dies, up to HRc55 and machine parts.
- ▶ Due to Multiple Helix for 3.0mm and over 3.0mm diameter end mills, vibration can be minimized at cutting, and wear of cutting tool can be decreased too.



CARBIDE 4 27°/30° PLAIN p.C363-C365

◇ Call for Availability

D1<Ø3.0, 30° Helix Unit : mm

EDP No.	Mill Diameter D1	Shank Diameter D2	Length of Cut L1	Overall Length L2
SEME36115	11.5	12	30	80
SEME36120	12.0	12	30	80
SEME36130	13.0	12	35	100
SEME3614012S	14.0	12	35	100
SEME3614014S	14.0	14	35	100
SEME36140	14.0	16	35	100
SEME36150	15.0	16	38	100
SEME36160	16.0	16	40	100
SEME36170	17.0	16	42	100
SEME36180	18.0	16	45	100
SEME3618018S	18.0	18	45	100
SEME36190	19.0	20	45	100
SEME36200	20.0	20	45	100
SEME36210	21.0	20	45	100
SEME36220	22.0	20	45	100
SEME36230	23.0	25	50	120
SEME36240	24.0	25	50	120
SEME36250	25.0	25	50	120

Mill Dia. Tolerance(mm)	Shank Dia. Tolerance
0~-0.03	h5

◎ : Excellent ○ : Good

ISO Material Description	P										M				K							
	Non-alloy steel					Low alloy steel					High alloyed steel, and tool steel				Stainless steel		Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
HRc	13	25	28	32	30	10	29	32	38	15	35	15	23	10	10	26	3	25	3	25	21	21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230	130	230
Recommend	○	○	◎	◎	◎	○	◎	◎	◎	○	◎	○	○	○	○	○	○	○	○	○	○	○

ISO Material Description	N										S					H							
	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron			
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43
HRc	15	30	25	38	34	15	30	25	38	34	36	37	55	60	42	55	60	42	55	40	41	55	
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550	550	550
Recommend																					○	◎	○

# YG 4G MILL END MILLS

PLAIN SHANK SEME71 SERIES

## CARBIDE, 4 FLUTE

- ▶ Due to new coating and new tool geometry, outstanding cutting ability and wear resistance.
- ▶ Excellent for cutting prehardened steels, carbon steels, alloy steels of molds and dies, up to HRc55 and machine parts.
- ▶ Due to Multiple Helix for 3.0mm and over 3.0mm diameter end mills, vibration can be minimized at cutting, and wear of cutting tool can be decreased too.
- Designed equal index flute for long length end mills.
- ▶ Due to gash land geometry used at end tooth, heavy duty cutting can be achieved.
- ▶ Available various length products like short, regular and long length end mills etc.

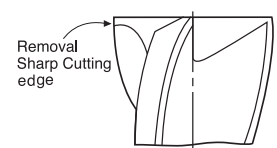


CARBIDE 4 35°/38° PLAIN p.C363-C365

◇ Call for Availability

D1<Ø3.0, Long Length 38° Helix Unit : mm

EDP No.	Mill Diameter D1	Shank Diameter D2	Length of Cut L1	Overall Length L2	Remark
SEME7101001	1.0	6	1	40	Short
SEME7101002	1.0	6	2	40	Short
SEME71010	1.0	6	2.5	50	Regular
SEME7101003	1.0	6	3	50	Long
SEME7101004	1.0	6	4	50	Long
SEME7101006	1.0	6	6	50	Long
SEME7101202	1.2	6	2	40	Short
SEME71012	1.2	6	3	50	Regular
SEME7101204	1.2	6	4	50	Long
SEME7101206	1.2	6	6	50	Long
SEME71015015	1.5	6	1.5	40	Short
SEME7101503	1.5	6	3	40	Short
SEME71015	1.5	6	4	50	Regular
SEME7101506	1.5	6	6	50	Long
SEME7101508	1.5	6	8	50	Long
SEME7101510	1.5	6	10	50	Long
SEME7102002	2.0	6	2	40	Short
SEME7102004	2.0	6	4	40	Short
SEME71020	2.0	6	6	50	Regular
SEME7102008	2.0	6	8	50	Long
SEME7102010	2.0	6	10	50	Long
SEME7102012	2.0	6	12	50	Long
SEME71025025	2.5	6	2.5	40	Short
SEME7102505	2.5	6	5	40	Short



▶ NEXT PAGE

◎ : Excellent ○ : Good

ISO Material Description	P										M				K							
	Non-alloy steel					Low alloy steel					High alloyed steel, and tool steel				Stainless steel		Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
HRc	13	25	28	32	30	10	29	32	38	15	35	15	23	10	10	26	3	25	3	25	21	21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230	130	230
Recommend	○	○	◎	◎	◎	○	◎	◎	◎	○	◎	○	○	○	○	○	○	○	○	○	○	○

ISO Material Description	N										S					H							
	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron			
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43
HRc	15	30	25	38	34	15	30	25	38	34	36	37	55	60	42	55	60	42	55	40	41	55	
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550	550	550
Recommend																					○	◎	○



HSS

HSS



PLAIN SHANK SEME71 SERIES

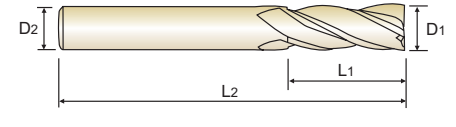
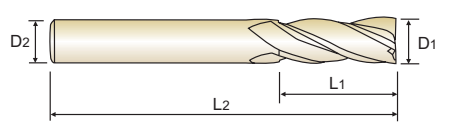
PLAIN SHANK SEME71 SERIES

CARBIDE, 4 FLUTE

CARBIDE, 4 FLUTE

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- ▶ Excellent for cutting prehardened steels, carbon steels, alloy steels of molds and dies, up to HRC55 and machine parts.
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Call for Availability

Call for Availability

D1<math>\phi</math>3.0, Long Length 38' Helix

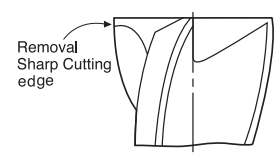
D1<math>\phi</math>3.0, Long Length 38' Helix

Unit : mm

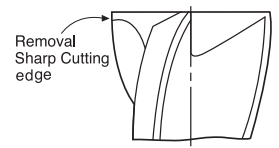
Unit : mm

EDP No.	Mill Diameter	Shank Diameter	Length of Cut	Overall Length	Remark
	D1	D2	L1	L2	
SEME71025	2.5	6	7	50	Regular
SEME7102510	2.5	6	10	50	Long
SEME7102512	2.5	6	12	50	Long
SEME7103003	3.0	6	3	40	Short
SEME7103006	3.0	6	6	40	Short
SEME71030	3.0	6	8	50	Regular
SEME7103010	3.0	6	10	50	Long
SEME7103012	3.0	6	12	50	Long
SEME7103014	3.0	6	14	50	Long
SEME7104004	4.0	6	4	40	Short
SEME7104008	4.0	6	8	40	Short
SEME71040	4.0	6	10	50	Regular
SEME7104012	4.0	6	12	50	Long
SEME7104014	4.0	6	14	50	Long
SEME7104016	4.0	6	16	50	Long
SEME7105005	5.0	6	5	50	Short
SEME7105010	5.0	6	10	50	Short
SEME71050	5.0	6	15	60	Regular
SEME7105020	5.0	6	20	60	Long
SEME7105025	5.0	6	25	60	Long
SEME7106006	6.0	6	6	50	Short
SEME7106012	6.0	6	12	50	Short

EDP No.	Mill Diameter	Shank Diameter	Length of Cut	Overall Length	Remark
	D1	D2	L1	L2	
SEME71060	6.0	6	15	60	Regular
SEME7106020	6.0	6	20	60	Long
SEME7106025	6.0	6	25	60	Long
SEME7108016	8.0	8	16	60	Short
SEME71080	8.0	8	20	70	Regular
SEME7108025	8.0	8	25	70	Long
SEME7108030	8.0	8	30	70	Long
SEME7110022	10.0	10	22	65	Short
SEME71100	10.0	10	25	75	Regular
SEME7110030	10.0	10	30	75	Long
SEME7110035	10.0	10	35	75	Long
SEME7112026	12.0	12	26	70	Short
SEME71120	12.0	12	30	80	Regular
SEME7112035	12.0	12	35	80	Long
SEME7112040	12.0	12	40	80	Long
SEME71140	14.0	16	35	100	Regular
SEME7116032	16.0	16	32	100	Short
SEME71160	16.0	16	40	100	Regular
SEME71180	18.0	20	45	100	Regular
SEME71200	20.0	20	45	100	Regular



▶ NEXT PAGE



Mill Dia. Tolerance (mm)	Shank Dia. Tolerance
0~-0.03	h5

◎ : Excellent ○ : Good

ISO	P										M				K			H		
	Non-alloy steel					Low alloy steel					High alloyed steel, and tool steel				Stainless steel		Grey cast iron		Nodular cast iron	Malleable cast iron
Material Description	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
VDI 3323																				
HRc	13	25	28	32	30	10	29	32	38	15	35	15	23	10	10	26	3	25	21	
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend	○	○	◎	◎	◎	○	◎	◎	◎	○	◎	○	○	○	○	○	○	○	○	○

ISO	N					S					H										
	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys			Titanium Alloys	Hardened steel	Chilled Cast Iron	Hardened Cast Iron				
Material Description	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
VDI 3323																					
HRc											15	30	25	38	34	36	37	55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend											○	○	○	○	○	○	○	○	○	◎	○

◎ : Excellent ○ : Good

ISO	P										M				K			H		
	Non-alloy steel					Low alloy steel					High alloyed steel, and tool steel				Stainless steel		Grey cast iron		Nodular cast iron	Malleable cast iron
Material Description	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
VDI 3323																				
HRc	13	25	28	32	30	10	29	32	38	15	35	15	23	10	10	26	3	25	21	
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend	○	○	◎	◎	◎	○	◎	◎	◎	○	◎	○	○	○	○	○	○	○	○	○

ISO	N					S					H										
	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys			Titanium Alloys	Hardened steel	Chilled Cast Iron	Hardened Cast Iron				
Material Description	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
VDI 3323																					
HRc											15	30	25	38	34	36	37	55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend											○	○	○	○	○	○	○	○	○	◎	○

**CARBIDE, 4 FLUTE LONG LENGTH**

- ▶ Due to new coating and new tool geometry, outstanding cutting ability and wear resistance.
- ▶ Excellent performance when cutting prehardened steels, up to HRc55 which are used for molds & dies.
- ▶ Available various length of cut and overall length products.



Call for Availability

Unit : mm

EDP No.	Mill Diameter	Shank Diameter	Length of Cut	Overall Length
	D1	D2	L1	L2
SEME7201003	1.0	6	3	60
SEME7201004	1.0	6	4	60
SEME7201005	1.0	6	5	60
SEME7201006	1.0	6	6	60
SEME7201007	1.0	6	7	60
SEME7201008	1.0	6	8	60
SEME7201010	1.0	6	10	60
SEME7201012	1.0	6	12	60
SEME7201204	1.2	6	4	60
SEME7201206	1.2	6	6	60
SEME7201208	1.2	6	8	60
SEME7201210	1.2	6	10	60
SEME7201212	1.2	6	12	60
SEME7201506	1.5	6	6	60
SEME7201508	1.5	6	8	60
SEME7201510	1.5	6	10	60
SEME7201512	1.5	6	12	60
SEME7201514	1.5	6	14	60
SEME7201516	1.5	6	16	60
SEME7202008	2.0	6	8	60
SEME7202010	2.0	6	10	60
SEME7202012	2.0	6	12	60
SEME7202014	2.0	6	14	60
SEME7202016	2.0	6	16	60
SEME7202510	2.5	6	10	60
SEME7202512	2.5	6	12	60
SEME7202516	2.5	6	16	60
SEME7202520	2.5	6	20	60

▶ NEXT PAGE

◎ : Excellent ○ : Good

ISO Material Description	P										M				K			H		
	Non-alloy steel					Low alloy steel					High alloyed steel, and tool steel				Stainless steel		Grey cast iron		Nodular cast iron	Malleable cast iron
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc	13	25	28	32	30	10	29	32	38	15	35	15	23	10	10	26	3	25	21	21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend	○	○	◎	◎	◎	○	◎	◎	◎	○	◎	○	○	○	○	○	○	○	○	○

ISO Material Description	N					S					H										
	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)		Non Metallic Materials		Heat Resistant Super Alloys			Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron				
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc	21	22	23	24	25	26	27	28	29	30	15	30	25	38	34	36	37	55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○

**CARBIDE, 4 FLUTE LONG LENGTH**

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Call for Availability

Unit : mm

EDP No.	Mill Diameter	Shank Diameter	Length of Cut	Overall Length
	D1	D2	L1	L2
SEME7202526	2.5	6	26	60
SEME72030163S	3.0	3	16	100
SEME7203010	3.0	6	10	70
SEME7203012	3.0	6	12	70
SEME7203014	3.0	6	14	70
SEME7203016	3.0	6	16	70
SEME7203020	3.0	6	20	70
SEME7203026	3.0	6	26	70
SEME7203030	3.0	6	30	70
SEME72040204S	4.0	4	20	100
SEME7204012	4.0	6	12	70
SEME7204016	4.0	6	16	70
SEME7204020	4.0	6	20	70
SEME7204026	4.0	6	26	70
SEME7204030	4.0	6	30	70
SEME7205020	5.0	6	20	70
SEME7205025	5.0	6	25	70
SEME7205025100	5.0	6	25	100
SEME7205030	5.0	6	30	80
SEME7205035	5.0	6	35	90
SEME7205040	5.0	6	40	100
SEME7206015	6.0	6	15	60
SEME720601508Q	6.0	6	15	80
SEME7206020	6.0	6	20	70
SEME720602009Q	6.0	6	20	90
SEME7206025	6.0	6	25	75
SEME7206030	6.0	6	30	80
SEME720603010Q	6.0	6	30	100

▶ NEXT PAGE

◎ : Excellent ○ : Good

ISO Material Description	P										M				K			H		
	Non-alloy steel					Low alloy steel					High alloyed steel, and tool steel				Stainless steel		Grey cast iron		Nodular cast iron	Malleable cast iron
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc	13	25	28	32	30	10	29	32	38	15	35	15	23	10	10	26	3	25	21	21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend	○	○	◎	◎	◎	○	◎	◎	◎	○	◎	○	○	○	○	○	○	○	○	○

ISO Material Description	N					S					H										
	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)		Non Metallic Materials		Heat Resistant Super Alloys			Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron				
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc	21	22	23	24	25	26	27	28	29	30	15	30	25	38	34	36	37	55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○

**CARBIDE, 4 FLUTE LONG LENGTH**

- ▶ Due to new coating and new tool geometry, outstanding cutting ability and wear resistance.
- ▶ Excellent performance when cutting prehardened steels, up to HRc55 which are used for molds & dies.
- ▶ Available various length of cut and overall length products.



Call for Availability

Unit : mm

EDP No.	Mill Diameter	Shank Diameter	Length of Cut	Overall Length
	D1	D2	L1	L2
SEME7206030150	6.0	6	30	150
SEME7206035	6.0	6	35	90
SEME7206040	6.0	6	40	90
SEME7206040120	6.0	6	40	120
SEME7206045	6.0	6	45	150
SEME7208025	8.0	8	25	80
SEME7208030	8.0	8	30	80
SEME7208030100	8.0	8	30	100
SEME7208035	8.0	8	35	90
SEME7208040	8.0	8	40	90
SEME7208040120	8.0	8	40	120
SEME7208040150	8.0	8	40	150
SEME7208045	8.0	8	45	100
SEME7208050	8.0	8	50	100
SEME7208050150	8.0	8	50	150
SEME7210030	10.0	10	30	80
SEME7210030100	10.0	10	30	100
SEME7210035	10.0	10	35	90
SEME7210040	10.0	10	40	90
SEME7210040120	10.0	10	40	120
SEME7210045	10.0	10	45	100
SEME7210050	10.0	10	50	100
SEME7210050150	10.0	10	50	150
SEME7210050200	10.0	10	50	200
SEME7210055	10.0	10	55	150
SEME7210060	10.0	10	60	110
SEME7210060200	10.0	10	60	200
SEME7212035	12.0	12	35	90

▶ NEXT PAGE

◎ : Excellent ○ : Good

ISO Material Description	P										M				K			H		
	Non-alloy steel					Low alloy steel					High alloyed steel, and tool steel				Stainless steel		Grey cast iron		Nodular cast iron	Malleable cast iron
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25	21	21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend	○	○	◎	◎	◎	○	◎	◎	◎	○	◎	○	○	○	○	○	○	○	○	○

ISO Material Description	N					S					H										
	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)		Non Metallic Materials			Heat Resistant Super Alloys		Titanium Alloys	Hardened steel	Chilled Cast Iron	Hardened Cast Iron					
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34	36	37	55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○

**CARBIDE, 4 FLUTE LONG LENGTH**

- ▶ Due to new coating and new tool geometry, outstanding cutting ability and wear resistance.
- ▶ Excellent performance when cutting prehardened steels, up to HRc55 which are used for molds & dies.
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Call for Availability

Unit : mm

EDP No.	Mill Diameter	Shank Diameter	Length of Cut	Overall Length
	D1	D2	L1	L2
SEME7212040	12.0	12	40	100
SEME7212040120	12.0	12	40	120
SEME7212045	12.0	12	45	130
SEME7212050	12.0	12	50	100
SEME7212050150	12.0	12	50	150
SEME7212055	12.0	12	55	110
SEME7212060	12.0	12	60	110
SEME7212060150	12.0	12	60	150
SEME7212060200	12.0	12	60	200
SEME7212065	12.0	12	65	150
SEME7212070	12.0	12	70	120
SEME7212070200	12.0	12	70	200
SEME7214050	14.0	16	50	110
SEME7214060	14.0	16	60	150
SEME7216040	16.0	16	40	150
SEME7216050	16.0	16	50	110
SEME7216050150	16.0	16	50	150
SEME7216060	16.0	16	60	120
SEME7216070	16.0	16	70	130
SEME7216070150	16.0	16	70	150
SEME7216070200	16.0	16	70	200
SEME7216080	16.0	16	80	150
SEME7216090	16.0	16	90	150
SEME72160110	16.0	16	110	200
SEME72160120	16.0	16	120	250
SEME7218050	18.0	20	50	120
SEME7218070	18.0	20	70	130
SEME72180100	18.0	20	100	200

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◎ : Excellent ○ : Good

ISO Material Description	P										M				K			H		
	Non-alloy steel					Low alloy steel					High alloyed steel, and tool steel				Stainless steel		Grey cast iron		Nodular cast iron	Malleable cast iron
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25	21	21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend	○	○	◎	◎	◎	○	◎	◎	◎	○	◎	○	○	○	○	○	○	○	○	○

ISO Material Description	N					S					H										
	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)		Non Metallic Materials			Heat Resistant Super Alloys		Titanium Alloys	Hardened steel	Chilled Cast Iron	Hardened Cast Iron					
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34	36	37	55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○





PLAIN SHANK SEME72 SERIES

### CARBIDE, 4 FLUTE LONG LENGTH

- ▶ Due to new coating and new tool geometry, outstanding cutting ability and wear resistance.
- ▶ Excellent performance when cutting prehardened steels, up to HRc55 which are used for molds & dies.
- ▶ Available various length of cut and overall length products.



Call for Availability

Unit : mm

EDP No.	Mill Diameter	Shank Diameter	Length of Cut	Overall Length
	D1	D2	L1	L2
SEME7220050	20.0	20	50	110
SEME7220050150	20.0	20	50	150
SEME7220060	20.0	20	60	130
SEME7220070	20.0	20	70	130
SEME7220080	20.0	20	80	150
SEME7220090	20.0	20	90	150
SEME7220090200	20.0	20	90	200
SEME72200110	20.0	20	110	200
SEME72200120	20.0	20	120	250
SEME7222075	22.0	20	75	150
SEME72220110	22.0	20	110	200
SEME7225070	25.0	25	70	150
SEME7225090	25.0	25	90	150
SEME72250110	25.0	25	110	200
SEME72250120	25.0	25	120	250

Mill Dia. Tolerance (mm)	Shank Dia. Tolerance
0~-0.03	h5

◎ : Excellent ○ : Good

ISO	P										M				K					
	Non-alloy steel					Low alloy steel					High alloyed steel, and tool steel				Stainless steel		Grey cast iron	Nodular cast iron	Malleable cast iron	
Material Description	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc	13	25	28	32	30	10	29	32	38	15	35	15	23	10	10	26	3	25	3	21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend	○	○	◎	◎	◎	○	◎	◎	◎	○	◎	○	◎	◎	○	○	○	○	○	○

ISO	N					S					H										
	Aluminum-wrought alloy		Aluminum-cast, alloyed		Copper and Copper Alloys (Bronze / Brass)	Non Metallic Materials		Heat Resistant Super Alloys			Titanium Alloys	Hardened steel	Chilled Cast Iron	Hardened Cast Iron							
Material Description	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc	21	22	23	24	25	26	27	28	29	30	15	30	25	38	34	36	37	55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	◎	○



PLAIN SHANK SEME73 SERIES

### CARBIDE, 4 FLUTE LONG NECK

- ▶ Due to new coating and new tool geometry, outstanding cutting ability and wear resistance.
- ▶ Excellent performance when cutting prehardened steels, up to HRc55 which are used for molds & dies.
- ▶ Available various length of cut and overall length products.



Call for Availability

Unit : mm

EDP No.	Mill Diameter	Shank Diameter	Length of Cut	Length Below Shank	Overall Length	Neck Diameter
	D1	D2	L1	L3	L2	D3
SEME7301002	1.0	4	1.5	2	50	0.95
SEME7301003	1.0	4	1.5	3	50	0.95
SEME7301004	1.0	4	1.5	4	50	0.95
SEME7301005	1.0	4	1.5	5	50	0.95
SEME7301006	1.0	4	1.5	6	50	0.95
SEME7301007	1.0	4	1.5	7	50	0.95
SEME7301008	1.0	4	1.5	8	50	0.95
SEME7301010	1.0	4	1.5	10	50	0.95
SEME7301012	1.0	4	1.5	12	50	0.95
SEME7301014	1.0	4	1.5	14	50	0.95
SEME7301016	1.0	4	1.5	16	50	0.95
SEME7301018	1.0	4	1.5	18	50	0.95
SEME7301020	1.0	4	1.5	20	50	0.95
SEME7301022	1.0	4	1.5	22	60	0.95
SEME7301026	1.0	4	1.5	26	60	0.95
SEME7301030	1.0	4	1.5	30	70	0.95
SEME7301040	1.0	4	1.5	40	80	0.95
SEME7301050	1.0	4	1.5	50	100	0.95
SEME7301204	1.2	4	1.8	4	50	1.15
SEME7301206	1.2	4	1.8	6	50	1.15
SEME7301208	1.2	4	1.8	8	50	1.15
SEME7301210	1.2	4	1.8	10	50	1.15
SEME7301212	1.2	4	1.8	12	50	1.15
SEME7301214	1.2	4	1.8	14	50	1.15
SEME7301216	1.2	4	1.8	16	50	1.15
SEME7301220	1.2	4	1.8	20	50	1.15

▶ NEXT PAGE

◎ : Excellent ○ : Good

ISO	P										M				K					
	Non-alloy steel					Low alloy steel					High alloyed steel, and tool steel				Stainless steel		Grey cast iron	Nodular cast iron	Malleable cast iron	
Material Description	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc	13	25	28	32	30	10	29	32	38	15	35	15	23	10	10	26	3	25	3	21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend	○	○	◎	◎	◎	○	◎	◎	◎	○	◎	○	○	○	○	○	○	○	○	○

ISO	N					S					H										
	Aluminum-wrought alloy		Aluminum-cast, alloyed		Copper and Copper Alloys (Bronze / Brass)	Non Metallic Materials		Heat Resistant Super Alloys			Titanium Alloys	Hardened steel	Chilled Cast Iron	Hardened Cast Iron							
Material Description	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc	21	22	23	24	25	26	27	28	29	30	15	30	25	38	34	36	37	55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	◎	○

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PLAIN SHANK SEME73 SERIES

PLAIN SHANK SEME73 SERIES

CARBIDE, 4 FLUTE LONG NECK

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- ▶ Due to new coating and new tool geometry, outstanding cutting ability and wear resistance.
- ▶ Excellent performance when cutting prehardened steels, up to HRC55 which are used for molds & dies.
- ▶ Available various length of cut and overall length products.

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- ▶ Available various length of cut and overall length products.



Call for Availability

Call for Availability

Unit : mm

EDP No.	Mill Diameter	Shank Diameter	Length of Cut	Length Below Shank	Overall Length	Neck Diameter
	D1	D2	L1	L3	L2	D3
SEME7301226	1.2	4	1.8	26	60	1.15
SEME7301230	1.2	4	1.8	30	70	1.15
SEME7301504	1.5	4	2.3	4	50	1.45
SEME7301505	1.5	4	2.3	5	50	1.45
SEME7301506	1.5	4	2.3	6	50	1.45
SEME7301507	1.5	4	2.3	7	50	1.45
SEME7301508	1.5	4	2.3	8	50	1.45
SEME7301510	1.5	4	2.3	10	50	1.45
SEME7301512	1.5	4	2.3	12	50	1.45
SEME7301514	1.5	4	2.3	14	50	1.45
SEME7301516	1.5	4	2.3	16	50	1.45
SEME7301518	1.5	4	2.3	18	50	1.45
SEME7301520	1.5	4	2.3	20	50	1.45
SEME7301522	1.5	4	2.3	22	60	1.45
SEME7301526	1.5	4	2.3	26	60	1.45
SEME7301530	1.5	4	2.3	30	70	1.45
SEME7302006	2.0	4	3	6	50	1.95
SEME7302008	2.0	4	3	8	50	1.95
SEME7302010	2.0	4	3	10	50	1.95
SEME7302012	2.0	4	3	12	50	1.95
SEME7302014	2.0	4	3	14	50	1.95
SEME7302016	2.0	4	3	16	50	1.95
SEME7302018	2.0	4	3	18	50	1.95
SEME7302020	2.0	4	3	20	50	1.95
SEME7302022	2.0	4	3	22	60	1.95
SEME7302026	2.0	4	3	26	60	1.95

Unit : mm

EDP No.	Mill Diameter	Shank Diameter	Length of Cut	Length Below Shank	Overall Length	Neck Diameter
	D1	D2	L1	L3	L2	D3
SEME7302030	2.0	4	3	30	70	1.95
SEME7302035	2.0	4	3	35	70	1.95
SEME7302040	2.0	4	3	40	80	1.95
SEME7302045	2.0	4	3	45	90	1.95
SEME7302050	2.0	4	3	50	100	1.95
SEME7302060	2.0	4	3	60	110	1.95
SEME7302508	2.5	4	4	8	50	2.40
SEME7302510	2.5	4	4	10	50	2.40
SEME7302512	2.5	4	4	12	50	2.40
SEME7302514	2.5	4	4	14	50	2.40
SEME7302516	2.5	4	4	16	50	2.40
SEME7302518	2.5	4	4	18	50	2.40
SEME7302520	2.5	4	4	20	50	2.40
SEME7302522	2.5	4	4	22	60	2.40
SEME7302526	2.5	4	4	26	60	2.40
SEME7302530	2.5	4	4	30	70	2.40
SEME7302535	2.5	4	4	35	70	2.40
SEME7302540	2.5	4	4	40	80	2.40
SEME7302545	2.5	4	4	45	90	2.40
SEME7302550	2.5	4	4	50	100	2.40
SEME7303006	3.0	6	4.5	6	50	2.85
SEME7303008	3.0	6	4.5	8	50	2.85
SEME7303010	3.0	6	4.5	10	50	2.85
SEME7303012	3.0	6	4.5	12	50	2.85
SEME7303014	3.0	6	4.5	14	60	2.85
SEME7303016	3.0	6	4.5	16	60	2.85

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◎ : Excellent ○ : Good

ISO	P										M				K			H		
	Non-alloy steel					Low alloy steel					High alloyed steel, and tool steel				Stainless steel		Grey cast iron		Nodular cast iron	Malleable cast iron
Material Description	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
VDI 3323																				
HRc	13	25	28	32	30	10	29	32	38	15	35	15	23	10	10	26	3	25	21	21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend	○	○	◎	◎	◎	○	◎	◎	◎	○	◎	○	○	○	○	○	○	○	○	○

ISO	N										S					H					
	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)		Non Metallic Materials			Heat Resistant Super Alloys			Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron			
Material Description	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
VDI 3323																					
HRc	21	22	23	24	25	26	27	28	29	30	15	30	25	38	34	36	37	55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend																		○	◎	◎	○

◎ : Excellent ○ : Good

ISO	P										M				K			H			
	Non-alloy steel					Low alloy steel					High alloyed steel, and tool steel				Stainless steel		Grey cast iron		Nodular cast iron	Malleable cast iron	
Material Description	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
VDI 3323																					
HRc	13	25	28	32	30	10	29	32	38	15	35	15	23	10	10	26	3	25	21	21	
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230	
Recommend	○	○	◎	◎	◎	○	◎	◎	◎	○	◎	○	○	○	○	○	○	○	○	○	○

ISO	N										S					H					
	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)		Non Metallic Materials			Heat Resistant Super Alloys			Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron			
Material Description	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
VDI 3323																					
HRc	21	22	23	24	25	26	27	28	29	30	15	30	25	38	34	36	37	55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend																		○	◎	◎	○

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PLAIN SHANK SEME73 SERIES



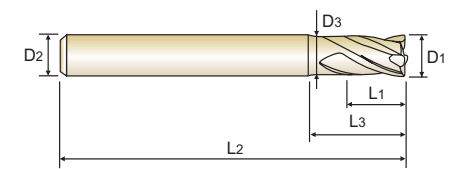
PLAIN SHANK SEME73 SERIES

CARBIDE, 4 FLUTE LONG NECK

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- ▶ Excellent performance when cutting prehardened steels, up to HRc55 which are used for molds & dies.
- ▶ Available various length of cut and overall length products.



Call for Availability

Call for Availability

EDP No.	Mill Diameter	Shank Diameter	Length of Cut	Length Below Shank	Overall Length	Neck Diameter
	D1	D2	L1	L3	L2	D3
SEME7303018	3.0	6	4.5	18	60	2.85
SEME7303020	3.0	6	4.5	20	60	2.85
SEME7303022	3.0	6	4.5	22	65	2.85
SEME7303026	3.0	6	4.5	26	65	2.85
SEME7303030	3.0	6	4.5	30	70	2.85
SEME7303035	3.0	6	4.5	35	70	2.85
SEME7303040	3.0	6	4.5	40	80	2.85
SEME7303045	3.0	6	4.5	45	90	2.85
SEME7303050	3.0	6	4.5	50	100	2.85
SEME7303060	3.0	6	4.5	60	100	2.85
SEME7304008	4.0	6	6	8	50	3.85
SEME7304010	4.0	6	6	10	50	3.85
SEME7304012	4.0	6	6	12	50	3.85
SEME7304014	4.0	6	6	14	60	3.85
SEME7304016	4.0	6	6	16	60	3.85
SEME7304018	4.0	6	6	18	60	3.85
SEME7304020	4.0	6	6	20	60	3.85
SEME7304022	4.0	6	6	22	65	3.85
SEME7304026	4.0	6	6	26	65	3.85
SEME7304030	4.0	6	6	30	70	3.85
SEME7304035	4.0	6	6	35	70	3.85
SEME7304040	4.0	6	6	40	80	3.85
SEME7304045	4.0	6	6	45	90	3.85
SEME7304050	4.0	6	6	50	100	3.85
SEME7304060	4.0	6	6	60	100	3.85
SEME7305016	5.0	6	8	16	60	4.85

EDP No.	Mill Diameter	Shank Diameter	Length of Cut	Length Below Shank	Overall Length	Neck Diameter
	D1	D2	L1	L3	L2	D3
SEME7305020	5.0	6	8	20	60	4.85
SEME7305026	5.0	6	8	26	65	4.85
SEME7305030	5.0	6	8	30	70	4.85
SEME7305035	5.0	6	8	35	75	4.85
SEME7305040	5.0	6	8	40	80	4.85
SEME7305050	5.0	6	8	50	90	4.85
SEME7305060	5.0	6	8	60	100	4.85
SEME7306015	6.0	6	9	15	60	5.85
SEME7306020	6.0	6	9	20	60	5.85
SEME7306030	6.0	6	9	30	70	5.85
SEME7306032	6.0	6	9	32	90	5.85
SEME7308025	8.0	8	12	25	70	7.70
SEME7308030	8.0	8	12	30	80	7.70
SEME7308042	8.0	8	12	42	100	7.70
SEME7310030	10.0	10	15	30	75	9.70
SEME7310035	10.0	10	15	35	80	9.70
SEME7310045	10.0	10	15	45	100	9.70
SEME7312035	12.0	12	20	35	80	11.70
SEME7312040	12.0	12	20	40	90	11.70
SEME7312050	12.0	12	20	50	110	11.70

Mill Dia. Tolerance (mm)	Shank Dia. Tolerance
0~-0.03	h5

▶ NEXT PAGE

◎: Excellent ○: Good

ISO	P										M				K					
	Non-alloy steel					Low alloy steel					High alloyed steel, and tool steel				Stainless steel		Grey cast iron		Nodular cast iron	Malleable cast iron
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend	○	○	◎	◎	◎	○	◎	◎	◎	○	◎	○	○	○	○	○	○	○	○	○

ISO	N					S					H										
	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys			Titanium Alloys	Hardened steel	Chilled Cast Iron	Hardened Cast Iron				
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34	36	37	55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend																		○	◎	○	○

◎: Excellent ○: Good

ISO	P										M				K						
	Non-alloy steel					Low alloy steel					High alloyed steel, and tool steel				Stainless steel		Grey cast iron		Nodular cast iron	Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21	
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230	
Recommend	○	○	◎	◎	◎	○	◎	◎	◎	○	◎	○	○	○	○	○	○	○	○	○	○

ISO	N					S					H										
	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys			Titanium Alloys	Hardened steel	Chilled Cast Iron	Hardened Cast Iron				
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34	36	37	55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend																		○	◎	○	○

HSS

CBN END MILLS

i-Xmill END MILLS

i-SMART MODULAR END MILLS

X5070 END MILLS

4G MILL END MILLS

X-POWER PRO END MILLS

TitaNox-POWER END MILLS

JET-POWER END MILLS

V7 PLUS A END MILLS

V7 MILL INOX

ALU-POWER HPC END MILLS

ALU-POWER END MILLS

D-POWER GRAPHITE END MILLS

STANDARD CARBIDE

ONLY ONE COATED PM60 END MILLS

SINE-POWER

TANK-POWER END MILLS

STANDARD COBALT & HSS

TECHNICAL DATA



HSS

HSS



PLAIN SHANK SEME75 SERIES



PLAIN SHANK SEME75 SERIES

**CARBIDE, 6 FLUTE 45° HELIX (Regular, Long Shank)**

**CARBIDE, 6 FLUTE 45° HELIX (Regular, Long Shank)**

- ▶ Due to new coating and new tool geometry, outstanding cutting ability and wear resistance.
- ▶ Excellent performance when cutting prehardened steels, up to HRC55 which are used for molds & dies.
- ▶ Due to 45 helix angle, better surface roughness can be achieved at side cutting.
- ▶ Available various effective length and overall length products.

- ▶ Due to new coating and new tool geometry, outstanding cutting ability and wear resistance.
- ▶ Excellent performance when cutting prehardened steels, up to HRC55 which are used for molds & dies.
- ▶ Due to 45 helix angle, better surface roughness can be achieved at side cutting.
- ▶ Available various effective length and overall length products.



Call for Availability

Call for Availability

Unit : mm

EDP No.	Mill Diameter	Shank Diameter	Length of Cut	Overall Length	Remark
	D1	D2	L1	L2	
SEME75060	6.0	6	15	60	Regular
SEME7506020	6.0	6	20	70	Long
SEME7506030	6.0	6	30	80	Long
SEME7506030110	6.0	6	30	110	Long
SEME75080	8.0	8	20	70	Regular
SEME7508030	8.0	8	30	80	Long
SEME7508035	8.0	8	35	90	Long
SEME7508040	8.0	8	40	90	Long
SEME7508040130	8.0	8	40	130	Long
SEME75100	10.0	10	25	75	Regular
SEME7510030	10.0	10	30	80	Long
SEME7510040	10.0	10	40	90	Long
SEME7510050	10.0	10	50	100	Long
SEME7510050150	10.0	10	50	150	Long
SEME75120	12.0	12	30	80	Regular
SEME7512040	12.0	12	40	90	Long
SEME7512050	12.0	12	50	100	Long
SEME7512060	12.0	12	60	110	Long
SEME7512060150	12.0	12	60	150	Long
SEME75160	16.0	16	40	100	Regular
SEME7516050	16.0	16	50	110	Long
SEME7516060	16.0	16	60	120	Long
SEME7516090	16.0	16	90	150	Long
SEME75160110	16.0	16	110	200	Long
SEME75160110250	16.0	16	110	250	Long
SEME75200	20.0	20	45	100	Regular

Unit : mm

EDP No.	Mill Diameter	Shank Diameter	Length of Cut	Overall Length	Remark
	D1	D2	L1	L2	
SEME7520060	20.0	20	60	120	Long
SEME7520070	20.0	20	70	130	Long
SEME75200110	20.0	20	110	200	Long
SEME75200110250	20.0	20	110	250	Long
SEME75200110300	20.0	20	110	300	Long

Mill Dia. Tolerance (mm)	Shank Dia. Tolerance
0~-0.03	h5

▶ NEXT PAGE

◎ : Excellent ○ : Good

ISO	P										M				K						
	Non-alloy steel					Low alloy steel					High alloyed steel, and tool steel				Stainless steel		Grey cast iron		Nodular cast iron		Malleable cast iron
Material Description	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
HRc	13	25	28	32	38	10	29	32	38	15	35	15	23	10	10	26	3	25	21	21	
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230	
Recommend	○	○	◎	◎	◎	○	◎	◎	◎	○	◎	○	○	○	○	○	○	○	○	○	

ISO	N										S					H					
	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)		Non Metallic Materials			Heat Resistant Super Alloys					Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron	
Material Description	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HB	60	100	75	90	130	110	90	100			15	30	25	38	34	400 Rm	1050 Rm	55	60	42	55
Recommend	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	◎	○

◎ : Excellent ○ : Good

ISO	P										M				K						
	Non-alloy steel					Low alloy steel					High alloyed steel, and tool steel				Stainless steel		Grey cast iron		Nodular cast iron		Malleable cast iron
Material Description	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
HRc	13	25	28	32	38	10	29	32	38	15	35	15	23	10	10	26	3	25	21	21	
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230	
Recommend	○	○	◎	◎	◎	○	◎	◎	◎	○	◎	○	○	○	○	○	○	○	○	○	

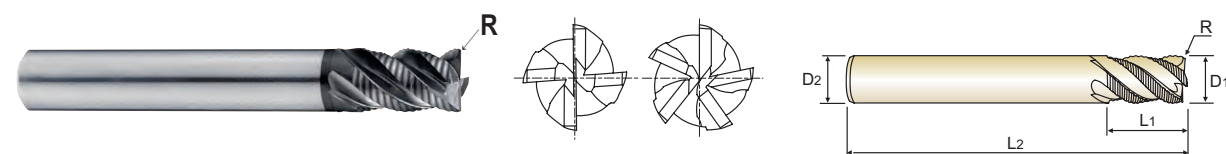
ISO	N										S					H					
	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)		Non Metallic Materials			Heat Resistant Super Alloys					Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron	
Material Description	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HB	60	100	75	90	130	110	90	100			15	30	25	38	34	400 Rm	1050 Rm	55	60	42	55
Recommend	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	◎	○



PLAIN SHANK G9D75 SERIES  
FLAT SHANK G9D67 SERIES

### CARBIDE, 4&5 FLUTE MULTIPLE HELIX SHORT LENGTH ROUGHING CORNER RADIUS

- ▶ Unique flute design for excellent chip evacuation and vibration reduction.
- ▶ Optimal roughing tooth profile to reduce cutting forces.
- ▶ Special tool geometry for high feed rate and heavy cutting.
- ▶ Strong end tooth design for plunge and pocket milling.
- ▶ Custom engineered coating to allow long tool life and excellent chip evacuation.



◇ Call for Availability

5 Flute, 44°/44.5°/45° Unit : mm

EDP No.		Corner Radius	Mill Diameter	Shank Diameter	Length of Cut	Overall Length	No. of Flute
PLAIN	FLAT	R	D1	D2	L1	L2	
<a href="#">G9D75060</a>	<a href="#">G9D67060</a>	R0.5	6.0	6	9	57	4
<a href="#">G9D75080</a>	<a href="#">G9D67080</a>	R0.5	8.0	8	12	63	4
<a href="#">G9D75100</a>	<a href="#">G9D67100</a>	R0.5	10.0	10	15	72	4
<a href="#">G9D75120</a>	<a href="#">G9D67120</a>	R0.5	12.0	12	18	83	4
<a href="#">G9D75160</a>	<a href="#">G9D67160</a>	R1.0	16.0	16	24	92	5
<a href="#">G9D75200</a>	<a href="#">G9D67200</a>	R1.0	20.0	20	30	104	5

Mill Dia. Tolerance (mm)	Shank Dia. Tolerance
0~-0.05	h5

◎ : Excellent ○ : Good

ISO Material Description	P										M				K						
	Non-alloy steel					Low alloy steel					High alloyed steel, and tool steel				Stainless steel		Grey cast iron		Nodular cast iron		Malleable cast iron
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
HRc	13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25	3	25		
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230	
Recommend	○	○	◎	◎	◎	○	◎	◎	◎	○	◎	○	○	○	◎	◎	◎	◎	◎	◎	

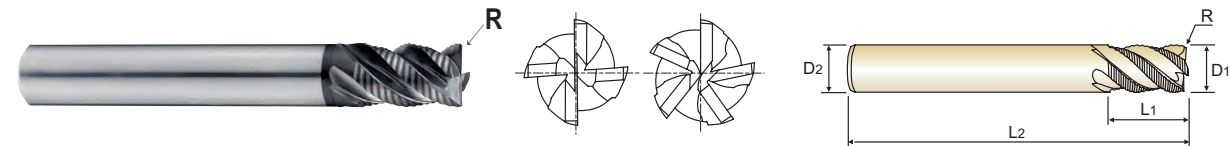
ISO Material Description	N					S					H										
	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys			Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron			
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc	21	22	23	24	25	26	27	28	29	30	15	30	25	38	34	36	37	55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend	○	○	○	○	○	○	○	○			○	○	○	○	○	○	○	○	○	○	○



PLAIN SHANK G9D76 SERIES  
FLAT SHANK G9D68 SERIES

### CARBIDE, 4&5 FLUTE MULTIPLE HELIX LONG LENGTH ROUGHING CORNER RADIUS

- ▶ Unique flute design for excellent chip evacuation and vibration reduction.
- ▶ Optimal roughing tooth profile to reduce cutting forces.
- ▶ Special tool geometry for high feed rate and heavy cutting.
- ▶ Strong end tooth design for plunge and pocket milling.
- ▶ Custom engineered coating to allow long tool life and excellent chip evacuation.



◇ Call for Availability

5 Flute, 44°/44.5°/45° Unit : mm

EDP No.		Corner Radius	Mill Diameter	Shank Diameter	Length of Cut	Overall Length	No. of Flute
PLAIN	FLAT	R	D1	D2	L1	L2	
<a href="#">G9D76060</a>	<a href="#">G9D68060</a>	R0.5	6.0	6	12	57	4
<a href="#">G9D76080</a>	<a href="#">G9D68080</a>	R0.5	8.0	8	16	63	4
<a href="#">G9D76100</a>	<a href="#">G9D68100</a>	R0.5	10.0	10	20	72	4
<a href="#">G9D76120</a>	<a href="#">G9D68120</a>	R0.5	12.0	12	24	83	4
<a href="#">G9D76160</a>	<a href="#">G9D68160</a>	R1.0	16.0	16	32	92	5
<a href="#">G9D76200</a>	<a href="#">G9D68200</a>	R1.0	20.0	20	40	104	5

Mill Dia. Tolerance (mm)	Shank Dia. Tolerance
0~-0.05	h5

◎ : Excellent ○ : Good

ISO Material Description	P										M				K						
	Non-alloy steel					Low alloy steel					High alloyed steel, and tool steel				Stainless steel		Grey cast iron		Nodular cast iron		Malleable cast iron
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
HRc	13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25	3	25		
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230	
Recommend	○	○	◎	◎	◎	○	◎	◎	◎	○	◎	○	○	○	◎	◎	◎	◎	◎	◎	

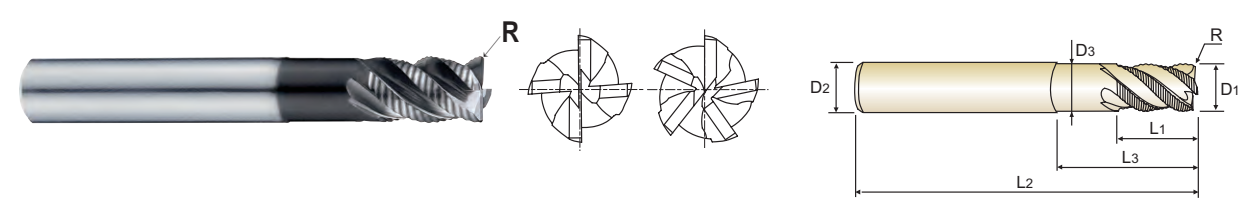
  

ISO Material Description	N					S					H										
	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys			Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron			
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc	21	22	23	24	25	26	27	28	29	30	15	30	25	38	34	36	37	55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend	○	○	○	○	○	○	○	○			○	○	○	○	○	○	○	○	○	○	○

**YG 4G MILL END MILLS** **X-SPEED ROUGHER** PLAIN SHANK **G9D77 SERIES** FLAT SHANK **G9D69 SERIES**

**CARBIDE, 4&5 FLUTE MULTIPLE HELIX LONG REACH ROUGHING CORNER RADIUS**

- ▶ Unique flute design for excellent chip evacuation and vibration reduction.
- ▶ Optimal roughing tooth profile to reduce cutting forces.
- ▶ Special tool geometry for high feed rate and heavy cutting.
- ▶ Strong end tooth design for plunge and pocket milling.
- ▶ Custom engineered coating to allow long tool life and excellent chip evacuation.



CARBIDE 4&5 44°/45° PLAIN FLAT p.C388-C389

Call for Availability

EDP No.		Corner Radius	Mill Diameter	Shank Diameter	Length of Cut	Length Below Shank	Overall Length	Neck Diameter	No. of Flute
PLAIN	FLAT	R	D1	D2	L1	L3	L2	D3	
<a href="#">G9D77060</a>	<a href="#">G9D69060</a>	R0.5	6.0	6	9	18	57	5.50	4
<a href="#">G9D77080</a>	<a href="#">G9D69080</a>	R0.5	8.0	8	12	24	63	7.50	4
<a href="#">G9D77100</a>	<a href="#">G9D69100</a>	R0.5	10.0	10	15	30	72	9.50	4
<a href="#">G9D77120</a>	<a href="#">G9D69120</a>	R0.5	12.0	12	18	36	83	11.50	4
<a href="#">G9D77160</a>	<a href="#">G9D69160</a>	R1.0	16.0	16	24	48	100	15.50	5
<a href="#">G9D77200</a>	<a href="#">G9D69200</a>	R1.0	20.0	20	30	60	110	19.20	5

Mill Dia. Tolerance (mm)	Shank Dia. Tolerance
0~-0.05	h5

◎ : Excellent ○ : Good

ISO	P										M				K							
	Non-alloy steel					Low alloy steel					High alloyed steel, and tool steel				Stainless steel		Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20		
HRc	13	25	28	32	30	10	29	32	38	15	35	15	23	10	10	26	3	25	3	25		
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230		
Recommend	○	○	◎	◎	◎	○	◎	◎	◎	○	◎	○	○	○	◎	◎	◎	◎	◎	◎		

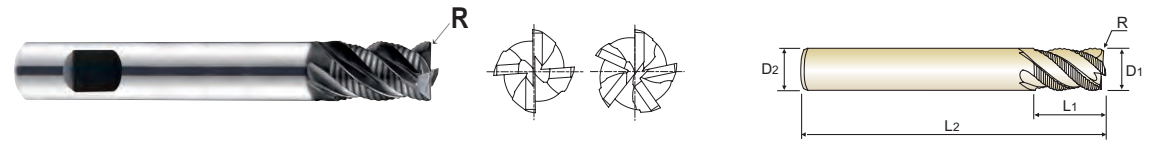
  

ISO	N					S					H										
	Aluminum-wrought alloy		Aluminum-cast, alloyed		Copper and Copper Alloys (Bronze / Brass)	Heat Resistant Super Alloys			Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron								
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34	55	60	42	42	55	
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend						○	○	○													

**YG 4G MILL END MILLS** **X-SPEED ROUGHER** FLAT SHANK **GAE53 SERIES**

**HSS-PM, 4&5 FLUTE MULTIPLE HELIX SHORT LENGTH ROUGHING CORNER RADIUS**

- ▶ Unique flute design for excellent chip evacuation and vibration reduction.
- ▶ Optimal roughing tooth profile to reduce cutting forces.
- ▶ Special tool geometry for high feed rate and heavy cutting.
- ▶ Strong end tooth design for plunge and pocket milling.
- ▶ Custom engineered coating to allow long tool life and excellent chip evacuation.



CARBIDE 4&5 44°/45° FLAT p.C388-C389

Call for Availability

EDP No.	Corner Radius	Mill Diameter		Shank Diameter	Length of Cut	Overall Length	No. of Flute
		Metric	Inch				
FLAT	R	D1(js12)		D2(h5)	L1	L2	
<a href="#">GAE53060</a>	R0.5	6.0	.2362	6	13	57	4
<a href="#">GAE53070</a>	R0.5	7.0	.2756	10	16	66	4
<a href="#">GAE53080</a>	R0.5	8.0	.3150	10	19	69	4
<a href="#">GAE53090</a>	R0.5	9.0	.3543	10	19	69	4
<a href="#">GAE53100</a>	R0.5	10.0	.3937	10	22	72	4
<a href="#">GAE53120</a>	R0.5	12.0	.4724	12	26	83	4
<a href="#">GAE53140</a>	R1.0	14.0	.5512	16	26	83	5
<a href="#">GAE53160</a>	R1.0	16.0	.6299	16	32	92	5
<a href="#">GAE53180</a>	R1.0	18.0	.7087	20	32	92	5
<a href="#">GAE53200</a>	R1.0	20.0	.7874	20	38	104	5

Tolerances according to DIN 7160 & 7161

Tolerance range in μm						
Nominal-Diameter in mm						
	from 1 to 3	over 3 to 6	over 6 to 10	over 10 to 18	over 18 to 30	over 30 to 50
js12	± 50	± 60	± 75	± 90	± 105	± 125
h5	0 - 6	0 - 8	0 - 9	0 - 11	0 - 13	0 - 16

◎ : Excellent ○ : Good

ISO	P										M				K							
	Non-alloy steel					Low alloy steel					High alloyed steel, and tool steel				Stainless steel		Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20		
HRc	13	25	28	32	30	10	29	32	38	15	35	15	23	10	10	26	3	25	3	25		
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230		
Recommend	○	○	◎	◎	◎	○	◎	◎	◎	○	◎	○	○	○	◎	◎	◎	◎	◎	◎		

ISO	N					S					H										
	Aluminum-wrought alloy		Aluminum-cast, alloyed		Copper and Copper Alloys (Bronze / Brass)	Heat Resistant Super Alloys			Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron								
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34	55	60	42	42	55	
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend						○	○	○													





RECOMMENDED CUTTING CONDITIONS



RECOMMENDED CUTTING CONDITIONS

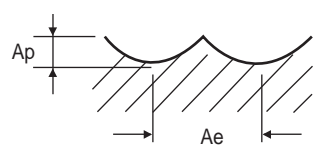
GMF15 SERIES 2FLUTE BALL NOSE - PLANE

GMF15 SERIES 2FLUTE BALL NOSE - PLANE

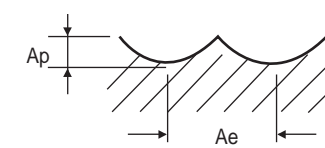
Table with columns: ISO, VDI 3323, Material Description, Ae, Ap, Parameter, Diameter (Ø) [0.04, .008, .012, .015, .020, .024, .028, .031, .035, 3/64, 1/16, 5/64]. Rows include P (1-8, 9, 10-11.1, 11.2), K (15-20), and H (38.1-38.2, 40, 41).

Table with columns: ISO, VDI 3323, Material Description, Ae, Ap, Parameter, Diameter (Ø) [3/32, 1/8, 3/16, 13/64, 1/4, 9/32, 5/16, 3/8, 1/2, 9/16, 5/8, 3/4]. Rows include P (1-8, 9, 10-11.1, 11.2), K (15-20), and H (38.1-38.2, 40, 41).

SFM = Surface Feet per Minute
RPM = Revolutions Per Minute
IPT = Inches Per Tooth
IPM = Inches Per Minute
Ap : Inch (Axial Depth of Cut)
Ae : Inch (Radial Depth of Cut)



SFM = Surface Feet per Minute
RPM = Revolutions Per Minute
IPT = Inches Per Tooth
IPM = Inches Per Minute
Ap : Inch (Axial Depth of Cut)
Ae : Inch (Radial Depth of Cut)



HSS

HSS



RECOMMENDED CUTTING CONDITIONS



RECOMMENDED CUTTING CONDITIONS

GMF16 SERIES 2FLUTE BALL NOSE - SLOTTING

GMF16 SERIES 2FLUTE BALL NOSE - SLOTTING

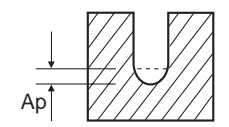
DIA. = Diameter LBS = Length Below Shank RPM = rev./min. FEED = inch/min.

Table with columns for ISO, VDI, Material Description, Parameter, and Diameter (Ø) with sub-columns for various diameters and parameters like SFM, IPT, RPM, IPM, and Ap.

Table with columns for ISO, VDI, Material Description, Parameter, and Diameter (Ø) with sub-columns for various diameters and parameters like SFM, IPT, RPM, IPM, and Ap.

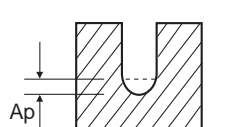
SFM = Surface Feet per Minute RPM = Revolutions Per Minute IPT = Inches Per Tooth IPM = Inches Per Minute Ap : Inch (Axial Depth of Cut) Ae : Inch (Radial Depth of Cut)

(Depth of Cut per one pass)



SFM = Surface Feet per Minute RPM = Revolutions Per Minute IPT = Inches Per Tooth IPM = Inches Per Minute Ap : Inch (Axial Depth of Cut) Ae : Inch (Radial Depth of Cut)

(Depth of Cut per one pass)



HSS

HSS



RECOMMENDED CUTTING CONDITIONS



RECOMMENDED CUTTING CONDITIONS

GMF16 SERIES 2FLUTE BALL NOSE - SLOTTING

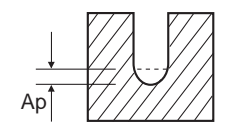
GMF16 SERIES 2FLUTE BALL NOSE - SLOTTING

Table with columns: ISO, VDI 3323, Material Description, Parameter, Diameter (Ø), and various cutting parameters (SFM, IPT, RPM, IPM, Ap) for different materials and diameters.

Table with columns: ISO, VDI 3323, Material Description, Parameter, Diameter (Ø), and various cutting parameters (SFM, IPT, RPM, IPM, Ap) for different materials and diameters.

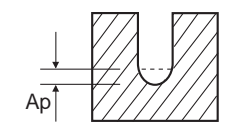
SFM = Surface Feet per Minute
RPM = Revolutions Per Minute
IPT = Inches Per Tooth
IPM = Inches Per Minute
Ap : Inch (Axial Depth of Cut)
Ae : Inch (Radial Depth of Cut)

(Depth of Cut per one pass)



SFM = Surface Feet per Minute
RPM = Revolutions Per Minute
IPT = Inches Per Tooth
IPM = Inches Per Minute
Ap : Inch (Axial Depth of Cut)
Ae : Inch (Radial Depth of Cut)

(Depth of Cut per one pass)







RECOMMENDED CUTTING CONDITIONS



RECOMMENDED CUTTING CONDITIONS

GMF16 SERIES 2FLUTE BALL NOSE - SLOTTING

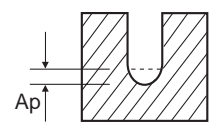
GMF16 SERIES 2FLUTE BALL NOSE - SLOTTING

Table with columns: ISO, VDI 3323, Material Description, Parameter (LBS), and Diameter (Ø) with sub-columns for various diameters (3/32 to 3/16). Rows include materials like Non-alloy steel, Low alloy steel, High alloyed steel, and Grey cast iron.

Table with columns: ISO, VDI 3323, Material Description, Parameter (LBS), and Diameter (Ø) with sub-columns for various diameters (3/16 to 1/2). Rows include materials like Non-alloy steel, Low alloy steel, High alloyed steel, and Grey cast iron.

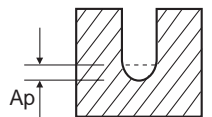
SFM = Surface Feet per Minute
RPM = Revolutions Per Minute
IPT = Inches Per Tooth
IPM = Inches Per Minute
Ap : Inch (Axial Depth of Cut)
Ae : Inch (Radial Depth of Cut)

(Depth of Cut per one pass)



SFM = Surface Feet per Minute
RPM = Revolutions Per Minute
IPT = Inches Per Tooth
IPM = Inches Per Minute
Ap : Inch (Axial Depth of Cut)
Ae : Inch (Radial Depth of Cut)

(Depth of Cut per one pass)





RECOMMENDED CUTTING CONDITIONS



RECOMMENDED CUTTING CONDITIONS

GMF17 SERIES 4FLUTE BALL NOSE - PLANE

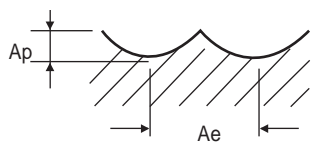
GMF18 SERIES 2FLUTE CORNER RADIUS - SLOTTING

DIA. = Diameter LBS = Length Below Shank RPM = rev./min. FEED = inch/min.

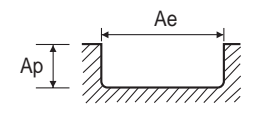
Table with columns: ISO, VDI 3323, Material Description, Ae, Ap, Parameter, Diameter (Ø) [1/8, 3/16, 1/4, 5/16, 3/8, 1/2]. Rows include P (1-8, 9, 10-11.1, 11.2) and K (15-20) series.

Table with columns: ISO, VDI 3323, Material Description, Ae, Ap, Parameter, Diameter (Ø) [3/64, 1/16, 5/64, 1/8, 9/64, 13/64, 1/4, 5/16, 3/8, 1/2, 9/16, 5/8, 3/4]. Rows include P (1-8, 9, 10-11.1, 11.2) and K (15-20) series.

SFM = Surface Feet per Minute RPM = Revolutions Per Minute IPT = Inches Per Tooth IPM = Inches Per Minute Ap : Inch (Axial Depth of Cut) Ae : Inch (Radial Depth of Cut)



SFM = Surface Feet per Minute RPM = Revolutions Per Minute IPT = Inches Per Tooth IPM = Inches Per Minute Ap : Inch (Axial Depth of Cut) Ae : Inch (Radial Depth of Cut)





RECOMMENDED CUTTING CONDITIONS



RECOMMENDED CUTTING CONDITIONS

GMF19 SERIES 2FLUTE CORNER RADIUS - SLOTTING

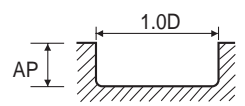
GMF19 SERIES 2FLUTE CORNER RADIUS - SLOTTING

DIA. = Diameter
LBS = Length Below Shank
RPM = rev./min.
FEED = inch/min.

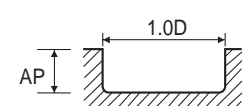
Table with columns: ISO, VDI 3323, Material Description, Parameter, Diameter (Ø) (various sizes), SFM(Vc), IPT(fz), RPM, IPM(FEED), Ap. Rows include Non-alloy steel, Low alloy steel, High alloyed steel, and Grey cast iron.

Table with columns: ISO, VDI 3323, Material Description, Parameter, Diameter (Ø) (various sizes), SFM(Vc), IPT(fz), RPM, IPM(FEED), Ap. Rows include Non-alloy steel, Low alloy steel, High alloyed steel, and Grey cast iron.

SFM = Surface Feet per Minute
RPM = Revolutions Per Minute
IPT = Inches Per Tooth
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Ap : Inch (Axial Depth of Cut)
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SFM = Surface Feet per Minute
RPM = Revolutions Per Minute
IPT = Inches Per Tooth
IPM = Inches Per Minute
Ap : Inch (Axial Depth of Cut)
Ae : Inch (Radial Depth of Cut)







RECOMMENDED CUTTING CONDITIONS



RECOMMENDED CUTTING CONDITIONS

**GMF19 SERIES 2FLUTE CORNER RADIUS - SLOTTING**

ISO	VDI 3323	Material Description	Parameter	Diameter (Ø)													
				1/16	1/16	5/64	5/64	5/64	5/64	5/64	1/8	1/8	1/8	1/8	1/8	1/8	
				LBS	3/8	1/2	1/4	5/16	3/8	1/2	9/16	5/8	5/16	3/8	1/2	5/8	3/4
P	1-8	Non-alloy steel Low alloy steel	SFM(Vc)	365	365	445	445	445	400	400	400	490	490	490	490	440	440
			IPT(fz)	.0002	.0002	.0003	.0003	.0003	.0003	.0003	.0003	.0004	.0004	.0004	.0004	.0004	.0004
			RPM	22450	22450	21770	21770	21770	19590	19590	19590	15020	15020	15020	15020	13520	13520
			IPM(FEED)	9	9	12	12	12	10	10	10	12	12	12	12	10	10
			Ap	.0050	.0050	.0109	.0109	.0109	.0063	.0063	.0063	.0250	.0250	.0175	.0175	.0100	.0100
			SFM(Vc)	225	225	285	285	285	255	255	255	320	320	320	320	285	285
	9	Low alloy steel	IPT(fz)	.0001	.0001	.0002	.0002	.0002	.0002	.0002	.0003	.0003	.0003	.0003	.0003	.0003	
			RPM	13780	13780	13910	13910	13910	12520	12520	12520	9730	9730	9730	9730	8760	8760
			IPM(FEED)	4	4	6	6	6	5	5	5	6	6	6	6	5	5
			Ap	.0037	.0037	.0082	.0082	.0082	.0047	.0047	.0047	.0187	.0187	.0131	.0131	.0075	.0075
			SFM(Vc)	365	365	445	445	445	400	400	400	490	490	490	490	440	440
			IPT(fz)	.0002	.0002	.0003	.0003	.0003	.0003	.0003	.0003	.0004	.0004	.0004	.0004	.0004	.0004
10-11.1	High alloyed steel, and tool steel	RPM	22450	22450	21770	21770	21770	19590	19590	19590	15020	15020	15020	15020	13520	13520	
		IPM(FEED)	9	9	12	12	12	10	10	10	12	12	12	12	10	10	
		Ap	.0050	.0050	.0109	.0109	.0109	.0063	.0063	.0063	.0250	.0250	.0175	.0175	.0100	.0100	
		SFM(Vc)	225	225	285	285	285	255	255	255	320	320	320	320	285	285	
		IPT(fz)	.0001	.0001	.0002	.0002	.0002	.0002	.0002	.0002	.0003	.0003	.0003	.0003	.0003	.0003	
		RPM	13780	13780	13910	13910	13910	12520	12520	12520	9730	9730	9730	9730	8760	8760	
11.2	High alloyed steel, and tool steel	IPM(FEED)	4	4	6	6	6	5	5	5	6	6	6	6	5	5	
		Ap	.0037	.0037	.0082	.0082	.0082	.0047	.0047	.0047	.0187	.0187	.0131	.0131	.0075	.0075	
		SFM(Vc)	365	365	445	445	445	400	400	400	490	490	490	490	440	440	
		IPT(fz)	.0002	.0002	.0003	.0003	.0003	.0003	.0003	.0003	.0004	.0004	.0004	.0004	.0004	.0004	
		RPM	22450	22450	21770	21770	21770	19590	19590	19590	15020	15020	15020	15020	13520	13520	
		IPM(FEED)	9	9	12	12	12	10	10	10	12	12	12	12	10	10	
K	15-20	Grey cast iron Nodular cast iron Malleable cast iron	Ap	.0050	.0050	.0109	.0109	.0109	.0063	.0063	.0063	.0250	.0250	.0175	.0175	.0100	.0100
			SFM(Vc)	140	140	180	180	180	160	160	160	195	195	195	195	175	175
			IPT(fz)	.0001	.0001	.0002	.0002	.0002	.0002	.0002	.0002	.0003	.0003	.0003	.0003	.0002	.0002
			RPM	8670	8670	8710	8710	8710	7840	7840	7840	5950	5950	5950	5950	5360	5360
			IPM(FEED)	2	2	3	3	3	3	3	3	3	3	3	3	2	2
			Ap	.0030	.0030	.0066	.0066	.0066	.0037	.0037	.0037	.0150	.0150	.0105	.0105	.0060	.0060
H	38.1-38.2	Hardened steel	SFM(Vc)	225	225	285	285	285	255	255	255	320	320	320	285	285	
			IPT(fz)	.0001	.0001	.0002	.0002	.0002	.0002	.0002	.0002	.0003	.0003	.0003	.0003	.0003	.0003
			RPM	13780	13780	13910	13910	13910	12520	12520	12520	9730	9730	9730	9730	8760	8760
			IPM(FEED)	4	4	6	6	6	5	5	5	6	6	6	6	5	5
			Ap	.0037	.0037	.0082	.0082	.0082	.0047	.0047	.0047	.0187	.0187	.0131	.0131	.0075	.0075
			SFM(Vc)	140	140	180	180	180	160	160	160	195	195	195	195	175	175
	40	Chilled Cast Iron	IPT(fz)	.0001	.0001	.0002	.0002	.0002	.0002	.0002	.0003	.0003	.0003	.0003	.0003	.0002	.0002
			RPM	8670	8670	8710	8710	8710	7840	7840	7840	5950	5950	5950	5950	5360	5360
			IPM(FEED)	2	2	3	3	3	3	3	3	3	3	3	3	2	2
			Ap	.0030	.0030	.0066	.0066	.0066	.0037	.0037	.0037	.0150	.0150	.0105	.0105	.0060	.0060
			SFM(Vc)	140	140	180	180	180	160	160	160	195	195	195	195	175	175
			IPT(fz)	.0001	.0001	.0002	.0002	.0002	.0002	.0002	.0002	.0003	.0003	.0003	.0003	.0002	.0002
41	Hardened Cast Iron	RPM	8670	8670	8710	8710	8710	7840	7840	7840	5950	5950	5950	5950	5360	5360	
		IPM(FEED)	2	2	3	3	3	3	3	3	3	3	3	3	2	2	
		Ap	.0030	.0030	.0066	.0066	.0066	.0037	.0037	.0037	.0150	.0150	.0105	.0105	.0060	.0060	
		SFM(Vc)	235	235	235	235	235	210	210	210	245	245	250	250	245	245	
		IPT(fz)	.0005	.0005	.0005	.0005	.0005	.0005	.0005	.0005	.0007	.0007	.0009	.0009	.0011	.0011	
		RPM	4790	4790	4790	4790	4790	4310	4310	4310	3710	3710	3040	2540	1890	1550	1260
H	38.1-38.2	Hardened steel	IPM(FEED)	5	5	5	5	5	4	4	4	4	5	5	6	6	
			Ap	.0225	.0225	.0157	.0157	.0157	.0090	.0090	.0300	.0210	.0263	.0315	.0600	.0750	.0900
			SFM(Vc)	360	360	360	360	325	325	370	370	375	410	415	415	400	400
			IPT(fz)	.0007	.0007	.0007	.0007	.0006	.0006	.0010	.0010	.0013	.0015	.0016	.0016	.0014	.0014
			RPM	7350	7350	7350	7350	6610	6610	5670	5670	4590	4200	3160	2540	2050	2050
			IPM(FEED)	10	10	10	10	8	8	11	11	12	12	10	8	6	6
H	40	Chilled Cast Iron	Ap	.0281	.0281	.0197	.0197	.0197	.0113	.0113	.0375	.0263	.0328	.0394	.0750	.0937	.1125
			SFM(Vc)	235	235	235	235	210	210	245	245	250	250	245	245	245	245
			IPT(fz)	.0005	.0005	.0005	.0005	.0005	.0005	.0005	.0005	.0007	.0007	.0009	.0009	.0011	.0011
			RPM	4790	4790	4790	4790	4310	4310	3710	3710	3040	2540	1890	1550	1260	1260
			IPM(FEED)	5	5	5	5	4	4	5	5	6	6	5	4	3	3
			Ap	.0225	.0225	.0157	.0157	.0157	.0090	.0090	.0300	.0210	.0263	.0315	.0600	.0750	.0900
H	41	Hardened Cast Iron	SFM(Vc)	235	235	235	235	210	210	245	245	250	250	245	245	245	
			IPT(fz)	.0005	.0005	.0005	.0005	.0005	.0005	.0005	.0005	.0007	.0007	.0009	.0009	.0011	.0011
			RPM	4790	4790	4790	4790	4310	4310	3710	3710	3040	2540	1890	1550	1260	1260
			IPM(FEED)	5	5	5	5	4	4	5	5	6	6	5	4	3	3
			Ap	.0225	.0225	.0157	.0157	.0157	.0090	.0090	.0300	.0210	.0263	.0315	.0600	.0750	.0900

**GMF19 SERIES 2FLUTE CORNER RADIUS - SLOTTING**

ISO	VDI 3323	Material Description	Parameter	Diameter (Ø)													
				3/16	3/16	3/16	3/16	3/16	3/16	1/4	1/4	5/16	3/8	1/2	5/8	3/4	
				3/8	1/2	5/8	3/4	1	1-3/16	3/4	1-3/16	1	1-3/16	1-1/4	1-3/8	1-1/2	
P	1-8	Non-alloy steel Low alloy steel	SFM(Vc)	565	565	565	565	510	510	590	590	595	620	620	615	620	
			IPT(fz)	.0009	.0009	.0009	.0009	.0008	.0008	.0012	.0012	.0017	.0021	.0020	.0024	.0022	
			RPM	11550	11550	11550	11550	10390	10390	8980	8980	7260	6300	4720	3750	3150	
			IPM(FEED)	21	21	21	21	17	17	22	22	25	26	19	18	14	
			Ap	.0375	.0375	.0263	.0263	.0150	.0150	.0500	.0350	.0437	.0525	.1000	.1250	.1500	
			SFM(Vc)	360	360	360	360	325	325	370	370	375	410	415	415	400	
	9	Low alloy steel	IPT(fz)	.0007	.0007	.0007	.0007	.0006	.0006	.0010	.0010	.0013	.0015	.0016	.0016	.0014	
			RPM	7350	7350	7350	7350	6610	6610	5670	5670	4590	4200	3160	2540	2050	
			IPM(FEED)	10	10	10	10	8	8	11	11	12	12	10	8	6	
			Ap	.0281	.0281	.0197	.0197	.0113	.0113	.0375	.0263	.0328	.0394	.0750	.0937	.1125	
			SFM(Vc)	565	565	565	565	510	510	590	590	595	620	620	615	620	
			IPT(fz)	.0009	.0009	.0009	.0009	.0008	.0008	.0012	.0012	.0017	.0021	.0020	.0024	.0022	
10-11.1	High alloyed steel, and tool steel	RPM	11550	11550	11550	11550	10390	10390	8980	8980	7260	6300	4720	3750	3150		
		IPM(FEED)	21	21	21	21	17	17	22	22	25	26	19	18	14		
		Ap	.0375	.0375	.0263	.0263	.0150	.0150	.0500	.0350	.0437	.0525	.1000	.1250	.1500		
		SFM(Vc)	360	360	360	360	325	325	370	370	375	410	415	415	400		
		IPT(fz)	.0007	.0007	.0007	.0007	.0006	.0006	.0010	.0010	.0013	.0015	.0016	.0016	.0014		
		RPM	7350	7350	7350	7350	6610	6610	5670	5670	4590	4200	3160	2540	2050		



RECOMMENDED CUTTING CONDITIONS

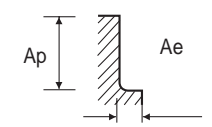


RECOMMENDED CUTTING CONDITIONS

**GMF20 SERIES 4FLUTE CORNER RADIUS - SIDE CUTTING**

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø)											
						3/64	5/64	1/8	3/16	13/64	1/4	5/16	3/8	1/2	5/8	3/4	
P	1-8	Non-alloy steel Low alloy steel	0.05D	2.0D	SFM(Vc)	305	370	410	460	475	490	490	520	510	505	510	
					IPT(fz)	.0001	.0002	.0003	.0004	.0005	.0005	.0008	.0009	.0009	.0009	.0009	
					RPM	25000	18100	12500	9400	8900	7500	6000	5300	3900	3100	2600	
	9	Low alloy steel	0.05D	2.0D	SFM(Vc)	195	240	265	295	300	310	315	340	345	345	340	
					IPT(fz)	.0001	.0002	.0003	.0005	.0006	.0007	.0009	.0011	.0011	.0011	.0011	
					RPM	15870	11650	8090	5960	5620	4760	3830	3440	2630	2120	1720	
	10-11.1	High alloyed steel, and tool steel	0.05D	2.0D	SFM(Vc)	305	370	410	460	475	490	490	520	510	505	510	
					IPT(fz)	.0001	.0002	.0003	.0004	.0005	.0005	.0008	.0009	.0009	.0009	.0009	
					RPM	25000	18100	12500	9400	8900	7500	6000	5300	3900	3100	2600	
	11.2	High alloyed steel, and tool steel	0.05D	2.0D	SFM(Vc)	195	240	265	295	300	310	315	340	345	345	340	
					IPT(fz)	.0001	.0002	.0003	.0005	.0006	.0007	.0009	.0011	.0011	.0011	.0011	
					RPM	15870	11650	8090	5960	5620	4760	3830	3440	2630	2120	1720	
K	15-20	Grey cast iron Nodular cast iron Malleable cast iron	0.05D	2.0D	SFM(Vc)	305	370	410	460	475	490	490	520	510	505	510	
					IPT(fz)	.0001	.0002	.0003	.0004	.0005	.0005	.0008	.0009	.0009	.0009	.0009	
					RPM	25000	18100	12500	9400	8900	7500	6000	5300	3900	3100	2600	
H	38.1-38.2	Hardened steel	0.02D	2.0D	SFM(Vc)	120	150	165	190	195	205	210	210	210	210	205	
					IPT(fz)	.0001	.0002	.0002	.0004	.0004	.0005	.0007	.0008	.0008	.0009	.0009	
					RPM	9830	7260	4990	3830	3680	3100	2540	2120	1590	1290	1050	
	40	Chilled Cast Iron	0.05D	2.0D	SFM(Vc)	195	240	265	295	300	310	315	340	345	345	340	
					IPT(fz)	.0001	.0002	.0003	.0005	.0006	.0007	.0009	.0011	.0011	.0011	.0011	
					RPM	15870	11650	8090	5960	5620	4760	3830	3440	2630	2120	1720	
	41	Hardened Cast Iron	0.02D	2.0D	SFM(Vc)	120	150	165	190	195	205	210	210	210	210	205	
					IPT(fz)	.0001	.0002	.0002	.0004	.0004	.0005	.0007	.0008	.0008	.0009	.0009	
					RPM	9830	7260	4990	3830	3680	3100	2540	2120	1590	1290	1050	

SFM = Surface Feet per Minute  
 RPM = Revolutions Per Minute  
 IPT = Inches Per Tooth  
 IPM = Inches Per Minute  
 Ap : Inch (Axial Depth of Cut)  
 Ae : Inch (Radial Depth of Cut)

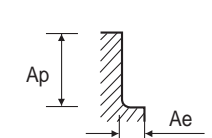


\* 1.5XD Axial cutting depth should be for DIA over 5/8 inch

**GAE53 SERIES 4&5 FLUTE CORNER RADIUS - SIDE CUTTING**

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø)									
						6	8	10	12	14	16	18	20		
P	1	Non-alloy steel	0.5D	1.5D	SFM(Vc)	200	225	220	225	225	230	225	225		
					IPT(fz)	.0007	.0011	.0020	.0024	.0022	.0024	.0028	.0032		
					RPM	3250	2750	2150	1800	1550	1400	1200	1100		
	2	Non-alloy steel	0.5D	1.5D	SFM(Vc)	155	175	175	175	175	180	185	175		
					IPT(fz)	.0007	.0011	.0019	.0025	.0023	.0025	.0028	.0032		
					RPM	2500	2150	1700	1400	1200	1100	1000	850		
	3-4	Non-alloy steel	0.5D	1.5D	SFM(Vc)	110	130	125	125	125	125	130	125		
					IPT(fz)	.0007	.0011	.0017	.0024	.0022	.0025	.0027	.0031		
					RPM	1800	1550	1200	1000	850	750	700	600		
	5	Non-alloy steel	0.5D	1.5D	SFM(Vc)	95	100	105	105	100	100	100	105		
					IPT(fz)	.0007	.0011	.0017	.0022	.0021	.0025	.0027	.0030		
					RPM	1500	1200	1000	850	700	600	550	500		
6	Low alloy steel	0.5D	1.5D	SFM(Vc)	155	175	175	175	175	180	185	175			
				IPT(fz)	.0007	.0011	.0019	.0025	.0023	.0025	.0028	.0032			
				RPM	2500	2150	1700	1400	1200	1100	1000	850			
7	Low alloy steel	0.5D	1.5D	SFM(Vc)	110	130	125	125	125	125	130	125			
				IPT(fz)	.0007	.0011	.0017	.0024	.0022	.0025	.0027	.0031			
				RPM	1800	1550	1200	1000	850	750	700	600			
8-9	Low alloy steel	0.5D	1.5D	SFM(Vc)	95	100	105	105	100	100	100	105			
				IPT(fz)	.0007	.0011	.0017	.0022	.0021	.0025	.0027	.0030			
				RPM	1500	1200	1000	850	700	600	550	500			
10	High alloyed steel, and tool steel	0.5D	1.5D	SFM(Vc)	155	175	175	175	175	180	185	175			
				IPT(fz)	.0007	.0011	.0019	.0025	.0023	.0025	.0028	.0032			
				RPM	2500	2150	1700	1400	1200	1100	1000	850			
11.1	High alloyed steel, and tool steel	0.5D	1.5D	SFM(Vc)	95	100	105	105	100	100	100	105			
				IPT(fz)	.0007	.0011	.0017	.0022	.0021	.0025	.0027	.0030			
				RPM	1500	1200	1000	850	700	600	550	500			
M	14.1-14.2	Stainless steel	0.5D	1.5D	SFM(Vc)	110	120	120	115	125	115	120	125		
					IPT(fz)	.0007	.0012	.0017	.0025	.0023	.0028	.0030	.0032		
					RPM	1750	1450	1150	950	850	700	650	600		
K	15-20	Grey cast iron Nodular cast iron Malleable cast iron	0.5D	1.5D	SFM(Vc)	155	175	175	175	175	180	185	175		
					IPT(fz)	.0007	.0011	.0019	.0025	.0023	.0025	.0028	.0032		
					RPM	2500	2150	1700	1400	1200	1100	1000	850		

SFM = Surface Feet per Minute  
 RPM = Revolutions Per Minute  
 IPT = Inches Per Tooth  
 IPM = Inches Per Minute  
 Ap : Inch (Axial Depth of Cut)  
 Ae : Inch (Radial Depth of Cut)



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RECOMMENDED CUTTING CONDITIONS



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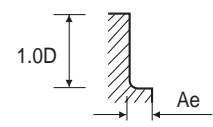
GMF21 SERIES 4FLUTE CORNER RADIUS - SIDE CUTTING

GMF21 SERIES 4FLUTE CORNER RADIUS - SIDE CUTTING

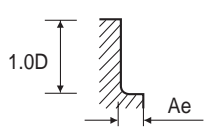
Table with columns: ISO, VDI 3323, Material Description, Parameter, Diameter (Ø) / LBS (3/64 to 1/8), SFM(Vc), IPT(fz), RPM, IPM(FEED), Ap. Rows include P (1-8, 9, 10, 11.1-11.2) and K (15-20) materials.

Table with columns: ISO, VDI 3323, Material Description, Parameter, Diameter (Ø) / LBS (1/8 to 3/4), SFM(Vc), IPT(fz), RPM, IPM(FEED), Ap. Rows include P (1-8, 9, 10, 11.1-11.2) and K (15-20) materials.

SFM = Surface Feet per Minute
RPM = Revolutions Per Minute
IPT = Inches Per Tooth
IPM = Inches Per Minute
Ap : Inch (Axial Depth of Cut)
Ae : Inch (Radial Depth of Cut)



SFM = Surface Feet per Minute
RPM = Revolutions Per Minute
IPT = Inches Per Tooth
IPM = Inches Per Minute
Ap : Inch (Axial Depth of Cut)
Ae : Inch (Radial Depth of Cut)





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RECOMMENDED CUTTING CONDITIONS



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GMF22 SERIES 2FLUTE SQUARE - SLOTTING

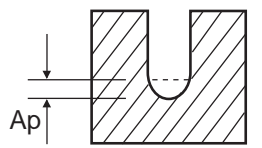
GMF22 SERIES 2FLUTE SQUARE - SLOTTING

Table with columns: ISO, VDI 3323, Material Description, Parameter, Diameter (Ø) / LBS (sub-columns: .008, .015, .015, .015, .015, .015, .020, .020, .020, .020, .020, .024, .024, .024). Rows include P (1-8, 9, 10, 11.1-11.2) and K (15-20) series.

Table with columns: ISO, VDI 3323, Parameter, Diameter (Ø) / LBS (sub-columns: .024, .024, .024, .024, 1/32, 1/32, 1/32, 1/32, 1/32, 1/32, 3/64, 3/64, 3/64). Rows include P (1-8, 9, 10, 11.1-11.2) and K (15-20) series.

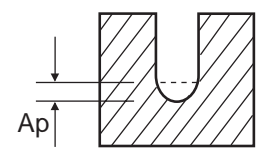
SFM = Surface Feet per Minute
RPM = Revolutions Per Minute
IPT = Inches Per Tooth
IPM = Inches Per Minute
Ap : Inch (Axial Depth of Cut)
Ae : Inch (Radial Depth of Cut)

(Depth of Cut per one pass)



SFM = Surface Feet per Minute
RPM = Revolutions Per Minute
IPT = Inches Per Tooth
IPM = Inches Per Minute
Ap : Inch (Axial Depth of Cut)
Ae : Inch (Radial Depth of Cut)

(Depth of Cut per one pass)



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RECOMMENDED CUTTING CONDITIONS

RECOMMENDED CUTTING CONDITIONS

GMF22 SERIES 2FLUTE SQUARE - SLOTTING

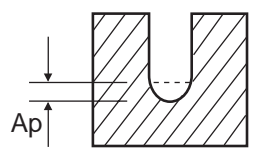
GMF22 SERIES 2FLUTE SQUARE - SLOTTING

Table with columns: ISO, VDI 3323, Material Description, Parameter, Diameter (Ø) / LBS (1/16 to 1/2), SFM(Vc), IPT(fz), RPM, IPM(FEED), Ap. Rows include P (1-8, 9, 10, 11.1-11.2), K (15-20), and H (38.1-38.2, 40, 41).

Table with columns: ISO, VDI 3323, Material Description, Parameter, Diameter (Ø) / LBS (1/16 to 1/2), SFM(Vc), IPT(fz), RPM, IPM(FEED), Ap. Rows include P (1-8, 9, 10, 11.1-11.2), K (15-20), and H (38.1-38.2, 40, 41).

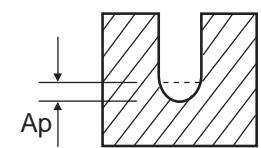
SFM = Surface Feet per Minute
RPM = Revolutions Per Minute
IPT = Inches Per Tooth
IPM = Inches Per Minute
Ap : Inch (Axial Depth of Cut)
Ae : Inch (Radial Depth of Cut)

(Depth of Cut per one pass)



SFM = Surface Feet per Minute
RPM = Revolutions Per Minute
IPT = Inches Per Tooth
IPM = Inches Per Minute
Ap : Inch (Axial Depth of Cut)
Ae : Inch (Radial Depth of Cut)

(Depth of Cut per one pass)



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RECOMMENDED CUTTING CONDITIONS



RECOMMENDED CUTTING CONDITIONS

**GMF22 SERIES 2FLUTE SQUARE - SLOTTING**

**GMF22 SERIES 2FLUTE SQUARE - SLOTTING**

ISO	VDI 3323	Material Description	Parameter	Diameter (Ø) / LBS															
				1/8		1/8		1/8		1/8		3/16		3/16		3/16		13/64	
				LBS	1/2	9/16	5/8	11/16	3/4	1	3/8	1/2	5/8	11/16	3/4	1	1 3/16	3/4	
P	1-8	Non-alloy steel Low alloy steel	SFM(Vc)	335	335	335	305	305	305	330	330	330	330	330	295	295	330		
			IPT(fz)	.0016	.0016	.0016	.0014	.0014	.0014	.0032	.0032	.0032	.0032	.0032	.0029	.0029	.0036		
			RPM	10300	10300	10300	9270	9270	9270	6720	6720	6720	6720	6720	6050	6050	6200		
			IPM(FEED)	32	32	32	26	26	26	43	43	43	43	43	35	35	44		
			Ap	.0079	.0079	.0079	.0045	.0045	.0045	.0169	.0169	.0118	.0118	.0118	.0067	.0067	.0128		
			SFM(Vc)	320	320	320	285	285	285	315	315	315	315	315	280	280	315		
	9	Low alloy steel	IPT(fz)	.0012	.0012	.0012	.0010	.0010	.0010	.0030	.0030	.0030	.0030	.0030	.0027	.0027	.0029		
			RPM	9730	9730	9730	8760	8760	8760	6380	6380	6380	6380	6380	5740	5740	5910		
			IPM(FEED)	22	22	22	18	18	18	38	38	38	38	38	31	31	34		
			Ap	.0061	.0061	.0061	.0035	.0035	.0035	.0131	.0131	.0092	.0092	.0092	.0052	.0052	.0100		
			SFM(Vc)	335	335	335	305	305	305	330	330	330	330	330	295	295	330		
			IPT(fz)	.0016	.0016	.0016	.0014	.0014	.0014	.0032	.0032	.0032	.0032	.0032	.0029	.0029	.0036		
10	High alloyed steel, and tool steel	RPM	10300	10300	10300	9270	9270	9270	6720	6720	6720	6720	6720	6050	6050	6200			
		IPM(FEED)	32	32	32	26	26	26	43	43	43	43	43	35	35	44			
		Ap	.0079	.0079	.0079	.0045	.0045	.0045	.0169	.0169	.0118	.0118	.0118	.0067	.0067	.0128			
		SFM(Vc)	320	320	320	285	285	285	315	315	315	315	315	280	280	315			
		IPT(fz)	.0012	.0012	.0012	.0010	.0010	.0010	.0030	.0030	.0030	.0030	.0030	.0027	.0027	.0029			
		RPM	9730	9730	9730	8760	8760	8760	6380	6380	6380	6380	6380	5740	5740	5910			
11.1-11.2		IPM(FEED)	22	22	22	18	18	18	38	38	38	38	38	31	31	34			
		Ap	.0061	.0061	.0061	.0035	.0035	.0035	.0131	.0131	.0092	.0092	.0092	.0052	.0052	.0100			
		SFM(Vc)	335	335	335	305	305	305	330	330	330	330	330	295	295	330			
		IPT(fz)	.0016	.0016	.0016	.0014	.0014	.0014	.0032	.0032	.0032	.0032	.0032	.0029	.0029	.0036			
		RPM	10300	10300	10300	9270	9270	9270	6720	6720	6720	6720	6720	6050	6050	6200			
		IPM(FEED)	32	32	32	26	26	26	43	43	43	43	43	35	35	44			
K	15-20	Grey cast iron Nodular cast iron Malleable cast iron	Ap	.0079	.0079	.0079	.0045	.0045	.0045	.0169	.0169	.0118	.0118	.0118	.0067	.0067	.0128		
			SFM(Vc)	205	205	205	185	185	185	275	275	275	275	275	250	250	280		
			IPT(fz)	.0013	.0013	.0013	.0012	.0012	.0012	.0023	.0023	.0023	.0023	.0023	.0020	.0020	.0022		
			RPM	6240	6240	6240	5610	5610	5610	5630	5630	5630	5630	5630	5060	5060	5230		
			IPM(FEED)	17	17	17	14	14	14	25	25	25	25	25	21	21	23		
			Ap	.0044	.0044	.0044	.0025	.0025	.0025	.0094	.0094	.0066	.0066	.0066	.0037	.0037	.0071		
H	38.1-38.2	Hardened steel	SFM(Vc)	320	320	320	285	285	285	315	315	315	315	315	280	280	315		
			IPT(fz)	.0012	.0012	.0012	.0010	.0010	.0010	.0030	.0030	.0030	.0030	.0030	.0027	.0027	.0029		
			RPM	9730	9730	9730	8760	8760	8760	6380	6380	6380	6380	6380	5740	5740	5910		
			IPM(FEED)	22	22	22	18	18	18	38	38	38	38	38	31	31	34		
			Ap	.0061	.0061	.0061	.0035	.0035	.0035	.0131	.0131	.0092	.0092	.0092	.0052	.0052	.0100		
			SFM(Vc)	205	205	205	185	185	185	275	275	275	275	275	250	250	280		
	40	Chilled Cast Iron	IPT(fz)	.0013	.0013	.0013	.0012	.0012	.0012	.0023	.0023	.0023	.0023	.0023	.0020	.0020	.0022		
			RPM	6240	6240	6240	5610	5610	5610	5630	5630	5630	5630	5630	5060	5060	5230		
			IPM(FEED)	17	17	17	14	14	14	25	25	25	25	25	21	21	23		
			Ap	.0044	.0044	.0044	.0025	.0025	.0025	.0094	.0094	.0066	.0066	.0066	.0037	.0037	.0071		
			SFM(Vc)	250	250	250	270	270	270	270	270	270	270	270	270	270	270	270	
			IPT(fz)	.0020	.0020	.0020	.0020	.0020	.0020	.0020	.0020	.0020	.0020	.0020	.0020	.0025	.0025	.0032	
41	Hardened Cast Iron	RPM	4710	4710	4710	4710	4710	4710	4710	4710	4710	4710	4160	4160	4160	3330			
		IPM(FEED)	19	19	19	19	19	19	19	19	19	19	19	21	21	20			
		Ap	.0041	.0041	.0041	.0025	.0025	.0025	.0087	.0087	.0087	.0087	.0087	.0087	.0087	.0087	.0109		
		SFM(Vc)	285	285	285	285	285	285	285	285	285	285	285	310	310	310	310		
		IPT(fz)	.0026	.0026	.0026	.0026	.0026	.0026	.0026	.0026	.0026	.0026	.0026	.0032	.0032	.0032	.0032		
		RPM	5320	5320	5320	5320	5320	5320	5320	5320	5320	5320	5320	4720	4720	4720	3830		
H	40		IPM(FEED)	28	28	28	28	28	28	28	28	28	28	31	31	34			
			Ap	.0057	.0057	.0057	.0035	.0035	.0035	.0131	.0131	.0092	.0092	.0092	.0052	.0052	.0100		
			SFM(Vc)	250	250	250	270	270	270	270	270	270	270	270	270	270	270	270	
			IPT(fz)	.0020	.0020	.0020	.0020	.0020	.0020	.0020	.0020	.0020	.0020	.0020	.0020	.0025	.0025	.0032	
			RPM	4710	4710	4710	4710	4710	4710	4710	4710	4710	4710	4710	4160	4160	4160	3330	
			IPM(FEED)	19	19	19	19	19	19	19	19	19	19	19	21	21	20	17	
H	41		Ap	.0041	.0041	.0041	.0025	.0025	.0025	.0087	.0087	.0087	.0087	.0087	.0087	.0087	.0109		
			SFM(Vc)	250	250	250	270	270	270	270	270	270	270	270	270	270	270	270	
			IPT(fz)	.0020	.0020	.0020	.0020	.0020	.0020	.0020	.0020	.0020	.0020	.0020	.0020	.0025	.0025	.0032	
			RPM	4710	4710	4710	4710	4710	4710	4710	4710	4710	4710	4710	4160	4160	4160	3330	
			IPM(FEED)	19	19	19	19	19	19	19	19	19	19	19	21	21	20	17	
			Ap	.0041	.0041	.0041	.0025	.0025	.0025	.0087	.0087	.0087	.0087	.0087	.0087	.0087	.0087	.0109	

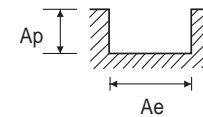
ISO	VDI 3323	Parameter	Diameter (Ø) / LBS														
			13/64		13/64		13/64		13/64		1/4		1/4		1/2		
			LBS	1 3/16	1 3/8	1 1/2	2	5/8	3/4	1 3/16	1	1 3/16	1 3/4	1 3/8	1/2	2	
P	1-8	Non-alloy steel Low alloy steel	SFM(Vc)	295	295	295	295	295	330	330	330	330	330	330	330	330	
			IPT(fz)	.0032	.0032	.0032	.0032	.0032	.0039	.0039	.0039	.0047	.0055	.0055	.0059	.0059	
			RPM	5580	5580	5580	5580	5580	5010	5010	5010	4030	3360	3360	2500	2500	
			IPM(FEED)	36	36	36	36	36	39	39	39	38	37	37	30	30	
			Ap	.0073	.0073	.0073	.0046	.0046	.0225	.0225	.0157	.0197	.0236	.0236	.0450	.0315	
			SFM(Vc)	285	285	285	285	285	310	310	310	315	315	315	310	310	
	9	Low alloy steel	IPT(fz)	.0026	.0026	.0026	.0026	.0026	.0032	.0032	.0032	.0032	.0032	.0039	.0044	.0044	.0047
			RPM	5320	5320	5320	5320	5320	4720	4720	4720	4720	4720	3830	3200	3200	2380
			IPM(FEED)	28	28	28	28	28	31	31	31	30	28	28	22	22	
			Ap	.0057	.0057	.0057	.0035	.0035	.0175	.0175	.0122	.0153	.0184	.0184	.0350	.0245	
			SFM(Vc)	295	295	295	295	295	330	330	330	330	330	330	325	325	
			IPT(fz)	.0032	.0032	.0032	.0032	.0032	.0039	.0039	.0039	.0047	.0055	.0055	.0059	.0059	
10	High alloyed steel, and tool steel	RPM	5580	5580	5580	5580	5580	5010	5010	5010	4030	3360	3360	2500	2500		
		IPM(FEED)	36	36	36	36	36	39	39	39	38	37	37	30	30		
		Ap	.0073	.0073	.0073	.0046	.0046	.0225	.0225	.0157	.0197	.0236	.0236	.0450	.0315		
		SFM(Vc)	285	285	285	285	285	310	310	310	315	315	315	310	310		
		IPT(fz)	.0026	.0026	.0026	.0026	.0026	.0032	.0032	.0032	.0032	.0032	.0032	.0039	.0044	.0044	
		RPM	5320	5320	5320	5320	5320	4720	4720	4720	4720	4720	4720	3830	3200	3200	
11.1-11.2		IPM(FEED)	28	28	28	28	28	31	31	31	30	28	28	22	22		
		Ap	.0057	.0057	.0057	.0035	.0035	.0175	.0175	.0122	.0153	.0184	.0184	.0350	.0245		
		SFM(Vc)	295	295	295	295	295	330									



### GMF23 SERIES 2FLUTE SQUARE - SLOTTING

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø)															
						.004	.008	.012	.015	.020	.024	.028	.031	.035	.040	.047	1/16	5/64	3/32		
P	1-8	Non-alloy steel Low alloy steel	1.0D	0.5D (Up to Ø1/8 : 0.2D) (Up to Ø1/32 : 0.15D)	SFM(Vc)	45	85	120	160	185	200	200	205	220	220	225	230	240	265		
					IPT(fz)	.00004	.00005	.0001	.0001	.0001	.0001	.0001	.0001	.0002	.0002	.0002	.0003	.0004	.0004		
					RPM	41300	41300	38400	40900	35400	31500	27600	25400	23800	21200	18100	14200	11700	10800		
					IPM(FEED)	4	4	4	5	5	6	6	7	7	7	8	8	8	9		
	9	Low alloy steel	1.0D	0.5D (Up to Ø1/8 : 0.2D) (Up to Ø1/32 : 0.15D)	SFM(Vc)	25	50	70	95	110	120	120	125	130	135	135	140	155	170		
					IPT(fz)	.00004	.00004	.0001	.0001	.0001	.0001	.0001	.0001	.0002	.0002	.0002	.0003	.0003	.0004		
					RPM	24800	24800	23000	24600	21300	18900	16500	15200	14300	12700	10900	8500	7600	6900		
					IPM(FEED)	2	2	2	3	3	3	4	4	5	5	5	5	5	6		
	10	High alloyed steel, and tool steel	1.0D	0.5D (Up to Ø1/8 : 0.2D) (Up to Ø1/32 : 0.15D)	SFM(Vc)	45	85	120	160	185	200	200	205	220	220	225	230	240	265		
					IPT(fz)	.00004	.00005	.0001	.0001	.0001	.0001	.0001	.0001	.0002	.0002	.0002	.0003	.0004	.0004		
					RPM	41300	41300	38400	40900	35400	31500	27600	25400	23800	21200	18100	14200	11700	10800		
					IPM(FEED)	4	4	4	5	5	6	6	7	7	7	8	8	8	9		
11.1-11.2	High alloyed steel, and tool steel	1.0D	0.5D (Up to Ø1/8 : 0.2D) (Up to Ø1/32 : 0.15D)	SFM(Vc)	25	50	70	95	110	120	120	125	130	135	135	140	155	170			
				IPT(fz)	.00004	.00004	.0001	.0001	.0001	.0001	.0001	.0001	.0002	.0002	.0002	.0003	.0003	.0004			
				RPM	24800	24800	23000	24600	21300	18900	16500	15200	14300	12700	10900	8500	7600	6900			
				IPM(FEED)	2	2	2	3	3	3	4	4	5	5	5	5	5	6			
M	14.1	Stainless steel	1.0D	0.05D (Up to Ø1/32 : 0.15D)	SFM(Vc)	20	45	60	80	95	100	100	105	110	110	110	115	130	140		
					IPT(fz)	.00004	.00004	.00005	.0001	.0001	.0001	.0001	.0001	.0002	.0002	.0002	.0003	.0003	.0004		
					RPM	20670	20670	19190	20470	17720	15750	13780	12700	11900	10580	9050	7090	6350	5730		
					IPM(FEED)	2	2	2	2	2	3	3	4	4	4	4	4	4	5		
K	15-20	Grey cast iron Nodular cast iron Malleable cast iron	1.0D	0.5D (Up to Ø1/8 : 0.2D) (Up to Ø1/32 : 0.15D)	SFM(Vc)	45	85	120	160	185	200	200	205	220	220	225	230	240	265		
					IPT(fz)	.00004	.00005	.0001	.0001	.0001	.0001	.0001	.0001	.0002	.0002	.0002	.0003	.0004	.0004		
					RPM	41300	41300	38400	40900	35400	31500	27600	25400	23800	21200	18100	14200	11700	10800		
					IPM(FEED)	4	4	4	5	5	6	6	7	7	7	8	8	8	9		
H	38.1-38.2	Hardened steel	1.0D	0.5D (Up to Ø1/8 : 0.2D) (Up to Ø1/32 : 0.15D)	SFM(Vc)	15	35	50	65	75	80	80	80	85	90	90	95	105	110		
					IPT(fz)	.00003	.00003	.00003	.00003	.00004	.00004	.00005	.00005	.0001	.0001	.0001	.0001	.0002	.0002		
					RPM	16540	16540	15350	16380	14170	12600	11020	10160	9520	8460	7240	5670	5080	4410		
					IPM(FEED)	1	1	1	1	1	1	1	1	1	1	2	1	2	2		
	40	Chilled Cast Iron	1.0D	0.5D (Up to Ø1/8 : 0.2D) (Up to Ø1/32 : 0.15D)	SFM(Vc)	25	50	70	95	110	120	120	125	130	135	135	140	155	170		
					IPT(fz)	.00004	.00004	.0001	.0001	.0001	.0001	.0001	.0001	.0002	.0002	.0002	.0003	.0003	.0004		
					RPM	24800	24800	23000	24600	21300	18900	16500	15200	14300	12700	10900	8500	7600	6900		
					IPM(FEED)	2	2	2	3	3	3	4	4	5	5	5	5	5	6		
	41	Hardened Cast Iron	1.0D	0.5D (Up to Ø1/8 : 0.2D) (Up to Ø1/32 : 0.15D)	SFM(Vc)	15	35	50	65	75	80	80	80	85	90	90	95	105	110		
					IPT(fz)	.00003	.00003	.00003	.00003	.00004	.00004	.00005	.00005	.0001	.0001	.0001	.0001	.0002	.0002		
					RPM	16540	16540	15350	16380	14170	12600	11020	10160	9520	8460	7240	5670	5080	4410		
					IPM(FEED)	1	1	1	1	1	1	1	1	1	1	2	1	2	2		

SFM = Surface Feet per Minute  
RPM = Revolutions Per Minute  
IPT = Inches Per Tooth  
IPM = Inches Per Minute  
Ap : Inch (Axial Depth of Cut)  
Ae : Inch (Radial Depth of Cut)



### GMF23 SERIES 2FLUTE SQUARE - SLOTTING

ISO	VDI 3323	Ae	Ap	Parameter	Diameter (Ø)																
					1/8	9/64	3/16	13/64	1/4	17/64	9/32	5/16	11/32	23/64	3/8	13/32	7/16	1/2	9/16	5/8	3/4
P	1-8	1.0D	0.5D (Up to Ø1/8 : 0.2D) (Up to Ø1/32 : 0.15D)	SFM(Vc)	275	300	320	325	345	350	355	345	350	335	340	345	340	355	360	355	
				IPT(fz)	.0005	.0007	.0010	.0011	.0013	.0014	.0016	.0019	.0019	.0020	.0021	.0021	.0021	.0022	.0021	.0021	.0021
				RPM	8400	8100	6500	6100	5300	5000	4800	4200	3900	3700	3400	3200	3000	2600	2400	2200	1800
				IPM(FEED)	9	11	13	13	14	14	15	16	15	15	14	13	12	11	10	9	7
	9	1.0D	0.5D (Up to Ø1/8 : 0.2D) (Up to Ø1/32 : 0.15D)	SFM(Vc)	175	185	195	195	210	210	215	205	205	205	215	205	210	220	230	215	
				IPT(fz)	.0005	.0007	.0010	.0011	.0014	.0015	.0015	.0017	.0017	.0016	.0016	.0017	.0017	.0017	.0016	.0016	
				RPM	5300	5000	4000	3700	3200	3000	2900	2500	2300	2200	2100	2000	1800	1600	1500	1400	1100
				IPM(FEED)	6	7	8	8	9	9	9	8	8	7	7	6	6	5	5	4	
	10	1.0D	0.5D (Up to Ø1/8 : 0.2D) (Up to Ø1/32 : 0.15D)	SFM(Vc)	275	300	320	325	345	350	355	345	350	335	340	345	340	355	360	355	
				IPT(fz)	.0005	.0007	.0010	.0011	.0013	.0014	.0016	.0019	.0019	.0020	.0021	.0021	.0021	.0022	.0021	.0021	.0021
				RPM	8400	8100	6500	6100	5300	5000	4800	4200	3900	3700	3400	3200	3000	2600	2400	2200	1800
				IPM(FEED)	9	11	13	13	14	14	15	16	15	15	14	13	12	11	10	9	7
11.1-11.2	1.0D	0.5D (Up to Ø1/8 : 0.2D) (Up to Ø1/32 : 0.15D)	SFM(Vc)	175	185	195	195	210	210	215	205	205	205	215	205	210	220	230	215		
			IPT(fz)	.0005	.0007	.0010	.0011	.0014	.0015	.0015	.0017	.0017	.0016	.0016	.0017	.0017	.0017	.0016	.0016		
			RPM	5300	5000	4000	3700	3200	3000	2900	2500	2300	2200	2100	2000	1800	1600	1500	1400	1100	
			IPM(FEED)	6	7	8	8	9	9	9	8	8	7	7	6	6	5	5	4		
M	14.1	1.0D	0.05D (Up to Ø1/32 : 0.15D)	SFM(Vc)	145	155	165	165	175	180	180	175	175	175	175	175	170	175	175	175	
				IPT(fz)	.0006	.0007	.0009	.0011	.0014	.0014	.0015	.0017	.0018	.0019	.0020	.0020	.0020	.0021	.0021	.0021	.0020
				RPM	4370	4160	3330	3060	2680	2560	2420	2120	1940	1860	1760	1630	1500	1290	1190	1070	880
				IPM(FEED)	5	6	6	7	7	7	7	7	7	6	6	6	5	5	5	4	
K	15-20	1.0D	0.5D (Up to Ø1/8 : 0.2D) (Up to Ø1/32 : 0.15D)	SFM(Vc)	275	300	320	325	345	350	355	345	350	335	340	345	340	355	360	355	
				IPT(fz)	.0005	.0007	.0010	.0011	.0013	.0014	.0016	.0019	.0019	.0020	.0021	.0021	.0021	.0022	.0021	.0021	.0021
				RPM	8400	8100	6500	6100	5300	5000	4800	4200	3900	3700	3400	3200	3000	2600	2400	2200	1800
				IPM(FEED)	9	11	13	13	14	14	15	16	15	15	14	13	12	11	10	9	7
H	38.1-38.2	1.0D	0.5D (Up to Ø1/8 : 0.2D) (Up to Ø1/32 : 0.15D)	SFM(Vc)	105	115	120	120	125	130	135	140	140	140	140	145	145	150	150	140	
				IPT(fz)	.0003	.0003	.0004	.0004	.0005	.0008	.0008	.0009	.0010	.0010	.0010	.0011	.0008	.0009	.0010	.0011	.0007
				RPM	3170	3090	2490	2250	1890	1850	1800	1690	1560	1500	1430	1330	1250	1100	1010	910	710
				IPM(FEED)	2	2	2	2	2	3	3	3	3	3	3	3	2	2	2	2	1
	40	1.0D	0.5D (Up to Ø1/8 : 0.2D) (Up to Ø1/32 : 0.15D)	SFM(Vc)	175	185	195	195	210	210	215	205	205	205	215	205	210	220	230	215	
				IPT(fz)	.0005	.0007	.0010	.0011	.0014	.0015	.0015	.0017	.0017	.0016	.0016	.0017	.0017	.0017	.0016	.0016	
				RPM	5300	5000	4000	3700	3200	3000	2900	2500	2300	2200	2100	2000	1800	1600	1500	1400	1100
				IPM(FEED)	6	7	8	8	9	9	9	8	8	7	7	6	6	5	5	4	
	41	1.0D	0.5D (Up to Ø1/8 : 0.2D) (Up to Ø1/32 : 0.15D)	SFM(Vc)	105	115	120	120	125	130	135	140	140	140	140	145	145	150	150	140	
				IPT(fz)	.0003	.															

HSS

HSS



RECOMMENDED CUTTING CONDITIONS



RECOMMENDED CUTTING CONDITIONS

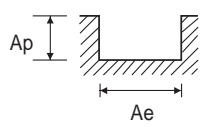
GMF24 SERIES 2FLUTE SQUARE - SLOTTING

GMF24 SERIES 2FLUTE SQUARE - SLOTTING

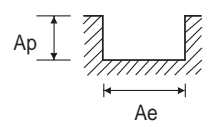
Table with columns: ISO, VDI 3323, Material Description, Ae, Ap, Parameter, and Diameter (Ø) / LOC. Rows include P (1-8, 9, 10, 11.1-11.2), K (15-20), and H (38.1-38.2, 40, 41).

Table with columns: ISO, VDI 3323, Material Description, Ae, Ap, Parameter, and Diameter (Ø) / LOC. Rows include P (1-8, 9, 10, 11.1-11.2), K (15-20), and H (38.1-38.2, 40, 41).

SFM = Surface Feet per Minute
RPM = Revolutions Per Minute
IPT = Inches Per Tooth
IPM = Inches Per Minute
Ap : Inch (Axial Depth of Cut)
Ae : Inch (Radial Depth of Cut)



SFM = Surface Feet per Minute
RPM = Revolutions Per Minute
IPT = Inches Per Tooth
IPM = Inches Per Minute
Ap : Inch (Axial Depth of Cut)
Ae : Inch (Radial Depth of Cut)





RECOMMENDED CUTTING CONDITIONS



RECOMMENDED CUTTING CONDITIONS

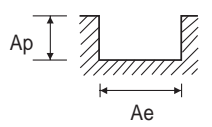
GMF24 SERIES 2FLUTE SQUARE - SLOTTING

GMF24 SERIES 2FLUTE SQUARE - SLOTTING

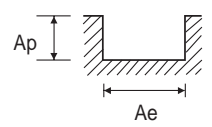
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Table with columns: ISO, VDI 3323, Ae, Ap, Parameter, LOC, and Diameter (Ø) / LOC. Rows include P 1-8, 9, 10, 11.1-11.2, K 15-20, and H 38.1-38.2, 40, 41.

SFM = Surface Feet per Minute
RPM = Revolutions Per Minute
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Ap : Inch (Axial Depth of Cut)
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SFM = Surface Feet per Minute
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Ae : Inch (Radial Depth of Cut)

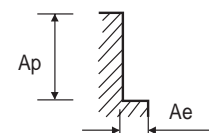




### GMF25, 26 SERIES 4FLUTE SQUARE - SIDE CUTTING

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø)												
						3/64	1/16	5/16	3/32	1/8	9/64	3/16	13/64	7/32	1/4			
P	1-8	Non-alloy steel Low alloy steel	0.05D	1.0D	SFM(Vc)	280	290	1190	330	345	370	400	405	420	430			
					IPT(fz)	.0001	.0002	.0002	.0003	.0003	.0005	.0007	.0008	.0009	.0010			
					RPM	22680	17720	14560	13440	10540	10090	8180	7640	7330	6570			
					IPM(FEED)	12	11	12	14	13	19	24	25	27	27			
					SFM(Vc)	165	175	780	210	215	230	245	245	255	260			
					IPT(fz)	.0001	.0002	.0002	.0002	.0003	.0005	.0007	.0008	.0009	.0011			
	9	Low alloy steel	0.05D	1.0D	SFM(Vc)	165	175	780	210	215	230	245	245	255	260			
					IPT(fz)	.0001	.0002	.0002	.0002	.0003	.0005	.0007	.0008	.0009	.0011			
					RPM	13610	10630	9520	8610	6570	6230	4960	4580	4410	3970			
					IPM(FEED)	7	7	7	9	8	12	15	15	17	17			
					SFM(Vc)	280	290	1190	330	345	370	400	405	420	430			
					IPT(fz)	.0001	.0002	.0002	.0003	.0003	.0005	.0007	.0008	.0009	.0010			
10	High alloyed steel, and tool steel	0.05D	1.0D	SFM(Vc)	280	290	1190	330	345	370	400	405	420	430				
				IPT(fz)	.0001	.0002	.0002	.0003	.0003	.0005	.0007	.0008	.0009	.0010				
				RPM	22680	17720	14560	13440	10540	10090	8180	7640	7330	6570				
				IPM(FEED)	12	11	12	14	13	19	24	25	27	27				
				SFM(Vc)	165	175	780	210	215	230	245	245	255	260				
				IPT(fz)	.0001	.0002	.0002	.0002	.0003	.0005	.0007	.0008	.0009	.0011				
11.1-11.2	High alloyed steel, and tool steel	0.05D	1.0D	SFM(Vc)	165	175	780	210	215	230	245	245	255	260				
				IPT(fz)	.0001	.0002	.0002	.0002	.0003	.0005	.0007	.0008	.0009	.0011				
				RPM	13610	10630	9520	8610	6570	6230	4960	4580	4410	3970				
				IPM(FEED)	7	7	7	9	8	12	15	15	17	17				
				SFM(Vc)	140	145	650	175	180	190	205	205	210	220				
				IPT(fz)	.0001	.0002	.0002	.0003	.0003	.0005	.0007	.0008	.0009	.0010				
M	14.1	Stainless steel	0.05D	1.0D	SFM(Vc)	140	145	650	175	180	190	205	205	210	220			
					IPT(fz)	.0001	.0002	.0002	.0003	.0003	.0005	.0007	.0008	.0009	.0010			
					RPM	11340	8860	7940	7170	5460	5200	4160	3830	3710	3350			
					IPM(FEED)	6	6	6	7	7	10	12	13	13	13			
					SFM(Vc)	280	290	1190	330	345	370	400	405	420	430			
					IPT(fz)	.0001	.0002	.0002	.0003	.0003	.0005	.0007	.0008	.0009	.0010			
K	15-20	Grey cast iron Nodular cast iron Malleable cast iron	0.05D	1.0D	SFM(Vc)	280	290	1190	330	345	370	400	405	420	430			
					IPT(fz)	.0001	.0002	.0002	.0003	.0003	.0005	.0007	.0008	.0009	.0010			
					RPM	22680	17720	14560	13440	10540	10090	8180	7640	7330	6570			
					IPM(FEED)	12	11	12	14	13	19	24	25	27	27			
					SFM(Vc)	110	115	130	135	130	140	155	150	155	155			
					IPT(fz)	.0001	.0001	.0001	.0001	.0001	.0002	.0002	.0003	.0003	.0003			
H	38.1-38.2	Hardened steel	0.05D	1.0D	SFM(Vc)	110	115	130	135	130	140	155	150	155	155			
					IPT(fz)	.0001	.0001	.0001	.0001	.0001	.0002	.0002	.0003	.0003	.0003			
					RPM	9070	7090	6350	5510	3970	3860	3110	2810	2670	2360			
					IPM(FEED)	2	2	2	3	2	3	3	3	3	3			
					SFM(Vc)	165	175	780	210	215	230	245	245	255	260			
					IPT(fz)	.0001	.0002	.0002	.0002	.0003	.0005	.0007	.0008	.0009	.0011			
	40	Chilled Cast Iron	0.05D	1.0D	SFM(Vc)	165	175	780	210	215	230	245	245	255	260			
					IPT(fz)	.0001	.0002	.0002	.0002	.0003	.0005	.0007	.0008	.0009	.0011			
					RPM	13610	10630	9520	8610	6570	6230	4960	4580	4410	3970			
					IPM(FEED)	7	7	7	9	8	12	15	15	17	17			
					SFM(Vc)	110	115	130	135	130	140	155	150	155	155			
					IPT(fz)	.0001	.0001	.0001	.0001	.0001	.0002	.0002	.0003	.0003	.0003			
41	Hardened Cast Iron	0.05D	1.0D	SFM(Vc)	110	115	130	135	130	140	155	150	155	155				
				IPT(fz)	.0001	.0001	.0001	.0001	.0001	.0002	.0002	.0003	.0003	.0003				
				RPM	9070	7090	6350	5510	3970	3860	3110	2810	2670	2360				
				IPM(FEED)	2	2	2	3	2	3	3	3	3	3				

SFM = Surface Feet per Minute  
RPM = Revolutions Per Minute  
IPT = Inches Per Tooth  
IPM = Inches Per Minute  
Ap : Inch (Axial Depth of Cut)  
Ae : Inch (Radial Depth of Cut)



### GMF25, 26 SERIES 4FLUTE SQUARE - SIDE CUTTING

ISO	VDI 3323	Ae	Ap	Parameter	Diameter (Ø)															
					17/64	9/32	19/64	5/16	11/32	23/64	3/8	7/16	1/2	9/16	5/8	3/4				
P	1-8	0.05D	1.0D	SFM(Vc)	435	440	440	435	435	430	420	425	425	445	455	430				
				IPT(fz)	.0011	.0012	.0013	.0014	.0014	.0015	.0015	.0016	.0016	.0016	.0016	.0016				
				RPM	6290	5980	5650	5290	4830	4590	4280	3710	3240	3030	2770	2200				
				IPM(FEED)	28	28	29	30	28	27	27	23	21	19	18	14				
				SFM(Vc)	265	265	265	260	260	260	255	260	260	275	280	275				
				IPT(fz)	.0011	.0011	.0012	.0013	.0012	.0012	.0012	.0012	.0013	.0012	.0012	.0013				
	9	Low alloy steel	0.05D	1.0D	SFM(Vc)	265	265	265	260	260	260	255	260	260	275	280	275			
					IPT(fz)	.0011	.0011	.0012	.0013	.0012	.0012	.0012	.0012	.0013	.0012	.0012	.0013			
					RPM	3800	3610	3390	3170	2910	2790	2620	2280	1980	1860	1710	1400			
					IPM(FEED)	17	16	16	16	15	14	13	11	10	9	9	7			
					SFM(Vc)	435	440	440	435	435	430	420	425	425	445	455	430			
					IPT(fz)	.0011	.0012	.0013	.0014	.0014	.0015	.0015	.0016	.0016	.0016	.0016	.0016			
10	High alloyed steel, and tool steel	0.05D	1.0D	SFM(Vc)	435	440	440	435	435	430	420	425	425	445	455	430				
				IPT(fz)	.0011	.0012	.0013	.0014	.0014	.0015	.0015	.0016	.0016	.0016	.0016	.0016				
				RPM	6290	5980	5650	5290	4830	4590	4280	3710	3240	3030	2770	2200				
				IPM(FEED)	28	28	29	30	28	27	27	23	21	19	18	14				
				SFM(Vc)	265	265	265	260	260	260	255	260	260	275	280	275				
				IPT(fz)	.0011	.0011	.0012	.0013	.0012	.0012	.0012	.0012	.0013	.0012	.0012	.0013				
11.1-11.2	High alloyed steel, and tool steel	0.05D	1.0D	SFM(Vc)	265	265	265	260	260	260	255	260	260	275	280	275				
				IPT(fz)	.0011	.0011	.0012	.0013	.0012	.0012	.0012	.0012	.0013	.0012	.0012	.0013				
				RPM	3800	3610	3390	3170	2910	2790	2620	2280	1980	1860	1710	1400				
				IPM(FEED)	17	16	16	16	15	14	13	11	10	9	9	7				
				SFM(Vc)	225	225	220	215	220	220	215	215	210	220	225	215				
				IPT(fz)	.0011	.0011	.0013	.0014	.0014	.0014	.0015	.0015	.0015	.0015	.0015	.0015				
M	14.1	Stainless steel	0.05D	1.0D	SFM(Vc)	225	225	220	215	220	220	215	215	210	220	225	215			
					IPT(fz)	.0011	.0011	.0013	.0014	.0014	.0014	.0015	.0015	.0015	.0015	.0015	.0015			
					RPM	3200	3030	2840	2650	2420	2330	2200	1880	1610	1510	1390	1100			
					IPM(FEED)	14	14	14	15	14	13	13	11	10	9	8	6			
					SFM(Vc)	435	440	440	435	435	430	420	425	425	445	455	430			
					IPT(fz)	.0011	.0012	.0013	.0014	.0014	.0015	.0015	.0016	.0016	.0016	.0016	.0016			
K	15-20	Grey cast iron Nodular cast iron Malleable cast iron	0.05D	1.0D	SFM(Vc)	435	440	440	435	435	430	420	425	425	445	455	430			
					IPT(fz)	.0011	.0012	.0013	.0014	.0014	.0015	.0015	.0016	.0016	.0016	.0016	.0016			
					RPM	6290	5980	5650	5290	4830	4590	4280	3710	3240	3030	2770	2200			
					IPM(FEED)	28	28	29	30	28	27	27	23	21	19	18	14			
					SFM(Vc)	160	165	170	175	175	175	175	180	180	185	185	175			
					IPT(fz)	.0004	.0004	.0005	.0006	.0005	.0005	.0006	.0006	.0005	.0006	.0006	.0006			
H	38.1-38.2	Hardened steel	0.05D	1.0D	SFM(Vc)	160	165	170	175	175	175	175	180	180	185	185	175			
					IPT(fz)	.0004	.0004	.0005	.0006	.0005	.0005	.0006	.0006	.0005	.0006	.0006	.0006			
					RPM	2310	2250	2190	2120	1950	1870	1780	1560	1370	1260	1140	890			
					IPM(FEED)	4	4	4	5	4	4	4	4	3	3	3	2			
					SFM(Vc)	265	265	265	260	260	260	255	260	260	275	280	275			
					IPT(fz)	.0011	.0011	.0012	.0013	.0012	.0012	.0012	.0012	.0013	.0012	.0012	.0013			
	40	Chilled Cast Iron	0.05D	1.0D	SFM(Vc)	265	265	265	260	260	26									



RECOMMENDED CUTTING CONDITIONS



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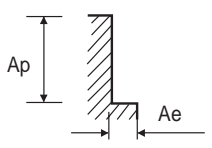
GMF27 SERIES 4FLUTE SQUARE - SIDE CUTTING

GMF27 SERIES 4FLUTE SQUARE - SIDE CUTTING

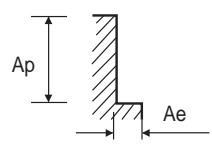
Table with columns: ISO, VDI 3323, Material Description, Ae, Ap, Parameter (LOC), and Diameter (Ø) with sub-columns for various diameters (3/64 to 1/8).

Table with columns: ISO, VDI 3323, Material Description, Ae, Ap, Parameter (LOC), and Diameter (Ø) with sub-columns for various diameters (1/8 to 1/4).

SFM = Surface Feet per Minute
RPM = Revolutions Per Minute
IPT = Inches Per Tooth
IPM = Inches Per Minute
Ap : Inch (Axial Depth of Cut)
Ae : Inch (Radial Depth of Cut)



SFM = Surface Feet per Minute
RPM = Revolutions Per Minute
IPT = Inches Per Tooth
IPM = Inches Per Minute
Ap : Inch (Axial Depth of Cut)
Ae : Inch (Radial Depth of Cut)



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RECOMMENDED CUTTING CONDITIONS



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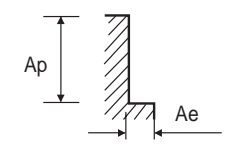
GMF27 SERIES 4FLUTE SQUARE - SIDE CUTTING

GMF27 SERIES 4FLUTE SQUARE - SIDE CUTTING

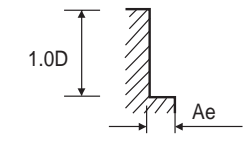
Table with columns for ISO, VDI 3323, Ae, Ap, Parameter, LOC, and Diameter (Ø) with sub-columns for various diameters (1/4, 5/16, 3/8, 1/2, 5/8, 3/4, 1). Rows include material groups P, K, and H with specific material types and cutting parameters like SFM, IPT, RPM, and IPM.

Table with columns for ISO, VDI 3323, Material Description, Ae, Ap, Parameter, LOC, and Diameter (Ø) with sub-columns for various diameters (3/8, 1/2, 5/8, 3/4, 1). Rows include material groups P, K, and H with specific material types and cutting parameters like SFM, IPT, RPM, and IPM.

SFM = Surface Feet per Minute
RPM = Revolutions Per Minute
IPT = Inches Per Tooth
IPM = Inches Per Minute
Ap : Inch (Axial Depth of Cut)
Ae : Inch (Radial Depth of Cut)



SFM = Surface Feet per Minute
RPM = Revolutions Per Minute
IPT = Inches Per Tooth
IPM = Inches Per Minute
Ap : Inch (Axial Depth of Cut)
Ae : Inch (Radial Depth of Cut)



CBN END MILLS

i-Xmill END MILLS

i-SMART MODULAR END MILLS

X5070 END MILLS

4G MILL END MILLS

X-POWER PRO END MILLS

TitaNox-POWER END MILLS

JET-POWER END MILLS

V7 PLUS A END MILLS

V7 MILL INOX

ALU-POWER HPC END MILLS

ALU-POWER END MILLS

D-POWER GRAPHITE END MILLS

STANDARD CARBIDE

ONLY ONE COATED PM60 END MILLS

SINE-POWER

TANK-POWER END MILLS

STANDARD COBALT & HSS

TECHNICAL DATA



HSS

HSS



RECOMMENDED CUTTING CONDITIONS



RECOMMENDED CUTTING CONDITIONS

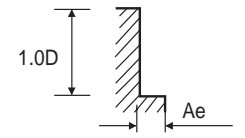
GMF28 SERIES 4FLUTE SQUARE - SIDE CUTTING

GMF28 SERIES 4FLUTE SQUARE - SIDE CUTTING

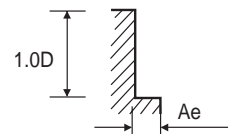
Table with columns for ISO, VDI 3323, Material Description, Parameter, and Diameter (Ø) / LBS. Rows include P (1-8, 9, 10, 11.1-11.2) and K (15-20) series.

Table with columns for ISO, VDI 3323, Parameter, and Diameter (Ø) / LBS. Rows include P (1-8, 9, 10, 11.1-11.2) and K (15-20) series.

SFM = Surface Feet per Minute
RPM = Revolutions Per Minute
IPT = Inches Per Tooth
IPM = Inches Per Minute
Ap : Inch (Axial Depth of Cut)
Ae : Inch (Radial Depth of Cut)



SFM = Surface Feet per Minute
RPM = Revolutions Per Minute
IPT = Inches Per Tooth
IPM = Inches Per Minute
Ap : Inch (Axial Depth of Cut)
Ae : Inch (Radial Depth of Cut)



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RECOMMENDED CUTTING CONDITIONS



RECOMMENDED CUTTING CONDITIONS

GMF29 SERIES 6FLUTE 45° HELIX - SIDE CUTTING (NORMAL SPEED)

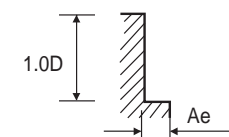
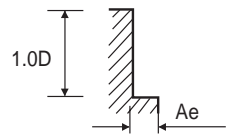
GMF29 SERIES 6FLUTE 45° HELIX - SIDE CUTTING (HIGH SPEED)

Table with columns: ISO, VDI 3323, Material Description, Ae, Ap, Parameter, Diameter (Ø) [1/4, 1/4, 5/16, 5/16, 3/8, 3/8, 1/2, 1/2, 5/8, 5/8, 3/4, 3/4]. Rows include materials like Non-alloy steel, Low alloy steel, High alloyed steel, and Hardened steel.

Table with columns: ISO, VDI 3323, Material Description, Ae, Ap, Parameter, Diameter (Ø) [1/4, 1/4, 5/16, 5/16, 3/8, 3/8, 1/2, 1/2, 5/8, 5/8, 3/4, 3/4]. Rows include materials like Non-alloy steel, High alloyed steel, and Hardened steel.

SFM = Surface Feet per Minute
RPM = Revolutions Per Minute
IPT = Inches Per Tooth
IPM = Inches Per Minute
Ap : Inch (Axial Depth of Cut)
Ae : Inch (Radial Depth of Cut)

SFM = Surface Feet per Minute
RPM = Revolutions Per Minute
IPT = Inches Per Tooth
IPM = Inches Per Minute
Ap : Inch (Axial Depth of Cut)
Ae : Inch (Radial Depth of Cut)



**G907, G928, G908, G929, G909, G930** SERIES

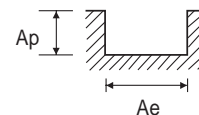
**G907, G928, G908, G929, G909, G930** SERIES

**4&5FLUTE MULTIPLE HELIX CORNER RADIUS - - SLOTTING**
**4&5FLUTE MULTIPLE HELIX CORNER RADIUS - - SIDE CUTTING**

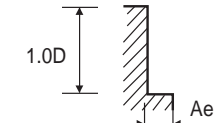
ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø)						
						1/4	5/16	3/8	1/2	5/8	3/4	1
P	1-2	Non-alloy steel	1.0D	1.0D	SFM(Vc)	785	735	705	785	735	705	760
					IPT(fz)	.0013	.0018	.0023	.0025	.0026	.0029	.0032
					RPM	12000	9000	7200	6000	4500	3600	2900
	3-5		1.0D	0.8D	SFM(Vc)	695	665	630	705	670	630	680
					IPT(fz)	.0010	.0014	.0018	.0021	.0020	.0022	.0025
					RPM	10600	8100	6400	5400	4100	3200	2600
	6	1.0D	1.0D	SFM(Vc)	785	735	705	785	735	705	760	
				IPT(fz)	.0013	.0018	.0023	.0025	.0026	.0029	.0032	
				RPM	12000	9000	7200	6000	4500	3600	2900	
	7-9	1.0D	0.8D	SFM(Vc)	695	665	630	705	670	630	680	
				IPT(fz)	.0010	.0014	.0018	.0021	.0020	.0022	.0025	
				RPM	10600	8100	6400	5400	4100	3200	2600	
10	1.0D	1.0D	SFM(Vc)	785	735	705	785	735	705	760		
			IPT(fz)	.0013	.0018	.0023	.0025	.0026	.0029	.0032		
			RPM	12000	9000	7200	6000	4500	3600	2900		
11.1-11.2	1.0D	0.8D	SFM(Vc)	695	665	630	705	670	630	680		
			IPT(fz)	.0010	.0014	.0018	.0021	.0020	.0022	.0025		
			RPM	10600	8100	6400	5400	4100	3200	2600		
K	15	Grey cast iron	1.0D	1.0D	SFM(Vc)	785	735	705	785	735	705	760
					IPT(fz)	.0013	.0018	.0023	.0025	.0026	.0029	.0032
					RPM	12000	9000	7200	6000	4500	3600	2900
	16		1.0D	1.0D	SFM(Vc)	695	665	630	705	670	630	680
					IPT(fz)	.0010	.0014	.0018	.0021	.0020	.0022	.0025
					RPM	10600	8100	6400	5400	4100	3200	2600
	17	1.0D	1.0D	SFM(Vc)	785	735	705	785	735	705	760	
				IPT(fz)	.0013	.0018	.0023	.0025	.0026	.0029	.0032	
				RPM	12000	9000	7200	6000	4500	3600	2900	
	18	1.0D	1.0D	SFM(Vc)	695	665	630	705	670	630	680	
				IPT(fz)	.0010	.0014	.0018	.0021	.0020	.0022	.0025	
				RPM	10600	8100	6400	5400	4100	3200	2600	
19-20	1.0D	1.0D	SFM(Vc)	785	735	705	785	735	705	760		
			IPT(fz)	.0013	.0018	.0023	.0025	.0026	.0029	.0032		
			RPM	12000	9000	7200	6000	4500	3600	2900		
H	40		1.0D	0.8D	SFM(Vc)	695	665	630	705	670	630	680
					IPT(fz)	.0010	.0014	.0018	.0021	.0020	.0022	.0025
					RPM	10600	8100	6400	5400	4100	3200	2600
					IPM(FEED)	61	65	65	61	59	52	46
					IPM(FEED)	43	47	47	45	41	35	33

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø)						
						1/4	5/16	3/8	1/2	5/8	3/4	1
P	1-2	Non-alloy steel	0.5D	1.0D	SFM(Vc)	1035	975	935	1045	980	940	995
					IPT(fz)	.0016	.0022	.0028	.0032	.0032	.0035	.0040
					RPM	15800	11900	9500	8000	6000	4800	3800
	3-5		0.35D	1.0D	SFM(Vc)	935	875	835	930	885	845	890
					IPT(fz)	.0013	.0018	.0023	.0026	.0026	.0028	.0029
					RPM	14300	10700	8500	7100	5400	4300	3400
	6	0.5D	1.0D	SFM(Vc)	1035	975	935	1045	980	940	995	
				IPT(fz)	.0016	.0022	.0028	.0032	.0032	.0035	.0040	
				RPM	15800	11900	9500	8000	6000	4800	3800	
	7-9	0.35D	1.0D	SFM(Vc)	935	875	835	930	885	845	890	
				IPT(fz)	.0013	.0018	.0023	.0026	.0026	.0028	.0029	
				RPM	14300	10700	8500	7100	5400	4300	3400	
10	0.5D	1.0D	SFM(Vc)	1035	975	935	1045	980	940	995		
			IPT(fz)	.0016	.0022	.0028	.0032	.0032	.0035	.0040		
			RPM	15800	11900	9500	8000	6000	4800	3800		
11.1-11.2	0.35D	1.0D	SFM(Vc)	935	875	835	930	885	845	890		
			IPT(fz)	.0013	.0018	.0023	.0026	.0026	.0028	.0029		
			RPM	14300	10700	8500	7100	5400	4300	3400		
K	15	Grey cast iron	0.5D	1.0D	SFM(Vc)	1035	975	935	1045	980	940	995
					IPT(fz)	.0016	.0022	.0028	.0032	.0032	.0035	.0040
					RPM	15800	11900	9500	8000	6000	4800	3800
	16		0.35D	1.0D	SFM(Vc)	935	875	835	930	885	845	890
					IPT(fz)	.0013	.0018	.0023	.0026	.0026	.0028	.0029
					RPM	14300	10700	8500	7100	5400	4300	3400
	17	0.5D	1.0D	SFM(Vc)	1035	975	935	1045	980	940	995	
				IPT(fz)	.0016	.0022	.0028	.0032	.0032	.0035	.0040	
				RPM	15800	11900	9500	8000	6000	4800	3800	
	18	0.35D	1.0D	SFM(Vc)	935	875	835	930	885	845	890	
				IPT(fz)	.0013	.0018	.0023	.0026	.0026	.0028	.0029	
				RPM	14300	10700	8500	7100	5400	4300	3400	
19-20	0.5D	1.0D	SFM(Vc)	1035	975	935	1045	980	940	995		
			IPT(fz)	.0016	.0022	.0028	.0032	.0032	.0035	.0040		
			RPM	15800	11900	9500	8000	6000	4800	3800		
					IPM(FEED)	101	106	106	101	97	84	75

SFM = Surface Feet per Minute  
RPM = Revolutions Per Minute  
IPT = Inches Per Tooth  
IPM = Inches Per Minute  
Ap : Inch (Axial Depth of Cut)  
Ae : Inch (Radial Depth of Cut)



SFM = Surface Feet per Minute  
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Ap : Inch (Axial Depth of Cut)  
Ae : Inch (Radial Depth of Cut)





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RECOMMENDED CUTTING CONDITIONS



RECOMMENDED CUTTING CONDITIONS

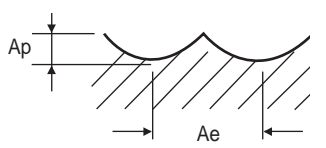
SEMD98 SERIES 2FLUTE BALL NOSE - PLANE

SEMD98 SERIES 2FLUTE BALL NOSE - PLANE

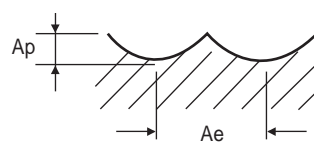
Table with columns: ISO, VDI 3323, Material Description, Ae, Ap, Parameter, Diameter (Ø) [0.1 to 2.5]. Rows include P (1-8, 9, 10-11.1, 11.2), K (15), and H (38.1-38.2, 40, 41).

Table with columns: ISO, VDI 3323, Material Description, Ae, Ap, Parameter, Diameter (Ø) [3.0 to 10.0]. Rows include P (1-8, 9, 10-11.1, 11.2), K (15), and H (38.1-38.2, 40, 41).

SFM = Surface Feet per Minute
RPM = Revolutions Per Minute
IPT = Inches Per Tooth
IPM = Inches Per Minute
Ap : Inch (Axial Depth of Cut)
Ae : Inch (Radial Depth of Cut)



SFM = Surface Feet per Minute
RPM = Revolutions Per Minute
IPT = Inches Per Tooth
IPM = Inches Per Minute
Ap : Inch (Axial Depth of Cut)
Ae : Inch (Radial Depth of Cut)



HSS

# YG 4G MILL END MILLS

RECOMMENDED CUTTING CONDITIONS

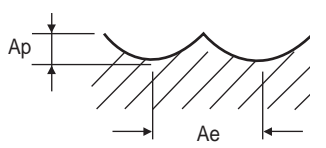
# YG 4G MILL END MILLS

RECOMMENDED CUTTING CONDITIONS

## SEMD98 SERIES 2FLUTE BALL NOSE - PLANE

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø)									
						11.0	12.0	13.0	14.0	15.0	16.0	18.0	20.0	25.0	
P	1-8	Non-alloy steel	0.08D	0.05D	SFM(Vc)	555	515	530	540	550	550	555	550	550	
					IPT(fz)	.0081	.0084	.0086	.0088	.0091	.0094	.0098	.0104	.0106	
					RPM	4875	4170	3960	3750	3550	3340	3005	2670	2130	
					IPM(FEED)	79	70	68	66	64	63	59	56	45	
					SFM(Vc)	530	495	510	520	525	530	535	530	530	
					IPT(fz)	.0071	.0074	.0078	.0082	.0087	.0081	.0085	.0089	.0091	
	9	Low alloy steel	0.08D	0.05D	SFM(Vc)	555	515	530	540	550	550	555	550	550	
					IPT(fz)	.0081	.0084	.0086	.0088	.0091	.0094	.0098	.0104	.0106	
					RPM	4875	4170	3960	3750	3550	3340	3005	2670	2130	
					IPM(FEED)	79	70	68	66	64	63	59	56	45	
					SFM(Vc)	530	495	510	520	525	530	535	530	530	
					IPT(fz)	.0071	.0074	.0078	.0082	.0087	.0081	.0085	.0089	.0091	
10-11.1	High alloyed steel, and tool steel	0.08D	0.05D	SFM(Vc)	555	515	530	540	550	550	555	550	550		
				IPT(fz)	.0081	.0084	.0086	.0088	.0091	.0094	.0098	.0104	.0106		
				RPM	4875	4170	3960	3750	3550	3340	3005	2670	2130		
				IPM(FEED)	79	70	68	66	64	63	59	56	45		
				SFM(Vc)	530	495	510	520	525	530	535	530	530		
				IPT(fz)	.0071	.0074	.0078	.0082	.0087	.0081	.0085	.0089	.0091		
11.2	High alloyed steel, and tool steel	0.08D	0.05D	SFM(Vc)	530	495	510	520	525	530	535	530	530		
				IPT(fz)	.0071	.0074	.0078	.0082	.0087	.0081	.0085	.0089	.0091		
				RPM	4670	4000	3800	3600	3400	3210	2895	2580	2060		
				IPM(FEED)	66	59	59	59	59	52	49	46	37		
				SFM(Vc)	555	515	530	540	550	550	555	550	550		
				IPT(fz)	.0081	.0084	.0086	.0088	.0091	.0094	.0098	.0104	.0106		
K	15	Grey cast iron Nodular cast iron Malleable cast iron	0.08D	0.05D	SFM(Vc)	555	515	530	540	550	550	555	550	550	
					IPT(fz)	.0081	.0084	.0086	.0088	.0091	.0094	.0098	.0104	.0106	
					RPM	4875	4170	3960	3750	3550	3340	3005	2670	2130	
					IPM(FEED)	79	70	68	66	64	63	59	56	45	
					SFM(Vc)	445	415	430	435	445	445	450	445	445	
					IPT(fz)	.0065	.0067	.0068	.0070	.0072	.0074	.0078	.0082	.0083	
H	38.1-38.2	Hardened steel	0.08D	0.05D	SFM(Vc)	445	415	430	435	445	445	450	445	445	
					IPT(fz)	.0065	.0067	.0068	.0070	.0072	.0074	.0078	.0082	.0083	
					RPM	3930	3360	3200	3030	2870	2700	2430	2160	1730	
					IPM(FEED)	51	45	44	43	41	40	38	35	29	
					SFM(Vc)	530	495	510	520	525	530	535	530	530	
					IPT(fz)	.0071	.0074	.0078	.0082	.0087	.0081	.0085	.0089	.0091	
	40	Chilled Cast Iron	0.08D	0.05D	SFM(Vc)	530	495	510	520	525	530	535	530	530	
					IPT(fz)	.0071	.0074	.0078	.0082	.0087	.0081	.0085	.0089	.0091	
					RPM	4670	4000	3800	3600	3400	3210	2895	2580	2060	
					IPM(FEED)	66	59	59	59	59	52	49	46	37	
					SFM(Vc)	445	415	430	435	445	445	450	445	445	
					IPT(fz)	.0065	.0067	.0068	.0070	.0072	.0074	.0078	.0082	.0083	
41	Hardened Cast Iron	0.08D	0.05D	SFM(Vc)	445	415	430	435	445	445	450	445	445		
				IPT(fz)	.0065	.0067	.0068	.0070	.0072	.0074	.0078	.0082	.0083		
				RPM	3930	3360	3200	3030	2870	2700	2430	2160	1730		
				IPM(FEED)	51	45	44	43	41	40	38	35	29		

SFM = Surface Feet per Minute  
RPM = Revolutions Per Minute  
IPT = Inches Per Tooth  
IPM = Inches Per Minute  
Ap : Inch (Axial Depth of Cut)  
Ae : Inch (Radial Depth of Cut)



## SEM846 SERIES 2FLUTE BALL NOSE - SLOTTING

ISO	VDI 3323	Material Description	Parameter	Diameter (Ø)																							
				0.1		0.1		0.1		0.1		0.2		0.2		0.2		0.2		0.3		0.3		0.3		0.4	
				LBS	0.2	0.3	0.5	1	0.5	1	1.5	2	3	1	1.5	2	2.5	3	4	5	1						
P	1-8	Non-alloy steel	SFM(Vc)	50	50	50	45	105	105	95	95	95	155	155	140	140	140	125	95	170							
			IPT(fz)	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0002	.0002	.0002	.0002	.0002	.0001	.0001	.0002							
			RPM	50000	50000	50000	45000	50000	50000	45000	45000	45000	50000	50000	45000	45000	45000	40000	30000	41000							
			IPM(FEED)	9	9	9	8	13	13	11	11	11	19	19	15	15	15	12	8	19							
			Ap	.0004	.0004	.0002	.0001	.0007	.0005	.0003	.0002	.0001	.0007	.0007	.0004	.0003	.0003	.0002	.0001	.0014							
			SFM(Vc)	50	50	50	45	105	105	95	95	95	155	155	140	140	140	125	95	160							
	9	Low alloy steel	SFM(Vc)	50	50	50	45	105	105	95	95	95	155	155	140	140	140	125	95	160							
			IPT(fz)	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0002	.0002	.0002	.0002	.0002	.0001	.0001	.0002							
			RPM	50000	50000	50000	45000	50000	50000	45000	45000	45000	50000	50000	45000	45000	45000	40000	30000	38800							
			IPM(FEED)	8	8	8	7	12	12	10	10	10	17	17	14	14	14	11	7	17							
			Ap	.0003	.0003	.0002	.0001	.0006	.0004	.0002	.0002	.0001	.0006	.0006	.0003	.0003	.0002	.0001	.0001	.0011							
			10-11.1	High alloyed steel, and tool steel	SFM(Vc)	50	50	50	45	105	105	95	95	95	155	155	140	140	140	125	95	170					
IPT(fz)	.0001	.0001			.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0002	.0002	.0002	.0002	.0002	.0001	.0001	.0002								
RPM	50000	50000			50000	45000	50000	50000	45000	45000	45000	50000	50000	45000	45000	45000	40000	30000	41000								
IPM(FEED)	9	9			9	8	13	13	11	11	11	19	19	15	15	15	12	8	19								
Ap	.0004	.0004			.0002	.0001	.0007	.0005	.0003	.0002	.0001	.0007	.0007	.0004	.0003	.0003	.0002	.0001	.0014								
11.2	High alloyed steel, and tool steel	SFM(Vc)			50	50	50	45	105	105	95	95	95	155	155	140	140	140	125	95	160						
		IPT(fz)	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0002	.0002	.0002	.0002	.0002	.0001	.0001	.0002								
		RPM	50000	50000	50000	45000	50000	50000	45000	45000	45000	50000	50000	45000	45000	45000	40000	30000	38800								
		IPM(FEED)	8	8	8	7	12	12	10	10	10	17	17	14	14	14	11	7	17								
		Ap	.0003	.0003	.0002	.0001	.0006	.0004	.0002	.0002	.0001	.0006	.0006	.0003	.0003	.0002	.0001	.0001	.0011								
		K	15-20	Grey cast iron Nodular cast iron Malleable cast iron	SFM(Vc)	50	50	50	45	105	105	95	95	95	155	155	140	140	140	125	95	170					
IPT(fz)	.0001				.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0002	.0002	.0002	.0002	.0002	.0001	.0001	.0002							
RPM	50000				50000	50000	45000	50000	50000	45000	45000	45000	50000	50000	45000	45000	45000	40000	30000	41000							
IPM(FEED)	9				9	9	8	13	13	11	11	11	19	19	15	15	15	12	8	19							
Ap	.0004				.0004	.0002	.0001	.0007	.0005	.0003	.0002	.0001	.0007	.0007	.0004	.0003	.0003	.0002	.0001	.0014							
H	38.1-38.2				Hardened steel	SFM(Vc)	50	50	50	45	90	90	80	80	80	130	130	120	120	120	105	80	140				
		IPT(fz)	.0001	.0001		.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0002	.0002	.0001	.0001	.0001	.0001	.0001	.0002							
		RPM	50000	50000		50000	45000	43200	43200	38880	38880	38880	42800	42800	38520	38520	38520	34240	25680	34200							
		IPM(FEED)	7.5	7.5		7.5	6.1	10.2	10.2	8.3	8.3	8.3	14.4	14.4	11.6	11.6	11.6	9.3	6.1	13.4							
		Ap	.0002	.0002		.0002	.0000	.0004	.0003	.0002	.0001	.0001	.0004	.0004	.0002	.0002	.0002	.0001	.0001	.0008							
		40	Chilled Cast Iron	SFM(Vc)		50	50	50	45	105	105	95	95	95	155	155	140	140	140	125	95	160					
	IPT(fz)			.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0002	.0002	.0002	.0002	.0002	.0001	.0001	.0002							
	RPM			50000	50000	50000	45000	50000	50000	45000	45000	45000	50000	50000	45000	45000	45000	40000	30000	38800							
	IPM(FEED)			8	8	8	7	12	12	10	10	10	17	17	14	14	14	11	7	17							
	Ap			.0003	.0003	.0002	.0001	.0006	.0004	.0002	.0002	.0001	.0006	.0006	.0003	.0003	.0002	.0001	.0001	.0011							
	41			Hardened Cast Iron	SFM(Vc)	50	50	50	45	90	90	80	80	80	130	130	120	120	120	105	80	140					
		IPT(fz)	.0001		.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0002	.0002	.0001	.0001	.0001	.0001	.0001	.0002							
RPM		50000	50000		50000	45000	43200	43200	38880	38880	38880	42800	42800	38520	38520	38520	34240	25680	34200								
IPM(FEED)		7.5	7.5		7.5	6.1	10.2	10																			

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RECOMMENDED CUTTING CONDITIONS

RECOMMENDED CUTTING CONDITIONS

SEM846 SERIES 2FLUTE BALL NOSE - SLOTTING

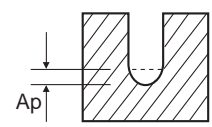
SEM846 SERIES 2FLUTE BALL NOSE - SLOTTING

Table with columns for ISO, VDI 3323, Material Description, Parameter, and Diameter (Ø) from 0.4 to 0.5 inches. Rows include P (Non-alloy steel, Low alloy steel, High alloyed steel, and tool steel), K (Grey cast iron, Nodular cast iron, Malleable cast iron), and H (Hardened steel, Chilled Cast Iron, Hardened Cast Iron).

Table with columns for ISO, VDI 3323, Parameter, and Diameter (Ø) from 0.5 to 0.7 inches. Rows include P (Non-alloy steel, Low alloy steel, High alloyed steel, and tool steel), K (Grey cast iron, Nodular cast iron, Malleable cast iron), and H (Hardened steel, Chilled Cast Iron, Hardened Cast Iron).

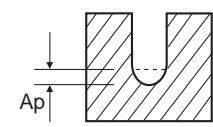
SFM = Surface Feet per Minute
RPM = Revolutions Per Minute
IPT = Inches Per Tooth
IPM = Inches Per Minute
Ap : mm (Axial Depth of Cut)
Ae : Inch (Radial Depth of Cut)

(Depth of Cut per one pass)



SFM = Surface Feet per Minute
RPM = Revolutions Per Minute
IPT = Inches Per Tooth
IPM = Inches Per Minute
Ap : mm (Axial Depth of Cut)
Ae : Inch (Radial Depth of Cut)

(Depth of Cut per one pass)





HSS



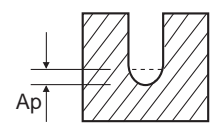
RECOMMENDED CUTTING CONDITIONS

SEM846 SERIES 2FLUTE BALL NOSE - SLOTTING

Table with columns for ISO, VDI 3323, Material Description, Parameter, and Diameter (Ø) from 0.7 to 0.9 inches. Rows include P (Non-alloy steel, Low alloy steel, High alloyed steel, and tool steel) and K (Grey cast iron, Nodular cast iron, Malleable cast iron).

SFM = Surface Feet per Minute
RPM = Revolutions Per Minute
IPT = Inches Per Tooth
IPM = Inches Per Minute
Ap : mm (Axial Depth of Cut)
Ae : Inch (Radial Depth of Cut)

(Depth of Cut per one pass)



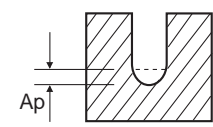
RECOMMENDED CUTTING CONDITIONS

SEM846 SERIES 2FLUTE BALL NOSE - SLOTTING

Table with columns for ISO, VDI 3323, Parameter, and Diameter (Ø) from 1.0 to 1.2 inches. Rows include P (Non-alloy steel, Low alloy steel, High alloyed steel, and tool steel) and K (Grey cast iron, Nodular cast iron, Malleable cast iron).

SFM = Surface Feet per Minute
RPM = Revolutions Per Minute
IPT = Inches Per Tooth
IPM = Inches Per Minute
Ap : mm (Axial Depth of Cut)
Ae : Inch (Radial Depth of Cut)

(Depth of Cut per one pass)



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RECOMMENDED CUTTING CONDITIONS



RECOMMENDED CUTTING CONDITIONS

SEM846 SERIES 2FLUTE BALL NOSE - SLOTTING

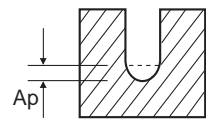
SEM846 SERIES 2FLUTE BALL NOSE - SLOTTING

Table with columns for ISO, VDI 3323, Material Description, Parameter, and Diameter (Ø) ranging from 1.2 to 1.5. Rows include P (Non-alloy steel, Low alloy steel, High alloyed steel, and tool steel) and K (Grey cast iron, Nodular cast iron, Malleable cast iron).

Table with columns for ISO, VDI 3323, Parameter, and Diameter (Ø) ranging from 1.5 to 1.8. Rows include P (Non-alloy steel, Low alloy steel, High alloyed steel, and tool steel) and K (Grey cast iron, Nodular cast iron, Malleable cast iron).

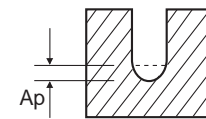
SFM = Surface Feet per Minute
RPM = Revolutions Per Minute
IPT = Inches Per Tooth
IPM = Inches Per Minute
Ap : mm (Axial Depth of Cut)
Ae : Inch (Radial Depth of Cut)

(Depth of Cut per one pass)



SFM = Surface Feet per Minute
RPM = Revolutions Per Minute
IPT = Inches Per Tooth
IPM = Inches Per Minute
Ap : mm (Axial Depth of Cut)
Ae : Inch (Radial Depth of Cut)

(Depth of Cut per one pass)



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RECOMMENDED CUTTING CONDITIONS

RECOMMENDED CUTTING CONDITIONS

SEM846 SERIES 2FLUTE BALL NOSE - SLOTTING

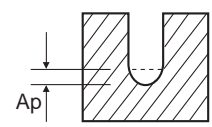
SEM846 SERIES 2FLUTE BALL NOSE - SLOTTING

Table with columns for ISO, VDI 3323, Material Description, Parameter, and Diameter (Ø) from 1.8 to 2.0. Rows include P (Non-alloy steel, Low alloy steel, High alloyed steel, and tool steel), K (Grey cast iron, Nodular cast iron, Malleable cast iron), and H (Hardened steel, Chilled Cast Iron, Hardened Cast Iron).

Table with columns for ISO, VDI 3323, Parameter, and Diameter (Ø) from 2.0 to 3.0. Rows include P (Non-alloy steel, Low alloy steel, High alloyed steel, and tool steel), K (Grey cast iron, Nodular cast iron, Malleable cast iron), and H (Hardened steel, Chilled Cast Iron, Hardened Cast Iron).

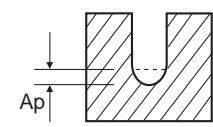
SFM = Surface Feet per Minute
RPM = Revolutions Per Minute
IPT = Inches Per Tooth
IPM = Inches Per Minute
Ap : mm (Axial Depth of Cut)
Ae : Inch (Radial Depth of Cut)

(Depth of Cut per one pass)



SFM = Surface Feet per Minute
RPM = Revolutions Per Minute
IPT = Inches Per Tooth
IPM = Inches Per Minute
Ap : mm (Axial Depth of Cut)
Ae : Inch (Radial Depth of Cut)

(Depth of Cut per one pass)





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RECOMMENDED CUTTING CONDITIONS



RECOMMENDED CUTTING CONDITIONS

SEM846 SERIES 2FLUTE BALL NOSE - SLOTTING

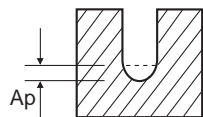
SEM846 SERIES 2FLUTE BALL NOSE - SLOTTING

Table with columns: ISO, VDI 3323, Material Description, Parameter, Diameter (Ø) (3.0 to 4.0), SFM(Vc), IPT(fz), RPM, IPM(FEED), Ap. Rows include Non-alloy steel, Low alloy steel, High alloyed steel, and Grey cast iron.

Table with columns: ISO, VDI 3323, Material Description, Parameter, Diameter (Ø) (4.0 to 12.0), SFM(Vc), IPT(fz), RPM, IPM(FEED), Ap. Rows include Non-alloy steel, Low alloy steel, High alloyed steel, and Grey cast iron.

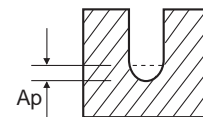
SFM = Surface Feet per Minute
RPM = Revolutions Per Minute
IPT = Inches Per Tooth
IPM = Inches Per Minute
Ap : mm (Axial Depth of Cut)
Ae : Inch (Radial Depth of Cut)

(Depth of Cut per one pass)



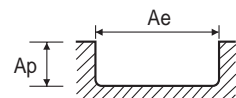
SFM = Surface Feet per Minute
RPM = Revolutions Per Minute
IPT = Inches Per Tooth
IPM = Inches Per Minute
Ap : mm (Axial Depth of Cut)
Ae : Inch (Radial Depth of Cut)

(Depth of Cut per one pass)



**SEMD99 SERIES 2FLUTE CORNER RADIUS - SLOTTING**

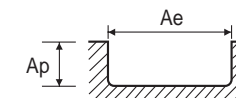
ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø)															
						0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0	1.2	1.5	2.0	2.5			
<b>P</b>	1-8	Non-alloy steel	1.0D	0.2D	SFM(Vc)	90	125	170	185	185	215	245	280	285	305	340	370	385			
					IPT(fz)	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0002	.0002	.0002	.0003	.0004			
					RPM	44000	41000	41000	36000	30000	30000	30000	30000	27600	24800	22000	18000	15000			
					IPM(FEED)	6	7	7	7	8	8	8	9	9	10	10	10	11			
	9	Low alloy steel	1.0D	0.2D	SFM(Vc)	60	85	110	120	120	145	165	175	185	195	210	240	245			
					IPT(fz)	.00004	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0002	.0002	.0002	.0003			
					RPM	28800	27000	27000	23400	19800	19800	19800	18900	18000	15750	13500	11560	9500			
					IPM(FEED)	2	3	3	3	4	4	4	4	4	4	4	5	5			
	10-11.1	High alloyed steel, and tool steel	1.0D	0.2D	SFM(Vc)	90	125	170	185	185	215	245	280	285	305	340	370	385			
					IPT(fz)	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0002	.0002	.0002	.0003	.0004			
					RPM	44000	41000	41000	36000	30000	30000	30000	30000	27600	24800	22000	18000	15000			
					IPM(FEED)	6	7	7	7	8	8	8	9	9	10	10	10	11			
11.2	High alloyed steel, and tool steel	1.0D	0.2D	SFM(Vc)	60	85	110	120	120	145	165	175	185	195	210	240	245				
				IPT(fz)	.00004	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0002	.0002	.0002	.0003				
				RPM	28800	27000	27000	23400	19800	19800	19800	18900	18000	15750	13500	11560	9500				
				IPM(FEED)	2	3	3	3	4	4	4	4	4	4	4	5	5				
<b>K</b>	15-20	Grey cast iron Nodular cast iron Malleable cast iron	1.0D	0.2D	SFM(Vc)	90	125	170	185	185	215	245	280	285	305	340	370	385			
					IPT(fz)	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0002	.0002	.0002	.0003	.0004			
					RPM	44000	41000	41000	36000	30000	30000	30000	30000	27600	24800	22000	18000	15000			
					IPM(FEED)	6	7	7	7	8	8	8	9	9	10	10	10	11			
<b>H</b>	38.1-38.2	Hardened steel	1.0D	0.2D	SFM(Vc)	35	50	70	75	75	85	100	105	115	120	130	150	155			
					IPT(fz)	.00004	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0002	.0002	.0002		
					RPM	17600	16500	16500	14300	12100	12100	12100	11550	11000	9750	8500	7200	6100			
					IPM(FEED)	2	2	2	2	2	2	2	2	2	2	2	3	3			
	40	Chilled Cast Iron	1.0D	0.2D	SFM(Vc)	60	85	110	120	120	145	165	175	185	195	210	240	245			
					IPT(fz)	.00004	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0002	.0002	.0002	.0003			
					RPM	28800	27000	27000	23400	19800	19800	19800	18900	18000	15750	13500	11560	9500			
					IPM(FEED)	2	3	3	3	4	4	4	4	4	4	4	5	5			
	41	Hardened Cast Iron	1.0D	0.2D	SFM(Vc)	35	50	70	75	75	85	100	105	115	120	130	150	155			
					IPT(fz)	.00004	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0002	.0002			
					RPM	17600	16500	16500	14300	12100	12100	12100	11550	11000	9750	8500	7200	6100			
					IPM(FEED)	2	2	2	2	2	2	2	2	2	2	2	3	3			



SFM = Surface Feet per Minute  
 RPM = Revolutions Per Minute  
 IPT = Inches Per Tooth  
 IPM = Inches Per Minute  
 Ap : Inch (Axial Depth of Cut)  
 Ae : Inch (Radial Depth of Cut)

**SEMD99 SERIES 2FLUTE CORNER RADIUS - SLOTTING**

ISO	VDI 3323	Ae	Ap	Parameter	Diameter (Ø)															
					3.0	3.5	4.0	4.5	5.0	5.5	6.0	7.0	8.0	10.0	11.0	12.0	14.0	16.0	20.0	
<b>P</b>	1-8	1.0D	0.2D	SFM(Vc)	410	430	440	460	470	485	490	500	495	520	520	510	520	510	520	
				IPT(fz)	.0004	.0005	.0006	.0008	.0009	.0011	.0012	.0015	.0018	.0021	.0021	.0020	.0021	.0023	.0022	
				RPM	13240	11980	10720	9940	9160	8530	7900	6950	6000	5040	4580	4120	3610	3100	2520	
				IPM(FEED)	11	12	13	15	17	18	20	20	21	21	19	17	15	14	11	
	9	1.0D	0.2D	SFM(Vc)	265	275	280	295	300	305	310	320	315	340	345	345	350	345	340	
				IPT(fz)	.0003	.0004	.0005	.0006	.0007	.0008	.0010	.0011	.0013	.0015	.0016	.0016	.0016	.0016	.0014	
				RPM	8560	7690	6820	6310	5800	5420	5040	4420	3800	3280	3030	2780	2440	2100	1640	
				IPM(FEED)	6	6	7	7	8	9	10	10	10	10	9	9	8	7	5	
	10-11.1	1.0D	0.2D	SFM(Vc)	410	430	440	460	470	485	490	500	495	520	520	510	520	510	520	
				IPT(fz)	.0004	.0005	.0006	.0008	.0009	.0011	.0012	.0015	.0018	.0021	.0021	.0020	.0021	.0023	.0022	
				RPM	13240	11980	10720	9940	9160	8530	7900	6950	6000	5040	4580	4120	3610	3100	2520	
				IPM(FEED)	11	12	13	15	17	18	20	20	21	21	19	17	15	14	11	
11.2	1.0D	0.2D	SFM(Vc)	265	275	280	295	300	305	310	320	315	340	345	345	350	345	340		
			IPT(fz)	.0003	.0004	.0005	.0006	.0007	.0008	.0010	.0011	.0013	.0015	.0016	.0016	.0016	.0016	.0014		
			RPM	8560	7690	6820	6310	5800	5420	5040	4420	3800	3280	3030	2780	2440	2100	1640		
			IPM(FEED)	6	6	7	7	8	9	10	10	10	10	9	9	8	7	5		
<b>K</b>	15-20	1.0D	0.2D	SFM(Vc)	410	430	440	460	470	485	490	500	495	520	520	510	520	510	520	
				IPT(fz)	.0004	.0005	.0006	.0008	.0009	.0011	.0012	.0015	.0018	.0021	.0021	.0020	.0021	.0023	.0022	
				RPM	13240	11980	10720	9940	9160	8530	7900	6950	6000	5040	4580	4120	3610	3100	2520	
				IPM(FEED)	11	12	13	15	17	18	20	20	21	21	19	17	15	14	11	
<b>H</b>	38.1-38.2	1.0D	0.2D	SFM(Vc)	165	175	175	200	195	200	205	210	210	210	210	215	210	205		
				IPT(fz)	.0003	.0003	.0004	.0004	.0005	.0006	.0007	.0008	.0009	.0012	.0012	.0012	.0012	.0012	.0012	
				RPM	5280	4790	4300	4300	3800	3540	3280	2900	2520	2020	1850	1680	1480	1280	1000	
				IPM(FEED)	3	3	3	4	4	4	5	5	5	5	4	4	4	3	2	
	40	1.0D	0.2D	SFM(Vc)	265	275	280	295	300	305	310	320	315	340	345	345	350	345	340	
				IPT(fz)	.0003	.0004	.0005	.0006	.0007	.0008	.0010	.0011	.0013	.0015	.0016	.0016	.0016	.0016	.0014	
				RPM	8560	7690	6820	6310	5800	5420	5040	4420	3800	3280	3030	2780	2440	2100	1640	
				IPM(FEED)	6	6	7	7	8	9	10	10	10	10	9	9	8	7	5	
	41	1.0D	0.2D	SFM(Vc)	165	175	175	200	195	200	205	210	210	210	210	215	210	205		
				IPT(fz)	.0003	.0003	.0004	.0004	.0005	.0006	.0007	.0008	.0009	.0012	.0012	.0012	.0012	.0012	.0012	
				RPM	5280	4790	4300	4300	3800	3540	3280	2900	2520	2020	1850	1680	1480	1280	1000	
				IPM(FEED)	3	3	3	4	4	4	5	5	5	5	4	4	4	3	2	



SFM = Surface Feet per Minute  
 RPM = Revolutions Per Minute  
 IPT = Inches Per Tooth  
 IPM = Inches Per Minute  
 Ap : Inch (Axial Depth of Cut)  
 Ae : Inch (Radial Depth of Cut)

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RECOMMENDED CUTTING CONDITIONS



RECOMMENDED CUTTING CONDITIONS

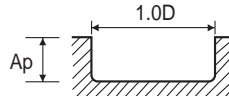
SEME61 SERIES 2FLUTE CORNER RADIUS - **SLOTING**

SEME61 SERIES 2FLUTE CORNER RADIUS - **SLOTING**

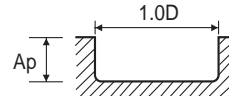
Table with columns: ISO, VDI 3323, Material Description, Parameter, Diameter (Ø) (0.2 to 0.5), SFM(Vc), IPT(fz), RPM, IPM(FEED), Ap. Rows include P (Non-alloy steel, Low alloy steel, High alloyed steel, and tool steel) and K (Grey cast iron, Nodular cast iron, Malleable cast iron).

Table with columns: ISO, VDI 3323, Material Description, Parameter, Diameter (Ø) (0.5 to 0.8), SFM(Vc), IPT(fz), RPM, IPM(FEED), Ap. Rows include P (Non-alloy steel, Low alloy steel, High alloyed steel, and tool steel) and K (Grey cast iron, Nodular cast iron, Malleable cast iron).

SFM = Surface Feet per Minute
RPM = Revolutions Per Minute
IPT = Inches Per Tooth
IPM = Inches Per Minute
Ap : mm (Axial Depth of Cut)
Ae : Inch (Radial Depth of Cut)



SFM = Surface Feet per Minute
RPM = Revolutions Per Minute
IPT = Inches Per Tooth
IPM = Inches Per Minute
Ap : mm (Axial Depth of Cut)
Ae : Inch (Radial Depth of Cut)





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RECOMMENDED CUTTING CONDITIONS

RECOMMENDED CUTTING CONDITIONS

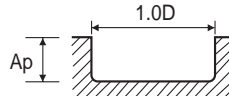
SEME61 SERIES 2FLUTE CORNER RADIUS - **SLOTING**

SEME61 SERIES 2FLUTE CORNER RADIUS - **SLOTING**

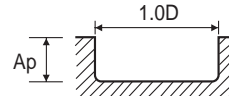
Table with columns: ISO, VDI 3323, Material Description, Parameter, Diameter (Ø) [0.8, 0.8, 0.8, 0.8, 1.0, 1.0, 1.0, 1.0, 1.0, 1.0, 1.0, 1.0, 1.0, 1.0, 1.2, 1.2, 1.2]. Rows include P (Non-alloy steel, Low alloy steel, High alloyed steel, and tool steel) and K (Grey cast iron, Nodular cast iron, Malleable cast iron).

Table with columns: ISO, VDI 3323, Material Description, Parameter, Diameter (Ø) [1.2, 1.2, 1.2, 1.2, 1.2, 1.2, 1.5, 1.5, 1.5, 1.5, 1.5, 1.5, 1.5, 1.5, 2.0, 2.0, 2.0]. Rows include P (Non-alloy steel, Low alloy steel, High alloyed steel, and tool steel) and K (Grey cast iron, Nodular cast iron, Malleable cast iron).

SFM = Surface Feet per Minute  
RPM = Revolutions Per Minute  
IPT = Inches Per Tooth  
IPM = Inches Per Minute  
Ap : mm (Axial Depth of Cut)  
Ae : Inch (Radial Depth of Cut)



SFM = Surface Feet per Minute  
RPM = Revolutions Per Minute  
IPT = Inches Per Tooth  
IPM = Inches Per Minute  
Ap : mm (Axial Depth of Cut)  
Ae : Inch (Radial Depth of Cut)





HSS

**YG** 4G MILL END MILLS

RECOMMENDED CUTTING CONDITIONS

**YG** 4G MILL END MILLS

RECOMMENDED CUTTING CONDITIONS

**SEME61** SERIES 2FLUTE CORNER RADIUS - **SLOTING**

**SEME01** SERIES 4FLUTE CORNER RADIUS - **SIDE CUTTING**

ISO	VDI 3323	Material Description	Parameter	Diameter (Ø)															
				4.0		5.0	6.0		8.0		10.0		12.0		16.0		20.0		
				LBS	45	50	15	20	30	25	35	30	40	32	45	35	50	40	55
<b>P</b>	1-8	Non-alloy steel	SFM(Vc)	420	420	565	585	585	595	595	620	620	620	620	615	615	620	620	
			IPT(fz)	.0005	.0005	.0009	.0012	.0012	.0017	.0017	.0021	.0021	.0020	.0020	.0024	.0024	.0022	.0022	
			RPM	10240	10240	11000	9500	9500	7200	7200	6000	6000	5000	5000	3720	3720	3000	3000	
			IPM(FEED)	10	10	20	24	24	25	25	25	25	20	20	18	18	13	13	
			Ap	.0079	.0079	.0394	.0331	.0331	.0441	.0441	.0787	.0551	.0945	.0661	.1260	.0882	.1575	.1575	
			SFM(Vc)	270	270	360	370	370	375	375	410	410	415	415	415	415	400	400	
	9	Low alloy steel	IPT(fz)	.0004	.0004	.0007	.0010	.0010	.0013	.0013	.0015	.0015	.0016	.0016	.0016	.0016	.0014	.0014	
			RPM	6560	6560	7000	6000	6000	4550	4550	4000	4000	3340	3340	2520	2520	1950	1950	
			IPM(FEED)	5.1	5.1	9.4	11.8	11.8	11.8	11.8	11.8	10.6	10.6	8.3	8.3	5.5	5.5		
			Ap	.0059	.0059	.0295	.0248	.0248	.0331	.0331	.0591	.0413	.0709	.0496	.0945	.0661	.1181	.1181	
			SFM(Vc)	420	420	565	585	585	595	595	620	620	620	620	615	615	620	620	
			IPT(fz)	.0005	.0005	.0009	.0012	.0012	.0017	.0017	.0021	.0021	.0020	.0020	.0024	.0024	.0022	.0022	
10-11.1	High alloyed steel, and tool steel	RPM	10240	10240	11000	9500	9500	7200	7200	6000	6000	5000	5000	3720	3720	3000	3000		
		IPM(FEED)	10	10	20	24	24	25	25	25	25	20	20	18	18	13	13		
		Ap	.0079	.0079	.0394	.0331	.0331	.0441	.0441	.0787	.0551	.0945	.0661	.1260	.0882	.1575	.1575		
		SFM(Vc)	270	270	360	370	370	375	375	410	410	415	415	415	415	400	400		
		IPT(fz)	.0004	.0004	.0007	.0010	.0010	.0013	.0013	.0015	.0015	.0016	.0016	.0016	.0016	.0014	.0014		
		RPM	6560	6560	7000	6000	6000	4550	4550	4000	4000	3340	3340	2520	2520	1950	1950		
11.2		IPM(FEED)	5.1	5.1	9.4	11.8	11.8	11.8	11.8	11.8	10.6	10.6	8.3	8.3	5.5	5.5			
		Ap	.0059	.0059	.0295	.0248	.0248	.0331	.0331	.0591	.0413	.0709	.0496	.0945	.0661	.1181	.1181		
		SFM(Vc)	420	420	565	585	585	595	595	620	620	620	620	615	615	620	620		
		IPT(fz)	.0005	.0005	.0009	.0012	.0012	.0017	.0017	.0021	.0021	.0020	.0020	.0024	.0024	.0022	.0022		
		RPM	10240	10240	11000	9500	9500	7200	7200	6000	6000	5000	5000	3720	3720	3000	3000		
		IPM(FEED)	10	10	20	24	24	25	25	25	25	20	20	18	18	13	13		
<b>K</b>	15-20	Grey cast iron Nodular cast iron Malleable cast iron	SFM(Vc)	420	420	565	585	585	595	595	620	620	620	620	615	615	620	620	
			IPT(fz)	.0005	.0005	.0009	.0012	.0012	.0017	.0017	.0021	.0021	.0020	.0020	.0024	.0024	.0022	.0022	
			RPM	10240	10240	11000	9500	9500	7200	7200	6000	6000	5000	5000	3720	3720	3000	3000	
			IPM(FEED)	10	10	20	24	24	25	25	25	25	20	20	18	18	13	13	
			Ap	.0079	.0079	.0394	.0331	.0331	.0441	.0441	.0787	.0551	.0945	.0661	.1260	.0882	.1575	.1575	
			SFM(Vc)	170	170	235	245	245	250	250	250	250	245	245	255	255	245	245	
<b>H</b>	38.1-38.2	Hardened steel	IPT(fz)	.0003	.0003	.0005	.0007	.0007	.0009	.0009	.0011	.0011	.0012	.0012	.0012	.0011	.0011		
			RPM	4120	4120	4560	3930	3930	3020	3020	2420	2420	2000	2000	1540	1540	1200	1200	
			IPM(FEED)	2	2	5	6	6	6	6	6	6	5	5	4	4	3	3	
			Ap	.0047	.0047	.0236	.0198	.0198	.0265	.0265	.0472	.0331	.0567	.0397	.0756	.0529	.0945	.0945	
			SFM(Vc)	270	270	360	370	370	375	375	410	410	415	415	415	415	400	400	
			IPT(fz)	.0004	.0004	.0007	.0010	.0010	.0013	.0013	.0015	.0015	.0016	.0016	.0016	.0016	.0014	.0014	
	40	Chilled Cast Iron	RPM	6560	6560	7000	6000	6000	4550	4550	4000	4000	3340	3340	2520	2520	1950	1950	
			IPM(FEED)	5.1	5.1	9.4	11.8	11.8	11.8	11.8	11.8	10.6	10.6	8.3	8.3	5.5	5.5		
			Ap	.0059	.0059	.0295	.0248	.0248	.0331	.0331	.0591	.0413	.0709	.0496	.0945	.0661	.1181	.1181	
			SFM(Vc)	170	170	235	245	245	250	250	250	250	245	245	255	255	245	245	
			IPT(fz)	.0003	.0003	.0005	.0007	.0007	.0009	.0009	.0011	.0011	.0012	.0012	.0012	.0012	.0011	.0011	
			RPM	4120	4120	4560	3930	3930	3020	3020	2420	2420	2000	2000	1540	1540	1200	1200	
41	Hardened Cast Iron	IPM(FEED)	2	2	5	6	6	6	6	6	5	5	4	4	3	3			
		Ap	.0047	.0047	.0236	.0198	.0198	.0265	.0265	.0472	.0331	.0567	.0397	.0756	.0529	.0945	.0945		
		SFM(Vc)	170	170	235	245	245	250	250	250	250	245	245	255	255	245	245		
		IPT(fz)	.0003	.0003	.0005	.0007	.0007	.0009	.0009	.0011	.0011	.0012	.0012	.0012	.0012	.0011	.0011		
		RPM	4120	4120	4560	3930	3930	3020	3020	2420	2420	2000	2000	1540	1540	1200	1200		
		IPM(FEED)	2	2	5	6	6	6	6	6	6	5	5	4	4	3	3		

ISO	VDI 3323	Ae	Ap	Parameter	Diameter (Ø)										
					1.0	1.2	1.5	2.0	2.5	3.0	3.5	4.0	4.5	5.0	
<b>P</b>	1-8	0.05D	2.0D	SFM(Vc)	285	305	340	370	385	410	430	440	460	470	
				IPT(fz)	.0001	.0001	.0001	.0002	.0002	.0003	.0003	.0004	.0004	.0005	.0005
				RPM	27600	24800	22000	18000	15000	13240	11980	10720	9940	9160	
				IPM(FEED)	12	12	12	13	13	13	15	17	17	17	
				SFM(Vc)	185	195	210	240	245	265	275	280	295	300	
				IPT(fz)	.0001	.0001	.0002	.0002	.0003	.0003	.0004	.0004	.0005	.0006	
	9	0.05D	2.0D	RPM	18000	15750	13500	11560	9500	8560	7690	6820	6310	5800	
				IPM(FEED)	9	9	9	9	10	10	11	12	13	14	
				SFM(Vc)	285	305	340	370	385	410	430	440	460	470	
				IPT(fz)	.0001	.0001	.0001	.0002	.0002	.0003	.0003	.0004	.0004	.0005	
				RPM	27600	24800	22000	18000	15000	13240	11980	10720	9940	9160	
				IPM(FEED)	12	12	12	13	13	13	15	17	17	17	
10-11.1	0.05D	2.0D	SFM(Vc)	185	195	210	240	245	265	275	280	295	300		
			IPT(fz)	.0001	.0001	.0002	.0002	.0003	.0003	.0004	.0004	.0005	.0006		
			RPM	18000	15750	13500	11560	9500	8560	7690	6820	6310	5800		
			IPM(FEED)	9	9	9	9	10	10	11	12	13	14		
			SFM(Vc)	185	195	210	240	245	265	275	280	295	300		
			IPT(fz)	.0001	.0001	.0002	.0002	.0003	.0003	.0004	.0004	.0005	.0006		
11.2	0.05D	2.0D	RPM	18000	15750	13500	11560	9500	8560	7690	6820	6310	5800		
			IPM(FEED)	9	9	9	9	10	10	11	12	13	14		
			SFM(Vc)	285	305	340	370	385	410	430	440	460	470		
			IPT(fz)	.0001	.0001	.0001	.0002	.0002	.0003	.0003	.0004	.0004	.0005		
			RPM	27600	24800	22000	18000	15000	13240	11980	10720	9940	9160		
			IPM(FEED)	12	12	12	13	13	13	15	17	17	17		
<b>K</b>	15-20	0.05D	2.0D	SFM(Vc)	285	305	340	370	385	410	430	440	460	470	
				IPT(fz)	.0001	.0001	.0001	.0002	.0002	.0003	.0003	.0004	.0004	.0005	
				RPM	27600	24800	22000	18000	15000	13240	11980	10720	9940	9160	
				IPM(FEED)	12	12	12	13	13	13	15	17	17	17	
				SFM(Vc)	115	120	130	150	155	165	175	175	190	195	
				IPT(fz)	.0001	.0001	.0001	.0002	.0002	.0002	.0003	.0003	.0004	.0004	
<b>H</b>	38.1-38.2	0.02D	2.0D	RPM	11000	9750	8500	7200	6100	5280	4790	4300	4050	3800	
				IPM(FEED)	5	5	5	5	5	5	5	6	6	7	
				SFM(Vc)	185	195	210	240	245	265	275	280	295	300	
				IPT(fz)	.0001	.0001	.0002	.0002	.0003	.0003	.0004	.0004	.0005	.0006	
				RPM	18000	15750	13500	11560	9500	8560	7690	6820	6310	5800	
				IPM(FEED)	9	9	9	9	10	10	11	12	13	14	
40	0.05D	2.0D	SFM(Vc)	115	120	130	150	155	165	175	175	190	195		
			IPT(fz)	.0001	.0001	.0001	.0002	.0002	.0002	.0003	.0003	.0004	.0004		
			RPM	11000	9750	8500	7200	6100	5280	4790	4300	4050	3800		
			IPM(FEED)	5	5	5	5</								



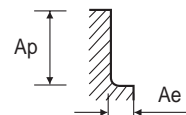
**SEME01** SERIES 4FLUTE CORNER RADIUS - **SIDE CUTTING**

**SEME64** SERIES 4FLUTE CORNER RADIUS - **SIDE CUTTING**

ISO	VDI 3323	Ae	Ap	Parameter	Diameter (Ø)									
					5.5	6.0	7.0	8.0	10.0	11.0	12.0	14.0	16.0	20.0
<b>P</b>	1-8	0.05D	2.0D	SFM(Vc)	485	490	500	495	520	520	510	520	510	520
				IPT(fz)	.0005	.0005	.0006	.0008	.0009	.0009	.0009	.0009	.0009	.0009
				RPM	8530	7900	6950	6000	5040	4580	4120	3610	3100	2520
				IPM(FEED)	17	17	18	18	18	16	14	13	11	9
	9	0.05D	2.0D	SFM(Vc)	305	310	320	315	340	345	345	350	345	340
				IPT(fz)	.0007	.0007	.0008	.0009	.0011	.0011	.0011	.0011	.0011	.0011
				RPM	5420	5040	4420	3800	3280	3030	2780	2440	2100	1640
				IPM(FEED)	14	14	14	14	14	13	13	11	9	7
	10-11.1	0.05D	2.0D	SFM(Vc)	485	490	500	495	520	520	510	520	510	520
				IPT(fz)	.0005	.0005	.0006	.0008	.0009	.0009	.0009	.0009	.0009	.0009
				RPM	8530	7900	6950	6000	5040	4580	4120	3610	3100	2520
				IPM(FEED)	17	17	18	18	18	16	14	13	11	9
11.2	0.05D	2.0D	SFM(Vc)	305	310	320	315	340	345	345	350	345	340	
			IPT(fz)	.0007	.0007	.0008	.0009	.0011	.0011	.0011	.0011	.0011	.0011	
			RPM	5420	5040	4420	3800	3280	3030	2780	2440	2100	1640	
			IPM(FEED)	14	14	14	14	14	13	13	11	9	7	
<b>K</b>	15-20	0.05D	2.0D	SFM(Vc)	485	490	500	495	520	520	510	520	510	520
				IPT(fz)	.0005	.0005	.0006	.0008	.0009	.0009	.0009	.0009	.0009	.0009
				RPM	8530	7900	6950	6000	5040	4580	4120	3610	3100	2520
				IPM(FEED)	17	17	18	18	18	16	14	13	11	9
<b>H</b>	38.1-38.2	0.02D	2.0D	SFM(Vc)	200	205	210	210	210	210	215	210	205	
				IPT(fz)	.0005	.0005	.0006	.0007	.0008	.0008	.0008	.0009	.0009	
				RPM	3540	3280	2900	2520	2020	1850	1680	1480	1280	1000
				IPM(FEED)	7	7	7	7	7	6	6	5	5	4
	40	0.05D	2.0D	SFM(Vc)	305	310	320	315	340	345	345	350	345	340
				IPT(fz)	.0007	.0007	.0008	.0009	.0011	.0011	.0011	.0011	.0011	.0011
				RPM	5420	5040	4420	3800	3280	3030	2780	2440	2100	1640
				IPM(FEED)	14	14	14	14	14	13	13	11	9	7
	41	0.02D	2.0D	SFM(Vc)	200	205	210	210	210	210	215	210	205	
				IPT(fz)	.0005	.0005	.0006	.0007	.0008	.0008	.0008	.0009	.0009	
				RPM	3540	3280	2900	2520	2020	1850	1680	1480	1280	1000
				IPM(FEED)	7	7	7	7	7	6	6	5	5	4

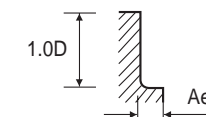
ISO	VDI 3323	Material Description	Parameter	Diameter (Ø)																
				1	1	1	1	1	1	1	1	1	1.2	1.2	1.2	1.2	1.2	1.2		
				LBS	4	6	8	10	12	16	20	22	26	3	4	6	8	10	12	16
<b>P</b>	1-8	Non-alloy steel	SFM(Vc)	340	305	305	305	275	205	205	100	100	370	370	370	330	330	330	295	
			IPT(fz)	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	
			RPM	33100	29790	29790	29790	26480	19860	19860	9930	9930	29750	29750	29750	26780	26780	26780	23800	
			IPM(FEED)	14	11	11	11	9	6	6	3	3	14	14	14	12	12	12	9	
	9	Low alloy steel	SFM(Vc)	225	200	200	200	180	135	135	65	65	235	235	235	210	210	210	185	
			IPT(fz)	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001		
			RPM	21600	19440	19440	19440	17280	12960	12960	6480	6480	18900	18900	18900	17010	17010	17010	15120	
			IPM(FEED)	10	8	8	8	7	4	4	2	2	10	10	10	9	9	9	7	
	10	High alloyed steel, and tool steel	SFM(Vc)	340	305	305	305	275	205	205	100	100	370	370	370	330	330	330	295	
			IPT(fz)	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001		
			RPM	33100	29790	29790	29790	26480	19860	19860	9930	9930	29750	29750	29750	26780	26780	26780	23800	
			IPM(FEED)	14	11	11	11	9	6	6	3	3	14	14	14	12	12	12	9	
11.1-11.2	High alloyed steel, and tool steel	SFM(Vc)	225	200	200	200	180	135	135	65	65	235	235	235	210	210	210	185		
		IPT(fz)	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001			
		RPM	21600	19440	19440	19440	17280	12960	12960	6480	6480	18900	18900	18900	17010	17010	17010	15120		
		IPM(FEED)	10	8	8	8	7	4	4	2	2	10	10	10	9	9	9	7		
<b>K</b>	15-20	Grey cast iron Nodular cast iron Malleable cast iron	SFM(Vc)	340	305	305	305	275	205	205	100	100	370	370	370	330	330	330	295	
			IPT(fz)	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001		
			RPM	33100	29790	29790	29790	26480	19860	19860	9930	9930	29750	29750	29750	26780	26780	26780	23800	
			IPM(FEED)	14	11	11	11	9	6	6	3	3	14	14	14	12	12	12	9	
<b>H</b>	38.1-38.2	Hardened steel	SFM(Vc)	135	120	120	120	110	80	80	40	40	145	145	145	130	130	130	115	
			IPT(fz)	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001		
			RPM	13200	11880	11880	11880	10560	7920	7920	3960	3960	11700	11700	11700	10530	10530	10530	9360	
			IPM(FEED)	6	5	5	5	4	2	2	1	1	6	6	6	5	5	5	4	
	40	Chilled Cast Iron	SFM(Vc)	225	200	200	200	180	135	135	65	65	235	235	235	210	210	210	185	
			IPT(fz)	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001		
			RPM	21600	19440	19440	19440	17280	12960	12960	6480	6480	18900	18900	18900	17010	17010	17010	15120	
			IPM(FEED)	10	8	8	8	7	4	4	2	2	10	10	10	9	9	9	7	
	41	Hardened Cast Iron	SFM(Vc)	135	120	120	120	110	80	80	40	40	145	145	145	130	130	130	115	
			IPT(fz)	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001		
			RPM	13200	11880	11880	11880	10560	7920	7920	3960	3960	11700	11700	11700	10530	10530	10530	9360	
			IPM(FEED)	6	5	5	5	4	2	2	1	1	6	6	6	5	5	5	4	

SFM = Surface Feet per Minute  
 RPM = Revolutions Per Minute  
 IPT = Inches Per Tooth  
 IPM = Inches Per Minute  
 Ap : Inch (Axial Depth of Cut)  
 Ae : Inch (Radial Depth of Cut)



\* 16mm, axial cutting depth should be 1.5xD

SFM = Surface Feet per Minute  
 RPM = Revolutions Per Minute  
 IPT = Inches Per Tooth  
 IPM = Inches Per Minute  
 Ap : Inch (Axial Depth of Cut)  
 Ae : mm (Radial Depth of Cut)



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RECOMMENDED CUTTING CONDITIONS

RECOMMENDED CUTTING CONDITIONS

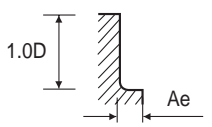
SEME64 SERIES 4FLUTE CORNER RADIUS - SIDE CUTTING

SEME64 SERIES 4FLUTE CORNER RADIUS - SIDE CUTTING

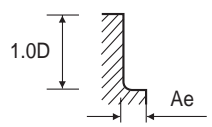
Table with columns for ISO, VDI 3323, Material Description, Parameter, and Diameter (Ø) with sub-columns for various diameters (1.2 to 14). Rows include materials like Non-alloy steel, Low alloy steel, High alloyed steel, and Grey cast iron.

Table with columns for ISO, VDI 3323, Material Description, Parameter, and Diameter (Ø) with sub-columns for various diameters (16 to 12). Rows include materials like Non-alloy steel, Low alloy steel, High alloyed steel, and Grey cast iron.

SFM = Surface Feet per Minute
RPM = Revolutions Per Minute
IPT = Inches Per Tooth
IPM = Inches Per Minute
Ap : Inch (Axial Depth of Cut)
Ae : mm (Radial Depth of Cut)



SFM = Surface Feet per Minute
RPM = Revolutions Per Minute
IPT = Inches Per Tooth
IPM = Inches Per Minute
Ap : Inch (Axial Depth of Cut)
Ae : mm (Radial Depth of Cut)







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RECOMMENDED CUTTING CONDITIONS



RECOMMENDED CUTTING CONDITIONS

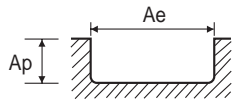
SEME35 SERIES 2FLUTE SQUARE - SLOTTING

SEME35 SERIES 2FLUTE SQUARE - SLOTTING

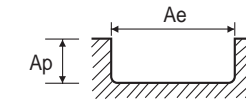
Table with columns: ISO, VDI 3323, Material Description, Ae, Ap, Parameter, Diameter (Ø) (0.1-2), SFM(Vc), IPT(fz), RPM, IPM(FEED)

Table with columns: ISO, VDI 3323, Ae, Ap, Parameter, Diameter (Ø) (2.5-9), SFM(Vc), IPT(fz), RPM, IPM(FEED)

SFM = Surface Feet per Minute
RPM = Revolutions Per Minute
IPT = Inches Per Tooth
IPM = Inches Per Minute
Ap : Inch (Axial Depth of Cut)
Ae : Inch (Radial Depth of Cut)



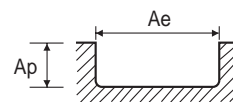
SFM = Surface Feet per Minute
RPM = Revolutions Per Minute
IPT = Inches Per Tooth
IPM = Inches Per Minute
Ap : Inch (Axial Depth of Cut)
Ae : Inch (Radial Depth of Cut)



**SEME35 SERIES 2FLUTE SQUARE - SLOTTING**

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø)										
						9.5	10	10.5	11	11.5	12	13	14	15	16	
P	1-8	Non-alloy steel	1D	0.5D (Up to Ø3 : 0.2D) (Up to Ø1 : 0.15D)	SFM(Vc)	340	335	340	340	340	340	350	355	360	365	
					IPT(fz)	.0020	.0021	.0021	.0021	.0021	.0021	.0021	.0021	.0021	.0021	
	RPM	3495	3260	3130	3000	2870	2740	2605	2470	2335	2200					
	IPM(FEED)	14	14	13	13	12	12	11	10	10	9					
P	9	Low alloy steel	1D	0.5D (Up to Ø3 : 0.2D) (Up to Ø1 : 0.15D)	SFM(Vc)	210	205	210	210	210	210	215	220	225	225	
					IPT(fz)	.0017	.0017	.0016	.0016	.0016	.0016	.0016	.0016	.0016	.0017	
	RPM	2130	2000	1920	1840	1760	1680	1600	1520	1440	1360					
	IPM(FEED)	7	7	6	6	6	5	5	5	5	5					
P	10	High alloyed steel, and tool steel	1D	0.5D (Up to Ø3 : 0.2D) (Up to Ø1 : 0.15D)	SFM(Vc)	340	335	340	340	340	340	350	355	360	365	
					IPT(fz)	.0020	.0021	.0021	.0021	.0021	.0021	.0021	.0021	.0021	.0021	
	RPM	3495	3260	3130	3000	2870	2740	2605	2470	2335	2200					
	IPM(FEED)	14	14	13	13	12	12	11	10	10	9					
P	11.1-11.2	High alloyed steel, and tool steel	1D	0.5D (Up to Ø3 : 0.2D) (Up to Ø1 : 0.15D)	SFM(Vc)	210	205	210	210	210	210	215	220	225	225	
					IPT(fz)	.0017	.0017	.0016	.0016	.0016	.0016	.0016	.0016	.0016	.0017	
	RPM	2130	2000	1920	1840	1760	1680	1600	1520	1440	1360					
	IPM(FEED)	7	7	6	6	6	5	5	5	5	5					
M	14.1	Stainless steel	1D	0.05D (Up to Ø1 : 0.02D)	SFM(Vc)	175	175	175	170	170	170	170	175	175	175	
					IPT(fz)	.0019	.0020	.0020	.0019	.0019	.0019	.0020	.0020	.0021	.0021	
					RPM	1785	1680	1600	1520	1440	1360	1285	1210	1135	1060	
					IPM(FEED)	7	7	6	6	6	5	5	5	5	5	
K	15-20	Grey cast iron Nodular cast iron Malleable cast iron	1D	0.5D (Up to Ø3 : 0.2D) (Up to Ø1 : 0.15D)	SFM(Vc)	340	335	340	340	340	340	350	355	360	365	
					IPT(fz)	.0020	.0021	.0021	.0021	.0021	.0021	.0021	.0021	.0021	.0021	
					RPM	3495	3260	3130	3000	2870	2740	2605	2470	2335	2200	
					IPM(FEED)	14	14	13	13	12	12	11	10	10	9	
H	38.1-38.2	Hardened steel	1D	0.5D (Up to Ø3 : 0.2D) (Up to Ø1 : 0.15D)	SFM(Vc)	140	140	140	145	145	145	145	150	150	150	
					IPT(fz)	.0009	.0009	.0009	.0009	.0010	.0010	.0010	.0009	.0009	.0009	
	RPM	1440	1360	1310	1260	1210	1160	1095	1030	965	900					
	IPM(FEED)	3	3	2	2	2	2	2	2	2	2					
H	40	Chilled Cast Iron	1D	0.5D (Up to Ø3 : 0.2D) (Up to Ø1 : 0.15D)	SFM(Vc)	210	205	210	210	210	210	215	220	225	225	
					IPT(fz)	.0017	.0017	.0016	.0016	.0016	.0016	.0016	.0016	.0016	.0017	
	RPM	2130	2000	1920	1840	1760	1680	1600	1520	1440	1360					
	IPM(FEED)	7	7	6	6	6	5	5	5	5	5					
H	41	Hardened Cast Iron	1D	0.5D (Up to Ø3 : 0.2D) (Up to Ø1 : 0.15D)	SFM(Vc)	140	140	140	145	145	145	145	150	150	150	
					IPT(fz)	.0009	.0009	.0009	.0009	.0010	.0010	.0010	.0009	.0009	.0009	
	RPM	1440	1360	1310	1260	1210	1160	1095	1030	965	900					
	IPM(FEED)	3	3	2	2	2	2	2	2	2	2					

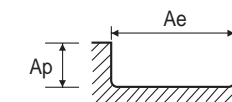
SFM = Surface Feet per Minute  
 RPM = Revolutions Per Minute  
 IPT = Inches Per Tooth  
 IPM = Inches Per Minute  
 Ap : Inch (Axial Depth of Cut)  
 Ae : Inch (Radial Depth of Cut)



**SEME35 SERIES 2FLUTE SQUARE - SLOTTING**

ISO	VDI 3323	Ae	Ap	Parameter	Diameter (Ø)										
					17	18	19	20	21	22	23	24	25		
P	1-8	1D	0.5D (Up to Ø3 : 0.2D) (Up to Ø1 : 0.15D)	SFM(Vc)	365	360	355	345	350	350	350	350	350	350	
				IPT(fz)	.0021	.0021	.0021	.0021	.0021	.0021	.0021	.0021	.0021	.0021	
	RPM	2070	1940	1810	1680	1615	1550	1480	1425	1360					
	IPM(FEED)	9	8	8	7	7	7	6	6	5					
P	9	1D	0.5D (Up to Ø3 : 0.2D) (Up to Ø1 : 0.15D)	SFM(Vc)	225	225	220	220	220	220	220	220	215		
				IPT(fz)	.0016	.0016	.0015	.0016	.0016	.0016	.0017	.0017	.0017		
	RPM	1285	1210	1135	1060	1015	970	925	885	840					
	IPM(FEED)	4	4	4	3	3	3	3	3	3					
P	10	1D	0.5D (Up to Ø3 : 0.2D) (Up to Ø1 : 0.15D)	SFM(Vc)	365	360	355	345	350	350	350	350	350		
				IPT(fz)	.0021	.0021	.0021	.0021	.0021	.0021	.0021	.0021	.0021		
	RPM	2070	1940	1810	1680	1615	1550	1480	1425	1360					
	IPM(FEED)	9	8	8	7	7	7	6	6	5					
P	11.1-11.2	1D	0.5D (Up to Ø3 : 0.2D) (Up to Ø1 : 0.15D)	SFM(Vc)	225	225	220	220	220	220	220	220	215		
				IPT(fz)	.0016	.0016	.0015	.0016	.0016	.0016	.0017	.0017	.0017		
	RPM	1285	1210	1135	1060	1015	970	925	885	840					
	IPM(FEED)	4	4	4	3	3	3	3	3	3					
M	14.1	1D	0.05D (Up to Ø1 : 0.02D)	SFM(Vc)	175	175	175	175	175	175	175	175	175		
					IPT(fz)	.0020	.0021	.0020	.0020	.0019	.0019	.0019	.0018	.0018	
					RPM	1005	950	895	840	800	775	745	715	680	
					IPM(FEED)	4	4	4	3	3	3	3	3	3	
K	15-20	1D	0.5D (Up to Ø3 : 0.2D) (Up to Ø1 : 0.15D)	SFM(Vc)	365	360	355	345	350	350	350	350	350		
					IPT(fz)	.0021	.0021	.0021	.0021	.0021	.0021	.0021	.0021	.0019	
					RPM	2070	1940	1810	1680	1615	1550	1480	1425	1360	
					IPM(FEED)	9	8	8	7	7	7	6	6	5	
H	38.1-38.2	1D	0.5D (Up to Ø3 : 0.2D) (Up to Ø1 : 0.15D)	SFM(Vc)	150	145	145	140	140	140	140	140	140		
				IPT(fz)	.0009	.0009	.0009	.0010	.0008	.0009	.0008	.0008	.0007		
	RPM	845	790	735	680	650	620	600	570	540					
	IPM(FEED)	2	2	1	1	1	1	1	1	1					
H	40	1D	0.5D (Up to Ø3 : 0.2D) (Up to Ø1 : 0.15D)	SFM(Vc)	225	225	220	220	220	220	220	220	215		
				IPT(fz)	.0016	.0016	.0015	.0016	.0016	.0016	.0017	.0017	.0017		
	RPM	1285	1210	1135	1060	1015	970	925	885	840					
	IPM(FEED)	4	4	4	3	3	3	3	3	3					
H	41	1D	0.5D (Up to Ø3 : 0.2D) (Up to Ø1 : 0.15D)	SFM(Vc)	150	145	145	140	140	140	140	140	140		
				IPT(fz)	.0009	.0009	.0009	.0010	.0008	.0009	.0008	.0008	.0007		
	RPM	845	790	735	680	650	620	600	570	540					
	IPM(FEED)	2	2	1	1	1	1	1	1	1					

SFM = Surface Feet per Minute  
 RPM = Revolutions Per Minute  
 IPT = Inches Per Tooth  
 IPM = Inches Per Minute  
 Ap : Inch (Axial Depth of Cut)  
 Ae : Inch (Radial Depth of Cut)



HSS



RECOMMENDED CUTTING CONDITIONS



RECOMMENDED CUTTING CONDITIONS

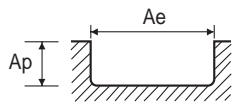
SEME70 SERIES 2FLUTE SQUARE - SLOTTING

SEME70 SERIES 2FLUTE SQUARE - SLOTTING

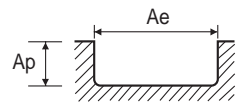
Table with columns for ISO, VDI 3323, Material Description, Ae, Ap, Parameter, and Diameter (Ø) with sub-columns for various diameters (1, 1.2, 1.5, 2, 2.5, 3).

Table with columns for ISO, VDI 3323, Material Description, Ae, Ap, Parameter, and Diameter (Ø) with sub-columns for various diameters (1, 1.5, 2, 2.5, 3).

SFM = Surface Feet per Minute
RPM = Revolutions Per Minute
IPT = Inches Per Tooth
IPM = Inches Per Minute
Ap : Inch (Axial Depth of Cut)
Ae : Inch (Radial Depth of Cut)



SFM = Surface Feet per Minute
RPM = Revolutions Per Minute
IPT = Inches Per Tooth
IPM = Inches Per Minute
Ap : Inch (Axial Depth of Cut)
Ae : Inch (Radial Depth of Cut)



HSS

CBN END MILLS

i-Xmill END MILLS

i-SMART MODULAR END MILLS

X5070 END MILLS

4G MILL END MILLS

X-POWER PRO END MILLS

TitaNox-POWER END MILLS

JET-POWER END MILLS

V7 PLUS A END MILLS

V7 MILL INOX

ALU-POWER HPC END MILLS

ALU-POWER END MILLS

D-POWER GRAPHITE END MILLS

STANDARD CARBIDE

ONLY ONE COATED PM60 END MILLS

SINE-POWER

TANK-POWER END MILLS

STANDARD COBALT & HSS

TECHNICAL DATA



HSS

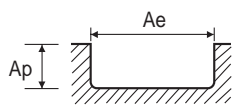


RECOMMENDED CUTTING CONDITIONS

SEME70 SERIES 2FLUTE SQUARE - SLOTTING

Table with columns for ISO, VDI, Material Description, Ae, Ap, Parameter, and Diameter (Ø) with sub-columns for LOC and various diameter sizes (3, 4, 5, 6, 8, 10, 12, 16, 20, 25, 30).

SFM = Surface Feet per Minute
RPM = Revolutions Per Minute
IPT = Inches Per Tooth
IPM = Inches Per Minute
Ap : Inch (Axial Depth of Cut)
Ae : Inch (Radial Depth of Cut)

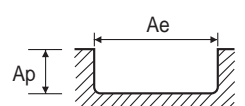


RECOMMENDED CUTTING CONDITIONS

SEME70 SERIES 2FLUTE SQUARE - SLOTTING

Table with columns for ISO, VDI, Ae, Ap, Parameter, and Diameter (Ø) with sub-columns for LOC and various diameter sizes (5, 6, 8, 10, 12, 15, 20, 25, 30, 35, 40, 45, 50, 60).

SFM = Surface Feet per Minute
RPM = Revolutions Per Minute
IPT = Inches Per Tooth
IPM = Inches Per Minute
Ap : Inch (Axial Depth of Cut)
Ae : Inch (Radial Depth of Cut)



HSS

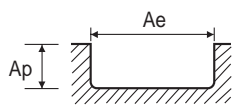


RECOMMENDED CUTTING CONDITIONS

SEME70 SERIES 2FLUTE SQUARE - SLOTTING

Table with columns for ISO, VDI 3323, Material Description, Ae, Ap, Parameter, and Diameter (Ø) with sub-columns for diameters 10, 10, 10, 10, 10, 10, 10, 12, 12, 12, 12, 12, 12, 12.

SFM = Surface Feet per Minute
RPM = Revolutions Per Minute
IPT = Inches Per Tooth
IPM = Inches Per Minute
Ap : Inch (Axial Depth of Cut)
Ae : Inch (Radial Depth of Cut)

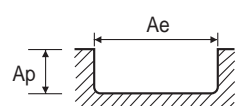


RECOMMENDED CUTTING CONDITIONS

SEME70 SERIES 2FLUTE SQUARE - SLOTTING

Table with columns for ISO, VDI 3323, Ae, Ap, Parameter, and Diameter (Ø) with sub-columns for diameters 14, 14, 16, 16, 16, 16, 16, 16, 16, 18, 18, 18, 20, 20, 20.

SFM = Surface Feet per Minute
RPM = Revolutions Per Minute
IPT = Inches Per Tooth
IPM = Inches Per Minute
Ap : Inch (Axial Depth of Cut)
Ae : Inch (Radial Depth of Cut)





RECOMMENDED CUTTING CONDITIONS



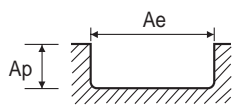
RECOMMENDED CUTTING CONDITIONS

**SEME70 SERIES 2FLUTE SQUARE - SLOTTING**

**SEM845 SERIES 2FLUTE SQUARE - SLOTTING**

ISO	VDI 3323	Material Description	Ae	Ap	Parameter LOC	Diameter (Ø)											
						20				22				25			
						80	90	110	120	75	110	70	90	110	120	75	110
<b>P</b>	1-8	Non-alloy steel	1D	0.3D (Up to Ø3 : 0.4mm)	SFM(Vc)	250	250	225	225	250	250	255	255	255	255		
					IPT(fz)	.0014	.0012	.0013	.0013	.0014	.0013	.0016	.0014	.0014	.0014	.0012	
					RPM	1220	1220	1100	1100	1100	1100	980	980	980	980		
					IPM(FEED)	3	3	3	3	3	3	3	3	3	2		
	9	Low alloy steel	1D	0.3D (Up to Ø3 : 0.4mm)	SFM(Vc)	195	195	175	175	190	190	195	195	195	195		
					IPT(fz)	.0014	.0012	.0012	.0012	.0013	.0012	.0016	.0013	.0013	.0013	.0012	
					RPM	950	950	860	860	840	840	750	750	750	750		
					IPM(FEED)	3	2	2	2	2	2	2	2	2	2		
	10	High alloyed steel, and tool steel	1D	0.3D (Up to Ø3 : 0.4mm)	SFM(Vc)	250	250	225	225	250	250	255	255	255	255		
					IPT(fz)	.0014	.0012	.0013	.0013	.0014	.0013	.0016	.0014	.0014	.0014	.0012	
					RPM	1220	1220	1100	1100	1100	1100	980	980	980	980		
					IPM(FEED)	3	3	3	3	3	3	3	3	3	2		
11.1-11.2	High alloyed steel, and tool steel	1D	0.3D (Up to Ø3 : 0.4mm)	SFM(Vc)	195	195	175	175	190	190	195	195	195	195			
				IPT(fz)	.0014	.0012	.0012	.0012	.0013	.0012	.0016	.0013	.0013	.0013	.0012		
				RPM	950	950	860	860	840	840	750	750	750	750			
				IPM(FEED)	3	2	2	2	2	2	2	2	2	2			
<b>K</b>	15-20	Grey cast iron Nodular cast iron Malleable cast iron	1D	0.3D (Up to Ø3 : 0.4mm)	SFM(Vc)	250	250	225	225	250	250	255	255	255	255		
					IPT(fz)	.0014	.0012	.0013	.0013	.0014	.0013	.0016	.0014	.0014	.0014	.0012	
					RPM	1220	1220	1100	1100	1100	1100	980	980	980	980		
					IPM(FEED)	3	3	3	3	3	3	3	3	3	2		
<b>H</b>	38.1-38.2	Hardened steel	1D	0.05D	SFM(Vc)	125	125	110	110	125	125	125	125	125	125		
					IPT(fz)	.0151	.0151	.0109	.0047	.0046	.0204	.0189	.0189	.0189	.0150		
					RPM	600	600	540	540	550	550	480	480	480	480		
					IPM(FEED)	18	18	12	5	5	22	18	18	18	14		
	40	Chilled Cast Iron	1D	0.3D (Up to Ø3 : 0.4mm)	SFM(Vc)	195	195	175	175	190	190	195	195	195	195		
					IPT(fz)	.0014	.0012	.0012	.0012	.0013	.0012	.0016	.0013	.0013	.0013	.0012	
					RPM	950	950	860	860	840	840	750	750	750	750		
					IPM(FEED)	3	2	2	2	2	2	2	2	2	2		
	41	Hardened Cast Iron	1D	0.05D	SFM(Vc)	125	125	110	110	125	125	125	125	125	125		
					IPT(fz)	.0151	.0151	.0109	.0047	.0046	.0204	.0189	.0189	.0189	.0150		
					RPM	600	600	540	540	550	550	480	480	480	480		
					IPM(FEED)	18	18	12	5	5	22	18	18	18	14		

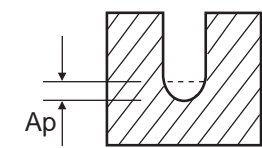
SFM = Surface Feet per Minute  
 RPM = Revolutions Per Minute  
 IPT = Inches Per Tooth  
 IPM = Inches Per Minute  
 Ap : Inch (Axial Depth of Cut)  
 Ae : Inch (Radial Depth of Cut)



ISO	VDI 3323	Material Description	Parameter LBS	Diameter (Ø)																	
				0.1			0.2			0.3			0.4			0.5			0.6		
				0.3	0.5	1	0.5	1	1.5	2	3	4	1	1.5	2	2.5	3	4	5	1	1.5
<b>P</b>	1-8	Non-alloy steel	SFM(Vc)	50	50	45	80	80	70	70	105	105	95	95	95	85	65	115	115	115	
			IPT(fz)	.0001	.0001	.0001	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0004	.0004	.0004	
			RPM	50000	50000	45000	38500	38500	34650	34650	34200	34200	30780	30780	30780	27360	20520	27400	27400	27400	
			IPM(FEED)	12	12	10	15	15	12	12	15	15	12	12	12	10	7	21	21	21	
	9	Low alloy steel	SFM(Vc)	50	50	45	75	75	65	65	100	100	90	90	90	80	60	105	105	105	
			IPT(fz)	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0002	.0002	.0001	.0001	.0001	.0001	.0001	.0003	.0003	.0003	
			RPM	46200	46200	41580	36300	36300	32670	32670	32300	32300	29070	29070	29070	25840	19380	25800	25800	25800	
			IPM(FEED)	9	9	7	11	11	9	9	11	11	9	9	9	7	5	15	15	15	
	10-11.1	High alloyed steel, and tool steel	SFM(Vc)	50	50	45	80	80	70	70	105	105	95	95	95	85	65	115	115	115	
			IPT(fz)	.0001	.0001	.0001	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0004	.0004	.0004		
			RPM	50000	50000	45000	38500	38500	34650	34650	34200	34200	30780	30780	30780	27360	20520	27400	27400	27400	
			IPM(FEED)	12	12	10	15	15	12	12	15	15	12	12	12	10	7	21	21	21	
11.2	High alloyed steel, and tool steel	SFM(Vc)	50	50	45	75	75	65	65	100	100	90	90	90	80	60	105	105	105		
		IPT(fz)	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0002	.0002	.0001	.0001	.0001	.0001	.0001	.0003	.0003	.0003		
		RPM	46200	46200	41580	36300	36300	32670	32670	32300	32300	29070	29070	29070	25840	19380	25800	25800	25800		
		IPM(FEED)	9	9	7	11	11	9	9	11	11	9	9	9	7	5	15	15	15		
<b>K</b>	15-20	Grey cast iron Nodular cast iron Malleable cast iron	SFM(Vc)	50	50	45	80	80	70	70	105	105	95	95	95	85	65	115	115	115	
			IPT(fz)	.0001	.0001	.0001	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0004	.0004	.0004		
			RPM	50000	50000	45000	38500	38500	34650	34650	34200	34200	30780	30780	30780	27360	20520	27400	27400	27400	
			IPM(FEED)	12	12	10	15	15	12	12	15	15	12	12	12	10	7	21	21	21	
<b>H</b>	38.1-38.2	Hardened steel	SFM(Vc)	40	40	40	65	65	60	60	90	90	80	80	80	70	55	95	95	95	
			IPT(fz)	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0002	.0002	.0001	.0001	.0001	.0001	.0002	.0002	.0002		
			RPM	40600	40600	36540	32100	32100	28890	28890	28500	28500	25650	25650	25650	22800	17100	22800	22800	22800	
			IPM(FEED)	7	7	6	8	8	6	6	9	9	7	7	7	6	4	11	11	11	
	40	Chilled Cast Iron	SFM(Vc)	50	50	45	75	75	65	65	100	100	90	90	90	80	60	105	105	105	
			IPT(fz)	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0002	.0002	.0001	.0001	.0001	.0001	.0001	.0003	.0003	.0003	
			RPM	46200	46200	41580	36300	36300	32670	32670	32300	32300	29070	29070	29070	25840	19380	25800	25800	25800	
			IPM(FEED)	9	9	7	11	11	9	9	11	11	9	9	9	7	5	15	15	15	
	41	Hardened Cast Iron	SFM(Vc)	40	40	40	65	65	60	60	90	90	80	80	80	70	55	95	95	95	
			IPT(fz)	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0002	.0002	.0001	.0001	.0001	.0001	.0001	.0002	.0002	.0002	
			RPM	40600	40600	36540	32100	32100	28890	28890	28500	28500	25650	25650	25650	22800	17100	22800	22800	22800	
			IPM(FEED)	7	7	6	8	8	6	6	9	9	7	7	7	6	4	11	11	11	

SFM = Surface Feet per Minute  
 RPM = Revolutions Per Minute  
 IPT = Inches Per Tooth  
 IPM = Inches Per Minute  
 Ap : mm (Axial Depth of Cut)  
 Ae : Inch (Radial Depth of Cut)

(Depth of Cut per one pass)



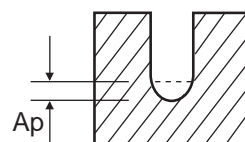


### SEM845 SERIES 2FLUTE SQUARE - SLOTTING

ISO	VDI 3323	Material Description	Parameter	Diameter (Ø)																	
				0.4		0.4		0.4		0.4		0.4		0.5		0.5		0.5		0.5	
				LBS	2.5	3	4	5	6	8	10	1	1.5	2	2.5	3	4	5	6	8	10
P	1-8	Non-alloy steel	SFM(Vc)	100	100	100	90	90	70	35	140	140	140	140	125	125	125	115	85	85	
			IPM(fz)	.0003	.0003	.0003	.0003	.0003	.0003	.0002	.0004	.0004	.0004	.0004	.0003	.0003	.0003	.0003	.0003	.0003	.0003
			RPM	24660	24660	24660	21920	21920	16440	8220	27400	27400	27400	27400	24660	24660	24660	21920	16440	16440	16440
			IPM(FEED)	17	17	17	14	14	9	4	21	21	21	21	17	17	17	14	9	9	9
			Ap	0.0006	0.0006	0.0004	0.0004	0.0002	0.0002	0.0002	0.0018	0.0018	0.0013	0.0013	0.0007	0.0007	0.0004	0.0004	0.0003	0.0002	0.0002
			Ap	0.0004	0.0004	0.0003	0.0003	0.0002	0.0001	0.0001	0.0014	0.0014	0.0010	0.0010	0.0006	0.0006	0.0004	0.0004	0.0002	0.0002	0.0002
	9	Low alloy steel	SFM(Vc)	95	95	95	85	85	65	30	135	135	135	135	120	120	120	105	80	80	
			IPM(fz)	.0003	.0003	.0003	.0002	.0002	.0002	.0002	.0003	.0003	.0003	.0003	.0003	.0003	.0003	.0003	.0002	.0002	.0002
			RPM	23220	23220	23220	20640	20640	15480	7740	25800	25800	25800	25800	23220	23220	23220	20640	15480	15480	15480
			IPM(FEED)	12	12	12	10	10	6	3	17	17	17	17	14	14	14	11	7	7	7
			Ap	0.0004	0.0004	0.0003	0.0003	0.0002	0.0001	0.0001	0.0014	0.0014	0.0010	0.0010	0.0006	0.0006	0.0004	0.0004	0.0002	0.0002	0.0002
			Ap	0.0004	0.0004	0.0003	0.0003	0.0002	0.0001	0.0001	0.0014	0.0014	0.0010	0.0010	0.0006	0.0006	0.0004	0.0004	0.0002	0.0002	0.0002
10-11.1	High alloyed steel, and tool steel	SFM(Vc)	100	100	100	90	90	70	35	140	140	140	140	125	125	125	115	85	85		
		IPM(fz)	.0003	.0003	.0003	.0003	.0003	.0003	.0002	.0004	.0004	.0004	.0004	.0003	.0003	.0003	.0003	.0003	.0003	.0003	
		RPM	24660	24660	24660	21920	21920	16440	8220	27400	27400	27400	27400	24660	24660	24660	21920	16440	16440	16440	
		IPM(FEED)	17	17	17	14	14	9	4	21	21	21	21	17	17	17	14	9	9	9	
		Ap	0.0006	0.0006	0.0004	0.0004	0.0002	0.0002	0.0002	0.0018	0.0018	0.0013	0.0013	0.0007	0.0007	0.0004	0.0004	0.0003	0.0002	0.0002	
		Ap	0.0004	0.0004	0.0003	0.0003	0.0002	0.0001	0.0001	0.0014	0.0014	0.0010	0.0010	0.0006	0.0006	0.0004	0.0004	0.0002	0.0002	0.0002	
11.2	High alloyed steel, and tool steel	SFM(Vc)	95	95	95	85	85	65	30	135	135	135	135	120	120	120	105	80	80		
		IPM(fz)	.0003	.0003	.0003	.0002	.0002	.0002	.0002	.0003	.0003	.0003	.0003	.0003	.0003	.0003	.0003	.0002	.0002	.0002	
		RPM	23220	23220	23220	20640	20640	15480	7740	25800	25800	25800	25800	23220	23220	23220	20640	15480	15480	15480	
		IPM(FEED)	12	12	12	10	10	6	3	17	17	17	17	14	14	14	11	7	7	7	
		Ap	0.0004	0.0004	0.0003	0.0003	0.0002	0.0001	0.0001	0.0014	0.0014	0.0010	0.0010	0.0006	0.0006	0.0004	0.0004	0.0002	0.0002	0.0002	
		Ap	0.0004	0.0004	0.0003	0.0003	0.0002	0.0001	0.0001	0.0014	0.0014	0.0010	0.0010	0.0006	0.0006	0.0004	0.0004	0.0002	0.0002	0.0002	
K	15-20	Grey cast iron Nodular cast iron Malleable cast iron	SFM(Vc)	100	100	100	90	90	70	35	140	140	140	140	125	125	125	115	85	85	
			IPM(fz)	.0003	.0003	.0003	.0003	.0003	.0003	.0002	.0004	.0004	.0004	.0004	.0003	.0003	.0003	.0003	.0003	.0003	.0003
			RPM	24660	24660	24660	21920	21920	16440	8220	27400	27400	27400	27400	24660	24660	24660	21920	16440	16440	16440
			IPM(FEED)	17	17	17	14	14	9	4	21	21	21	21	17	17	17	14	9	9	9
			Ap	0.0006	0.0006	0.0004	0.0004	0.0002	0.0002	0.0002	0.0018	0.0018	0.0013	0.0013	0.0007	0.0007	0.0004	0.0004	0.0003	0.0002	0.0002
			Ap	0.0004	0.0004	0.0003	0.0003	0.0002	0.0001	0.0001	0.0014	0.0014	0.0010	0.0010	0.0006	0.0006	0.0004	0.0004	0.0002	0.0002	0.0002
H	38.1-38.2	Hardened steel	SFM(Vc)	85	85	85	75	75	55	30	115	115	115	115	105	105	105	95	70	70	
			IPM(fz)	.0002	.0002	.0002	.0002	.0002	.0002	.0001	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0002
			RPM	20520	20520	20520	18240	18240	13680	6840	22800	22800	22800	22800	20520	20520	20520	18240	13680	13680	13680
			IPM(FEED)	9	9	9	7	7	5	2	11	11	11	11	9	9	9	7	5	5	5
			Ap	0.0003	0.0003	0.0002	0.0002	0.0001	0.0001	0.0001	0.0010	0.0010	0.0007	0.0007	0.0004	0.0004	0.0002	0.0002	0.0002	0.0002	0.0001
			Ap	0.0003	0.0003	0.0003	0.0021	0.0021	0.012	0.008	0.008	0.005	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003
	40	Chilled Cast Iron	SFM(Vc)	95	95	95	85	85	65	30	135	135	135	135	120	120	120	105	80	80	
			IPM(fz)	.0003	.0003	.0003	.0002	.0002	.0002	.0002	.0003	.0003	.0003	.0003	.0003	.0003	.0003	.0003	.0003	.0002	.0002
			RPM	23220	23220	23220	20640	20640	15480	7740	25800	25800	25800	25800	23220	23220	23220	20640	15480	15480	15480
			IPM(FEED)	12	12	12	10	10	6	3	17	17	17	17	14	14	14	11	7	7	7
			Ap	0.0004	0.0004	0.0003	0.0003	0.0002	0.0001	0.0001	0.0014	0.0014	0.0010	0.0010	0.0006	0.0006	0.0004	0.0004	0.0002	0.0002	0.0002
			Ap	0.0004	0.0004	0.0004	0.029	0.029	0.017	0.011	0.011	0.006	0.004	0.004	0.004	0.004	0.004	0.004	0.002	0.002	0.002
41	Hardened Cast Iron	SFM(Vc)	85	85	85	75	75	55	30	115	115	115	115	105	105	105	95	70	70		
		IPM(fz)	.0002	.0002	.0002	.0002	.0002	.0002	.0001	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0002	
		RPM	20520	20520	20520	18240	18240	13680	6840	22800	22800	22800	22800	20520	20520	20520	18240	13680	13680	13680	
		IPM(FEED)	9	9	9	7	7	5	2	11	11	11	11	9	9	9	7	5	5	5	
		Ap	0.0003	0.0003	0.0002	0.0002	0.0001	0.0001	0.0001	0.0010	0.0010	0.0007	0.0007	0.0004	0.0004	0.0002	0.0002	0.0002	0.0002	0.0001	
		Ap	0.003	0.003	0.003	0.021	0.021	0.012	0.008	0.008	0.005	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	

SFM = Surface Feet per Minute  
RPM = Revolutions Per Minute  
IPT = Inches Per Tooth  
IPM = Inches Per Minute  
Ap : mm (Axial Depth of Cut)  
Ae : Inch (Radial Depth of Cut)

(Depth of Cut per one pass)



### SEM845 SERIES 2FLUTE SQUARE - SLOTTING

ISO	VDI 3323	Parameter	Diameter (Ø)																										
			0.5		0.5		0.5		0.6		0.6		0.6		0.6		0.6		0.6		0.7		0.7		0.7		0.8		
			LBS	12	14	16	2	3	4	5	6	8	10	12	14	16	2	4	6	8	10	12	2	4	6	8	10	12	2
P	1-8	Non-alloy steel	SFM(Vc)	40	40	15	170	170	150	150	150	135	100	100	50	50	200	180	180	160	160	120	225						
			IPM(fz)	.0002	.0002	.0002	.0006	.0006	.0005	.0005	.0005	.0004	.0004	.0004	.0003	.0003	.0003	.0003	.0003	.0003	.0003	.0003	.0006	.0005	.0005	.0004	.0004	.0004	.0006
			RPM	8220	8220	2740	27400	27400	24660	24660	24660	21920	16440	16440	8220	8220	27400	24660	24660	21920	21920	16440	27400						
			IPM(FEED)	4	4	1	31	31	25	25	25	20	13	13	6	6	31	25	25	20	20	13	31						
			Ap	0.005	0.005	0.005	0.038	0.038	0.022	0.014	0.014	0.008	0.005	0.005	0.005	0.005	0.005	0.063	0.025	0.016	0.016	0.009	0.006	0.072					
			Ap	0.004	0.004	0.004	0.029	0.029	0.017	0.011	0.011	0.006	0.004	0.004	0.004	0.004	0.004	0.049	0.02	0.012	0.012	0.007	0.005	0.056					
	9	Low alloy steel	SFM(Vc)	40	40	15	160	160	145	145	145	130	95	95	50	50	185	170	170	150	150	110	215						
			IPM(fz)	.0002	.0002	.0002	.0004	.0004	.0004	.0004	.0004	.0003	.0003	.0003	.0003	.0003	.0003	.0004	.0004	.0003	.0003	.0003	.0005						
			RPM	7740	7740	2580	25800	25800	23220	23220	23220	20640	15480	15480	7740	7740	25800	23220	23220	20640	20640	15480	25800						
			IPM(FEED)	3	3	1	22	22	17	17	17	14	9	9	4	4	22	17	17	14	14	9	24						



RECOMMENDED CUTTING CONDITIONS



RECOMMENDED CUTTING CONDITIONS

SEM845 SERIES 2FLUTE SQUARE - SLOTTING

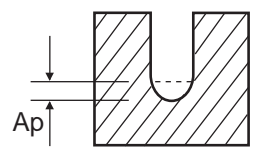
SEM845 SERIES 2FLUTE SQUARE - SLOTTING

Table with columns for ISO, VDI 3323, Material Description, Parameter, and Diameter (Ø) with sub-columns for various diameters and feeds.

Table with columns for ISO, VDI 3323, Parameter, and Diameter (Ø) with sub-columns for various diameters and feeds.

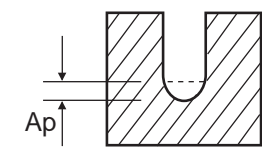
SFM = Surface Feet per Minute
RPM = Revolutions Per Minute
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Ap : mm (Axial Depth of Cut)
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(Depth of Cut per one pass)



SFM = Surface Feet per Minute
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Ae : Inch (Radial Depth of Cut)

(Depth of Cut per one pass)



HSS



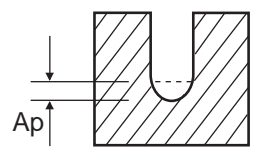
RECOMMENDED CUTTING CONDITIONS

SEM845 SERIES 2FLUTE SQUARE - SLOTTING

Table with columns for ISO, VDI 3323, Material Description, Parameter, and Diameter (Ø) for various materials like Non-alloy steel, Low alloy steel, High alloyed steel, and Grey cast iron.

SFM = Surface Feet per Minute
RPM = Revolutions Per Minute
IPT = Inches Per Tooth
IPM = Inches Per Minute
Ap : mm (Axial Depth of Cut)
Ae : Inch (Radial Depth of Cut)

(Depth of Cut per one pass)



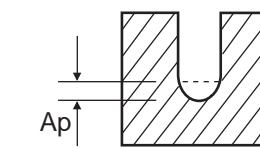
RECOMMENDED CUTTING CONDITIONS

SEM845 SERIES 2FLUTE SQUARE - SLOTTING

Table with columns for ISO, VDI 3323, Parameter, and Diameter (Ø) for various materials like Non-alloy steel, Low alloy steel, High alloyed steel, and Grey cast iron.

SFM = Surface Feet per Minute
RPM = Revolutions Per Minute
IPT = Inches Per Tooth
IPM = Inches Per Minute
Ap : mm (Axial Depth of Cut)
Ae : Inch (Radial Depth of Cut)

(Depth of Cut per one pass)







RECOMMENDED CUTTING CONDITIONS



RECOMMENDED CUTTING CONDITIONS

SEM845 SERIES 2FLUTE SQUARE - SLOTTING

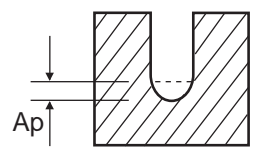
SEM845 SERIES 2FLUTE SQUARE - SLOTTING

Table with columns for ISO, VDI 3323, Material Description, Parameter, and Diameter (Ø) for various materials like Non-alloy steel, Low alloy steel, High alloyed steel, and Grey cast iron.

Table with columns for ISO, VDI 3323, Material Description, Parameter, and Diameter (Ø) for various materials like Non-alloy steel, Low alloy steel, High alloyed steel, and Grey cast iron.

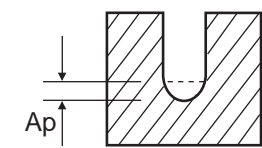
SFM = Surface Feet per Minute
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Ap : mm (Axial Depth of Cut)
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(Depth of Cut per one pass)



SFM = Surface Feet per Minute
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Ae : Inch (Radial Depth of Cut)

(Depth of Cut per one pass)



HSS



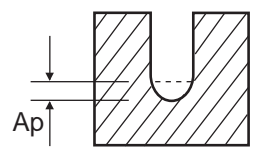
RECOMMENDED CUTTING CONDITIONS

SEM845 SERIES 2FLUTE SQUARE - SLOTTING

Table with columns for ISO, VDI 3323, Material Description, Parameter, and Diameter (Ø) from 3 to 35. Rows include P (1-8, 9, 10-11.1, 11.2) and K (15-20) series.

SFM = Surface Feet per Minute
RPM = Revolutions Per Minute
IPT = Inches Per Tooth
IPM = Inches Per Minute
Ap : mm (Axial Depth of Cut)
Ae : Inch (Radial Depth of Cut)

(Depth of Cut per one pass)



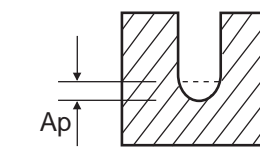
RECOMMENDED CUTTING CONDITIONS

SEM845 SERIES 2FLUTE SQUARE - SLOTTING

Table with columns for ISO, VDI 3323, Parameter, and Diameter (Ø) from 4 to 6. Rows include P (1-8, 9, 10-11.1, 11.2) and K (15-20) series.

SFM = Surface Feet per Minute
RPM = Revolutions Per Minute
IPT = Inches Per Tooth
IPM = Inches Per Minute
Ap : mm (Axial Depth of Cut)
Ae : Inch (Radial Depth of Cut)

(Depth of Cut per one pass)



HSS



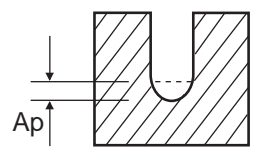
RECOMMENDED CUTTING CONDITIONS

SEM845 SERIES 2FLUTE SQUARE - SLOTTING

Table with columns for ISO, VDI 3323, Material Description, Parameter (SFM, IPT, RPM, IPM, Ap), and Diameter (Ø) ranging from 6 to 12 inches.

SFM = Surface Feet per Minute
RPM = Revolutions Per Minute
IPT = Inches Per Tooth
IPM = Inches Per Minute
Ap : mm (Axial Depth of Cut)
Ae : Inch (Radial Depth of Cut)

(Depth of Cut per one pass)

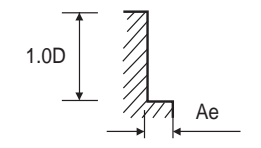


RECOMMENDED CUTTING CONDITIONS

SEME36, SEME71 SERIES 4FLUTE SQUARE - SIDE CUTTING

Table with columns for ISO, VDI 3323, Material Description, Ae, Ap, Parameter (SFM, IPT, RPM, IPM), and Diameter (Ø) ranging from 0.8 to 5.5 inches.

SFM = Surface Feet per Minute
RPM = Revolutions Per Minute
IPT = Inches Per Tooth
IPM = Inches Per Minute
Ap : Inch (Axial Depth of Cut)
Ae : Inch (Radial Depth of Cut)





HSS

HSS



RECOMMENDED CUTTING CONDITIONS

RECOMMENDED CUTTING CONDITIONS

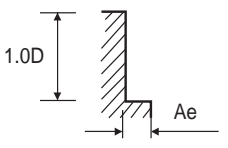
SEME36, SEME71 SERIES 4FLUTE SQUARE - SIDE CUTTING

SEME36, SEME71 SERIES 4FLUTE SQUARE - SIDE CUTTING

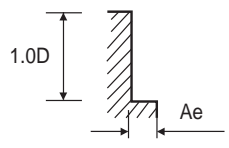
Table with columns for ISO, VDI 3323, Material Description, Ae, Ap, Parameter, and Diameter (Ø) from 6 to 12. Rows include P (Non-alloy steel, Low alloy steel, High alloyed steel, and tool steel), M (Stainless steel), K (Grey cast iron, Nodular cast iron, Malleable cast iron), and H (Hardened steel, Chilled Cast Iron, Hardened Cast Iron).

Table with columns for ISO, VDI 3323, Ae, Ap, Parameter, and Diameter (Ø) from 13 to 25. Rows include P (Non-alloy steel, Low alloy steel, High alloyed steel, and tool steel), M (Stainless steel), K (Grey cast iron, Nodular cast iron, Malleable cast iron), and H (Hardened steel, Chilled Cast Iron, Hardened Cast Iron).

SFM = Surface Feet per Minute
RPM = Revolutions Per Minute
IPT = Inches Per Tooth
IPM = Inches Per Minute
Ap : Inch (Axial Depth of Cut)
Ae : Inch (Radial Depth of Cut)



SFM = Surface Feet per Minute
RPM = Revolutions Per Minute
IPT = Inches Per Tooth
IPM = Inches Per Minute
Ap : Inch (Axial Depth of Cut)
Ae : Inch (Radial Depth of Cut)



HSS

CBN END MILLS

i-Xmill END MILLS

i-SMART MODULAR END MILLS

X5070 END MILLS

4G MILL END MILLS

X-POWER PRO END MILLS

TitaNox-POWER END MILLS

JET-POWER END MILLS

V7 PLUS A END MILLS

V7 MILL INOX

ALU-POWER HPC END MILLS

ALU-POWER END MILLS

D-POWER GRAPHITE END MILLS

STANDARD CARBIDE

ONLY ONE COATED PM60 END MILLS

SINE-POWER

TANK-POWER END MILLS

STANDARD COBALT & HSS

TECHNICAL DATA

HSS



RECOMMENDED CUTTING CONDITIONS



RECOMMENDED CUTTING CONDITIONS

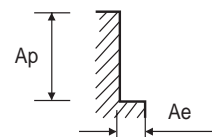
SEME72 SERIES 4FLUTE SQUARE - SIDE CUTTING

SEME72 SERIES 4FLUTE SQUARE - SIDE CUTTING

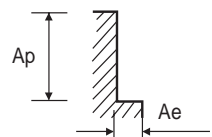
Table with columns for ISO, VDI 3323, Material Description, Ae, Ap, Parameter, and Diameter (Ø) with sub-columns for LOC and various diameters (1, 1.2, 1.5, 2, 2.5).

Table with columns for ISO, VDI 3323, Ae, Ap, Parameter, and Diameter (Ø) with sub-columns for LOC and various diameters (1.2, 1.5, 2, 2.5).

SFM = Surface Feet per Minute
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IPM = Inches Per Minute
Ap : Inch (Axial Depth of Cut)
Ae : Inch (Radial Depth of Cut)



SFM = Surface Feet per Minute
RPM = Revolutions Per Minute
IPT = Inches Per Tooth
IPM = Inches Per Minute
Ap : Inch (Axial Depth of Cut)
Ae : Inch (Radial Depth of Cut)



HSS

HSS

**YG** 4G MILL END MILLS

RECOMMENDED CUTTING CONDITIONS

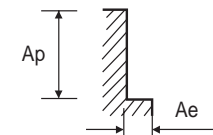
**YG** 4G MILL END MILLS

RECOMMENDED CUTTING CONDITIONS

SEME72 SERIES 4FLUTE SQUARE - SIDE CUTTING

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø)																									
						2.5		2.5		2.5		2.5		3		3		3		3		4									
						LOC	12	16	20	26	10	12	14	16	20	26	30	12	12	12	12	12	12	14							
P	1-8	Non-alloy steel	0.05D	2.5D	SFM(Vc)	230	210	210	185	230	230	230	205	205	205	205	245	SFM(Vc)	135	120	120	105	130	130	130	120	120	120	120	140	
					IPT(fz)	.0003	.0003	.0002	.0002	.0004	.0004	.0004	.0004	.0003	.0003	.0003	.0003	.0006	IPT(fz)	.0002	.0002	.0002	.0002	.0003	.0003	.0003	.0003	.0002	.0002	.0002	.0004
					RPM	8990	8090	8090	7200	7400	7400	7400	6660	6660	6660	6660	6000	RPM	5170	4650	4650	4130	4280	4280	4280	3860	3860	3860	3860	3410	
					IPM(FEED)	10	8	7	6	11	11	11	10	9	8	8	13	IPM(FEED)	4	3	3	2	5	5	5	4	4	3	3	6	
	9	Low alloy steel	0.05D	2.5D	SFM(Vc)	230	210	210	185	230	230	230	205	205	205	245	SFM(Vc)	140	140	125	125	150	150	135	135	135	155	155	155		
					IPT(fz)	.0003	.0003	.0002	.0002	.0004	.0004	.0004	.0004	.0003	.0003	.0003	.0003	.0006	IPT(fz)	.0004	.0004	.0004	.0004	.0006	.0006	.0005	.0005	.0005	.0008	.0008	.0008
					RPM	8990	8090	8090	7200	7400	7400	7400	6660	6660	6660	6660	6000	RPM	3410	3410	3070	3070	2900	2900	2610	2610	2610	2520	2520	2520	
					IPM(FEED)	10	8	7	6	11	11	11	10	9	8	8	13	IPM(FEED)	6	6	4	4	7	7	5	5	5	9	9	9	
	10-	High alloyed steel, and tool steel	0.05D	2.5D	SFM(Vc)	230	210	210	185	230	230	230	205	205	205	245	SFM(Vc)	245	245	225	225	265	265	240	240	240	275	275	275		
					IPT(fz)	.0003	.0003	.0002	.0002	.0004	.0004	.0004	.0004	.0003	.0003	.0003	.0003	.0006	IPT(fz)	.0006	.0006	.0005	.0005	.0008	.0008	.0008	.0008	.0007	.0012	.0012	.0012
					RPM	8990	8090	8090	7200	7400	7400	7400	6660	6660	6660	6660	6000	RPM	6000	6000	5400	5400	5120	5120	4610	4610	4610	4420	4420	4420	
					IPM(FEED)	10	8	7	6	11	11	11	10	9	8	8	13	IPM(FEED)	13	13	11	11	17	17	14	14	12	20	20	20	
11.1-11.2	High alloyed steel, and tool steel	0.05D	2.5D	SFM(Vc)	230	210	210	185	230	230	230	205	205	205	245	SFM(Vc)	140	140	125	125	150	150	135	135	135	155	155	155			
				IPT(fz)	.0003	.0003	.0002	.0002	.0004	.0004	.0004	.0004	.0003	.0003	.0003	.0003	.0006	IPT(fz)	.0004	.0004	.0004	.0004	.0006	.0006	.0005	.0005	.0005	.0008	.0008	.0008	
				RPM	8990	8090	8090	7200	7400	7400	7400	6660	6660	6660	6660	6000	RPM	3410	3410	3070	3070	2900	2900	2610	2610	2610	2520	2520	2520		
				IPM(FEED)	10	8	7	6	11	11	11	10	9	8	8	13	IPM(FEED)	6	6	4	4	7	7	5	5	5	9	9	9		
K	15-20	Grey cast iron Nodular cast iron Malleable cast iron	0.05D	2.5D	SFM(Vc)	230	210	210	185	230	230	230	205	205	205	245	SFM(Vc)	245	245	225	225	265	265	240	240	240	275	275	275		
					IPT(fz)	.0003	.0003	.0002	.0002	.0004	.0004	.0004	.0004	.0003	.0003	.0003	.0003	.0006	IPT(fz)	.0006	.0006	.0005	.0005	.0008	.0008	.0008	.0008	.0007	.0012	.0012	.0012
					RPM	8990	8090	8090	7200	7400	7400	7400	6660	6660	6660	6660	6000	RPM	6000	6000	5400	5400	5120	5120	4610	4610	4610	4420	4420	4420	
					IPM(FEED)	10	8	7	6	11	11	11	10	9	8	8	13	IPM(FEED)	13	13	11	11	17	17	14	14	12	20	20	20	
H	38.1-38.2	Hardened steel	0.02D	2.0D	SFM(Vc)	85	75	75	65	80	80	80	75	75	75	90	SFM(Vc)	90	90	80	80	100	100	90	90	90	100	100	100		
					IPT(fz)	.0002	.0002	.0002	.0001	.0003	.0003	.0003	.0003	.0002	.0002	.0002	.0003	IPT(fz)	.0003	.0003	.0003	.0003	.0004	.0004	.0004	.0004	.0004	.0007	.0007	.0007	
					RPM	3210	2890	2890	2570	2640	2640	2640	2380	2380	2380	2380	2150	RPM	2150	2150	1930	1930	1900	1900	1710	1710	1710	1640	1640	1640	
					IPM(FEED)	2	2	2	1	3	3	3	2	2	2	2	3	IPM(FEED)	3	3	2	2	3	3	3	3	2	4	4	4	
	40	Chilled Cast Iron	0.05D	2.5D	SFM(Vc)	135	120	120	105	130	130	130	120	120	120	140	SFM(Vc)	140	140	125	125	150	150	135	135	135	155	155	155		
					IPT(fz)	.0002	.0002	.0002	.0002	.0003	.0003	.0003	.0003	.0002	.0002	.0002	.0004	IPT(fz)	.0004	.0004	.0004	.0004	.0006	.0006	.0005	.0005	.0005	.0008	.0008	.0008	
					RPM	5170	4650	4650	4130	4280	4280	4280	3860	3860	3860	3860	3410	RPM	3410	3410	3070	3070	2900	2900	2610	2610	2610	2520	2520	2520	
					IPM(FEED)	4	3	3	2	5	5	5	4	4	3	3	6	IPM(FEED)	6	6	4	4	7	7	5	5	5	9	9	9	
	41	Hardened Cast Iron	0.02D	2.0D	SFM(Vc)	85	75	75	65	80	80	80	75	75	75	90	SFM(Vc)	90	90	80	80	100	100	90	90	90	100	100	100		
					IPT(fz)	.0002	.0002	.0002	.0001	.0003	.0003	.0003	.0003	.0002	.0002	.0002	.0003	IPT(fz)	.0003	.0003	.0003	.0003	.0004	.0004	.0004	.0004	.0004	.0007	.0007	.0007	
					RPM	3210	2890	2890	2570	2640	2640	2640	2380	2380	2380	2380	2150	RPM	2150	2150	1930	1930	1900	1900	1710	1710	1710	1640	1640	1640	
					IPM(FEED)	2	2	2	1	3	3	3	2	2	2	2	3	IPM(FEED)	3	3	2	2	3	3	3	3	2	4	4	4	

SFM = Surface Feet per Minute  
 RPM = Revolutions Per Minute  
 IPT = Inches Per Tooth  
 IPM = Inches Per Minute  
 Ap : Inch (Axial Depth of Cut)  
 Ae : Inch (Radial Depth of Cut)



SEME72 SERIES 4FLUTE SQUARE - SIDE CUTTING

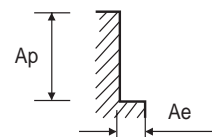
ISO	VDI 3323	Ae	Ap	Parameter	Diameter (Ø)																									
					1.5		1.5		1.5		1.5		1.5		2		2		2		2		2							
					LOC	18	20	22	26	30	6	8	10	12	16	18	20	22	22	22	22	22	22	22						
P	1-8	0.05D	2.5D	SFM(Vc)	245	245	225	225	265	265	240	240	240	275	275	275	275	SFM(Vc)	140	140	125	125	150	150	135	135	135	155	155	155
				IPT(fz)	.0006	.0006	.0005	.0005	.0008	.0008	.0008	.0008	.0007	.0012	.0012	.0012	.001	IPT(fz)	.0004	.0004	.0004	.0004	.0006	.0006	.0005	.0005	.0005	.0008	.0008	.0008
				RPM	6000	6000	5400	5400	5120	5120	4610	4610	4610	4420	4420	4420	4420	RPM	3410	3410	3070	3070	2900	2900	2610	2610	2610	2520	2520	2520
				IPM(FEED)	13	13	11	11	17	17	14	14	12	20	20	20	17	IPM(FEED)	6	6	4	4	7	7	5	5	5	9	9	9
	9	0.05D	2.5D	SFM(Vc)	245	245	225	225	265	265	240	240	240	275	275	275	275	SFM(Vc)	245	245	225	225	265	265	240	240	240	275	275	275
				IPT(fz)	.0006	.0006	.0005	.0005	.0008	.0008	.0008	.0008	.0007	.0012	.0012	.0012	.001	IPT(fz)	.0006	.0006	.0005	.0005	.0008	.0008	.0008	.0008	.0007	.0012	.0012	.0012
				RPM	6000	6000	5400	5400	5120	5120	4610	4610	4610	4420	4420	4420	4420	RPM	6000	6000	5400	5400	5120	5120	4610	4610	4610	4420	4420	4420
				IPM(FEED)	13	13	11	11	17	17	14	14	12	20	20	20	17	IPM(FEED)	13	13	11	11	17	17	14	14	12	20	20	20
	10-	0.05D	2.5D	SFM(Vc)	245	245	225	225	265	265	240	240	240	275	275	275	275	SFM(Vc)	140	140	125	125	150	150	135	135	135	155	155	155
				IPT(fz)	.0006	.0006	.0005	.0005	.0008	.0008	.0008	.0008	.0007	.0012	.0012	.0012	.001	IPT(fz)	.0004	.0004	.0004	.0004	.0006	.0006	.0005	.0005	.0005	.0008	.0008	.0008
				RPM	6000	6000	5400	5400	5120	5120	4610	4610	4610	4420	4420	4420	4420	RPM	3410	3410	3070	3070	2900	2900	2610	2610	2610	2520	2520	2520
				IPM(FEED)	13	13	11	11	17	17	14	14	12	20	20	20	17	IPM(FEED)	6	6	4	4	7	7	5	5	5	9	9	9
11.1-11.2	0.05D	2.5D	SFM(Vc)	245	245	225	225	265	265	240	240	240	275	275	275	275	SFM(Vc)	140	140	125	125	150	150	135	135	135	155	155	155	
			IPT(fz)	.0006	.0006	.0005	.0005	.0008	.0008	.0008	.0008	.0007	.0012	.0012	.0012	.001	IPT(fz)	.0004	.0004	.0004	.0004	.0006	.0006	.0005	.0005	.0005	.0008	.0008	.0008	
			RPM	6000	6000	5400	5400	5120	5120	4610	461																			



**SEME72 SERIES 4FLUTE SQUARE - SIDE CUTTING**

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø)												
						LOC	6	6	6	8	8	8	8	8	8	10	10	10
<b>P</b>	1-8	Non-alloy steel	0.05D	2.5D	SFM(Vc)	245	245	245	275	275	275	275	250	250	290	290	290	
					IPT(fz)	.001	.0009	.0009	.0016	.0016	.0016	.0014	.0014	.0012	.0019	.0019	.0019	
					RPM	3970	3970	3970	3360	3360	3360	3360	3020	3020	2820	2820	2820	
					IPM(FEED)	16	14	14	22	22	22	19	17	15	22	22	22	
	9	Low alloy steel	0.05D	2.5D	SFM(Vc)	140	140	140	155	155	155	155	140	140	170	170	170	
					IPT(fz)	.0007	.0006	.0006	.0011	.0011	.0011	.001	.001	.0008	.0013	.0013	.0013	
					RPM	2270	2270	2270	1900	1900	1900	1900	1710	1710	1640	1640	1640	
					IPM(FEED)	7	6	6	9	9	9	7	7	6	9	9	9	
	10-	High alloyed steel, and tool steel	0.05D	2.5D	SFM(Vc)	245	245	245	275	275	275	275	250	250	290	290	290	
					IPT(fz)	.001	.0009	.0009	.0016	.0016	.0016	.0014	.0014	.0012	.0019	.0019	.0019	
					RPM	3970	3970	3970	3360	3360	3360	3360	3020	3020	2820	2820	2820	
					IPM(FEED)	16	14	14	22	22	22	19	17	15	22	22	22	
11.1-11.2	High alloyed steel, and tool steel	0.05D	2.5D	SFM(Vc)	140	140	140	155	155	155	155	140	140	170	170	170		
				IPT(fz)	.0007	.0006	.0006	.0011	.0011	.0011	.001	.001	.0008	.0013	.0013	.0013		
				RPM	2270	2270	2270	1900	1900	1900	1900	1710	1710	1640	1640	1640		
				IPM(FEED)	7	6	6	9	9	9	7	7	6	9	9	9		
<b>K</b>	15-20	Grey cast iron Nodular cast iron Malleable cast iron	0.05D	2.5D	SFM(Vc)	245	245	245	275	275	275	275	250	250	290	290	290	
					IPT(fz)	.001	.0009	.0009	.0016	.0016	.0016	.0014	.0014	.0012	.0019	.0019	.0019	
					RPM	3970	3970	3970	3360	3360	3360	3360	3020	3020	2820	2820	2820	
					IPM(FEED)	16	14	14	22	22	22	19	17	15	22	22	22	
<b>H</b>	38.1-38.2	Hardened steel	0.02D	2.0D	SFM(Vc)	90	90	90	105	105	105	105	95	95	105	105	105	
					IPT(fz)	.0006	.0005	.0005	.0009	.0009	.0009	.0007	.0007	.0007	.0011	.0011	.0011	
					RPM	1480	1480	1480	1260	1260	1260	1260	1130	1130	1010	1010	1010	
					IPM(FEED)	3	3	3	4	4	4	4	3	3	4	4	4	
	40	Chilled Cast Iron	0.05D	2.5D	SFM(Vc)	140	140	140	155	155	155	155	140	140	170	170	170	
					IPT(fz)	.0007	.0006	.0006	.0011	.0011	.0011	.001	.001	.0008	.0013	.0013	.0013	
					RPM	2270	2270	2270	1900	1900	1900	1900	1710	1710	1640	1640	1640	
					IPM(FEED)	7	6	6	9	9	9	7	7	6	9	9	9	
	41	Hardened Cast Iron	0.02D	2.0D	SFM(Vc)	90	90	90	105	105	105	105	95	95	105	105	105	
					IPT(fz)	.0006	.0005	.0005	.0009	.0009	.0009	.0007	.0007	.0007	.0011	.0011	.0011	
					RPM	1480	1480	1480	1260	1260	1260	1130	1130	1010	1010	1010		
					IPM(FEED)	3	3	3	4	4	4	4	3	3	4	4	4	

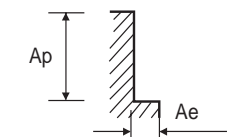
SFM = Surface Feet per Minute  
 RPM = Revolutions Per Minute  
 IPT = Inches Per Tooth  
 IPM = Inches Per Minute  
 Ap : Inch (Axial Depth of Cut)  
 Ae : Inch (Radial Depth of Cut)



**SEME72 SERIES 4FLUTE SQUARE - SIDE CUTTING**

ISO	VDI 3323	Ae	Ap	Parameter	Diameter (Ø)														
					LOC	10	10	10	10	12	12	12	12	12	12	12	14		
<b>P</b>	1-8	0.05D	2.5D	SFM(Vc)	290	290	260	260	285	285	285	285	285	285	255	255	305		
				IPT(fz)	.0016	.0016	.0016	.0015	.0018	.0018	.0016	.0016	.0016	.0016	.0014	.0014	.0014	.0016	
				RPM	2820	2820	2540	2540	2300	2300	2300	2300	2300	2300	2300	2070	2070	2120	
				IPM(FEED)	19	19	17	15	17	17	14	14	14	14	13	11	11	14	
	9	0.05D	2.5D	SFM(Vc)	170	170	155	155	170	170	170	170	170	170	155	155	175		
				IPT(fz)	.0011	.0011	.0011	.001	.0014	.0014	.0012	.0012	.0012	.001	.001	.001	.0012		
				RPM	1640	1640	1480	1480	1390	1390	1390	1390	1390	1390	1390	1250	1250	1230	
				IPM(FEED)	7	7	7	6	8	8	7	7	7	7	6	5	5	6	
	10-	0.05D	2.5D	SFM(Vc)	290	290	260	260	285	285	285	285	285	285	255	255	305		
				IPT(fz)	.0016	.0016	.0016	.0015	.0018	.0018	.0016	.0016	.0016	.0016	.0014	.0014	.0016		
				RPM	2820	2820	2540	2540	2300	2300	2300	2300	2300	2300	2070	2070	2120		
				IPM(FEED)	19	19	17	15	17	17	14	14	14	14	13	11	11	14	
11.1-11.2	0.05D	2.5D	SFM(Vc)	170	170	155	155	170	170	170	170	170	170	155	155	175			
			IPT(fz)	.0011	.0011	.0011	.001	.0014	.0014	.0012	.0012	.0012	.001	.001	.001	.0012			
			RPM	1640	1640	1480	1480	1390	1390	1390	1390	1390	1390	1250	1250	1230			
			IPM(FEED)	7	7	7	6	8	8	7	7	7	7	6	5	5	6		
<b>K</b>	15-20	0.05D	2.5D	SFM(Vc)	290	290	260	260	285	285	285	285	285	285	255	255	305		
				IPT(fz)	.0016	.0016	.0016	.0015	.0018	.0018	.0016	.0016	.0016	.0016	.0014	.0014	.0016		
				RPM	2820	2820	2540	2540	2300	2300	2300	2300	2300	2300	2070	2070	2120		
				IPM(FEED)	19	19	17	15	17	17	14	14	14	14	13	11	11	14	
<b>H</b>	38.1-38.2	0.02D	2.0D	SFM(Vc)	105	105	95	95	105	105	105	105	105	105	95	95	110		
				IPT(fz)	.0009	.0009	.0009	.0008	.001	.001	.0008	.0008	.0008	.0008	.0007	.0007	.0009		
				RPM	1010	1010	910	910	840	840	840	840	840	840	760	760	760		
				IPM(FEED)	4	4	3	3	3	3	3	3	3	3	2	2	3		
	40	0.05D	2.5D	SFM(Vc)	170	170	155	155	170	170	170	170	170	170	155	155	175		
				IPT(fz)	.0011	.0011	.0011	.001	.0014	.0014	.0012	.0012	.0012	.001	.001	.001	.0012		
				RPM	1640	1640	1480	1480	1390	1390	1390	1390	1390	1390	1250	1250	1230		
				IPM(FEED)	7	7	7	6	8	8	7	7	7	7	6	5	5	6	
	41	0.02D	2.0D	SFM(Vc)	105	105	95	95	105	105	105	105	105	105	95	95	110		
				IPT(fz)	.0009	.0009	.0009	.0008	.001	.001	.0008	.0008	.0008	.0008	.0007	.0007	.0009		
				RPM	1010	1010	910	910	840	840	840	840	840	840	760	760	760		
				IPM(FEED)	4	4	3	3	3	3	3	3	3	3	2	2	3		

SFM = Surface Feet per Minute  
 RPM = Revolutions Per Minute  
 IPT = Inches Per Tooth  
 IPM = Inches Per Minute  
 Ap : Inch (Axial Depth of Cut)  
 Ae : Inch (Radial Depth of Cut)



HSS

HSS

# YG 4G MILL END MILLS

## RECOMMENDED CUTTING CONDITIONS

# YG 4G MILL END MILLS

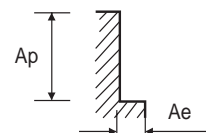
## RECOMMENDED CUTTING CONDITIONS

### SEME72 SERIES 4FLUTE SQUARE - SIDE CUTTING

### SEME72 SERIES 4FLUTE SQUARE - SIDE CUTTING

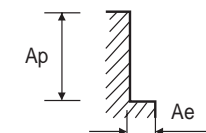
ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø)											
						LOC											
						14	16	16	16	16	16	16	16	18	18	18	
P	1-8	Non-alloy steel	0.05D	2.5D	SFM(Vc)	305	320	320	320	320	320	290	290	290	310	310	280
					IPT(fz)	.0016	.002	.002	.0017	.0017	.0015	.0015	.0015	.0015	.0019	.0016	.0015
					RPM	2120	1940	1940	1940	1940	1940	1750	1750	1750	1680	1680	1510
					IPM(FEED)	14	15	15	13	13	11	10	10	10	13	11	9
	9	Low alloy steel	0.05D	2.5D	SFM(Vc)	175	175	175	175	175	175	160	160	160	175	175	160
					IPT(fz)	.0012	.0014	.0014	.0012	.0012	.0011	.001	.001	.001	.0014	.0011	.001
					RPM	1230	1070	1070	1070	1070	1070	960	960	960	940	940	850
					IPM(FEED)	6	6	6	5	5	5	4	4	4	5	4	3
	10-	High alloyed steel, and tool steel	0.05D	2.5D	SFM(Vc)	305	320	320	320	320	320	290	290	290	310	310	280
					IPT(fz)	.0016	.002	.002	.0017	.0017	.0015	.0015	.0015	.0019	.0016	.0015	
					RPM	2120	1940	1940	1940	1940	1940	1750	1750	1750	1680	1680	1510
					IPM(FEED)	14	15	15	13	13	11	10	10	10	13	11	9
11.1-11.2	High alloyed steel, and tool steel	0.05D	2.5D	SFM(Vc)	175	175	175	175	175	175	160	160	160	175	175	160	
				IPT(fz)	.0012	.0014	.0014	.0012	.0012	.0011	.001	.001	.001	.0014	.0011	.001	
				RPM	1230	1070	1070	1070	1070	1070	960	960	960	940	940	850	
				IPM(FEED)	6	6	6	5	5	5	4	4	4	5	4	3	
K	15-20	Grey cast iron Nodular cast iron Malleable cast iron	0.05D	2.5D	SFM(Vc)	305	320	320	320	320	320	290	290	290	310	310	280
					IPT(fz)	.0016	.002	.002	.0017	.0017	.0015	.0015	.0015	.0019	.0016	.0015	
					RPM	2120	1940	1940	1940	1940	1940	1750	1750	1750	1680	1680	1510
					IPM(FEED)	14	15	15	13	13	11	10	10	10	13	11	9
H	38.1-38.2	Hardened steel	0.02D	2.0D	SFM(Vc)	110	110	110	110	110	110	100	100	100	110	110	100
					IPT(fz)	.0009	.001	.001	.0009	.0009	.0008	.0008	.0008	.0008	.0011	.0009	.0009
					RPM	760	670	670	670	670	670	600	600	600	590	590	530
					IPM(FEED)	3	3	3	2	2	2	2	2	2	3	2	2
	40	Chilled Cast Iron	0.05D	2.5D	SFM(Vc)	175	175	175	175	175	175	160	160	160	175	175	160
					IPT(fz)	.0012	.0014	.0014	.0012	.0012	.0011	.001	.001	.001	.0014	.0011	.001
					RPM	1230	1070	1070	1070	1070	1070	960	960	960	940	940	850
					IPM(FEED)	6	6	6	5	5	5	4	4	4	5	4	3
	41	Hardened Cast Iron	0.02D	2.0D	SFM(Vc)	110	110	110	110	110	110	100	100	100	110	110	100
					IPT(fz)	.0009	.001	.001	.0009	.0009	.0008	.0008	.0008	.0008	.0011	.0009	.0009
					RPM	760	670	670	670	670	670	600	600	600	590	590	530
					IPM(FEED)	3	3	3	2	2	2	2	2	2	3	2	2

SFM = Surface Feet per Minute  
 RPM = Revolutions Per Minute  
 IPT = Inches Per Tooth  
 IPM = Inches Per Minute  
 Ap : Inch (Axial Depth of Cut)  
 Ae : Inch (Radial Depth of Cut)



ISO	VDI 3323	Ae	Ap	Parameter	Diameter (Ø)															
					LOC															
					20	20	20	20	20	20	20	20	22	22	25	25	25	25		
P	1-8	0.05D	2.5D	SFM(Vc)	295	295	295	295	295	295	260	260	285	285	285	285	285			
				IPT(fz)	.0019	.0019	.0016	.0016	.0014	.0014	.0014	.0016	.0014	.0019	.0017	.0017	.0014			
				RPM	1420	1420	1420	1420	1420	1270	1270	1260	1260	1100	1100	1100	1100			
				IPM(FEED)	11	11	9	9	8	7	7	8	7	9	7	7	6			
	9	0.05D	2.5D	SFM(Vc)	170	170	170	170	170	150	150	185	185	210	210	210	210			
				IPT(fz)	.0013	.0013	.0011	.0011	.001	.001	.001	.0011	.001	.0013	.0011	.0011	.001			
				RPM	820	820	820	820	820	730	730	820	820	820	820	820	820			
				IPM(FEED)	4	4	4	4	3	3	3	4	3	4	4	4	3			
	10-	0.05D	2.5D	SFM(Vc)	295	295	295	295	295	260	260	285	285	285	285	285	285			
				IPT(fz)	.0019	.0019	.0016	.0016	.0014	.0014	.0014	.0016	.0014	.0019	.0017	.0017	.0014			
				RPM	1420	1420	1420	1420	1420	1270	1270	1260	1260	1100	1100	1100	1100			
				IPM(FEED)	11	11	9	9	8	7	7	8	7	9	7	7	6			
11.1-11.2	0.05D	2.5D	SFM(Vc)	170	170	170	170	170	150	150	185	185	210	210	210	210				
			IPT(fz)	.0013	.0013	.0011	.0011	.001	.001	.001	.0011	.001	.0013	.0011	.0011	.001				
			RPM	820	820	820	820	820	730	730	820	820	820	820	820	820				
			IPM(FEED)	4	4	4	4	3	3	3	4	3	4	4	4	3				
K	15-20	0.05D	2.5D	SFM(Vc)	295	295	295	295	295	260	260	285	285	285	285	285				
				IPT(fz)	.0019	.0019	.0016	.0016	.0014	.0014	.0014	.0016	.0014	.0019	.0017	.0017	.0014			
				RPM	1420	1420	1420	1420	1420	1270	1270	1260	1260	1100	1100	1100	1100			
				IPM(FEED)	11	11	9	9	8	7	7	8	7	9	7	7	6			
H	38.1-38.2	0.02D	2.0D	SFM(Vc)	105	105	105	105	105	95	95	115	115	130	130	130	130			
				IPT(fz)	.0011	.0011	.0009	.0009	.0008	.0008	.0008	.0009	.0008	.0011	.0009	.0009	.0008			
				RPM	500	500	500	500	500	450	450	500	500	500	500	500	500			
				IPM(FEED)	2	2	2	2	2	1	1	2	2	2	2	2	2			
	40	0.05D	2.5D	SFM(Vc)	170	170	170	170	170	150	150	185	185	210	210	210	210			
				IPT(fz)	.0013	.0013	.0011	.0011	.001	.001	.001	.0011	.001	.0013	.0011	.0011	.001			
				RPM	820	820	820	820	820	730	730	820	820	820	820	820	820			
				IPM(FEED)	4	4	4	4	3	3	3	4	3	4	4	4	3			
	41	0.02D	2.0D	SFM(Vc)	105	105	105	105	105	95	95	115	115	130	130	130	130			
				IPT(fz)	.0011	.0011	.0009	.0009	.0008	.0008	.0008	.0009	.0008	.0011	.0009	.0009	.0008			
				RPM	500	500	500	500	500	450	450	500	500	500	500	500	500			
				IPM(FEED)	2	2	2	2	2	1	1	2	2	2	2	2	2			

SFM = Surface Feet per Minute  
 RPM = Revolutions Per Minute  
 IPT = Inches Per Tooth  
 IPM = Inches Per Minute  
 Ap : Inch (Axial Depth of Cut)  
 Ae : Inch (Radial Depth of Cut)



HSS

HSS



RECOMMENDED CUTTING CONDITIONS



RECOMMENDED CUTTING CONDITIONS

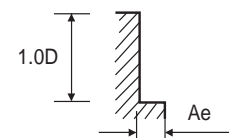
SEME73 SERIES 4FLUTE SQUARE - SIDE CUTTING

SEME73 SERIES 4FLUTE SQUARE - SIDE CUTTING

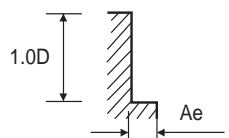
Table with columns for ISO, VDI 3323, Material Description, Parameter, and Diameter (Ø) with sub-columns for 1-18. Rows include P (Non-alloy steel, Low alloy steel, High alloyed steel, and tool steel) and K (Grey cast iron, Nodular cast iron, Malleable cast iron).

Table with columns for ISO, VDI 3323, Material Description, Parameter, and Diameter (Ø) with sub-columns for 1-16. Rows include P (Non-alloy steel, Low alloy steel, High alloyed steel, and tool steel) and K (Grey cast iron, Nodular cast iron, Malleable cast iron).

SFM = Surface Feet per Minute
RPM = Revolutions Per Minute
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Ap : Inch (Axial Depth of Cut)
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SFM = Surface Feet per Minute
RPM = Revolutions Per Minute
IPT = Inches Per Tooth
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RECOMMENDED CUTTING CONDITIONS



RECOMMENDED CUTTING CONDITIONS

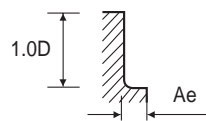
SEME73 SERIES 4FLUTE SQUARE - SIDE CUTTING

SEME73 SERIES 4FLUTE SQUARE - SIDE CUTTING

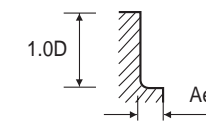
Table with columns for ISO, VDI 3323, Material Description, Parameter, and Diameter (Ø) for various materials like Non-alloy steel, Low alloy steel, High alloyed steel, and Grey cast iron.

Table with columns for ISO, VDI 3323, Parameter, and Diameter (Ø) for various materials like Non-alloy steel, Low alloy steel, High alloyed steel, and Grey cast iron.

SFM = Surface Feet per Minute
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HSS

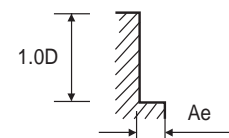


RECOMMENDED CUTTING CONDITIONS

**SEME73 SERIES 4FLUTE SQUARE - SIDE CUTTING**

ISO	VDI 3323	Material Description	Parameter	Diameter (Ø)																																																																									
				2					2.5					2.5																																																															
				LBS	26	30	35	40	45	50	60	8	10	12	14	16																																																													
P	1-8	Non-alloy steel	SFM(Vc)	230	230	170	170	85	85	85	310	310	310	280	280	IPT(fz)	.0002	.0002	.0002	.0002	.0001	.0001	.0001	.0003	.0003	.0003	.0003	.0003	RPM	11120	11120	8340	8340	4170	4170	4170	12000	12000	12000	10800	10800	IPM(FEED)	8	8	6	6	2	2	2	14	14	14	11	11	Ae	0.011	0.006	0.004	0.004	0.004	0.004	0.004	0.037	0.037	0.037	0.021	0.021										
			9	Low alloy steel	SFM(Vc)	150	150	110	110	55	55	55	195	195	195	175	175	IPT(fz)	.0002	.0002	.0002	.0002	.0001	.0001	.0001	.0003	.0003	.0003	.0003	.0003	RPM	7260	7260	5440	5440	2720	2720	2720	7600	7600	7600	6840	6840	IPM(FEED)	5	5	3	3	1	1	1	9	9	9	7	7	Ae	0.008	0.005	0.003	0.003	0.003	0.003	0.003	0.028	0.028	0.028	0.016	0.016								
					10-	High alloyed steel, and tool steel	SFM(Vc)	230	230	170	170	85	85	85	310	310	310	280	280	IPT(fz)	.0002	.0002	.0002	.0002	.0001	.0001	.0001	.0003	.0003	.0003	.0003	.0003	RPM	11120	11120	8340	8340	4170	4170	4170	12000	12000	12000	10800	10800	IPM(FEED)	8	8	6	6	2	2	2	14	14	14	11	11	Ae	0.011	0.006	0.004	0.004	0.004	0.004	0.004	0.037	0.037	0.037	0.021	0.021						
							11.1-11.2	High alloyed steel, and tool steel	SFM(Vc)	150	150	110	110	55	55	55	195	195	195	175	175	IPT(fz)	.0002	.0002	.0002	.0002	.0001	.0001	.0001	.0003	.0003	.0003	.0003	.0003	RPM	7260	7260	5440	5440	2720	2720	2720	7600	7600	7600	6840	6840	IPM(FEED)	5	5	3	3	1	1	1	9	9	9	7	7	Ae	0.008	0.005	0.003	0.003	0.003	0.003	0.003	0.028	0.028	0.028	0.016	0.016				
									K	15-20	Grey cast iron Nodular cast iron Malleable cast iron	SFM(Vc)	230	230	170	170	85	85	85	310	310	310	280	280	IPT(fz)	.0002	.0002	.0002	.0002	.0001	.0001	.0001	.0003	.0003	.0003	.0003	.0003	RPM	11120	11120	8340	8340	4170	4170	4170	12000	12000	12000	10800	10800	IPM(FEED)	8	8	6	6	2	2	2	14	14	14	11	11	Ae	0.011	0.006	0.004	0.004	0.004	0.004	0.004	0.037	0.037	0.037	0.021	0.021	
												H	38.1-38.2	Hardened steel	SFM(Vc)	100	100	75	75	35	35	35	115	115	115	105	105	IPT(fz)	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	RPM	4800	4800	3600	3600	1800	1800	1800	4500	4500	4500	4050	4050	IPM(FEED)	1.6	1.6	1	1	0.4	0.4	0.4	2.4	2.4	2.4	2	2	Ae	0.006	0.004	0.003	0.003	0.003	0.003	0.003	0.022	0.022	0.022
	40	Chilled Cast Iron													SFM(Vc)	150	150	110	110	55	55	55	195	195	195	175	175	IPT(fz)	.0002	.0002	.0002	.0002	.0001	.0001	.0001	.0003	.0003	.0003	.0003	.0003	RPM	7260	7260	5440	5440	2720	2720	2720	7600	7600	7600	6840	6840	IPM(FEED)	5	5	3	3	1	1	1	9	9	9	7	7	Ae	0.008	0.005	0.003	0.003	0.003	0.003	0.003	0.028	0.028	0.028
			41	Hardened Cast Iron											SFM(Vc)	100	100	75	75	35	35	35	115	115	115	105	105	IPT(fz)	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	RPM	4800	4800	3600	3600	1800	1800	1800	4500	4500	4500	4050	4050	IPM(FEED)	1.6	1.6	1	1	0.4	0.4	0.4	2.4	2.4	2.4	2	2	Ae	0.006	0.004	0.003	0.003	0.003	0.003	0.003	0.022	0.022	0.022

SFM = Surface Feet per Minute  
 RPM = Revolutions Per Minute  
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 Ap : Inch (Axial Depth of Cut)  
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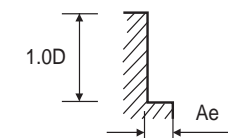


RECOMMENDED CUTTING CONDITIONS

**SEME73 SERIES 4FLUTE SQUARE - SIDE CUTTING**

ISO	VDI 3323	Material Description	Parameter	Diameter (Ø)																																																																														
				2.5					2.5					3																																																																				
				LBS	18	20	22	26	30	35	40	45	50	6	8	10	12																																																																	
P	1-8	Non-alloy steel	SFM(Vc)	280	280	280	245	245	245	185	185	185	330	330	330	330	IPT(fz)	.0003	.0003	.0003	.0002	.0002	.0002	.0002	.0002	.0002	.0004	.0004	.0004	.0004	RPM	10800	10800	10800	9600	9600	9600	7200	7200	7200	10700	10700	10700	10700	IPM(FEED)	11	11	11	9	9	9	6	6	6	15	15	15	15	Ae	0.021	0.021	0.013	0.013	0.013	0.008	0.008	0.005	0.005	0.063	0.063	0.044	0.044										
			9	Low alloy steel	SFM(Vc)	175	175	175	155	155	155	115	115	115	205	205	205	205	IPT(fz)	.0003	.0003	.0003	.0002	.0002	.0002	.0002	.0002	.0002	.0004	.0004	.0004	.0004	RPM	6840	6840	6840	6080	6080	6080	4560	4560	4560	6670	6670	6670	6670	IPM(FEED)	7	7	7	6	6	6	4	4	4	9	9	9	9	Ae	0.016	0.016	0.01	0.01	0.01	0.006	0.006	0.004	0.004	0.047	0.047	0.033	0.033								
					10-	High alloyed steel, and tool steel	SFM(Vc)	280	280	280	245	245	245	185	185	185	330	330	330	330	IPT(fz)	.0003	.0003	.0003	.0002	.0002	.0002	.0002	.0002	.0002	.0004	.0004	.0004	.0004	RPM	10800	10800	10800	9600	9600	9600	7200	7200	7200	10700	10700	10700	10700	IPM(FEED)	11	11	11	9	9	9	6	6	6	15	15	15	15	Ae	0.021	0.021	0.013	0.013	0.013	0.008	0.008	0.005	0.005	0.063	0.063	0.044	0.044						
							11.1-11.2	High alloyed steel, and tool steel	SFM(Vc)	175	175	175	155	155	155	115	115	115	205	205	205	205	IPT(fz)	.0003	.0003	.0003	.0002	.0002	.0002	.0002	.0002	.0002	.0004	.0004	.0004	.0004	RPM	6840	6840	6840	6080	6080	6080	4560	4560	4560	6670	6670	6670	6670	IPM(FEED)	7	7	7	6	6	6	4	4	4	9	9	9	9	Ae	0.016	0.016	0.01	0.01	0.01	0.006	0.006	0.004	0.004	0.047	0.047	0.033	0.033				
									K	15-20	Grey cast iron Nodular cast iron Malleable cast iron	SFM(Vc)	280	280	280	245	245	245	185	185	185	330	330	330	330	IPT(fz)	.0003	.0003	.0003	.0002	.0002	.0002	.0002	.0002	.0002	.0004	.0004	.0004	.0004	RPM	10800	10800	10800	9600	9600	9600	7200	7200	7200	10700	10700	10700	10700	IPM(FEED)	11	11	11	9	9	9	6	6	6	15	15	15	15	Ae	.0008	.0008	.0005	.0005	.0005	.0003	.0003	.0002	.0002	.0025	.0025	.0017	.0017	
												H	38.1-38.2	Hardened steel	SFM(Vc)	105	105	105	95	95	95	70	70	70	125	125	125	125	IPT(fz)	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0002	.0002	.0002	.0002	RPM	4050	4050	4050	3600	3600	3600	2700	2700	2700	4030	4030	4030	4030	IPM(FEED)	2	2	2	1.6	1.6	1.6	1	1	1	2.8	2.8	2.8	2.8	Ae	0.013	0.013	0.008	0.008	0.008	0.005	0.005	0.003	0.003	0.038	0.038
	40	Chilled Cast Iron													SFM(Vc)	175	175	175	155	155	155	115	115	115	205	205	205	205	IPT(fz)	.0003	.0003	.0003	.0002	.0002	.0002	.0002	.0002	.0002	.0004	.0004	.0004	.0004	RPM	6840	6840	6840	6080	6080	6080	4560	4560	4560	6670	6670	6670	6670	IPM(FEED)	7	7	7	6	6	6	4	4	4	9	9	9	9	Ae	0.016	0.016	0.01	0.01	0.01	0.006	0.006	0.004	0.004	0.047	0.047
			41	Hardened Cast Iron											SFM(Vc)	105	105	105	95	95	95	70	70	70	125	125	125	125	IPT(fz)	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0002	.0002	.0002	.0002	RPM	4050	4050	4050	3600	3600	3600	2700	2700	2700	4030	4030	4030	4030	IPM(FEED)	2	2	2	1.6	1.6	1.6	1	1	1	2.8	2.8	2.8	2.8	Ae	0.013	0.013	0.008	0.008	0.008	0.005	0.005	0.003	0.003	0.038	0.038

SFM = Surface Feet per Minute  
 RPM = Revolutions Per Minute  
 IPT = Inches Per Tooth  
 IPM = Inches Per Minute  
 Ap : Inch (Axial Depth of Cut)  
 Ae : mm (Radial Depth of Cut)





RECOMMENDED CUTTING CONDITIONS



RECOMMENDED CUTTING CONDITIONS

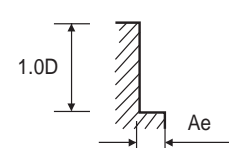
SEME73 SERIES 4FLUTE SQUARE - SIDE CUTTING

SEME73 SERIES 4FLUTE SQUARE - SIDE CUTTING

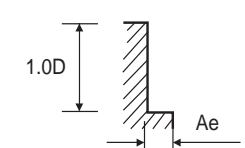
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Table with columns: ISO, VDI 3323, Material Description, Ap, Parameter (LBS), Diameter (Ø) (4, 8, 10, 12, 14, 16, 18, 20, 22, 26, 30, 35, 40, 45), SFM(Vc), IPT(fz), RPM, IPM(FEED), Ae.

SFM = Surface Feet per Minute
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Ap : Inch (Axial Depth of Cut)
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RECOMMENDED CUTTING CONDITIONS



RECOMMENDED CUTTING CONDITIONS

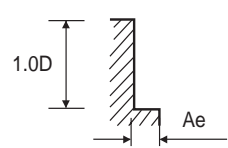
SEME73 SERIES 4FLUTE SQUARE - SIDE CUTTING

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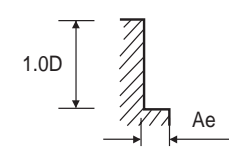
Table with columns: ISO, VDI 3323, Material Description, Ap, Parameter (LBS), and Diameter (Ø) with sub-columns for diameters 4, 5, 6, 8, 10, 12, 15, 20. Rows include materials like Non-alloy steel, Low alloy steel, High alloyed steel, and Grey cast iron.

Table with columns: ISO, VDI 3323, Material Description, Ap, Parameter (LBS), and Diameter (Ø) with sub-columns for diameters 6, 8, 10, 12, 15, 20. Rows include materials like Non-alloy steel, Low alloy steel, High alloyed steel, and Grey cast iron.

SFM = Surface Feet per Minute
RPM = Revolutions Per Minute
IPT = Inches Per Tooth
IPM = Inches Per Minute
Ap : Inch (Axial Depth of Cut)
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RECOMMENDED CUTTING CONDITIONS



RECOMMENDED CUTTING CONDITIONS

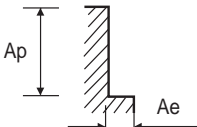
SEME75 SERIES 6FLUTE 45° HELIX - SIDE CUTTING (NORMAL)

SEME75 SERIES 6FLUTE 45° HELIX - SIDE CUTTING (NORMAL)

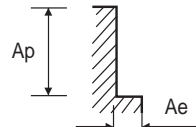
Table with columns for ISO, VDI 3323, Material Description, Ae, Ap, Parameter, and Diameter (Ø) with sub-columns for various diameters (6, 8, 10, 15, 20, 30, 40, 50).

Table with columns for ISO, VDI 3323, Material Description, Ae, Ap, Parameter, and Diameter (Ø) with sub-columns for various diameters (12, 16, 20, 30, 40, 50, 60, 90, 110).

SFM = Surface Feet per Minute
RPM = Revolutions Per Minute
IPT = Inches Per Tooth
IPM = Inches Per Minute
Ap : Inch (Axial Depth of Cut)
Ae : Inch (Radial Depth of Cut)



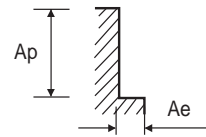
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**SEME75 SERIES 6FLUTE 45° HELIX - SIDE CUTTING (HIGH SPEED)**

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø)															
						6		8		10		12									
						LOC	15	20	30	20	30	35	40	25	30	40	50	30			
P	9	Non-alloy steel	0.05D	1.5D	SFM(Vc)	1090	1090	1090	1090	1090	1090	1090	1080	1080	1080	1080	1090				
					IPM(Fz)	.0024	.0024	.002	.0032	.0032	.0032	.0027	.0039	.0039	.0039	.0034	.0039				
					RPM	17640	17640	17640	13230	13230	13230	13230	10480	10480	10480	10480	8820				
					IPM(FEED)	252	252	214	252	252	252	214	248	248	248	210	208				
P	11.1-11.2	High alloyed steel, and tool steel	0.05D	1.5D	SFM(Vc)	1090	1090	1090	1090	1090	1090	1080	1080	1080	1080	1090					
					IPM(Fz)	.0024	.0024	.002	.0032	.0032	.0032	.0027	.0039	.0039	.0039	.0034	.0039				
					RPM	17640	17640	17640	13230	13230	13230	13230	10480	10480	10480	10480	8820				
					IPM(FEED)	252	252	214	252	252	252	214	248	248	248	210	208				
H	38.1-38.2	Hardened steel	0.05D	1.0D	SFM(Vc)	545	545	545	545	545	545	545	545	545	545	545					
					IPM(Fz)	.0024	.0024	.002	.0032	.0032	.0032	.0027	.004	.004	.004	.0034	.0039				
					RPM	8820	8820	8820	6615	6615	6615	6615	5290	5290	5290	5290	4410				
					IPM(FEED)	126	126	107	126	126	126	107	126	126	126	107	104				
H	40	Chilled Cast Iron	0.05D	1.5D	SFM(Vc)	1090	1090	1090	1090	1090	1090	1080	1080	1080	1080	1090					
					IPM(Fz)	.0024	.0024	.002	.0032	.0032	.0032	.0027	.0039	.0039	.0039	.0034	.0039				
					RPM	17640	17640	17640	13230	13230	13230	13230	10480	10480	10480	10480	8820				
					IPM(FEED)	252	252	214	252	252	252	214	248	248	248	210	208				
H	41	Hardened Cast Iron	0.05D	1.0D	SFM(Vc)	545	545	545	545	545	545	545	545	545	545	545					
					IPM(Fz)	.0024	.0024	.002	.0032	.0032	.0032	.0027	.004	.004	.004	.0034	.0039				
					RPM	8820	8820	8820	6615	6615	6615	6615	5290	5290	5290	5290	4410				
					IPM(FEED)	126	126	107	126	126	126	107	126	126	126	107	104				

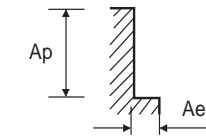
SFM = Surface Feet per Minute  
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 Ap : Inch (Axial Depth of Cut)  
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**SEME75 SERIES 6FLUTE 45° HELIX - SIDE CUTTING (HIGH SPEED)**

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø)															
						12		16		20											
						LOC	40	50	60	40	50	60	90	110	45	60	70	110			
P	9	Non-alloy steel	0.05D	1.5D	SFM(Vc)	1090	1090	1090	1090	1090	1090	980	980	1090	1090	1090	980				
					IPM(Fz)	.0039	.0034	.003	.0039	.0039	.0034	.003	.003	.004	.004	.0034	.003				
					RPM	8820	8820	8820	6615	6615	6615	5955	5955	5290	5290	5290	4765				
					IPM(FEED)	208	177	156	156	156	133	106	106	126	126	107	85				
P	11.1-11.2	High alloyed steel, and tool steel	0.05D	1.5D	SFM(Vc)	1090	1090	1090	1090	1090	1090	980	980	1090	1090	1090	980				
					IPM(Fz)	.0039	.0034	.003	.0039	.0039	.0034	.003	.003	.004	.004	.0034	.003				
					RPM	8820	8820	8820	6615	6615	6615	5955	5955	5290	5290	5290	4765				
					IPM(FEED)	208	177	156	156	156	133	106	106	126	126	107	85				
H	38.1-38.2	Hardened steel	0.05D	1.0D	SFM(Vc)	545	545	545	545	545	545	490	490	545	545	545	490				
					IPM(Fz)	.0039	.0033	.003	.0039	.0039	.0033	.003	.003	.0038	.0038	.0033	.0029				
					RPM	4410	4410	4410	3320	3320	3320	2980	2980	2645	2645	2645	2385				
					IPM(FEED)	104	88	78	78	78	66	53	53	61	61	52	41				
H	40	Chilled Cast Iron	0.05D	1.5D	SFM(Vc)	1090	1090	1090	1090	1090	1090	980	980	1090	1090	1090	980				
					IPM(Fz)	.0039	.0034	.003	.0039	.0039	.0034	.003	.003	.004	.004	.0034	.003				
					RPM	8820	8820	8820	6615	6615	6615	5955	5955	5290	5290	5290	4765				
					IPM(FEED)	208	177	156	156	156	133	106	106	126	126	107	85				
H	41	Hardened Cast Iron	0.05D	1.0D	SFM(Vc)	545	545	545	545	545	545	490	490	545	545	545	490				
					IPM(Fz)	.0039	.0033	.003	.0039	.0039	.0033	.003	.003	.0038	.0038	.0033	.0029				
					RPM	4410	4410	4410	3320	3320	3320	2980	2980	2645	2645	2645	2385				
					IPM(FEED)	104	88	78	78	78	66	53	53	61	61	52	41				

SFM = Surface Feet per Minute  
 RPM = Revolutions Per Minute  
 IPT = Inches Per Tooth  
 IPM = Inches Per Minute  
 Ap : Inch (Axial Depth of Cut)  
 Ae : Inch (Radial Depth of Cut)



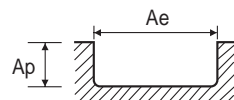


G9D75, G9D67, G9D76, G9D68, G9D77, G9D69 SERIES

4&5FLUTE MULTIPLE HELIX CORNER RADIUS - **SLOTTING**

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø)					
						6	8	10	12	16	20
P	1-2	Non-alloy steel	0.5D	1.0D	SFM(Vc)	740	740	740	740	740	740
					IPT(fz)	.0013	.0018	.0023	.0025	.0026	.0029
					RPM	12000	9000	7200	6000	4500	3600
					IPM(FEED)	61	65	65	61	59	52
	3-5	Low alloy steel	0.35D	1.0D	SFM(Vc)	655	670	660	670	675	660
					IPT(fz)	.0006	.0008	.001	.0012	.0013	.0016
					RPM	10600	8100	6400	5400	4100	3200
					IPM(FEED)	26	26	26	26	27	26
	6		0.5D	1.0D	SFM(Vc)	740	740	740	740	740	740
					IPT(fz)	.0013	.0018	.0023	.0025	.0026	.0029
					RPM	12000	9000	7200	6000	4500	3600
					IPM(FEED)	61	65	65	61	59	52
7-9		0.35D	1.0D	SFM(Vc)	655	670	660	670	675	660	
				IPT(fz)	.0006	.0008	.001	.0012	.0013	.0016	
				RPM	10600	8100	6400	5400	4100	3200	
				IPM(FEED)	26	26	26	26	27	26	
10		0.5D	1.0D	SFM(Vc)	740	740	740	740	740	740	
				IPT(fz)	.0013	.0018	.0023	.0025	.0026	.0029	
				RPM	12000	9000	7200	6000	4500	3600	
				IPM(FEED)	61	65	65	61	59	52	
11.1	High alloyed steel, and tool steel	0.35D	1.0D	SFM(Vc)	655	670	660	670	675	660	
				IPT(fz)	.0006	.0008	.001	.0012	.0013	.0016	
				RPM	10600	8100	6400	5400	4100	3200	
				IPM(FEED)	26	26	26	26	27	26	
15	Stainless steel	0.5D	1.0D	SFM(Vc)	740	740	740	740	740	740	
				IPT(fz)	.0013	.0018	.0023	.0025	.0026	.0029	
				RPM	12000	9000	7200	6000	4500	3600	
				IPM(FEED)	61	65	65	61	59	52	
16	Grey cast iron Nodular cast iron Malleable cast iron	0.35D	1.0D	SFM(Vc)	655	670	660	670	675	660	
				IPT(fz)	.0006	.0008	.001	.0012	.0013	.0016	
				RPM	10600	8100	6400	5400	4100	3200	
				IPM(FEED)	26	26	26	26	27	26	
17	Hardened steel	0.5D	1.0D	SFM(Vc)	740	740	740	740	740	740	
				IPT(fz)	.0013	.0018	.0023	.0025	.0026	.0029	
				RPM	12000	9000	7200	6000	4500	3600	
				IPM(FEED)	61	65	65	61	59	52	
18	Chilled Cast Iron	0.35D	1.0D	SFM(Vc)	655	670	660	670	675	660	
				IPT(fz)	.0006	.0008	.001	.0012	.0013	.0016	
				RPM	10600	8100	6400	5400	4100	3200	
				IPM(FEED)	26	26	26	26	27	26	
19-20	Hardened Cast Iron	0.5D	1.0D	SFM(Vc)	740	740	740	740	740	740	
				IPT(fz)	.0013	.0018	.0023	.0025	.0026	.0029	
				RPM	12000	9000	7200	6000	4500	3600	
				IPM(FEED)	61	65	65	61	59	52	

SFM = Surface Feet per Minute  
 RPM = Revolutions Per Minute  
 IPT = Inches Per Tooth  
 IPM = Inches Per Minute  
 Ap : Inch (Axial Depth of Cut)  
 Ae : Inch (Radial Depth of Cut)

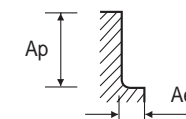


G9D75, G9D67, G9D76, G9D68, G9D77, G9D69 SERIES

4&5FLUTE MULTIPLE HELIX CORNER RADIUS - **SIDE CUTTING**

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø)					
						6	8	10	12	16	20
P	1-2	Non-alloy steel	0.5D	1.0D	SFM(Vc)	975	980	980	990	990	990
					IPT(fz)	.0016	.0022	.0028	.0032	.0032	.0035
					RPM	15800	11900	9500	8000	6000	4800
					IPM(FEED)	101	106	106	101	97	84
	3-5		0.35D	1.0D	SFM(Vc)	885	880	875	880	890	885
					IPT(fz)	.0013	.0018	.0023	.0026	.0026	.0028
					RPM	14300	10700	8500	7100	5400	4300
					IPM(FEED)	73	77	77	73	69	59
	6		0.5D	1.0D	SFM(Vc)	975	980	980	990	990	990
					IPT(fz)	.0016	.0022	.0028	.0032	.0032	.0035
					RPM	15800	11900	9500	8000	6000	4800
					IPM(FEED)	101	106	106	101	97	84
7-9	Low alloy steel	0.35D	1.0D	SFM(Vc)	885	880	875	880	890	885	
				IPT(fz)	.0013	.0018	.0023	.0026	.0026	.0028	
				RPM	14300	10700	8500	7100	5400	4300	
				IPM(FEED)	73	77	77	73	69	59	
10		0.5D	1.0D	SFM(Vc)	975	980	980	990	990	990	
				IPT(fz)	.0016	.0022	.0028	.0032	.0032	.0035	
				RPM	15800	11900	9500	8000	6000	4800	
				IPM(FEED)	101.2	106.3	106.3	101.2	96.5	84.3	
11.1	High alloyed steel, and tool steel	0.35D	1.0D	SFM(Vc)	885	880	875	880	890	885	
				IPT(fz)	.0013	.0018	.0023	.0026	.0026	.0028	
				RPM	14300	10700	8500	7100	5400	4300	
				IPM(FEED)	73	77	77	73	69	59	
15	Grey cast iron	0.5D	1.0D	SFM(Vc)	975	980	980	990	990	990	
				IPT(fz)	.0016	.0022	.0028	.0032	.0032	.0035	
				RPM	15800	11900	9500	8000	6000	4800	
				IPM(FEED)	101	106	106	101	97	84	
16		0.35D	1.0D	SFM(Vc)	885	880	875	880	890	885	
				IPT(fz)	.0013	.0018	.0023	.0026	.0026	.0028	
				RPM	14300	10700	8500	7100	5400	4300	
				IPM(FEED)	73	77	77	73	69	59	
17		0.5D	1.0D	SFM(Vc)	975	980	980	990	990	990	
				IPT(fz)	.0016	.0022	.0028	.0032	.0032	.0035	
				RPM	15800	11900	9500	8000	6000	4800	
				IPM(FEED)	101	106	106	101	97	84	
18	Nodular cast iron	0.35D	1.0D	SFM(Vc)	885	880	875	880	890	885	
				IPT(fz)	.0013	.0018	.0023	.0026	.0026	.0028	
				RPM	14300	10700	8500	7100	5400	4300	
				IPM(FEED)	73	77	77	73	69	59	
19-20	Malleable cast iron	0.5D	1.0D	SFM(Vc)	975	980	980	990	990	990	
				IPT(fz)	.0016	.0022	.0028	.0032	.0032	.0035	
				RPM	15800	11900	9500	8000	6000	4800	
				IPM(FEED)	101	106	106	101	97	84	

SFM = Surface Feet per Minute  
 RPM = Revolutions Per Minute  
 IPT = Inches Per Tooth  
 IPM = Inches Per Minute  
 Ap : Inch (Axial Depth of Cut)  
 Ae : Inch (Radial Depth of Cut)





Global Cutting Tool Leader **YG-1**



MILLING



Being the best through innovation

CARBIDE

# X-POWER PRO END MILLS

- for Pre-Hardened Steels up to HRc55, Mold & Die, Dry & Wet Cutting



SELECTION GUIDE



SERIES	Inch				
	GM153	GM207	GM639	GM649	GM212
FLUTE	4	4	4	4	4
HELIX ANGLE	30°	30°	30°	30°	30°
CUTTING EDGE SHAPE	SQUARE	SQUARE	CORNER RADIUS	CORNER RADIUS	CORNER RADIUS
SIZE MIN	D1/16	D1/8	D1/16	D1/16	D1/4
SIZE MAX	D1"	D1"	D1/2	D1/2	D1/2
PAGE	C396	C397	C398	C399	C400

SERIES	Inch												
	GM103	GM208	GM218	GM668	GM209	GM210	GM961	GM960	GM109	GM963	GM666	GM156	GM967
FLUTE	4	6&8	6&8	6&8	2	4	2	2	2	2	3~5	3~5	2
HELIX ANGLE	45°	45°	45°	45°	30°	30°	30°	30°	15°	30°	20°	20°	30°
CUTTING EDGE SHAPE	CORNER RADIUS	SQUARE	SQUARE	CORNER RADIUS	BALL NOSE	BALL NOSE	BALL NOSE	BALL NOSE	BALL NOSE	BALL NOSE	ROUGHING	ROUGHING	BALL NOSE
SIZE MIN	D3/8	D1/4	D1/4	D1/4	R1/64	R1/16	R1/16	R.012	R1/64	R1/32	D1/4	D1/4	R1/64
SIZE MAX	D7/8	D1"	D1"	D3/4	R3/8	R3/8	R1/2	R.031	R1/4	R3/16	D1"	D1"	R1/16
PAGE	C401	C402		C403	C404	C405	C406	C407	C408	C409	C410		C411
REGULAR LENGTH	LONG REACH	LONG LENGTH	EXTRA LONG LENGTH	LONG LENGTH	LONG LENGTH	LONG LENGTH	MEDIUM LENGTH	MINIATURE	STUB CUT LENGTH	TAPER NECK	STUB LENGTH FINE PITCH	LONG LENGTH FINE PITCH	RIB PROCESSING
COATING	Y-Coating	Y-Coating	Y-Coating	Y-Coating	Y-Coating	Y-Coating	Y-Coating	Y-Coating	Y-Coating	Y-Coating	Y-Coating	Y-Coating	Y-Coating

SOLID CARBIDE X-POWER PRO END MILLS

for Pre-Hardened Steels up to HRc55, Mold & Die, Dry & Wet Cutting

Please visit globalyg1.com/mat for material search

◎: Excellent ○: Good

Recommended cutting conditions : p. C431

ISO	VDI 3323	Material Description	Composition / Structure / Heat Treatment	HB	HRc	GM153	GM207	GM639	GM649	GM212
P	1	Non-alloy steel	About 0.15% C Annealed	125		○	○	○	○	○
	2		About 0.45% C Annealed	190	13	○	○	○	○	○
	3		About 0.45% C Quenched & Tempered	250	25	◎	◎	◎	◎	◎
	4		About 0.75% C Annealed	270	28	◎	◎	◎	◎	◎
	5		About 0.75% C Quenched & Tempered	300	32	◎	◎	◎	◎	◎
	6	Low alloy steel	Annealed	180	10	○	○	○	○	○
	7		Quenched & Tempered	275	29	◎	◎	◎	◎	◎
	8		Quenched & Tempered	300	32	◎	◎	◎	◎	◎
	9		Quenched & Tempered	350	38	◎	◎	◎	◎	◎
	10		High alloyed steel, and tool steel	Annealed	200	15	○	○	○	○
	11	Quenched & Tempered		325	35	◎	◎	◎	◎	◎
M	12	Stainless steel	Ferritic / Martensitic Annealed	200	15	○				
	13		Martensitic Quenched & Tempered	240	23	○				
	14		Austenitic	180	10	○				
K	15	Grey cast iron	Pearlitic / ferritic	180	10					
	16		Pearlitic (Martensitic)	260	26					
	17	Nodular cast iron	Ferritic	160	3					
	18		Pearlitic	250	25					
	19		Ferritic	130						
20	Malleable cast iron	Pearlitic	230	21						
N	21	Aluminum-wrought alloy	Not Curable	60						
	22		Curable Hardened	100						
	23		≤ 12% Si, Not Curable	75						
	24	Aluminum-cast, alloyed	≤ 12% Si, Curable Hardened	90						
	25		> 12% Si, Not Curable	130						
	26		Cutting Alloys, PB>1%	110						
	27	Copper and Copper Alloys (Bronze / Brass)	CuZn, CuSnZn (Brass)	90						
	28		CuSn, lead-free copper and electrolytic copper	100						
	29		Non Metallic Materials	Duroplastic, Fiber Reinforced Plastic						
	30	Rubber, Wood, etc.								
S	31	Heat Resistant Super Alloys	Fe Based Annealed	200	15					
	32		Cured	280	30					
	33		Annealed	250	25					
	34		Ni or Co Based Cured	350	38					
	35		Cast	320	34					
	36	Titanium Alloys	Pure Titanium	400 Rm						
	37		Alpha + Beta Alloys Hardened	1050 Rm						
H	38	Hardened steel	Hardened	550	55	○	○	○	○	○
	39		Hardened	630	60					
	40	Hardened Cast Iron	Cast	400	42	◎	◎	◎	◎	◎
	41		Hardened	550	55	○	○	○	○	○



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SELECTION GUIDE



SOLID CARBIDE X-POWER PRO END MILLS

for Pre-Hardened Steels up to HRc55, Mold & Die, Dry & Wet Cutting

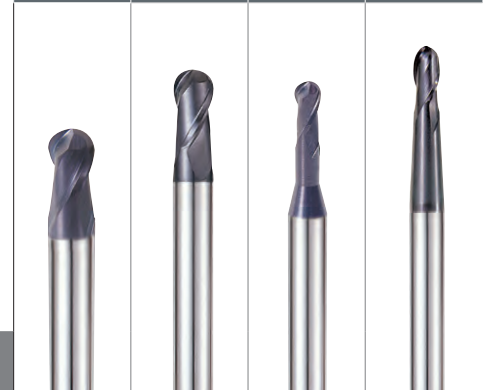


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Recommended cutting conditions : p. C431

Table with columns: SERIES, FLUTE, HELIX ANGLE, CUTTING EDGE SHAPE, SIZE MIN, SIZE MAX, PAGE. Rows: GM876, GM813, GM886, GM902.

Table with columns: SHORT LENGTH, LONG LENGTH, RIB PROCESSING, TAPER NECK. Rows: Y-Coating, Y-Coating, Y-Coating, Y-Coating.



Main material compatibility table with columns: ISO, VDI 3323, Material Description, Composition / Structure / Heat Treatment, HB, HRc, and application icons for each series (P, M, K, N, S, H).

Table with columns: GM815, GM818, GM8A1, GM839, GM819, GM810, GM883, GM895, GM811, GM817, GM812, GM834, GM814. Rows: FLUTE, HELIX ANGLE, BALL NOSE, CORNER RADIUS, SQUARE, RIB PROCESSING, LONG LENGTH, SHORT LENGTH, Y-Coating.



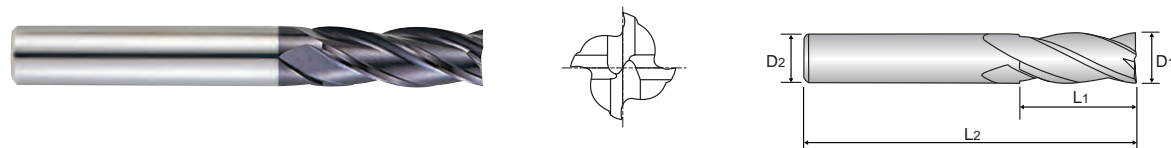
Material compatibility table for series GM815 through GM814, with application icons for each series (P, M, K, N, S, H).



PLAIN SHANK GM153 SERIES

CARBIDE, 4 FLUTE REGULAR LENGTH

- ▶ Designed to machine tool steel, alloy steel, mold steel and other high hardened materials.
- ▶ 4 flute allows for better workpiece finishes.
- ▶ Increased production.



EDP No.	Mill Diameter	Shank Diameter	Length of Cut	Overall Length
	D1	D2	L1	L2
GM153004	1/16	1/8	3/16	1-1/2
GM153008	1/8	1/8	1/2	1-1/2
GM153012	3/16	3/16	5/8	2
GM153016	1/4	1/4	3/4	2-1/2
GM153020	5/16	5/16	13/16	2-1/2
GM153024	3/8	3/8	1	2-1/2
GM153028	7/16	7/16	1	2-3/4
GM153032	1/2	1/2	1	3
GM153040	5/8	5/8	1-1/4	3-1/2
GM153048	3/4	3/4	1-1/2	4
GM153064	1	1	1-1/2	4

Mill Dia. Tolerance(inch)	Shank Dia. Tolerance
0 ~ -.0012	0 ~ -.0003

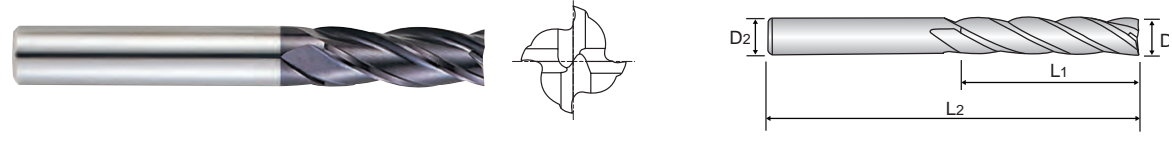
ISO Material Description	P										M			K																											
	Non-alloy steel					Low alloy steel					High alloyed steel, and tool steel			Stainless steel			Grey cast iron			Nodular cast iron			Malleable cast iron																		
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc	13	25	28	32	30	10	29	32	38	15	35	15	23	10	10	26	3	25	130	21	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230	
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230	
Recommend	○	○	◎	◎	◎	○	◎	◎	◎	◎	○	○	○	○	○	○	○	○	○	○	○	○	◎	◎	◎	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	



PLAIN SHANK GM207 SERIES

CARBIDE, 4 FLUTE LONG LENGTH

- ▶ Designed to machine tool steel, alloy steel, mold steel and other high hardened materials.
- ▶ 4 flute allows for better workpiece finishes.
- ▶ Increased production.



EDP No.	Mill Diameter	Shank Diameter	Length of Cut	Overall Length
	D1	D2	L1	L2
GM207008	1/8	1/8	3/4	2-1/4
GM207012	3/16	3/16	3/4	2-1/2
GM207016	1/4	1/4	1-1/8	3
GM207020	5/16	5/16	1-1/8	3
GM207024	3/8	3/8	1-1/8	3
GM207032	1/2	1/2	2	4
GM207040	5/8	5/8	2-1/4	5
GM207048	3/4	3/4	2-1/4	5
GM207064	1	1	2-1/4	5

Mill Dia. Tolerance(inch)	Shank Dia. Tolerance
0 ~ -.0012	0 ~ -.0003

ISO Material Description	P										M			K																											
	Non-alloy steel					Low alloy steel					High alloyed steel, and tool steel			Stainless steel			Grey cast iron			Nodular cast iron			Malleable cast iron																		
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc	13	25	28	32	30	10	29	32	38	15	35	15	23	10	10	26	3	25	130	21	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230	
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230	
Recommend	○	○	◎	◎	◎	○	◎	◎	◎	◎	○	○	○	○	○	○	○	○	○	○	○	○	◎	◎	◎	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	





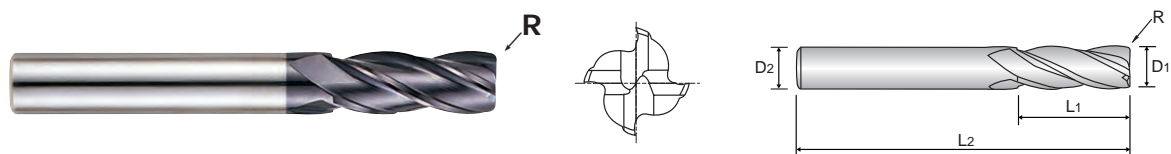
PLAIN SHANK **GM639** SERIES



PLAIN SHANK **GM649** SERIES

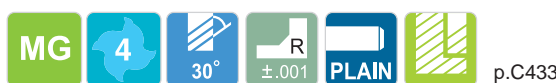
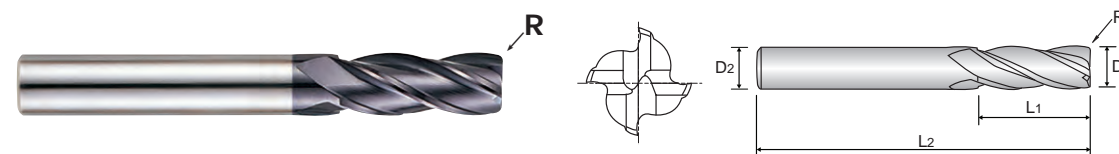
### CARBIDE, 4 FLUTE STUB LENGTH CORNER RADIUS

- Designed to machine tool steel, alloy steel, mold steel and other high hardened materials.
- Superior workpiece finishes.
- Increased feed rate.



### CARBIDE, 4 FLUTE REGULAR LENGTH CORNER RADIUS

- Designed to machine tool steel, alloy steel, mold steel and other high hardened materials.
- Superior workpiece finishes.
- Increased feed rate.



EDP No.	Corner Radius	Mill Diameter	Shank Diameter	Length of Cut	Overall Length
	R (±.001)	D1	D2	L1	L2
<b>GM639004</b>	R.008	<b>1/16</b>	1/4	1/8	2-1/4
<b>GM639008</b>	R.01	<b>1/8</b>	1/4	1/4	2-1/4
<b>GM639901</b>	R.02	<b>1/8</b>	1/4	1/4	2-1/4
<b>GM639012</b>	R.01	<b>3/16</b>	1/4	3/8	2-1/2
<b>GM639903</b>	R.02	<b>3/16</b>	1/4	3/8	2-1/2
<b>GM639904</b>	R.03	<b>3/16</b>	1/4	3/8	2-1/2
<b>GM639016</b>	R.01	<b>1/4</b>	1/4	1/2	3
<b>GM639905</b>	R.02	<b>1/4</b>	1/4	1/2	3
<b>GM639906</b>	R.03	<b>1/4</b>	1/4	1/2	3
<b>GM639020</b>	R.02	<b>5/16</b>	5/16	1/2	3
<b>GM639907</b>	R.03	<b>5/16</b>	5/16	1/2	3
<b>GM639908</b>	R.06	<b>5/16</b>	5/16	1/2	3
<b>GM639024</b>	R.02	<b>3/8</b>	3/8	5/8	3
<b>GM639910</b>	R.03	<b>3/8</b>	3/8	5/8	3
<b>GM639911</b>	R.06	<b>3/8</b>	3/8	5/8	3
<b>GM639912</b>	R.09	<b>3/8</b>	3/8	5/8	3
<b>GM639032</b>	R.02	<b>1/2</b>	1/2	5/8	4
<b>GM639913</b>	R.03	<b>1/2</b>	1/2	5/8	4
<b>GM639914</b>	R.06	<b>1/2</b>	1/2	5/8	4
<b>GM639915</b>	R.09	<b>1/2</b>	1/2	5/8	4

EDP No.	Corner Radius	Mill Diameter	Shank Diameter	Length of Cut	Overall Length
	R (±.001)	D1	D2	L1	L2
<b>GM649004</b>	R.008	<b>1/16</b>	1/4	3/16	2-1/4
<b>GM649008</b>	R.01	<b>1/8</b>	1/4	1/2	2-1/4
<b>GM649901</b>	R.02	<b>1/8</b>	1/4	1/2	2-1/4
<b>GM649012</b>	R.01	<b>3/16</b>	1/4	5/8	2-1/2
<b>GM649903</b>	R.02	<b>3/16</b>	1/4	5/8	2-1/2
<b>GM649904</b>	R.03	<b>3/16</b>	1/4	5/8	2-1/2
<b>GM649016</b>	R.01	<b>1/4</b>	1/4	3/4	3
<b>GM649905</b>	R.02	<b>1/4</b>	1/4	3/4	3
<b>GM649906</b>	R.03	<b>1/4</b>	1/4	3/4	3
<b>GM649020</b>	R.02	<b>5/16</b>	5/16	13/16	3
<b>GM649907</b>	R.03	<b>5/16</b>	5/16	13/16	3
<b>GM649908</b>	R.06	<b>5/16</b>	5/16	13/16	3
<b>GM649024</b>	R.02	<b>3/8</b>	3/8	1	3
<b>GM649910</b>	R.03	<b>3/8</b>	3/8	1	3
<b>GM649911</b>	R.06	<b>3/8</b>	3/8	1	3
<b>GM649912</b>	R.09	<b>3/8</b>	3/8	1	3
<b>GM649028</b>	R.02	<b>7/16</b>	7/16	1	4
<b>GM649916</b>	R.03	<b>7/16</b>	7/16	1	4
<b>GM649917</b>	R.06	<b>7/16</b>	7/16	1	4
<b>GM649032</b>	R.02	<b>1/2</b>	1/2	1	4
<b>GM649913</b>	R.03	<b>1/2</b>	1/2	1	4
<b>GM649914</b>	R.06	<b>1/2</b>	1/2	1	4
<b>GM649915</b>	R.09	<b>1/2</b>	1/2	1	4

Mill Dia. Tolerance (inch)	Shank Dia. Tolerance
0 ~ -.0012	0 ~ -.0003

Mill Dia. Tolerance (inch)	Shank Dia. Tolerance
0 ~ -.0012	0 ~ -.0003

◎ : Excellent ○ : Good

ISO Material Description	P											M			K						
	Non-alloy steel					Low alloy steel						High alloyed steel, and tool steel			Stainless steel			Grey cast iron		Nodular cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
HRc																					
HB	125	190	250	278	300	180	297	320	350	200	325	200	240	180	10	26	3	25	130	21	
Recommend	○	○	◎	◎	◎	○	◎	◎	◎	○	◎										

ISO Material Description	N										S						H					
	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)					Non Metallic Materials		Heat Resistant Super Alloys				Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron	
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	
HRc																						
HB	60	100	75	90	130	110	90	100			15	30	25	38	34	400 Rm	1050 Rm	55	60	42	55	
Recommend																				○	◎	○

◎ : Excellent ○ : Good

ISO Material Description	P											M			K						
	Non-alloy steel					Low alloy steel						High alloyed steel, and tool steel			Stainless steel			Grey cast iron		Nodular cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
HRc																					
HB	125	190	250	270	300	180	297	320	350	200	325	200	240	180	10	26	3	25	130	21	
Recommend	○	○	◎	◎	◎	○	◎	◎	◎	○	◎										

ISO Material Description	N										S						H					
	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)					Non Metallic Materials		Heat Resistant Super Alloys				Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron	
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	
HRc																						
HB	60	100	75	90	130	110	90	100			15	30	25	38	34	400 Rm	1050 Rm	55	60	42	55	
Recommend																				○	◎	○

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PLAIN SHANK GM212 SERIES



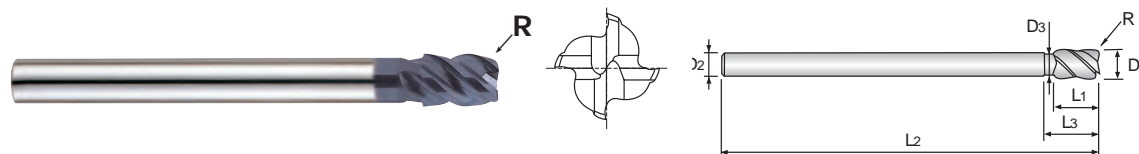
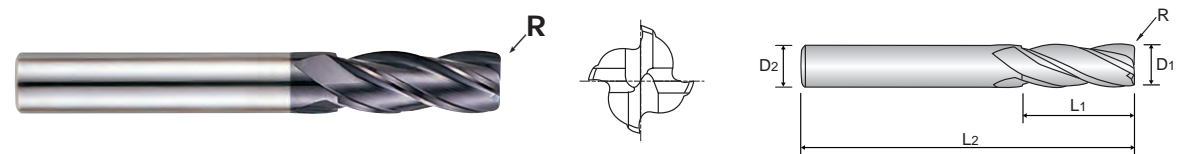
PLAIN SHANK GM103 SERIES

### CARBIDE, 4 FLUTE CORNER RADIUS LONG LENGTH

- ▶ Designed to machine tool steel, alloy steel, mold steel and other high hardened materials.
- ▶ Superior workpiece finishes.
- ▶ Increased feed rate.

### CARBIDE, 4 FLUTE 45° HELIX LONG REACH CORNER RADIUS

- ▶ Designed to machine tool steel, alloy steel, mold steel and other high hardened materials.
- ▶ Superior workpiece finishes.
- ▶ Increased feed rate.



EDP No.	Corner Radius	Mill Diameter	Shank Diameter	Length of Cut	Overall Length
	R (±.001)	D1	D2	L1	L2
GM212016	R.02	1/4	1/4	1-1/8	3
GM212901	R.03	1/4	1/4	1-1/8	3
GM212020	R.02	5/16	5/16	1-1/8	3
GM212902	R.03	5/16	5/16	1-1/8	3
GM212903	R.06	5/16	5/16	1-1/8	3
GM212024	R.02	3/8	3/8	1-1/8	3
GM212905	R.03	3/8	3/8	1-1/8	3
GM212906	R.06	3/8	3/8	1-1/8	3
GM212032	R.02	1/2	1/2	2	4
GM212908	R.03	1/2	1/2	2	4
GM212909	R.06	1/2	1/2	2	4
GM212910	R.09	1/2	1/2	2	4

EDP No.	Corner Radius	Mill Diameter	Shank Diameter	Length of Cut	Length Below Shank	Overall Length
	R (±.001)	D1	D2	L1	L3	L2
GM103024	R.02	3/8	5/16	5/8	3/4	5
GM103901	R.04	3/8	5/16	5/8	3/4	5
GM103032	R.02	1/2	3/8	3/4	7/8	6
GM103902	R.04	1/2	3/8	3/4	7/8	6
GM103040	R.02	5/8	1/2	7/8	1	6-1/2
GM103903	R.04	5/8	1/2	7/8	1	6-1/2
GM103048	R.02	3/4	5/8	1	1-1/8	7
GM103904	R.04	3/4	5/8	1	1-1/8	7
GM103056	R.02	7/8	3/4	1-1/4	1-3/8	8

Mill Dia. Tolerance (inch)	Shank Dia. Tolerance
0 ~ -.0012	0 ~ -.0003

Mill Dia. Tolerance (inch)	Shank Dia. Tolerance
0 ~ -.0012	0 ~ -.0003

ISO Material Description	P										M			K							
	Non-alloy steel					Low alloy steel					High alloyed steel, and tool steel			Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
HRc	13	25	28	32	32	10	29	32	38	15	35	15	23	10	18	26	3	25	19	21	
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230	
Recommend	○	○	◎	◎	◎	○	◎	◎	◎	○	◎	○	○	○	○	○	○	○	○	○	

ISO Material Description	N										S						H				
	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys						Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc	60	100	75	90	130	110	90	100			15	30	25	38	34	400 Rm	1050 Rm	55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○

ISO Material Description	P										M			K							
	Non-alloy steel					Low alloy steel					High alloyed steel, and tool steel			Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
HRc	13	25	28	32	32	10	29	32	38	15	35	15	23	10	18	26	3	25	19	21	
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230	
Recommend	○	○	◎	◎	◎	○	◎	◎	◎	○	◎	○	○	○	○	○	○	○	○	○	

ISO Material Description	N										S						H				
	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys						Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc	60	100	75	90	130	110	90	100			15	30	25	38	34	400 Rm	1050 Rm	55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○

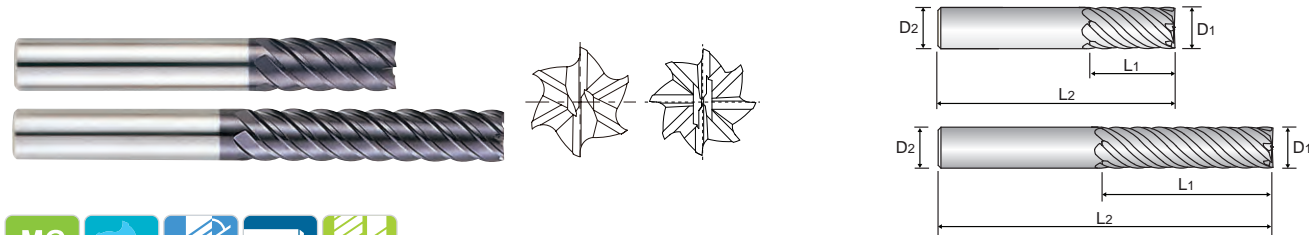
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LONG LENGTH PLAIN SHANK GM208 SERIES  
EXTRA LONG LENGTH PLAIN SHANK GM218 SERIES

CARBIDE, 6&8 FLUTE 45° HELIX LONG LENGTH & EXTRA LONG LENGTH

- ▶ Designed to machine high hardened materials.
- ▶ High speed cutting and finish milling with high feed rate.
- ▶ Superior workpiece finishes.
- ▶ Superior wear resistant.
- ▶ Suitable for dry milling.
- ▶ Corner Protection against chipping.



GM208 series - LONG LENGTH

Unit : inch

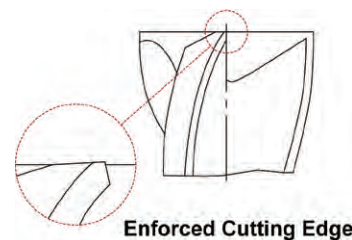
EDP No.	Mill Diameter	Shank Diameter	Length of Cut	Overall Length	No. of Flute
	D1	D2	L1	L2	
GM208016	1/4	1/4	1/2	2-1/4	6
GM208020	5/16	5/16	3/4	2-1/2	6
GM208024	3/8	3/8	7/8	2-7/8	6
GM208032	1/2	1/2	1	3-1/4	6
GM208040	5/8	5/8	1-1/4	3-5/8	6
GM208048	3/4	3/4	1-1/2	4-1/8	8
GM208064	1	1	1-3/4	4-1/4	8

GM218 series - EXTRA LONG LENGTH

Unit : inch

EDP No.	Mill Diameter	Shank Diameter	Length of Cut	Overall Length	No. of Flute
	D1	D2	L1	L2	
GM218016	1/4	1/4	1	2-3/4	6
GM218020	5/16	5/16	1-1/2	3-5/8	6
GM218024	3/8	3/8	1-3/4	4	6
GM218032	1/2	1/2	2-3/16	4-3/8	6
GM218040	5/8	5/8	2-5/8	5-1/8	6
GM218048	3/4	3/4	2-1/4	5	8
GM218901	3/4	3/4	3-1/4	6	8
GM218902	3/4	3/4	4-1/8	7	8
GM218064	1	1	4-1/8	7	8

Mill Dia. Tolerance(inch)	Shank Dia. Tolerance
0 ~ -.0012	0 ~ -.0003



Enforced Cutting Edge

◎ : Excellent ○ : Good

ISO Material Description	P											M			K						
	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron		
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
HRc	13	25	28	32	36	10	29	32	38	15	35	15	23	10	10	26	3	25	15	21	
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230	
Recommend	○	○	◎	◎	◎	○	◎	◎	◎	○	◎	○	○	○	○	○	○	○	○	○	○

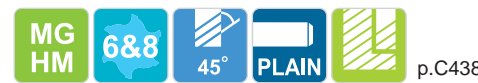
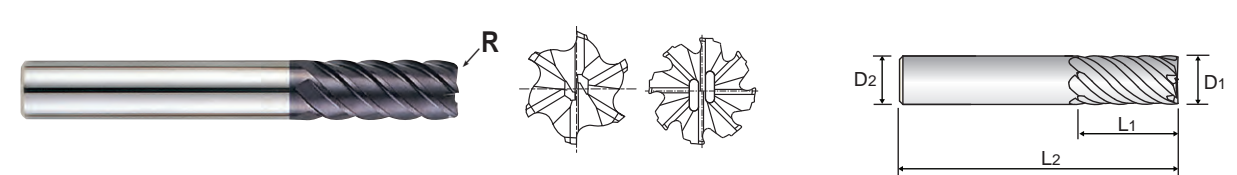
ISO Material Description	N					S						H										
	Aluminum-wrought alloy		Aluminum-cast, alloyed		Copper and Copper Alloys (Bronze / Brass)		Non Metallic Materials		Heat Resistant Super Alloys			Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron						
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	
HRc	60	100	75	90	130	110	90	100			15	30	25	38	34			55	60	42	55	
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550	
Recommend	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○



PLAIN SHANK GM668 SERIES

CARBIDE, 6&8 FLUTE 45° HELIX LONG LENGTH CORNER RADIUS

- ▶ Designed to machine high hardened materials.
- ▶ High speed cutting and finish milling with high feed rate.
- ▶ Superior workpiece finishes.
- ▶ Superior wear resistant.
- ▶ Suitable for dry milling.
- ▶ Corner Protection against chipping.



Unit : inch

EDP No.	Corner Radius	Mill Diameter	Shank Diameter	Length of Cut	Length Below Shank	Overall Length
	R	D1	D2	L1	L3	L2
GM668016	R.02	1/4	1/4	1/2	2-1/4	6
GM668020	R.02	5/16	5/16	3/4	2-1/2	6
GM668024	R.02	3/8	3/8	7/8	2-7/8	6
GM668032	R.02	1/2	1/2	1	3-1/4	6
GM668040	R.03	5/8	5/8	1-1/4	3-5/8	6
GM668048	R.03	3/4	3/4	1-1/2	4-1/8	8
GM668901	R.03	3/8	3/8	7/8	2-7/8	6
GM668902	R.03	1/2	1/2	1	3-1/4	6
GM668904	R.06	3/4	3/4	1-1/2	4-1/8	8

Mill Dia. Tolerance(inch)	Shank Dia. Tolerance
0 ~ -.0012	0 ~ -.0003

ISO Material Description	P											M			K						
	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron		
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
HRc	13	25	28	32	36	10	29	32	38	15	35	15	23	10	10	26	3	25	15	21	
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230	
Recommend	○	○	◎	◎	◎	○	◎	◎	◎	○	◎	○	○	○	○	○	○	○	○	○	○

ISO Material Description	N					S						H										
	Aluminum-wrought alloy		Aluminum-cast, alloyed		Copper and Copper Alloys (Bronze / Brass)		Non Metallic Materials		Heat Resistant Super Alloys			Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron						
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	
HRc	60	100	75	90	130	110	90	100			15	30	25	38	34			55	60	42	55	
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550	
Recommend	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○

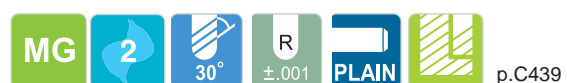
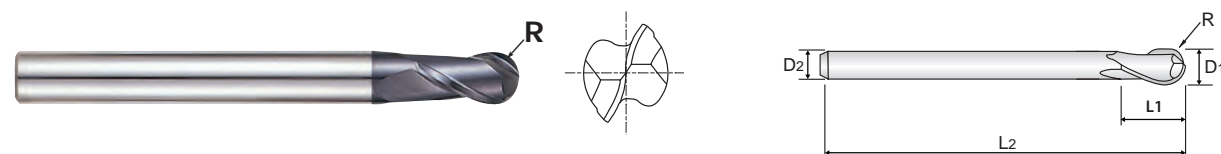




PLAIN SHANK GM209 SERIES

CARBIDE, 2 FLUTE LONG LENGTH BALL NOSE

- ▶ Designed to machine tool steel, alloy steel, mold steel and other high hardened materials.
- ▶ For copy-milling machines.



EDP No.	Radius of Ball Nose	Mill Diameter	Shank Diameter	Length of Cut	Overall Length
	R(±.001)	D1	D2	L1	L2
<b>GM209901</b>	R 1/64	1/32	1/4	1/32	2-1/2
<b>GM209902</b>	R 1/32	1/16	1/4	1/16	2-1/2
<b>GM209903</b>	R 3/64	3/32	1/4	3/32	2-1/2
<b>GM209008</b>	R 1/16	1/8	1/8	5/16	2-3/8
<b>GM209012</b>	R 3/32	3/16	3/16	3/8	3-1/8
<b>GM209016</b>	R 1/8	1/4	1/4	1/2	3-1/2
<b>GM209020</b>	R 5/32	5/16	5/16	9/16	4
<b>GM209024</b>	R 3/16	3/8	3/8	3/4	4
<b>GM209032</b>	R 1/4	1/2	1/2	7/8	4-1/4
<b>GM209048</b>	R 3/8	3/4	3/4	1-1/2	6-1/4

Mill Dia. Tolerance(inch)	Shank Dia. Tolerance
0 ~ -.0012	0 ~ -.0003

ISO Material Description	P											M			K							
	Non-alloy steel					Low alloy steel						High alloyed steel, and tool steel			Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20		
HRc	13	19	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25	13	21		
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230		
Recommend	○	○	◎	◎	◎	○	◎	◎	◎	○	◎	○	○	○	○	○	○	○	○	○	○	

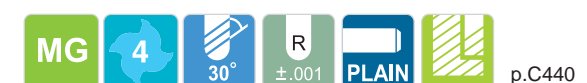
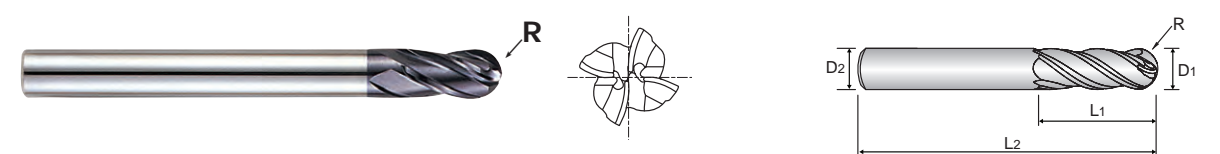
ISO Material Description	N										S						H				
	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys						Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc	60	100	75	90	130	110	90	100			15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend																		○	◎	◎	○



PLAIN SHANK GM210 SERIES

CARBIDE, 4 FLUTE LONG LENGTH BALL NOSE

- ▶ Designed to machine tool steels, alloy steels, mold steels and other high hardened materials.
- ▶ For copy - milling machines.
- ▶ 4 Flute design - higher feed than GM209 series



EDP No.	Radius of Ball Nose	Mill Diameter	Shank Diameter	Length of Cut	Overall Length
	R(±.001)	D1	D2	L1	L2
<b>GM210008</b>	R1/16	1/8	1/8	5/16	2-3/8
<b>GM210012</b>	R3/32	3/16	3/16	3/8	3-1/8
<b>GM210016</b>	R1/8	1/4	1/4	1/2	3-1/2
<b>GM210020</b>	R5/32	5/16	5/16	9/16	4
<b>GM210024</b>	R3/16	3/8	3/8	3/4	4
<b>GM210032</b>	R1/4	1/2	1/2	7/8	4-1/4
<b>GM210040</b>	R5/16	5/8	5/8	1-1/4	5-1/2
<b>GM210048</b>	R3/8	3/4	3/4	1-1/2	6-1/4

Mill Dia. Tolerance(inch)	Shank Dia. Tolerance
0 ~ -.0012	0 ~ -.0003

ISO Material Description	P											M			K							
	Non-alloy steel					Low alloy steel						High alloyed steel, and tool steel			Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20		
HRc	13	19	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25	13	21		
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230		
Recommend	○	○	◎	◎	◎	○	◎	◎	◎	○	◎	○	○	○	○	○	○	○	○	○	○	

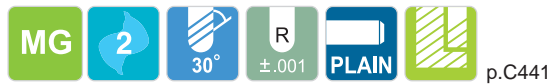
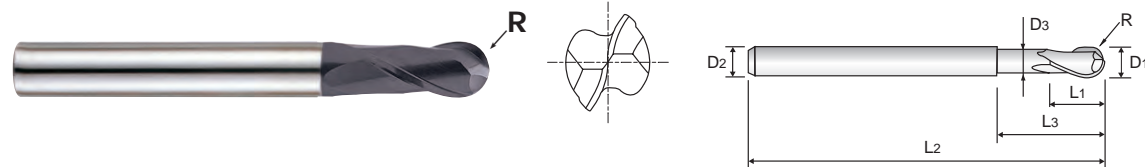
ISO Material Description	N										S						H				
	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys						Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc	60	100	75	90	130	110	90	100			15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend																		○	◎	◎	○



PLAIN SHANK GM961 SERIES

**CARBIDE, 2 FLUTE MEDIUM LENGTH BALL NOSE**

- ▶ Deep slotting milling is possible by reduced neck.
- ▶ High efficiency milling is possible in deep slotting with projection of the end mill being long.



EDP No.	Radius of Ball Nose	Mill Diameter	Shank Diameter	Length of Cut	Length Below Shank	Overall Length	Neck Diameter
	R (±.001)	D1	D2	L1	L3	L2	D3
<b>GM961008</b>	R1/16	1/8	1/4	5/16	-	2-3/4	-
<b>GM961012</b>	R3/32	3/16	1/4	1/2	-	3-1/8	-
<b>GM961016</b>	R1/8	1/4	1/4	1/2	7/8	3-1/8	.242
<b>GM961020</b>	R5/32	5/16	5/16	9/16	1-1/16	3-1/2	.305
<b>GM961024</b>	R3/16	3/8	3/8	3/4	1-1/4	4	.367
<b>GM961032</b>	R1/4	1/2	1/2	7/8	1-3/8	4-1/4	.492
<b>GM961064</b>	R1/2	1	1	2-1/8	3	7	.992

Mill Dia. Tolerance (inch)	Shank Dia. Tolerance
0 ~ -.0012	0 ~ -.0003

⊙ : Excellent ○ : Good

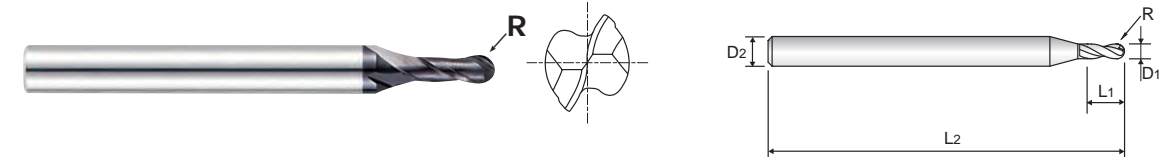
ISO Material Description	P											M			K						
	Non-alloy steel					Low alloy steel						High alloyed steel, and tool steel			Stainless steel			Grey cast iron	Nodular cast iron	Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
HRc	13	25	28	32	30	10	29	32	38	15	35	15	23	10	10	26	3	25	15	21	
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230	
Recommend	○	○	⊙	⊙	⊙	○	⊙	⊙	⊙	○	⊙										
ISO Material Description	N					S							H								
	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron	
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc	60	100	75	90	130	110	90	100			15	30	25	38	34	400 Rm	1050 Rm	55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend																		○	⊙	○	



PLAIN SHANK GM960 SERIES

**CARBIDE, 2 FLUTE MINIATURE BALL NOSE**

- ▶ High precision milling in medical, optical, electronics and aerospace industrial.
- ▶ Excellent performance at dry cutting condition.
- ▶ Excellent performance on high hardened steel up to HRC70.



EDP No.	Radius of Ball Nose	Mill Diameter	Shank Diameter	Length of Cut	Overall Length
	R (±.0005)	D1	D2	L1	L2
<b>GM960924</b>	R.0120	.024	1/8	.043	2-3/4
<b>GM960931</b>	R.0155	.031	1/8	.08	3-1/8
<b>GM960940</b>	R.0200	.040	1/8	.1	3-1/8
<b>GM960943</b>	R.0215	.043	1/8	.118	3-1/2
<b>GM960947</b>	R.0235	.047	1/8	.118	4
<b>GM960952</b>	R.0260	.052	1/8	.138	4-1/4
<b>GM960955</b>	R.0275	.055	1/8	.138	7
<b>GM960962</b>	R.0310	.062	1/8	.157	6-1/4

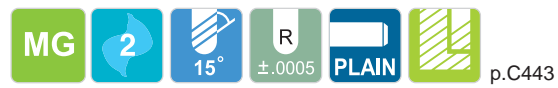
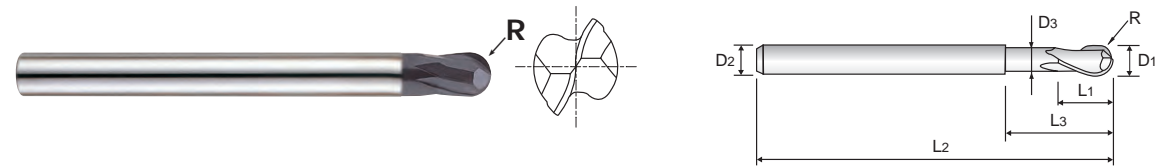
Mill Dia. Tolerance (inch)	Shank Dia. Tolerance
0 ~ -.0010	0 ~ -.0003

⊙ : Excellent ○ : Good

ISO Material Description	P											M			K						
	Non-alloy steel					Low alloy steel						High alloyed steel, and tool steel			Stainless steel			Grey cast iron	Nodular cast iron	Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
HRc	13	25	28	32	30	10	29	32	38	15	35	15	23	10	10	26	3	25	15	21	
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230	
Recommend												⊙									
ISO Material Description	N					S							H								
	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron	
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc	60	100	75	90	130	110	90	100			15	30	25	38	34	400 Rm	1050 Rm	55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend																		○	⊙	○	

**CARBIDE, 2 FLUTE 15° HELIX STUB CUT LENGTH BALL NOSE**

- ▶ Deep slotting milling is possible by reduced neck.
- ▶ High efficiency milling is possible in deep slotting with projection of the end mill being long.



Unit : inch

EDP No.	Radius of Ball Nose	Mill Diameter	Shank Diameter	Length of Cut	Length Below Shank	Overall Length	Neck Diameter
	R (±.0005)	D1	D2	L1	L3	L2	D3
<b>GM109002</b>	R1/64	1/32	1/4	1/32	1/16	2	.029
<b>GM109004</b>	R1/32	1/16	1/4	1/16	1/8	2	.059
<b>GM109006</b>	R3/64	3/32	1/4	3/32	3/16	2	.090
<b>GM109008</b>	R1/16	1/8	1/4	1/8	1/4	2-1/2	.121
<b>GM109012</b>	R3/32	3/16	1/4	3/16	3/8	3	.184
<b>GM109016</b>	R1/8	1/4	1/4	1/4	1/2	3-1/2	.246
<b>GM109020</b>	R5/32	5/16	5/16	5/16	5/8	4	.309
<b>GM109024</b>	R3/16	3/8	3/8	3/8	3/4	4	.371
<b>GM109032</b>	R1/4	1/2	1/2	1/2	1	4-1/2	.496

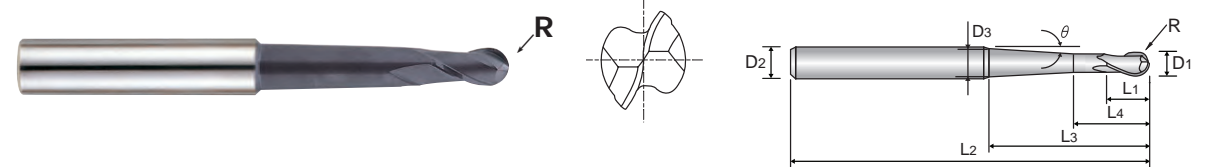
Mill Dia. Tolerance(inch)	Shank Dia. Tolerance
0 ~ -.0012	0 ~ -.0003

◎ : Excellent ○ : Good

ISO Material Description	P										M			K																																
	Non-alloy steel					Low alloy steel					High alloyed steel, and tool steel			Stainless steel			Grey cast iron			Nodular cast iron			Malleable cast iron																							
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41					
HRc	13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25	15	21	125	190	250	270	300	180	275	300	350	200	200	240	180	180	260	160	250	130	230	130	210	130	210	130	210		
HB	125	190	250	270	300	180	275	300	350	200	200	240	180	180	260	160	250	130	230	125	190	250	270	300	180	275	300	350	200	200	240	180	180	260	160	250	130	230	130	210	130	210	130	210		
Recommend	○	○	◎	◎	◎	○	◎	◎	◎	◎	○	◎	◎	○	◎	◎	◎	◎	◎	○	○	◎	◎	◎	○	◎	◎	◎	◎	○	◎	◎	◎	◎	○	◎	◎	◎	◎	◎	○	◎	◎	◎	◎	◎

**CARBIDE, 2 FLUTE BALL NOSE with TAPER NECK**

- ▶ High efficiency milling in deep slotting due to long projection of the end mills.



Unit : inch

EDP No.	Radius of Ball Nose	Mill Diameter	Shank Diameter	Length of Cut	Under Neck Parallel Length	Length Below Shank	Overall Length	Neck Diameter	Taper Neck Angle
	R (±.0005)	D1	D2	L1	L4	L3	L2	D3	θ
<b>GM963004</b>	R1/32	1/16	1/4	5/32	15/64	7/8	2-3/8	.096	1° 30'
<b>GM963901</b>	R1/32	1/16	1/4	5/32	15/64	1-5/8	3-1/8	.208	3°
<b>GM963008</b>	R1/16	1/8	1/4	1/4	21/64	2-1/16	3-5/8	.216	1° 30'
<b>GM963012</b>	R3/32	3/16	3/8	3/8	29/64	2-3/8	4-3/8	.288	1° 30'
<b>GM963016</b>	R1/8	1/4	3/8	1/2	5/8	2-1/16	4-3/8	.325	1° 30'
<b>GM963020</b>	R5/32	5/16	1/2	9/16	11/16	2-1/16	4-3/4	.385	1° 30'
<b>GM963024</b>	R3/16	3/8	1/2	11/16	13/16	2-3/8	5-1/16	.458	1° 30'

Mill Dia. Tolerance(inch)	Shank Dia. Tolerance
0 ~ -.0012	0 ~ -.0003

◎ : Excellent ○ : Good

ISO Material Description	P										M			K																																
	Non-alloy steel					Low alloy steel					High alloyed steel, and tool steel			Stainless steel			Grey cast iron			Nodular cast iron			Malleable cast iron																							
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41					
HRc	13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25	15	21	125	190	250	270	300	180	275	300	350	200	200	240	180	180	260	160	250	130	230	130	210	130	210	130	210		
HB	125	190	250	270	300	180	275	300	350	200	200	240	180	180	260	160	250	130	230	125	190	250	270	300	180	275	300	350	200	200	240	180	180	260	160	250	130	230	130	210	130	210	130	210		
Recommend	○	○	◎	◎	◎	○	◎	◎	◎	◎	○	◎	◎	○	◎	◎	◎	◎	◎	○	○	◎	◎	◎	○	◎	◎	◎	◎	○	◎	◎	◎	◎	○	◎	◎	◎	◎	◎	○	◎	◎	◎	◎	◎



HSS

HSS

CBN END MILLS

CBN END MILLS

i-Xmill END MILLS

i-Xmill END MILLS

i-SMART MODULAR END MILLS

i-SMART MODULAR END MILLS

X5070 END MILLS

X5070 END MILLS

4G MILL END MILLS

4G MILL END MILLS

X-POWER PRO END MILLS

X-POWER PRO END MILLS

TitaNox-POWER END MILLS

TitaNox-POWER END MILLS

JET-POWER END MILLS

JET-POWER END MILLS

V7 PLUS A END MILLS

V7 PLUS A END MILLS

V7 MILL INOX

V7 MILL INOX

ALU-POWER HPC END MILLS

ALU-POWER HPC END MILLS

ALU-POWER END MILLS

ALU-POWER END MILLS

D-POWER GRAPHITE END MILLS

D-POWER GRAPHITE END MILLS

STANDARD CARBIDE

STANDARD CARBIDE

ONLY ONE COATED PM60 END MILLS

ONLY ONE COATED PM60 END MILLS

SINE-POWER

SINE-POWER

TANK-POWER END MILLS

TANK-POWER END MILLS

STANDARD COBALT & HSS

STANDARD COBALT & HSS

TECHNICAL DATA

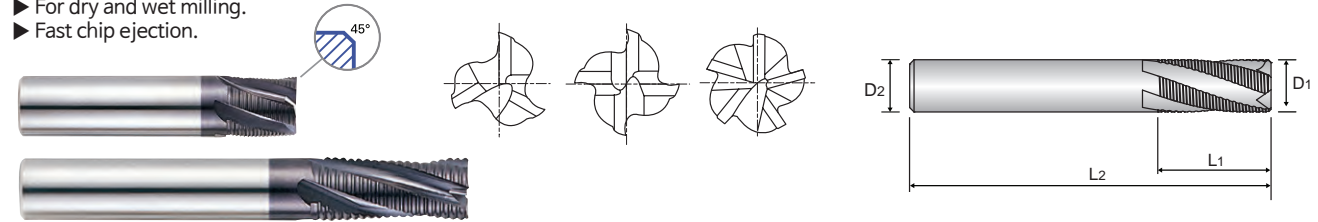
TECHNICAL DATA



STUB LENGTH PLAIN SHANK GM666 SERIES  
LONG LENGTH PLAIN SHANK GM156 SERIES

CARBIDE, MULTI FLUTE 20° HELIX STUB & LONG LENGTH FINE PITCH ROUGHING

- Designed to machine tool steel, alloy steel, mold steel and other high hardened materials.
- High velocity milling of hardened steels.
- For dry and wet milling.
- Fast chip ejection.



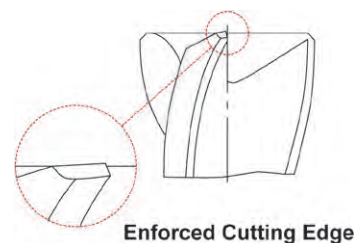
GM666 series - STUB LENGTH Unit : inch

EDP No.	Mill Diameter D1	Shank Diameter D2	Length of Cut L1	Overall Length L2	No. of Flute	Chamfer
GM666016	1/4	1/4	5/16	2-1/8	3	.015
GM666020	5/16	5/16	3/8	2-1/4	3	.015
GM666024	3/8	3/8	9/16	2-1/2	3	.015
GM666032	1/2	1/2	5/8	3	4	.024
GM666040	5/8	5/8	7/8	3-1/4	4	.024
GM666048	3/4	3/4	1	3-3/4	4	.024
GM666064	1	1	1	4	5	.024

GM156 series - LONG LENGTH Unit : inch

EDP No.	Mill Diameter D1	Shank Diameter D2	Length of Cut L1	Overall Length L2	No. of Flute	Chamfer
GM156016	1/4	1/4	3/4	2-1/2	3	.015
GM156020	5/16	5/16	3/4	2-1/2	3	.015
GM156024	3/8	3/8	7/8	2-1/2	3	.015
GM156032	1/2	1/2	1	3	4	.024
GM156040	5/8	5/8	1-1/4	3-1/2	4	.024
GM156048	3/4	3/4	1-5/8	4	4	.024
GM156064	1	1	1-3/4	4	5	.024

Mill Dia. (inch)	Mill Dia. Tolerance (inch)	Shank Dia. Tolerance
1/4-3/8	0 ~ -.0022	0 ~ -.0003
1/2-5/8	0 ~ -.0027	
3/4-1	0 ~ -.0033	



◎ : Excellent ○ : Good

ISO Material Description	P										M			K							
	Non-alloy steel					Low alloy steel					High alloyed steel, and tool steel			Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
HRc	13	25	28	32	30	29	32	38	35	35	15	23	10	10	26	3	25	3	25	21	
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	260	160	250	130	230		
Recommend	○	○	◎	◎	◎	○	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎

ISO Material Description	N										S						H				
	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys						Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HB	60	100	75	90	130	110	90	100			15	30	25	38	34	400 Rm	1050 Rm	55	60	42	55
Recommend	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○



PLAIN SHANK GM967 SERIES

CARBIDE, 2 FLUTE BALL NOSE for RIB PROCESSING

- For 3-D milling, deep slotting and pocketing.
- For depths of 6 to 10X cutting diameter.
- Machine carbon steel, alloy steel, tool steel, die and mold steels.
- Suitable for high speed cutting and high precision machining.
- Designed with reinforced shank for higher stability and rigidity.
- Long neck design for deep machining near walls.



GM967 series - BALL NOSE Unit : inch

EDP No.	Radius of Ball Nose R (±.0005)	Mill Diameter D1	Shank Diameter D2	Length of Cut L1	Length Below Shank L3	Overall Length L2	Neck Diameter D3
GM967002	R1/64	1/32	1/8	3/64	7/32	2	.029
GM967901	R1/64	1/32	1/8	3/64	5/16	2	.029
GM967003	R.0234	3/64	1/8	1/16	7/32	2	.045
GM967902	R.0234	3/64	1/8	1/16	9/32	2	.045
GM967903	R.0234	3/64	1/8	1/16	1/2	2	.045
GM967004	R1/32	1/16	1/8	3/32	5/16	2	.060
GM967904	R1/32	1/16	1/8	3/32	1/2	2	.060
GM967905	R1/32	1/16	1/8	3/32	5/8	2	.060
GM967005	R.0391	5/64	1/8	1/8	5/16	2	.076
GM967906	R.0391	5/64	1/8	1/8	5/8	2	.076
GM967907	R.0391	5/64	1/8	1/8	3/4	2	.076
GM967006	R3/64	3/32	1/8	9/64	5/8	2	.090
GM967908	R3/64	3/32	1/8	9/64	3/4	2	.090
GM967008	R1/16	1/8	1/4	3/16	5/8	2-1/4	.120
GM967909	R1/16	1/8	1/4	3/16	3/4	2-1/4	.120

Mill Dia. Tolerance (inch)	Shank Dia. Tolerance
0 ~ -.0006	0 ~ -.0003

ISO Material Description	P										M			K							
	Non-alloy steel					Low alloy steel					High alloyed steel, and tool steel			Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
HRc	13	25	28	32	30	29	32	38	35	35	15	23	10	10	26	3	25	3	25	21	
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	260	160	250	130	230		
Recommend	○	○	◎	◎	◎	○	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎

ISO Material Description	N										S						H				
	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys						Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HB	60	100	75	90	130	110	90	100			15	30	25	38	34	400 Rm	1050 Rm	55	60	42	55
Recommend	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○

HSS

HSS



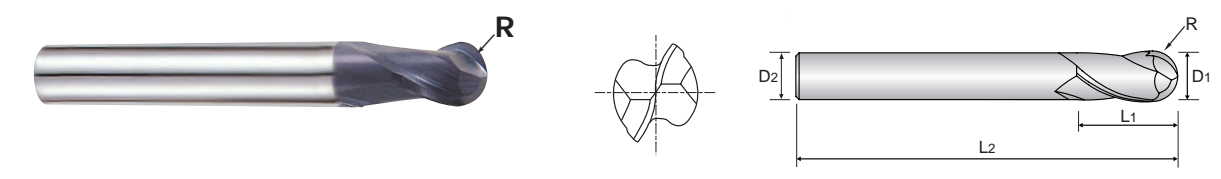
PLAIN SHANK GM876 SERIES



PLAIN SHANK GM813 SERIES

**CARBIDE, 2 FLUTE SHORT LENGTH BALL NOSE**

- ▶ Economic type with short overall length
- ▶ Radius tolerance ±0.02mm & short length of cut



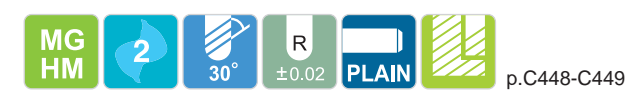
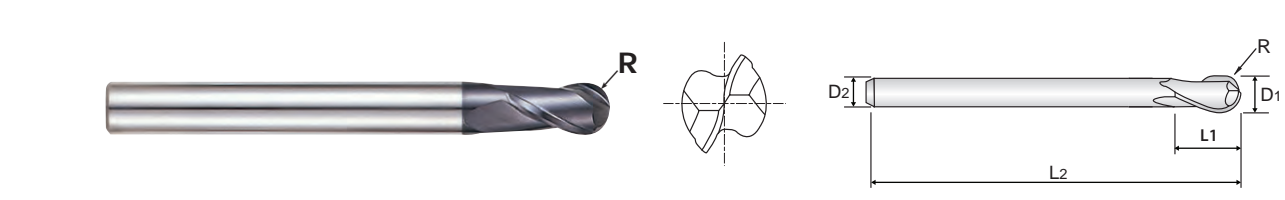
EDP No.	Radius of Ball Nose	Mill Diameter	Shank Diameter	Length of Cut	Overall Length
	R(±0.02)	D1	D2	L1	L2
<b>GM876010</b>	R0.5	1.0	3	3	38
<b>GM876020</b>	R1.0	2.0	6	3	50
<b>GM876030</b>	R1.5	3.0	6	4	50
<b>GM876040</b>	R2.0	4.0	6	5	54
<b>GM876060</b>	R3.0	6.0	6	7	54
<b>GM876080</b>	R4.0	8.0	8	9	58
<b>GM876100</b>	R5.0	10.0	10	11	66
<b>GM876120</b>	R6.0	12.0	12	12	73
<b>GM876160</b>	R8.0	16.0	16	16	82

Mill Dia. Tolerance(mm)	Shank Dia. Tolerance
0 ~ -0.03	h6

ISO Material Description	P											M			K						
	Non-alloy steel					Low alloy steel						High alloyed steel, and tool steel			Stainless steel			Grey cast iron	Nodular cast iron		Malleable cast iron
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
HRc	13	25	28	32	30	10	29	32	38	15	35	15	23	10	10	26	3	25	130	21	
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230	
Recommend	○	○	○	◎	◎	○	◎	◎	◎	○	◎	○	○	○	○	○	○	○	○	○	○

**CARBIDE, 2 FLUTE LONG LENGTH BALL NOSE**

- ▶ Designed to machine tool steel, alloy steel, mold steel and other high hardened materials
- ▶ For copy - milling machines



EDP No.	Radius of Ball Nose	Mill Diameter	Shank Diameter	Length of Cut	Overall Length
	R(±0.02)	D1	D2	L1	L2
<b>GM813010</b>	R0.5	1.0	4	2.5	50
<b>GM813020</b>	R1.0	2.0	6	5	50
<b>GM813030</b>	R1.5	3.0	6	8	60
<b>GM813040</b>	R2.0	4.0	6	8	70
<b>GM813050</b>	R2.5	5.0	6	10	80
<b>GM813060</b>	R3.0	6.0	6	12	90
<b>GM813080</b>	R4.0	8.0	8	14	100
<b>GM813100</b>	R5.0	10.0	10	18	100
<b>GM813120</b>	R6.0	12.0	12	22	110
<b>GM813160</b>	R8.0	16.0	16	30	140
<b>GM813200</b>	R10.0	20.0	20	38	160

Mill Dia. Tolerance(mm)	Shank Dia. Tolerance
0 ~ -0.03	h6

ISO Material Description	P											M			K						
	Non-alloy steel					Low alloy steel						High alloyed steel, and tool steel			Stainless steel			Grey cast iron	Nodular cast iron		Malleable cast iron
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
HRc	13	25	28	32	30	10	29	32	38	15	35	15	23	10	10	26	3	25	130	21	
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230	
Recommend	○	○	○	◎	◎	○	◎	◎	◎	○	◎	○	○	○	○	○	○	○	○	○	○

HSS

HSS



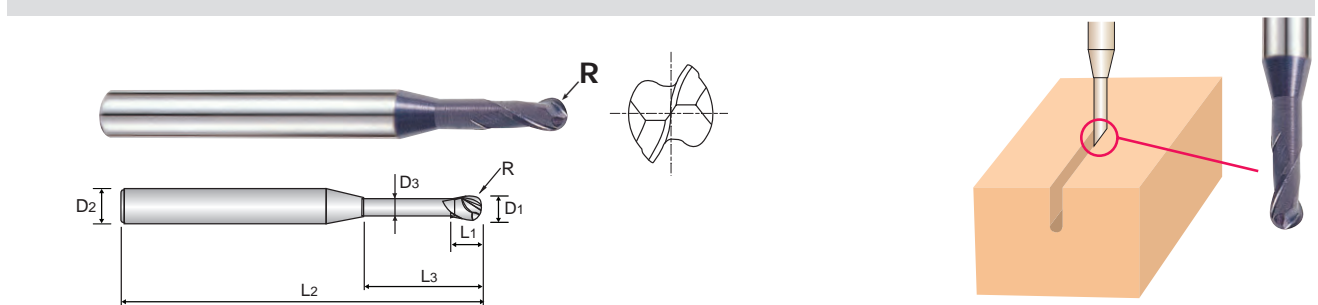
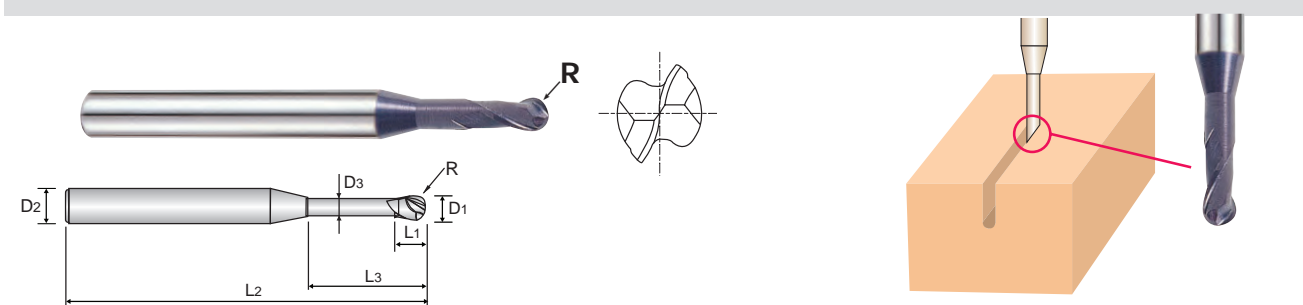
PLAIN SHANK GM886 SERIES



PLAIN SHANK GM886 SERIES

CARBIDE, 2 FLUTE BALL NOSE for RIB PROCESSING

CARBIDE, 2 FLUTE BALL NOSE for RIB PROCESSING



EDP No.	Radius of Ball Nose R(±0.01)	Mill Diameter D1	Shank Diameter D2	Length of Cut L1	Length Below Shank L3	Overall Length L2	Neck Diameter D3
GM886005	R0.25	0.5	4	0.7	2	45	0.45
GM886962	R0.25	0.5	4	0.7	4	45	0.45
GM886957	R0.3	0.6	4	0.9	2	45	0.55
GM886915	R0.3	0.6	4	0.9	4	45	0.55
GM886916	R0.3	0.6	4	0.9	6	45	0.55
GM886919	R0.4	0.8	4	1.2	4	45	0.75
GM886008	R0.4	0.8	4	1.2	6	45	0.75
GM886921	R0.5	1.0	4	1.5	4	45	0.95
GM886923	R0.5	1.0	4	1.5	5	45	0.95
GM886010	R0.5	1.0	4	1.5	6	45	0.95
GM886902	R0.5	1.0	4	1.5	8	45	0.95
GM886903	R0.5	1.0	4	1.5	10	45	0.95
GM886904	R0.5	1.0	4	1.5	12	45	0.95
GM886927	R0.5	1.0	4	1.5	16	50	0.95
GM886012	R0.6	1.2	4	1.8	8	45	1.15
GM886930	R0.75	1.5	4	2.3	6	45	1.45
GM886015	R0.75	1.5	4	2.3	8	45	1.45
GM886931	R0.75	1.5	4	2.3	10	45	1.45
GM886906	R0.75	1.5	4	2.3	12	45	1.45
GM886940	R1.0	2.0	4	3	6	45	1.95
GM886020	R1.0	2.0	4	3	8	45	1.95
GM886941	R1.0	2.0	4	3	10	45	1.95
GM886942	R1.0	2.0	4	3	12	50	1.95
GM886909	R1.0	2.0	4	3	16	50	1.95

EDP No.	Radius of Ball Nose R(±0.01)	Mill Diameter D1	Shank Diameter D2	Length of Cut L1	Length Below Shank L3	Overall Length L2	Neck Diameter D3
GM886910	R1.0	2.0	4	3	20	55	1.95
GM886945	R1.0	2.0	4	3	25	60	1.95
GM886967	R1.0	2.0	4	3	30	70	1.95
GM886947	R1.5	3.0	6	4.5	10	50	2.85
GM886948	R1.5	3.0	6	4.5	12	50	2.85
GM886030	R1.5	3.0	6	4.5	16	55	2.85
GM886911	R1.5	3.0	6	4.5	20	60	2.85
GM886968	R1.5	3.0	6	4.5	25	65	2.85
GM886040	R2.0	4.0	6	6	16	60	3.85
GM886912	R2.0	4.0	6	6	20	65	3.85
GM886913	R2.0	4.0	6	6	25	70	3.85
GM886971	R2.0	4.0	6	6	30	70	3.85
GM886972	R2.0	4.0	6	6	35	80	3.85
GM886050	R2.5	5.0	6	7.5	16	60	4.85
GM886060	R3.0	6.0	6	9	20	80	5.85
GM886954	R3.0	6.0	6	9	30	90	5.85

Mill Dia. Tolerance(mm)	Shank Dia. Tolerance
0 ~ -0.02	h6

Mill Dia. Tolerance(mm)	Shank Dia. Tolerance
0 ~ -0.02	h6

▶ NEXT PAGE

◎ : Excellent ○ : Good

ISO Material Description	P										M				K								
	Non-alloy steel					Low alloy steel					High alloyed steel, and tool steel				Stainless steel				Grey cast iron		Nodular cast iron		Malleable cast iron
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20			
HRc	13	25	28	32	35	38	40	42	45	48	50	52	55	58	60	62	64	66	68	70			
HB	125	190	250	270	300	180	215	235	260	285	200	225	240	260	180	200	160	180	130	230			
Recommend	○	○	○	◎	◎	○	◎	◎	◎	◎	○	○	○	○	○	○	○	○	○	○			

ISO Material Description	N										S						H				
	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)					Non Metallic Materials			Heat Resistant Super Alloys			Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc	60	100	75	90	130	110	90	100			15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○

◎ : Excellent ○ : Good

ISO Material Description	P										M				K								
	Non-alloy steel					Low alloy steel					High alloyed steel, and tool steel				Stainless steel				Grey cast iron		Nodular cast iron		Malleable cast iron
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20			
HRc	13	25	28	32	35	38	40	42	45	48	50	52	55	58	60	62	64	66	68	70			
HB	125	190	250	270	300	180	215	235	260	285	200	225	240	260	180	200	160	180	130	230			
Recommend	○	○	○	◎	◎	○	◎	◎	◎	◎	○	○	○	○	○	○	○	○	○	○			

ISO Material Description	N										S						H				
	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)					Non Metallic Materials			Heat Resistant Super Alloys			Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc	60	100	75	90	130	110	90	100			15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○

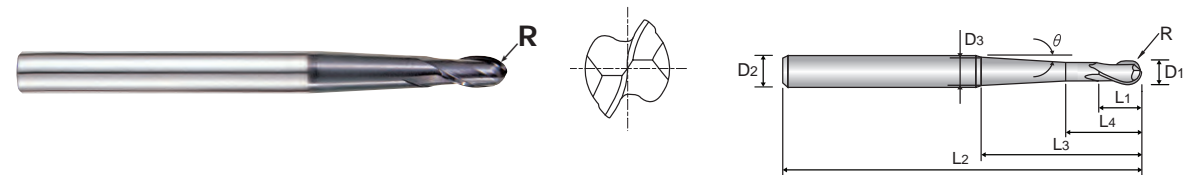




PLAIN SHANK GM902 SERIES

CARBIDE, 2 FLUTE BALL NOSE with TAPER NECK

► High efficiency milling in deep slotting due to long projection of the end mills



EDP No.	Radius of Ball Nose R(±0.01)	Mill Diameter D1	Shank Diameter D2	Length of Cut L1	Under Neck Parallel Length L4	Length Below Shank L3	Overall Length L2	Neck Diameter D3	Taper Neck Angle θ
<b>GM902010</b>	R0.5	1.0	6	2	4	23	60	2	1° 30'
<b>GM902901</b>	R0.5	1.0	6	2	4	23	60	4.3	5°
<b>GM902902</b>	R0.5	1.0	6	2	4	42	80	5	3°
<b>GM902020</b>	R1.0	2.0	6	4	6	23	60	2.9	1° 30'
<b>GM902903</b>	R1.0	2.0	6	4	6	23	60	5	5°
<b>GM902904</b>	R1.0	2.0	6	4	6	41	80	5.7	3°
<b>GM902030</b>	R1.5	3.0	6	6	8	32	70	5.6	3°
<b>GM902905</b>	R1.5	3.0	6	6	8	52	90	5.3	1° 30'
<b>GM902040</b>	R2.0	4.0	6	8	10	28	70	5.9	3°
<b>GM902906</b>	R2.0	4.0	6	8	10	49	90	6	1° 30'
<b>GM902060</b>	R3.0	6.0	8	12	15	34	90	8	3°
<b>GM902908</b>	R3.0	6.0	8	12	15	53	110	8	1° 30'
<b>GM902080</b>	R4.0	8.0	10	14	17	36	100	10	3°
<b>GM902909</b>	R4.0	8.0	10	14	17	55	120	10	1° 30'

Mill Dia. Tolerance(mm)	Shank Dia. Tolerance
0 ~ -0.03	h6

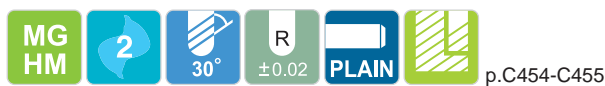
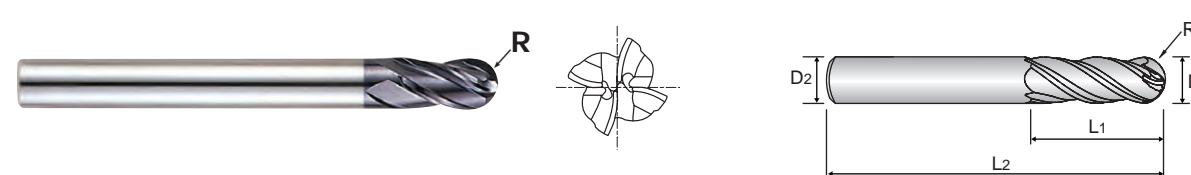
ISO Material Description	P											M			K																										
	Non-alloy steel					Low alloy steel						High alloyed steel, and tool steel			Stainless steel			Grey cast iron			Nodular cast iron			Malleable cast iron																	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc	13	25	28	32	38	10	29	32	38	15	35	15	23	10	18	26	3	25	15	21	15	23	10	26	3	25	15	23	10	26	3	25	15	23	10	26	3	25			
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230	180	260	160	250	130	230	180	260	160	250	130	230	180	260	160	250	130	230			
Recommend	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○			



PLAIN SHANK GM815 SERIES

CARBIDE, 4 FLUTE LONG LENGTH BALL NOSE

► Designed to machine tool steels, alloy steels, mold steels and other high hardened materials  
 ► For copy - milling machines  
 ► 4 Flute design - higher feed than GM813 series



EDP No.	Radius of Ball Nose R(±0.02)	Mill Diameter D1	Shank Diameter D2	Length of Cut L1	Overall Length L2
<b>GM815020</b>	R1.0	2.0	6	5	50
<b>GM815030</b>	R1.5	3.0	6	8	60
<b>GM815040</b>	R2.0	4.0	6	8	70
<b>GM815050</b>	R2.5	5.0	6	10	80
<b>GM815060</b>	R3.0	6.0	6	12	90
<b>GM815080</b>	R4.0	8.0	8	14	100
<b>GM815100</b>	R5.0	10.0	10	18	100
<b>GM815120</b>	R6.0	12.0	12	22	110
<b>GM815160</b>	R8.0	16.0	16	30	140

Mill Dia. Tolerance(mm)	Shank Dia. Tolerance
0 ~ -0.03	h6

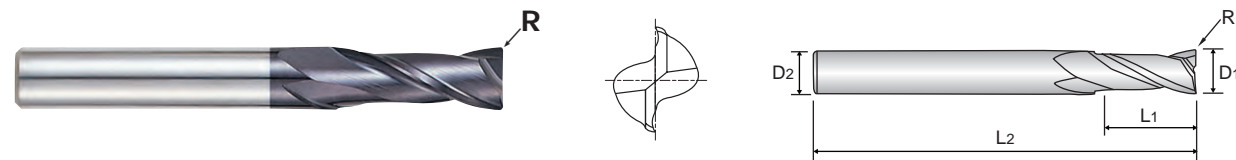
ISO Material Description	P											M			K																										
	Non-alloy steel					Low alloy steel						High alloyed steel, and tool steel			Stainless steel			Grey cast iron			Nodular cast iron			Malleable cast iron																	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc	13	25	28	32	38	10	29	32	38	15	35	15	23	10	18	26	3	25	15	21	15	23	10	26	3	25	15	23	10	26	3	25	15	23	10	26	3	25			
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230	180	260	160	250	130	230	180	260	160	250	130	230	180	260	160	250	130	230			
Recommend	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○			



PLAIN SHANK GM818 SERIES

CARBIDE, 2 FLUTE LONG LENGTH CORNER RADIUS

- ▶ Designed to machine tool steels, alloy steels, mold steels and other hardened materials
- ▶ Superior workpiece finishes
- ▶ Increased feed rates



Unit : mm

EDP No.	Corner Radius R	Mill Diameter D1	Shank Diameter D2	Length of Cut L1	Overall Length L2
<a href="#">GM818911</a>	R0.5	4.0	6	15	50
<a href="#">GM818060</a>	R0.5	6.0	6	20	60
<a href="#">GM818901</a>	R1.0	6.0	6	20	60
<a href="#">GM818080</a>	R0.5	8.0	8	25	70
<a href="#">GM818902</a>	R1.0	8.0	8	25	70
<a href="#">GM818100</a>	R0.5	10.0	10	30	90
<a href="#">GM818905</a>	R1.0	10.0	10	30	90
<a href="#">GM818908</a>	R1.0	12.0	12	30	90

Mill Dia. Tolerance(mm)	Shank Dia. Tolerance
0 ~ -0.03	h6

◎ : Excellent ○ : Good

ISO Material Description	P										M			K											
	Non-alloy steel					Low alloy steel					High alloyed steel, and tool steel			Stainless steel			Grey cast iron			Nodular cast iron			Malleable cast iron		
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
HRc	13	25	28	32	30	10	29	32	38	15	35	15	23	10	18	26	3	25	130	21	130	21	130	21	130
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230	130	230	130	230	130
Recommend	○	○	○	◎	◎	○	◎	◎	◎	◎	◎	○	○	○	○	○	○	○	○	○	○	○	○	○	○

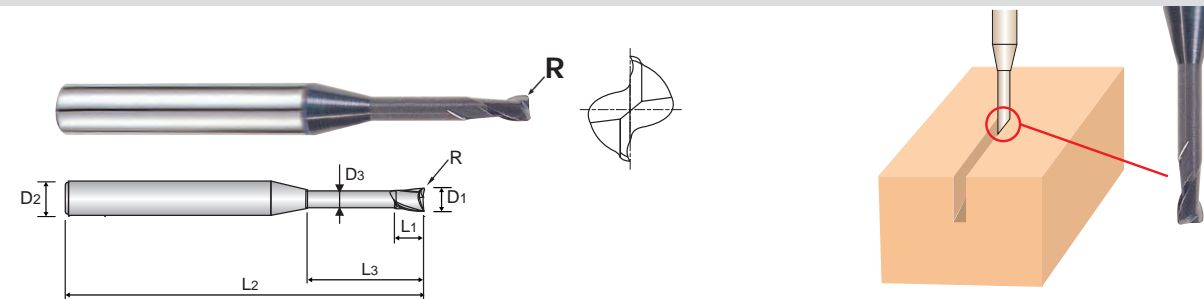
  

ISO Material Description	N										S						H																		
	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys						Titanium Alloys		Hardened steel			Chilled Cast Iron			Hardened Cast Iron										
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55
HRc	60	100	75	90	130	110	90	100			15	30	25	38	34	400 Rm	1050 Rm	55	60	42	55	55	60	42	55	55	55	60	42	55	55	60	42	55	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550	550	630	400	550	550	550	630	400	550	550	630	400	550	550
Recommend	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○



PLAIN SHANK GM8A1 SERIES

CARBIDE, 2 FLUTE CORNER RADIUS for RIB PROCESSING



Unit : mm

EDP No.	Corner Radius R	Mill Diameter D1	Shank Diameter D2	Length of Cut L1	Length Below Shank L3	Overall Length L2	Neck Diameter D3
<a href="#">GM8A1010</a>	R0.1	1.0	4	1.5	6	45	0.95
<a href="#">GM8A1920</a>	R0.1	1.0	4	1.5	8	45	0.95
<a href="#">GM8A1921</a>	R0.1	1.0	4	1.5	10	45	0.95
<a href="#">GM8A1012</a>	R0.2	1.2	4	1.8	6	45	1.15
<a href="#">GM8A1015</a>	R0.2	1.5	4	2.3	6	45	1.45
<a href="#">GM8A1937</a>	R0.2	1.5	4	2.3	8	45	1.45
<a href="#">GM8A1938</a>	R0.2	1.5	4	2.3	10	45	1.45
<a href="#">GM8A1939</a>	R0.2	1.5	4	2.3	12	45	1.45
<a href="#">GM8A1941</a>	R0.2	1.5	4	2.3	16	50	1.45
<a href="#">GM8A1018</a>	R0.2	1.8	4	2.7	6	45	1.75
<a href="#">GM8A1960</a>	R0.2	2.0	4	3	6	45	1.95
<a href="#">GM8A1020</a>	R0.2	2.0	4	3	8	45	1.95
<a href="#">GM8A1962</a>	R0.2	2.0	4	3	12	45	1.95
<a href="#">GM8A1961</a>	R0.2	2.0	4	3	10	45	1.95
<a href="#">GM8A1964</a>	R0.2	2.0	4	3	16	50	1.95
<a href="#">GM8A1966</a>	R0.2	2.0	4	3	20	55	1.95
<a href="#">GM8A1967</a>	R0.2	2.0	4	3	25	60	1.95
<a href="#">GM8A1969</a>	R0.2	2.5	4	3.7	12	45	2.40
<a href="#">GM8A1981</a>	R0.3	3.0	6	4.5	16	55	2.85
<a href="#">GM8A1983</a>	R0.3	3.0	6	4.5	20	60	2.85
<a href="#">GM8A1984</a>	R0.3	3.0	6	4.5	25	65	2.85
<a href="#">GM8A1976</a>	R0.3	3.0	6	4.5	30	70	2.85
<a href="#">GM8A1985</a>	R0.3	3.0	6	4.5	40	90	2.85
<a href="#">GM8A1040</a>	R0.3	4.0	6	6	12	50	3.85
<a href="#">GM8A1986</a>	R0.3	4.0	6	6	16	60	3.85
<a href="#">GM8A1987</a>	R0.3	4.0	6	6	20	60	3.85
<a href="#">GM8A1060</a>	R0.5	6.0	6	9	20	80	5.85
<a href="#">GM8A1802</a>	R0.5	6.0	6	9	40	100	5.85

Mill Dia. Tolerance(mm)	Shank Dia. Tolerance
0 ~ -0.03	h6

◎ : Excellent ○ : Good

ISO Material Description	P										M			K											
	Non-alloy steel					Low alloy steel					High alloyed steel, and tool steel			Stainless steel			Grey cast iron			Nodular cast iron			Malleable cast iron		
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
HRc	13	25	28	32	30	10	29	32	38	15	35	15	23	10	18	26	3	25	130	21	130	21	130	21	130
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230	130	230	130	230	130
Recommend	○	○	○	◎	◎	○	◎	◎	◎	◎	◎	○	○	○	○	○	○	○	○	○	○	○	○	○	○

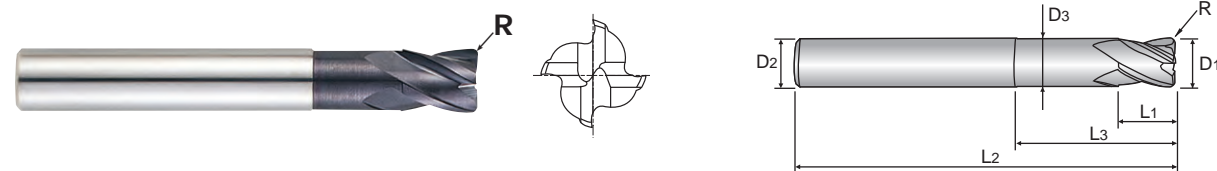
ISO Material Description	N										S						H																		
	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys						Titanium Alloys		Hardened steel			Chilled Cast Iron			Hardened Cast Iron										
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55
HRc	60	100	75	90	130	110	90	100			15	30	25	38	34	400 Rm	1050 Rm	55	60	42	55	55	60	42	55	55	55	60	42	55	55	60	42	55	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550	550	630	400	550	550	550	630	400	550	550	630	400	550	550
Recommend	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○



PLAIN SHANK GM839 SERIES

CARBIDE, 4 FLUTE STUB LENGTH CORNER RADIUS

- ▶ Designed to machine tool steels, alloy steels, mold steels and other hardened materials
- ▶ Superior workpiece finishes
- ▶ Increased feed rates



Unit : mm

EDP No.	Corner Radius	Mill Diameter	Shank Diameter	Length of Cut	Length Below Shank	Overall Length	Neck Diameter
	R	D1	D2	L1	L3	L2	D3
<b>GM839020</b>	R0.2	2.0	6	2.5	5	50	1.9
<b>GM839030</b>	R0.3	3.0	6	4	7	50	2.8
<b>GM839040</b>	R0.4	4.0	6	5	9	50	3.7
<b>GM839060</b>	R0.6	6.0	6	7	14	55	5.6
<b>GM839080</b>	R0.8	8.0	8	10	18	60	7.4
<b>GM839100</b>	R1.0	10.0	10	12	25	70	9.4
<b>GM839120</b>	R1.2	12.0	12	15	30	80	11.4

Mill Dia. Tolerance(mm)	Shank Dia. Tolerance
0 ~ -0.03	h6

◎ : Excellent ○ : Good

ISO Material Description	P										M			K							
	Non-alloy steel					Low alloy steel					High alloyed steel, and tool steel			Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
HRc	13	25	28	32	32	10	29	32	38	15	35	15	23	10	26	3	25				
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230	
Recommend	○	○	○	◎	◎	○	◎	◎	◎	◎	◎	○	○	○	○	○	○	○	○	○	○

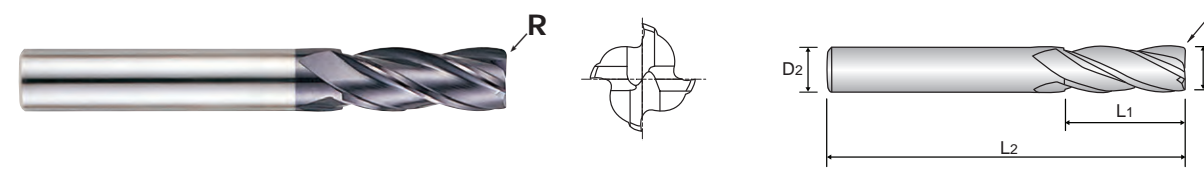
ISO Material Description	N										S						H				
	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys						Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend																		○	◎	◎	○



PLAIN SHANK GM819 SERIES

CARBIDE, 4 FLUTE LONG LENGTH CORNER RADIUS

- ▶ Designed to machine tool steels, alloy steels, mold steels and other hardened materials
- ▶ 4 flute allows for better workpiece finishes
- ▶ Increased production



Unit : mm

EDP No.	Corner Radius	Mill Diameter	Shank Diameter	Length of Cut	Overall Length
	R	D1	D2	L1	L2
<b>GM819030</b>	R0.3	3.0	6	12	50
<b>GM819040</b>	R0.3	4.0	6	15	50
<b>GM819911</b>	R0.5	4.0	6	15	50
<b>GM819912</b>	R0.5	5.0	6	20	60
<b>GM819060</b>	R0.5	6.0	6	20	60
<b>GM819901</b>	R1.0	6.0	6	20	60
<b>GM819080</b>	R0.5	8.0	8	25	70
<b>GM819902</b>	R1.0	8.0	8	25	70
<b>GM819904</b>	R2.0	8.0	8	25	70
<b>GM819100</b>	R0.5	10.0	10	30	90
<b>GM819905</b>	R1.0	10.0	10	30	90
<b>GM819906</b>	R1.5	10.0	10	30	90
<b>GM819907</b>	R2.0	10.0	10	30	90
<b>GM819120</b>	R0.5	12.0	12	30	90
<b>GM819908</b>	R1.0	12.0	12	30	90
<b>GM819909</b>	R1.5	12.0	12	30	90
<b>GM819910</b>	R2.0	12.0	12	30	90
<b>GM819160</b>	R0.5	16.0	16	50	110
<b>GM819916</b>	R1.0	16.0	16	50	110
<b>GM819918</b>	R2.0	16.0	16	50	110
<b>GM819921</b>	R2.0	20.0	20	55	110

Mill Dia. Tolerance(mm)	Shank Dia. Tolerance
0 ~ -0.03	h6

◎ : Excellent ○ : Good

ISO Material Description	P										M			K							
	Non-alloy steel					Low alloy steel					High alloyed steel, and tool steel			Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
HRc	13	25	28	32	32	10	29	32	38	15	35	15	23	10	26	3	25				
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230	
Recommend	○	○	○	◎	◎	○	◎	◎	◎	◎	◎	○	○	○	○	○	○	○	○	○	○

ISO Material Description	N										S						H				
	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys						Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend																		○	◎	◎	○

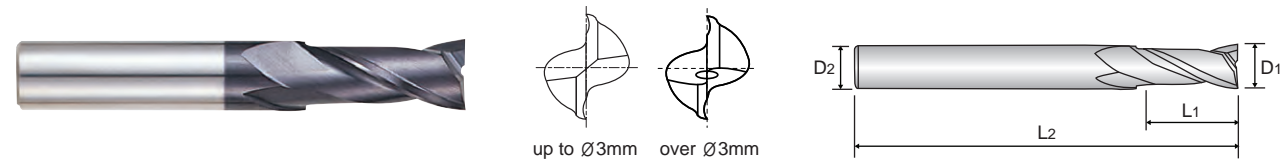




PLAIN SHANK GM810 SERIES

CARBIDE, 2 FLUTE SHORT LENGTH

- ▶ High precision milling in medical, optical, electronics and aerospace industries
- ▶ Excellent performance on hardened steel



EDP No.	Mill Diameter	Shank Diameter	Length of Cut	Overall Length
	D1	D2	L1	L2
GM810004	0.4	3	0.8	40
GM810005	0.5	3	1	40
GM810006	0.6	3	1.2	40
GM810007	0.7	3	1.4	40
GM810008	0.8	3	1.6	40
GM810009	0.9	3	2	40
GM810010	1.0	4	2.5	40
GM810901	1.0	6	2.5	40
GM810012	1.2	4	4	40
GM810014	1.4	4	4	40
GM810015	1.5	4	4	40
GM810902	1.5	6	4	40
GM810020	2.0	4	6	40
GM810903	2.0	6	6	40
GM810025	2.5	4	8	40
GM810030	3.0	6	8	45
GM810035	3.5	6	10	45
GM810040	4.0	6	11	45
GM810050	5.0	6	13	50
GM810060	6.0	6	13	50
GM810070	7.0	8	16	60
GM810080	8.0	8	19	60
GM810090	9.0	10	19	70
GM810100	10.0	10	22	70
GM810110	11.0	12	22	75
GM810120	12.0	12	26	75
GM810140	14.0	14	26	85
GM810160	16.0	16	32	100
GM810180	18.0	18	32	100
GM810200	20.0	20	38	105

Mill Dia. Tolerance(mm)	Shank Dia. Tolerance
0 ~ -0.03	h6

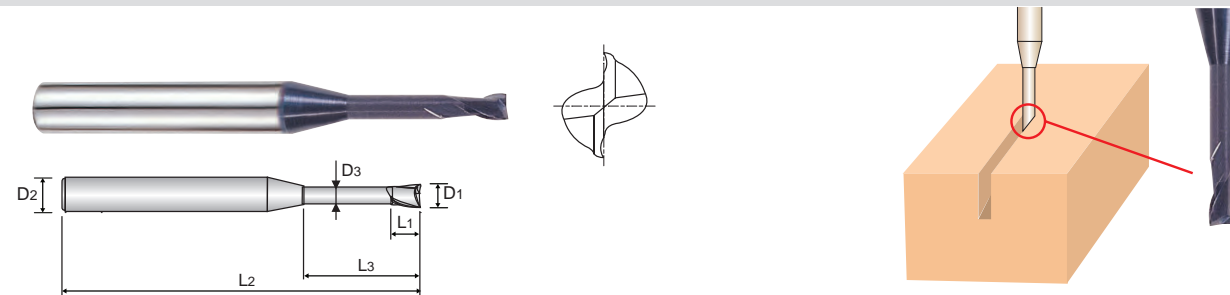
ISO Material Description	P											M			K							
	Non-alloy steel					Low alloy steel						High alloyed steel, and tool steel			Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20		
HRc	13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25	130	21			
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	260	160	250	130	230			
Recommend	○	○	○	◎	◎	○	◎	◎	◎	○	◎	○	○	○	○	○	○	○	○			

ISO Material Description	N										S						H				
	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys						Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	◎	○



PLAIN SHANK GM883 SERIES

CARBIDE, 2 FLUTE for RIB PROCESSING



EDP No.	Mill Diameter	Shank Diameter	Length of Cut	Length Below Shank	Overall Length	Neck Diameter
	D1	D2	L1	L3	L2	D3
GM883004	0.4	4	0.6	2	45	0.37
GM883005	0.5	4	0.7	2	45	0.45
GM883988	0.5	4	0.7	4	45	0.45
GM883820	0.7	4	1	3	45	0.65
GM883008	0.8	4	1.2	4	45	0.75
GM883908	0.8	4	1.2	6	45	0.75
GM883996	1.0	4	1.5	4	45	0.95
GM883010	1.0	4	1.5	6	45	0.95
GM883912	1.0	4	1.5	8	45	0.95
GM883913	1.0	4	1.5	10	45	0.95
GM883914	1.0	4	1.5	12	45	0.95
GM883997	1.0	4	1.5	16	50	0.95
GM883998	1.0	4	1.5	20	55	0.95
GM883012	1.2	4	1.8	6	45	1.15
GM883015	1.5	4	2.3	6	45	1.45
GM883923	1.5	4	2.3	8	45	1.45
GM883924	1.5	4	2.3	10	45	1.45
GM883925	1.5	4	2.3	12	45	1.45
GM883927	1.5	4	2.3	16	50	1.45
GM883810	1.5	4	2.3	20	55	1.45
GM883946	1.8	4	2.7	12	45	1.75
GM883958	2.0	4	3	6	45	1.95
GM883020	2.0	4	3	8	45	1.95
GM883959	2.0	4	3	10	45	1.95
GM883960	2.0	4	3	12	45	1.95
GM883961	2.0	4	3	14	50	1.95

Mill Dia. Tolerance(mm)	Shank Dia. Tolerance
0 ~ -0.015	h6

ISO Material Description	P											M			K							
	Non-alloy steel					Low alloy steel						High alloyed steel, and tool steel			Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20		
HRc	13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25	130	21			
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	260	160	250	130	230			
Recommend	○	○	○	◎	◎	○	◎	◎	◎	○	◎	○	○	○	○	○	○	○	○			

ISO Material Description	N										S						H				
	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys						Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	◎	○

HSS

HSS

**YG X-POWER PRO END MILLS**

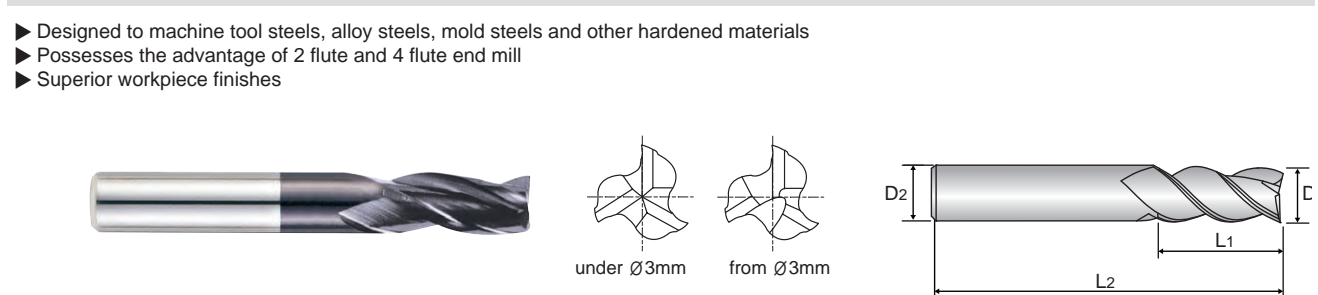
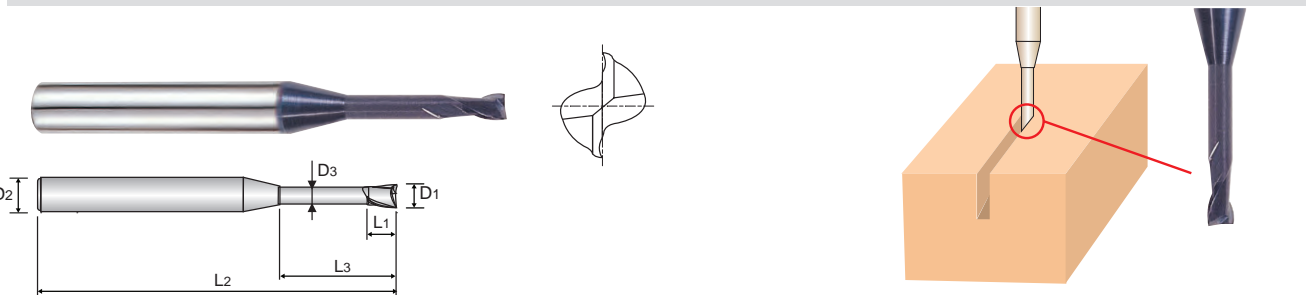
**YG X-POWER PRO END MILLS**

PLAIN SHANK **GM883** SERIES

PLAIN SHANK **GM895** SERIES

**CARBIDE, 2 FLUTE for RIB PROCESSING**

**CARBIDE, 3 FLUTE 38° HELIX SHORT LENGTH**



MG HM 2 30° PLAIN p.C462-C463

MG HM 3 38° PLAIN p.C464-C465

Unit : mm

EDP No.	Mill Diameter	Shank Diameter	Length of Cut	Length Below Shank	Overall Length	Neck Diameter
	D1	D2	L1	L3	L2	D3
<b>GM883962</b>	2.0	4	3	16	50	1.95
<b>GM883964</b>	2.0	4	3	20	55	1.95
<b>GM883966</b>	2.0	4	3	25	60	1.95
<b>GM883814</b>	2.0	4	3	30	70	1.95
<b>GM883970</b>	2.5	4	3.7	16	55	2.40
<b>GM883975</b>	3.0	6	4.5	10	45	2.85
<b>GM883976</b>	3.0	6	4.5	12	45	2.85
<b>GM883978</b>	3.0	6	4.5	16	55	2.85
<b>GM883979</b>	3.0	6	4.5	18	55	2.85
<b>GM883980</b>	3.0	6	4.5	20	60	2.85
<b>GM883981</b>	3.0	6	4.5	25	65	2.85
<b>GM883832</b>	3.0	6	4.5	30	70	2.85
<b>GM883983</b>	3.0	6	4.5	40	90	2.85
<b>GM883801</b>	4.0	6	6	16	60	3.85
<b>GM883802</b>	4.0	6	6	20	60	3.85
<b>GM883803</b>	4.0	6	6	25	70	3.85
<b>GM883804</b>	4.0	6	6	30	70	3.85
<b>GM883834</b>	4.0	6	6	40	90	3.85
<b>GM883836</b>	4.0	6	6	50	100	3.85
<b>GM883838</b>	4.0	6	6	30	90	5.85
<b>GM883807</b>	6.0	6	9	30	90	5.85
<b>GM883809</b>	6.0	6	9	50	110	5.85

Unit : mm

EDP No.	Mill Diameter	Shank Diameter	Length of Cut	Overall Length
	D1	D2	L1	L2
<b>GM895010</b>	1.0	3	2.5	38
<b>GM895015</b>	1.5	4	5	50
<b>GM895025</b>	2.5	3	7	38
<b>GM895030</b>	3.0	3	10	38
<b>GM895901</b>	3.0	6	10	50
<b>GM895040</b>	4.0	4	12	50
<b>GM895903</b>	4.0	6	12	50
<b>GM895050</b>	5.0	5	14	50
<b>GM895904</b>	5.0	6	14	57
<b>GM895060</b>	6.0	6	16	57
<b>GM895080</b>	8.0	8	20	63
<b>GM895100</b>	10.0	10	22	72
<b>GM895120</b>	12.0	12	25	73
<b>GM895160</b>	16.0	16	32	82

Mill Dia. Tolerance(mm)	Shank Dia. Tolerance
0 ~ -0.03	h6

Mill Dia. Tolerance(mm)	Shank Dia. Tolerance
0 ~ -0.015	h6

◎ : Excellent ○ : Good

ISO Material Description	P										M			K							
	Non-alloy steel					Low alloy steel					High alloyed steel, and tool steel			Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
HRc	13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25				
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230	
Recommend	○	○	○	◎	◎	○	◎	◎	◎	◎	◎	○	○	○	○	○	○	○	○	○	

ISO Material Description	N										S						H				
	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys						Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend																		○	◎	◎	○

◎ : Excellent ○ : Good

ISO Material Description	P										M			K							
	Non-alloy steel					Low alloy steel					High alloyed steel, and tool steel			Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
HRc	13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25				
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230	
Recommend	○	○	○	◎	◎	○	◎	◎	◎	◎	◎	○	○	○	○	○	○	○	○	○	

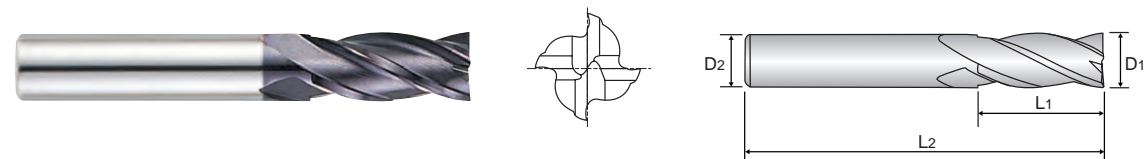
ISO Material Description	N										S						H				
	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys						Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend																		○	◎	◎	○



PLAIN SHANK GM811 SERIES

CARBIDE, 4 FLUTE SHORT LENGTH

- ▶ Designed to machine tool steels, alloy steels, mold steels and other hardened materials
- ▶ 4 flute allows for better workpiece finishes
- ▶ Increased production



EDP No.	Mill Diameter	Shank Diameter	Length of Cut	Overall Length
	D1	D2	L1	L2
<b>GM811020</b>	2.0	4	6	40
<b>GM811901</b>	2.0	6	6	40
<b>GM811025</b>	2.5	4	8	40
<b>GM811902</b>	2.5	6	8	40
<b>GM811030</b>	3.0	6	8	45
<b>GM811035</b>	3.5	6	10	45
<b>GM811040</b>	4.0	6	11	45
<b>GM811045</b>	4.5	6	11	45
<b>GM811050</b>	5.0	6	13	50
<b>GM811060</b>	6.0	6	13	50
<b>GM811080</b>	8.0	8	19	60
<b>GM811100</b>	10.0	10	22	70
<b>GM811120</b>	12.0	12	26	75
<b>GM811140</b>	14.0	14	26	85
<b>GM811160</b>	16.0	16	32	100
<b>GM811200</b>	20.0	20	38	105
<b>GM811250</b>	25.0	25	45	120

Mill Dia. Tolerance(mm)	Shank Dia. Tolerance
0 ~ -0.03	h6

◎ : Excellent ○ : Good

ISO Material Description	P										M			K							
	Non-alloy steel					Low alloy steel					High alloyed steel, and tool steel			Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
HRC	13	25	28	32	30	10	29	32	38	15	35	15	23	10	10	26	32	3	25	21	
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230	
Recommend	○	○	○	◎	◎	○	◎	◎	◎	○	◎	○	○	○	○	○	○	○	○	○	

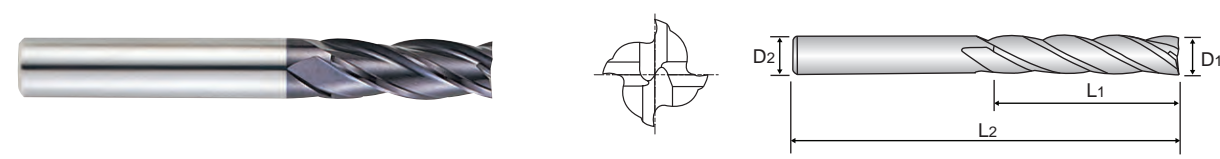
ISO Material Description	N				S										H						
	Aluminum-wrought alloy		Aluminum-cast, alloyed		Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron		
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRC											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend																		○	◎	◎	○



PLAIN SHANK GM817 SERIES

CARBIDE, 4 FLUTE LONG LENGTH

- ▶ Designed to machine tool steels, alloy steels, mold steels and other hardened materials
- ▶ 4 flute allows for better workpiece finishes
- ▶ Increased production



EDP No.	Mill Diameter	Shank Diameter	Length of Cut	Overall Length
	D1	D2	L1	L2
<b>GM817020</b>	2.0	4	8	40
<b>GM817030</b>	3.0	6	12	50
<b>GM817040</b>	4.0	6	15	50
<b>GM817050</b>	5.0	6	20	60
<b>GM817060</b>	6.0	6	20	60
<b>GM817080</b>	8.0	8	25	70
<b>GM817100</b>	10.0	10	30	90
<b>GM817120</b>	12.0	12	30	90
<b>GM817140</b>	14.0	16	40	110
<b>GM817160</b>	16.0	16	50	110
<b>GM817200</b>	20.0	20	55	110

Mill Dia. Tolerance(mm)	Shank Dia. Tolerance
0 ~ -0.03	h6

◎ : Excellent ○ : Good

ISO Material Description	P										M			K							
	Non-alloy steel					Low alloy steel					High alloyed steel, and tool steel			Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
HRC	13	25	28	32	30	10	29	32	38	15	35	15	23	10	10	26	32	3	25	21	
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230	
Recommend	○	○	○	◎	◎	○	◎	◎	◎	○	◎	○	○	○	○	○	○	○	○	○	

ISO Material Description	N				S										H						
	Aluminum-wrought alloy		Aluminum-cast, alloyed		Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron		
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRC											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend																		○	◎	◎	○





PLAIN SHANK GM812 SERIES

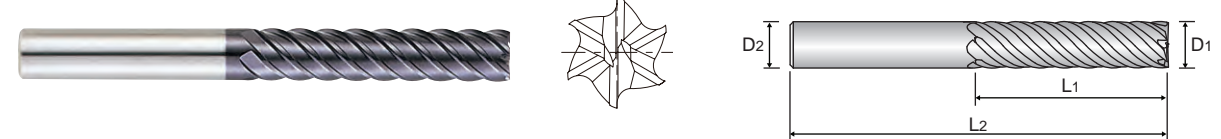
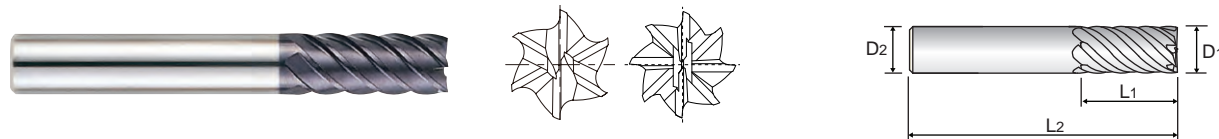
PLAIN SHANK GM834 SERIES

### CARBIDE, 6&8 FLUTE 45° HELIX LONG LENGTH

### CARBIDE, 6 FLUTE 45° HELIX EXTRA LONG LENGTH

- ▶ Designed to machine hardened materials
- ▶ High speed cutting and finish milling with high feed rates
- ▶ Superior workpiece finishes
- ▶ Superior wear resistant
- ▶ Suitable for dry milling

- ▶ Designed to machine hardened materials
- ▶ High speed cutting and finish milling with high feed rates
- ▶ Superior workpiece finishes
- ▶ Superior wear resistant
- ▶ Suitable for dry milling



Unit : mm

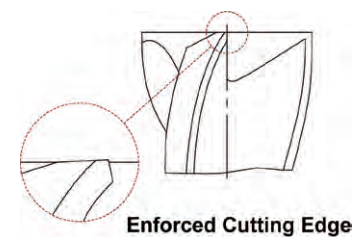
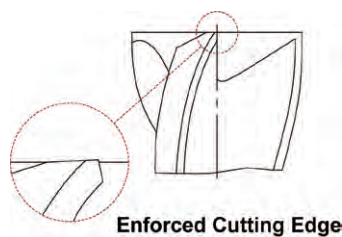
EDP No.	Mill Diameter	Shank Diameter	Length of Cut	Overall Length	No. of Flute
	D1	D2	L1	L2	
<b>GM812060</b>	6.0	6	13	57	6
<b>GM812080</b>	8.0	8	19	63	6
<b>GM812100</b>	10.0	10	22	72	6
<b>GM812120</b>	12.0	12	26	83	6
<b>GM812160</b>	16.0	16	32	92	6
<b>GM812200</b>	20.0	20	38	104	8

Unit : mm

EDP No.	Mill Diameter	Shank Diameter	Length of Cut	Overall Length
	D1	D2	L1	L2
<b>GM834060</b>	6.0	6	26	70
<b>GM834080</b>	8.0	8	36	90
<b>GM834100</b>	10.0	10	46	100
<b>GM834120</b>	12.0	12	56	110
<b>GM834160</b>	16.0	16	66	130
<b>GM834200</b>	20.0	20	76	140
<b>GM834250</b>	25.0	25	92	180

Mill Dia. Tolerance(mm)	Shank Dia. Tolerance
0 ~ -0.03	h6

Mill Dia. Tolerance(mm)	Shank Dia. Tolerance
0 ~ -0.03	h6



◎ : Excellent ○ : Good

ISO Material Description	P											M			K							
	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron			
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20		
HRc																						
HB	125	130	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230		
Recommend	○	○	○	◎	◎	○	◎	◎	◎	○	◎	○	○	○	○	○	○	○	○	○		
ISO Material Description	N					S											H					
	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)		Non Metallic Materials			Heat Resistant Super Alloys					Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron		
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	
HRc																						
HB	60	100	75	90	130	110	90	100				15	30	25	38	34			55	60	42	55
Recommend																○	○	○	○	◎	○	

◎ : Excellent ○ : Good

ISO Material Description	P											M			K							
	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron			
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20		
HRc																						
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230		
Recommend	○	○	○	◎	◎	○	◎	◎	◎	○	◎	○	○	○	○	○	○	○	○	○		
ISO Material Description	N					S											H					
	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)		Non Metallic Materials			Heat Resistant Super Alloys					Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron		
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	
HRc																						
HB	60	100	75	90	130	110	90	100				15	30	25	38	34			55	60	42	55
Recommend																○	○	○	○	◎	○	

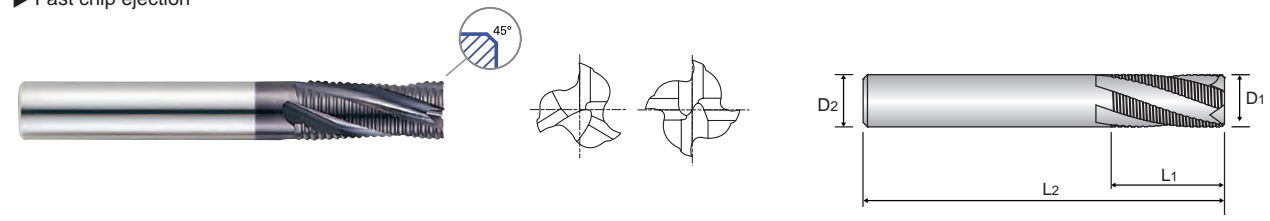
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PLAIN SHANK GM814 SERIES

**CARBIDE, MULTI FLUTE 20° HELIX LONG LENGTH ROUGHING - FINE**

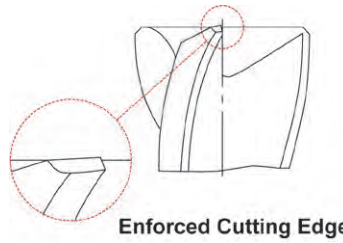
- ▶ Designed to machine tool steels, alloy steels, mold steels and other hardened materials
- ▶ High velocity milling of hardened steels
- ▶ For dry and wet milling
- ▶ Fast chip ejection



EDP No.	Mill Diameter D1	Shank Diameter D2	Length of Cut L1	Overall Length L2	No. of Flute	Chamfer
<b>GM814060</b>	6.0	6	16	57	3	0.38
<b>GM814080</b>	8.0	8	16	63	3	0.38
<b>GM814100</b>	10.0	10	22	72	4	0.6
<b>GM814120</b>	12.0	12	26	83	4	0.6
<b>GM814160</b>	16.0	16	32	92	4	0.6
<b>GM814200</b>	20.0	20	38	104	4	0.6

**Tolerances according to DIN 7160 & 7161**

	Tolerance range in $\mu\text{m}$				
	Nominal-Diameter in $\mu\text{m}$				
	from 1 to 3	over 3 to 6	over 6 to 10	over 10 to 18	over 18 to 30
h10	0 - 40	0 - 48	0 - 58	0 - 70	0 - 84
h6	0 - 6	0 - 8	0 - 9	0 - 11	0 - 13



◎ : Excellent ○ : Good

ISO	P											M				K						
	Non-alloy steel					Low alloy steel						High alloyed steel, and tool steel				Stainless steel		Grey cast iron		Nodular cast iron		Malleable cast iron
Material Description	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20		
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20		
HRc	13	25	28	32	32	10	29	32	38	15	35	15	23	10	10	26	3	25	130	21		
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230		
Recommend	○	○	○	◎	◎	○	◎	◎	◎	◎	◎	○	○	○	○	○	○	○	○	○		

ISO	N										S							H			
	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)					Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel	Chilled Cast Iron
Material Description	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc	60	100	75	90	130	110	90	100			15	30	25	38	34	400 Rm	1050 Rm	55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	◎	○



RECOMMENDED CUTTING CONDITIONS

**GM153 SERIES 4FLUTE SQUARE - SIDE CUTTING**

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø)										
						1/16	1/8	3/16	1/4	5/16	3/8	1/2	5/8	3/4	1	
P	1-4	Non-alloy steel	0.05D	1.0D	SFM(Vc)	210	320	340	400	380	350	395	395	365	395	
					IPT(fz)	.0002	.0004	.0009	.0012	.0017	.0019	.0019	.0018	.0019	.0018	
					RPM	12840	9780	6930	6110	4650	3570	3020	2410	1860	1510	
					IPM(FEED)	12	14	26	29	31	26	23	18	14	11	
					SFM(Vc)	135	200	205	240	225	215	240	245	230	240	
					IPT(fz)	.0002	.0004	.0009	.0012	.0015	.0015	.0015	.0015	.0015	.0015	
	5	0.05D	1.0D	0.05D	1.0D	SFM(Vc)	8250	6110	4180	3670	2750	2190	1830	1500	1170	920
						IPM(FEED)	7	9	16	18	17	13	11	9	7	6
						SFM(Vc)	210	320	340	400	380	350	395	395	365	395
						IPT(fz)	.0002	.0004	.0009	.0012	.0017	.0019	.0019	.0018	.0019	.0018
						RPM	12840	9780	6930	6110	4650	3570	3020	2410	1860	1510
						IPM(FEED)	12	14	26	29	31	26	23	18	14	11
6-7	0.05D	1.0D	0.05D	1.0D	SFM(Vc)	135	200	205	240	225	215	240	245	230	240	
					IPT(fz)	.0002	.0004	.0009	.0012	.0015	.0015	.0015	.0015	.0015	.0015	
					RPM	8250	6110	4180	3670	2750	2190	1830	1500	1170	920	
					IPM(FEED)	7	9	16	18	17	13	11	9	7	6	
					SFM(Vc)	210	320	340	400	380	350	395	395	365	395	
					IPT(fz)	.0002	.0004	.0009	.0012	.0017	.0019	.0019	.0018	.0019	.0018	
8-9	0.05D	1.0D	0.05D	1.0D	SFM(Vc)	12840	9780	6930	6110	4650	3570	3020	2410	1860	1510	
					IPM(FEED)	12	14	26	29	31	26	23	18	14	11	
					SFM(Vc)	135	200	205	240	225	215	240	245	230	240	
					IPT(fz)	.0002	.0004	.0009	.0012	.0015	.0015	.0015	.0015	.0015	.0015	
					RPM	8250	6110	4180	3670	2750	2190	1830	1500	1170	920	
					IPM(FEED)	7	9	16	18	17	13	11	9	7	6	
10	0.05D	1.0D	0.05D	1.0D	SFM(Vc)	210	320	340	400	380	350	395	395	365	395	
					IPT(fz)	.0002	.0004	.0009	.0012	.0017	.0019	.0019	.0018	.0019	.0018	
					RPM	12840	9780	6930	6110	4650	3570	3020	2410	1860	1510	
					IPM(FEED)	12	14	26	29	31	26	23	18	14	11	
					SFM(Vc)	135	200	205	240	225	215	240	245	230	240	
					IPT(fz)	.0002	.0004	.0009	.0012	.0015	.0015	.0015	.0015	.0015	.0015	
11.1-11.2	0.05D	1.0D	0.05D	1.0D	SFM(Vc)	8250	6110	4180	3670	2750	2190	1830	1500	1170	920	
					IPM(FEED)	7	9	16	18	17	13	11	9	7	6	
					SFM(Vc)	115	165	170	205	190	180	195	190	180	195	
					IPT(fz)	.0002	.0004	.0009	.0011	.0016	.0018	.0018	.0019	.0018	.0017	
					RPM	7030	5040	3460	3130	2320	1830	1490	1160	920	750	
					IPM(FEED)	6	7	13	14	15	13	11	9	7	5	
M	12-14.2	Stainless steel	0.05D	1.0D	SFM(Vc)	90	120	125	145	150	145	170	160	145	155	
					IPT(fz)	.0001	.0002	.0003	.0004	.0006	.0007	.0007	.0007	.0006	.0005	
					RPM	5500	3670	2550	2220	1830	1480	1300	980	740	590	
					IPM(FEED)	2	3	3	4	5	4	4	3	2	1	
					SFM(Vc)	135	200	205	240	225	215	240	245	230	240	
					IPT(fz)	.0002	.0004	.0009	.0012	.0015	.0015	.0015	.0015	.0015	.0015	
H	38.1-38.2	Hardened steel	0.05D	1.0D	SFM(Vc)	8250	6110	4180	3670	2750	2190	1830	1500	1170	920	
					IPM(FEED)	7	9	16	18	17	13	11	9	7	6	
					SFM(Vc)	90	120	125	145	150	145	170	160	145	155	
					IPT(fz)	.0001	.0002	.0003	.0004	.0006	.0007	.0007	.0007	.0006	.0005	
					RPM	5500	3670	2550	2220	1830	1480	1300	980	740	590	
					IPM(FEED)	2	3	3	4	5	4	4	3	2	1	
40	Chilled Cast Iron	0.05D	1.0D	1.0D	SFM(Vc)	90	120	125	145	150	145	170	160	145	155	
					IPT(fz)	.0001	.0002	.0003	.0004	.0006	.0007	.0007	.0007	.0006	.0005	
					RPM	5500	3670	2550	2220	1830	1480	1300	980	740	590	
					IPM(FEED)	2	3	3	4	5	4	4	3	2	1	
					SFM(Vc)	135	200	205	240	225	215	240	245	230	240	
					IPT(fz)	.0002	.0004	.0009	.0012	.0015	.0015	.0015	.0015	.0015	.0015	
41	Hardened Cast Iron	0.05D	1.0D	1.0D	SFM(Vc)	8250	6110	4180	3670	2750	2190	1830	1500	1170	920	
					IPM(FEED)	7	9	16	18	17	13	11	9	7	6	
					SFM(Vc)	90	120	125	145	150	145	170	160	145	155	
					IPT(fz)	.0001	.0002	.0003	.0004	.0006	.0007	.0007	.0007	.0006	.0005	
					RPM	5500	3670	2550	2220	1830	1480	1300	980	740	590	
					IPM(FEED)	2	3	3	4	5	4	4	3	2	1	

SFM = Surface Feet per Minute  
 RPM = Revolutions Per Minute  
 IPT = Inches Per Tooth  
 IPM = Inches Per Minute  
 Ap : Inch (Axial Depth of Cut)  
 Ae : Inch (Radial Depth of Cut)



RECOMMENDED CUTTING CONDITIONS



RECOMMENDED CUTTING CONDITIONS

GM207 SERIES 4FLUTE SQUARE - SIDE CUTTING

Table with columns: ISO, VDI 3323, Material Description, Ae, Ap, Parameter, Diameter (Ø) [1/8, 3/16, 1/4, 5/16, 3/8, 1/2, 5/8, 3/4, 1]. Rows include Non-alloy steel, Low alloy steel, High alloyed steel, and Hardened steel.

SFM = Surface Feet per Minute
RPM = Revolutions Per Minute
IPT = Inches Per Tooth
IPM = Inches Per Minute
Ap : Inch (Axial Depth of Cut)
Ae : Inch (Radial Depth of Cut)

GM639, GM649, GM212 SERIES 4FLUTE CORNER RADIUS - SIDE CUTTING

Table with columns: ISO, VDI 3323, Material Description, Ae, Ap, Parameter, Diameter (Ø) [1/4, 5/16, 3/8, 1/2]. Rows include Non-alloy steel, Low alloy steel, High alloyed steel, and Hardened steel.

SFM = Surface Feet per Minute
RPM = Revolutions Per Minute
IPT = Inches Per Tooth
IPM = Inches Per Minute
Ap : Inch (Axial Depth of Cut)
Ae : Inch (Radial Depth of Cut)



HSS



# X-POWER PRO END MILLS

## RECOMMENDED CUTTING CONDITIONS



# X-POWER PRO END MILLS

## RECOMMENDED CUTTING CONDITIONS

HSS

### GM103 SERIES

### 4FLUTE CORNER RADIUS - SIDE CUTTING

### GM103 SERIES

### 4FLUTE CORNER RADIUS - CONTOURING

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø)				
						3/8	1/2	5/8	3/4	7/8
P	1-4	Non-alloy steel	0.05D	1.5D	SFM(Vc)	830	830	830	830	830
					IPT(fz)	.0026	.0034	.0038	.0039	.0039
					RPM	8460	6340	5070	4230	3620
					IPM(FEED)	87	87	78	66	56
					SFM(Vc)	830	830	830	830	830
					IPT(fz)	.0016	.0021	.0026	.0031	.0036
	5	Non-alloy steel	0.05D	1.5D	SFM(Vc)	830	830	830	830	830
					IPT(fz)	.0016	.0021	.0026	.0031	.0036
					RPM	8460	6340	5070	4230	3620
					IPM(FEED)	53	53	53	53	53
					SFM(Vc)	830	830	830	830	830
					IPT(fz)	.0026	.0034	.0038	.0039	.0039
6-7	Low alloy steel	0.05D	1.5D	SFM(Vc)	830	830	830	830	830	
				IPT(fz)	.0026	.0034	.0038	.0039	.0039	
				RPM	8460	6340	5070	4230	3620	
				IPM(FEED)	87	87	78	66	56	
				SFM(Vc)	830	830	830	830	830	
				IPT(fz)	.0016	.0021	.0026	.0031	.0036	
8-9	Low alloy steel	0.05D	1.5D	SFM(Vc)	830	830	830	830	830	
				IPT(fz)	.0016	.0021	.0026	.0031	.0036	
				RPM	8460	6340	5070	4230	3620	
				IPM(FEED)	53	53	53	53	53	
				SFM(Vc)	830	830	830	830	830	
				IPT(fz)	.0026	.0034	.0038	.0039	.0039	
10	High alloyed steel, and tool steel	0.05D	1.5D	SFM(Vc)	830	830	830	830	830	
				IPT(fz)	.0026	.0034	.0038	.0039	.0039	
				RPM	8460	6340	5070	4230	3620	
				IPM(FEED)	87	87	78	66	56	
				SFM(Vc)	830	830	830	830	830	
				IPT(fz)	.0016	.0021	.0026	.0031	.0036	
11.1-11.2	High alloyed steel, and tool steel	0.05D	1.5D	SFM(Vc)	830	830	830	830	830	
				IPT(fz)	.0016	.0021	.0026	.0031	.0036	
				RPM	8460	6340	5070	4230	3620	
				IPM(FEED)	53	53	53	53	53	
				SFM(Vc)	615	615	615	615	610	
				IPT(fz)	.0016	.0021	.0026	.0032	.0037	
M	12-14.2	Hardened steel	0.05D	1.5D	SFM(Vc)	615	615	615	615	610
					IPT(fz)	.0016	.0021	.0026	.0032	.0037
					RPM	6270	4700	3760	3130	2660
					IPM(FEED)	40	40	40	40	40
					SFM(Vc)	615	615	615	615	610
					IPT(fz)	.0013	.0017	.0021	.0025	.0030
K	38.1-38.2	Hardened steel	0.05D	1.5D	SFM(Vc)	615	615	615	615	610
					IPT(fz)	.0013	.0017	.0021	.0025	.0030
					RPM	6270	4700	3760	3130	2660
					IPM(FEED)	32	32	32	32	32
					SFM(Vc)	830	830	830	830	830
					IPT(fz)	.0016	.0021	.0026	.0031	.0036
K	40	Chilled Cast Iron	0.05D	1.5D	SFM(Vc)	830	830	830	830	830
					IPT(fz)	.0016	.0021	.0026	.0031	.0036
					RPM	8460	6340	5070	4230	3620
					IPM(FEED)	53	53	53	53	53
					SFM(Vc)	615	615	615	615	610
					IPT(fz)	.0013	.0017	.0021	.0025	.0030
K	41	Hardened Cast Iron	0.05D	1.5D	SFM(Vc)	615	615	615	615	610
					IPT(fz)	.0013	.0017	.0021	.0025	.0030
					RPM	6270	4700	3760	3130	2660
					IPM(FEED)	32	32	32	32	32

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø)				
						3/8	1/2	5/8	3/4	7/8
P	1-4	Non-alloy steel	0.3D ~ 0.5D	0.1D	SFM(Vc)	830	830	830	1050	830
					IPT(fz)	.0015	.0020	.0024	.0023	.0034
					RPM	8460	6340	5070	5350	3620
					IPM(FEED)	50	50	50	50	50
					SFM(Vc)	615	615	615	615	610
					IPT(fz)	.0016	.0021	.0026	.0032	.0037
	5	Non-alloy steel	0.3D ~ 0.5D	0.1D	SFM(Vc)	830	830	830	1050	830
					IPT(fz)	.0015	.0020	.0024	.0023	.0034
					RPM	8460	6340	5070	5350	3620
					IPM(FEED)	50	50	50	50	50
					SFM(Vc)	615	615	615	615	610
					IPT(fz)	.0016	.0021	.0026	.0032	.0037
6-7	Low alloy steel	0.3D ~ 0.5D	0.1D	SFM(Vc)	830	830	830	1050	830	
				IPT(fz)	.0015	.0020	.0024	.0023	.0034	
				RPM	8460	6340	5070	5350	3620	
				IPM(FEED)	50	50	50	50	50	
				SFM(Vc)	615	615	615	615	610	
				IPT(fz)	.0016	.0021	.0026	.0032	.0037	
8-9	Low alloy steel	0.3D ~ 0.5D	0.1D	SFM(Vc)	830	830	830	1050	830	
				IPT(fz)	.0015	.0020	.0024	.0023	.0034	
				RPM	8460	6340	5070	5350	3620	
				IPM(FEED)	50	50	50	50	50	
				SFM(Vc)	615	615	615	615	610	
				IPT(fz)	.0016	.0021	.0026	.0032	.0037	
10	High alloyed steel, and tool steel	0.3D ~ 0.5D	0.1D	SFM(Vc)	830	830	830	1050	830	
				IPT(fz)	.0015	.0020	.0024	.0023	.0034	
				RPM	8460	6340	5070	5350	3620	
				IPM(FEED)	50	50	50	50	50	
				SFM(Vc)	615	615	615	615	610	
				IPT(fz)	.0016	.0021	.0026	.0032	.0037	
M	12-14.2	Hardened steel	0.3D ~ 0.5D	0.1D	SFM(Vc)	615	615	615	615	610
					IPT(fz)	.0014	.0018	.0023	.0027	.0032
					RPM	6270	4700	3760	3130	2660
					IPM(FEED)	34	34	34	34	34
					SFM(Vc)	615	615	615	615	610
					IPT(fz)	.0013	.0017	.0021	.0025	.0030
K	38.1-38.2	Hardened steel	0.2D ~ 0.3D	0.05D	SFM(Vc)	615	615	615	615	610
					IPT(fz)	.0008	.0011	.0013	.0016	.0019
					RPM	6270	4700	3760	3130	2660
					IPM(FEED)	20	20	20	20	20
					SFM(Vc)	615	615	615	615	610
					IPT(fz)	.0016	.0021	.0026	.0032	.0037
K	40	Chilled Cast Iron	0.2D ~ 0.3D	0.1D	SFM(Vc)	615	615	615	615	610
					IPT(fz)	.0016	.0021	.0026	.0032	.0037
					RPM	6270	4700	3760	3130	2660
					IPM(FEED)	40	40	40	40	40
					SFM(Vc)	615	615	615	615	610
					IPT(fz)	.0008	.0011	.0013	.0016	.0019
K	41	Hardened Cast Iron	0.2D ~ 0.3D	0.05D	SFM(Vc)	615	615	615	615	610
					IPT(fz)	.0008	.0011	.0013	.0016	.0019
					RPM	6270	4700	3760	3130	2660
					IPM(FEED)	20	20	20	20	20

SFM = Surface Feet per Minute  
 RPM = Revolutions Per Minute  
 IPT = Inches Per Tooth  
 IPM = Inches Per Minute  
 Ap : Inch (Axial Depth of Cut)  
 Ae : Inch (Radial Depth of Cut)

SFM = Surface Feet per Minute  
 RPM = Revolutions Per Minute  
 IPT = Inches Per Tooth  
 IPM = Inches Per Minute  
 Ap : Inch (Axial Depth of Cut)  
 Ae : Inch (Radial Depth of Cut)



RECOMMENDED CUTTING CONDITIONS

**GM208 SERIES 6&8FLUTE SQUARE - SIDE CUTTING**

**(NORMAL SPEED)**

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø)						
						1/4	5/16	3/8	1/2	5/8	3/4	1
P	1-4	Non-alloy steel	0.1D	1.5D	SFM(Vc)	370	350	335	380	350	335	340
					IPT(fz)	.0024	.0031	.0039	.0039	.0040	.0030	.0025
	RPM	5650	4280	3410	2900	2140	1710	1300				
	IPM(FEED)	81	81	81	67	51	41	26				
	5	Non-alloy steel	0.05D	1.5D	SFM(Vc)	260	245	235	265	245	230	235
					IPT(fz)	.0023	.0031	.0038	.0039	.0040	.0029	.0025
	RPM	3970	2990	2390	2020	1500	900	900				
	IPM(FEED)	55	55	55	47	36	28	18				
	6-7	Low alloy steel	0.1D	1.5D	SFM(Vc)	370	350	335	380	350	335	340
					IPT(fz)	.0024	.0031	.0039	.0039	.0040	.0030	.0025
RPM	5650	4280	3410	2900	2140	1710	1300					
IPM(FEED)	81	81	81	67	51	41	26					
8-9	Low alloy steel	0.05D	1.5D	SFM(Vc)	260	245	235	265	245	230	235	
				IPT(fz)	.0023	.0031	.0038	.0039	.0040	.0029	.0025	
RPM	3970	2990	2390	2020	1500	900	900					
IPM(FEED)	55	55	55	47	36	28	18					
10	High alloyed steel, and tool steel	0.1D	1.5D	SFM(Vc)	370	350	335	380	350	335	340	
				IPT(fz)	.0024	.0031	.0039	.0039	.0040	.0030	.0025	
RPM	5650	4280	3410	2900	2140	1710	1300					
IPM(FEED)	81	81	81	67	51	41	26					
11.1-11.2	High alloyed steel, and tool steel	0.05D	1.5D	SFM(Vc)	260	245	235	265	245	230	235	
				IPT(fz)	.0023	.0031	.0038	.0039	.0040	.0029	.0025	
RPM	3970	2990	2390	2020	1500	900	900					
IPM(FEED)	55	55	55	47	36	28	18					
H	38.1	Hardened steel	0.05D	1.5D	SFM(Vc)	260	245	235	265	245	230	235
					IPT(fz)	.0023	.0031	.0038	.0039	.0040	.0029	.0025
	RPM	3970	2990	2390	2020	1500	900	900				
	IPM(FEED)	55	55	55	47	36	28	18				
38.2	Hardened steel	0.05D	1.0D	SFM(Vc)	105	95	100	115	105	100	100	
				IPT(fz)	.0009	.0012	.0014	.0014	.0011	.0010	.0010	
RPM	1600	1160	1020	880	640	510	380					
IPM(FEED)	9	9	9	7	5	5	3					
40	Chilled Cast Iron	0.05D	1.5D	SFM(Vc)	260	245	235	265	245	230	235	
				IPT(fz)	.0023	.0031	.0038	.0039	.0040	.0029	.0025	
RPM	3970	2990	2390	2020	1500	1170	900					
IPM(FEED)	55	55	55	47	36	28	18					
41	Hardened Cast Iron	0.05D	1.0D	SFM(Vc)	105	95	100	115	105	100	100	
				IPT(fz)	.0009	.0012	.0014	.0014	.0011	.0010	.0010	
RPM	1600	1160	1020	880	640	510	380					
IPM(FEED)	9	9	9	7	5	5	3					

**(HIGH SPEED)**

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø)						
						1/4	5/16	3/8	1/2	5/8	3/4	1
P	1-11.2	Non-alloy steel Low alloy steel High alloyed steel, and tool steel	0.05D	1.5D	SFM(Vc)	1120	1050	1000	1120	1050	1010	1015
					IPT(fz)	.0024	.0032	.0039	.0040	.0039	.0030	.0025
					RPM	17110	12840	10190	8560	6420	5140	3880
					IPM(FEED)	245	245	240	203	152	122	77
H	38.1	Hardened steel	0.05D	1.5D	SFM(Vc)	1120	1050	1000	1120	1050	1010	1015
					IPT(fz)	.0024	.0032	.0039	.0040	.0039	.0030	.0025
					RPM	17110	12840	10190	8560	6420	5140	3880
					IPM(FEED)	245	245	240	203	152	122	77
H	38.2	Hardened steel	0.05D	1.0D	SFM(Vc)	560	525	505	560	525	505	505
					IPT(fz)	.0024	.0032	.0040	.0040	.0040	.0029	.0025
					RPM	8560	6420	5140	4280	3210	2570	1930
					IPM(FEED)	122	122	122	102	77	59	39
H	40	Chilled Cast Iron	0.05D	1.5D	SFM(Vc)	1120	1050	1000	1120	1050	1010	1015
					IPT(fz)	.0024	.0032	.0039	.0040	.0039	.0030	.0025
					RPM	17110	12840	10190	8560	6420	5140	3880
					IPM(FEED)	245	245	240	203	152	122	77
H	41	Hardened Cast Iron	0.05D	1.0D	SFM(Vc)	560	525	505	560	525	505	505
					IPT(fz)	.0024	.0032	.0040	.0040	.0040	.0029	.0025
					RPM	8560	6420	5140	4280	3210	2570	1930
					IPM(FEED)	122	122	122	102	77	59	39



RECOMMENDED CUTTING CONDITIONS

**GM218 SERIES 6&8FLUTE SQUARE - SIDE CUTTING**

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø)						
						1/4	5/16	3/8	1/2	5/8	3/4	1
P	1-9	Non-alloy steel Low alloy steel	0.01D	3.0D	SFM(Vc)	150	140	135	150	140	135	145
					IPT(fz)	.0014	.0018	.0021	.0024	.0026	.0020	.0022
					RPM	2290	1710	1380	1150	860	690	550
	10-11.1	High alloyed steel, and tool steel	0.05D	3.0D	SFM(Vc)	150	140	135	150	140	135	145
					IPT(fz)	.0014	.0018	.0021	.0024	.0026	.0020	.0022
					RPM	2290	1710	1380	1150	860	690	550
11.2	High alloyed steel, and tool steel	0.01D	3.0D	SFM(Vc)	110	105	100	115	105	100	105	
				IPT(fz)	.0014	.0017	.0020	.0021	.0024	.0020	.0021	
				RPM	1680	1280	1020	880	640	510	400	
H	38.1	Hardened steel	0.01D	3.0D	SFM(Vc)	110	105	100	115	105	100	105
					IPT(fz)	.0014	.0017	.0020	.0021	.0024	.0020	.0021
					RPM	1680	1280	1020	880	640	510	400
	38.2	Hardened steel	0.05D	3.0D	SFM(Vc)	95	90	85	90	90	85	90
					IPT(fz)	.0012	.0015	.0018	.0021	.0020	.0018	.0019
					RPM	1450	1100	870	690	550	430	340
40	Chilled Cast Iron	0.01D	3.0D	SFM(Vc)	110	105	100	115	105	100	105	
				IPT(fz)	.0014	.0017	.0020	.0021	.0024	.0020	.0021	
				RPM	1680	1280	1020	880	640	510	400	
41	Hardened Cast Iron	0.05D	3.0D	SFM(Vc)	95	90	85	90	90	85	90	
				IPT(fz)	.0012	.0015	.0018	.0021	.0020	.0018	.0019	
				RPM	1450	1100	870	690	550	430	340	

SFM = Surface Feet per Minute  
 RPM = Revolutions Per Minute  
 IPT = Inches Per Tooth  
 IPM = Inches Per Minute  
 Ap : Inch (Axial Depth of Cut)  
 Ae : Inch (Radial Depth of Cut)

HSS



RECOMMENDED CUTTING CONDITIONS



RECOMMENDED CUTTING CONDITIONS

GM668 SERIES 6&8FLUTE CORNER RADIUS - SIDE CUTTING

GM209 SERIES 2FLUTE BALL NOSE - PROFILE

Table with columns: ISO, VDI 3323, Material Description, Ae, Ap, Parameter, Diameter (Ø) [1/4, 5/16, 3/8, 1/2, 5/8, 3/4]. Rows include P (1-11.2) and H (38.1, 38.2, 40, 41) for various materials like Non-alloy steel, Hardened steel, and Chilled Cast Iron.

Table with columns: ISO, VDI 3323, Material Description, Ae, Parameter, Diameter (Ø) [1/32, 1/16, 3/32, 1/8, 3/16, 1/4, 5/16, 3/8, 1/2, 5/8, 3/4]. Rows include P (1-4, 5, 6-7, 8-9, 10, 11.1-11.2) and H (38.1-38.2, 40, 41) for various materials like Non-alloy steel, Low alloy steel, and High alloyed steel.

SFM = Surface Feet per Minute
RPM = Revolutions Per Minute
IPT = Inches Per Tooth
IPM = Inches Per Minute
Ap : Inch (Axial Depth of Cut)
Ae : Inch (Radial Depth of Cut)

(HIGH SPEED)

Table with columns: ISO, VDI 3323, Material Description, Ae, Parameter, Diameter (Ø) [1/32, 1/16, 3/32, 1/8, 3/16, 1/4, 5/16, 3/8, 1/2, 5/8, 3/4]. Rows include P (1-11.2) and H (38.1-38.2, 40-41) for various materials.

SFM = Surface Feet per Minute
RPM = Revolutions Per Minute
IPT = Inches Per Tooth
IPM = Inches Per Minute
Ap : Inch (Axial Depth of Cut)
Ae : Inch (Radial Depth of Cut)

Table with column: Ap. Values: D3/16~D1/4 = .008, D5/16~D3/4 = .012



HSS



RECOMMENDED CUTTING CONDITIONS



RECOMMENDED CUTTING CONDITIONS

GM210 SERIES 4FLUTE BALL NOSE - PROFILE

(NORMAL SPEED)

Table with columns: ISO, VDI 3323, Material Description, Ae, Parameter, Diameter (Ø) [1/8, 3/16, 1/4, 5/16, 3/8, 1/2, 5/8]. Rows include Non-alloy steel, Low alloy steel, High alloyed steel, and Hardened steel.

SFM = Surface Feet per Minute
RPM = Revolutions Per Minute
IPT = Inches Per Tooth
IPM = Inches Per Minute
Ap : Inch (Axial Depth of Cut)
Ae : Inch (Radial Depth of Cut)

(HIGH SPEED)

Table with columns: ISO, VDI 3323, Material Description, Ae, Parameter, Diameter (Ø) [1/8, 3/16, 1/4, 5/16, 3/8, 1/2, 5/8]. Rows include Non-alloy steel, Low alloy steel, High alloyed steel, and Hardened steel.

AP ~HRc55
D1/8 ~ D1/4 = .008
D5/16 ~ D5/8 = .012

GM961 SERIES 2FLUTE BALL NOSE - PROFILE

(NORMAL SPEED)

Table with columns: ISO, VDI 3323, Material Description, Ae, Parameter, Diameter (Ø) [1/8, 3/16, 1/4, 5/16, 3/8, 1/2, 5/8, 3/4, 1]. Rows include Non-alloy steel, Low alloy steel, High alloyed steel, and Hardened steel.

SFM = Surface Feet per Minute
RPM = Revolutions Per Minute
IPT = Inches Per Tooth
IPM = Inches Per Minute
Ap : Inch (Axial Depth of Cut)
Ae : Inch (Radial Depth of Cut)

AP ~HRc45 HRc45~55
D1/8 ~ D1/4 = .008 D1/8 = .006
D5/16 ~ D5/8 = .012 D3/16 ~ D5/16 = .010
D3/8 ~ D1 = .012

(HIGH SPEED)

Table with columns: ISO, VDI 3323, Material Description, Ae, Parameter, Diameter (Ø) [1/8, 3/16, 1/4, 5/16, 3/8, 1/2, 5/8, 3/4, 1]. Rows include Non-alloy steel, Low alloy steel, High alloyed steel, and Hardened steel.

AP ~HRc45 HRc45~55
D1/8 ~ D1/4 = .008 D1/8 = .006
D5/16 ~ D5/8 = .012 D3/16 ~ D5/16 = .010
D3/8 ~ D1 = .012



**X-POWER PRO  
END MILLS**

RECOMMENDED CUTTING CONDITIONS

**GM960 SERIES 2FLUTE BALL NOSE - PROFILE**

ISO	VDI 3323	Material Description	Parameter	Diameter (Ø)				
				.024	.031	.040	.047	.062
<b>P</b>	5, 8-9, 11.1-11.2	Non-alloy steel Low alloy steel High alloyed steel, and tool steels	SFM(Vc)	200	230	275	310	390
			IPT(fz)	.0004	.0005	.0005	.0005	.0006
			RPM	31830	28340	26260	25200	24030
			IPM(FEED)	25	27	27	28	29
<b>H</b>	38.1-38.2	Hardened steel	SFM(Vc)	200	230	275	310	390
			IPT(fz)	.0002	.0003	.0003	.0003	.0004
			RPM	31830	28340	26260	25200	24030
			IPM(FEED)	12	16	17	17	18
	40	Chilled Cast Iron	SFM(Vc)	200	230	275	310	390
			IPT(fz)	.0004	.0005	.0005	.0005	.0006
			RPM	31830	28340	26260	25200	24030
			IPM(FEED)	25	27	27	28	29
	41	Hardened Cast Iron	SFM(Vc)	200	230	275	310	390
			IPT(fz)	.0002	.0003	.0003	.0003	.0004
			RPM	31830	28340	26260	25200	24030
			IPM(FEED)	12	16	17	17	18

SFM = Surface Feet per Minute  
RPM = Revolutions Per Minute  
IPT = Inches Per Tooth  
IPM = Inches Per Minute  
Ap : Inch (Axial Depth of Cut)  
Ae : Inch (Radial Depth of Cut)

HRc30~HRc45		HRc45~HRc55	
D<.040	D≥.040	D<.040	D≥.040
<b>Ae</b> = 0.15xD	<b>Ae</b> = 0.15xD	<b>Ae</b> = 0.1xD	<b>Ae</b> = 0.15xD
<b>Ap</b> = 0.05xD	<b>Ap</b> = 0.75xD	<b>Ap</b> = 0.05xD	<b>Ap</b> = 0.05xD



**X-POWER PRO  
END MILLS**

RECOMMENDED CUTTING CONDITIONS

**GM109 SERIES 2FLUTE BALL NOSE - PROFILE**

**(NORMAL SPEED)**

ISO	VDI 3323	Material Description	Ae	Parameter	Diameter (Ø)								
					1/8	3/16	1/4	5/16	3/8	1/2	5/8	3/4	1
<b>H</b>	38.1	Hardened steel	0.1D	SFM(Vc)	455	510	620	630	655	785	785	755	805
				IPT(fz)	.0017	.0023	.0026	.0029	.0032	.0036	.0039	.0039	.0049
				RPM	13910	10390	9470	7700	6670	6000	4800	3850	3080
				IPM(FEED)	48	48	50	45	43	43	38	30	30
	38.2	Hardened steel	0.1D	SFM(Vc)	445	490	595	605	625	750	750	715	765
				IPT(fz)	.0017	.0023	.0026	.0029	.0033	.0036	.0039	.0039	.0048
				RPM	13600	9980	9090	7400	6370	5730	4580	3640	2920
				IPM(FEED)	45	45	48	43	42	42	36	28	28
	41	Hardened Cast Iron	0.1D	SFM(Vc)	445	490	595	605	625	750	750	715	765
				IPT(fz)	.0017	.0023	.0026	.0029	.0033	.0036	.0039	.0039	.0048
				RPM	13600	9980	9090	7400	6370	5730	4580	3640	2920
				IPM(FEED)	45	45	48	43	42	42	36	28	28

**(HIGH SPEED)**

ISO	VDI 3323	Material Description	Ae	Parameter	Diameter (Ø)								
					1/8	3/16	1/4	5/16	3/8	1/2	5/8	3/4	1
<b>H</b>	38.1	Hardened steel	0.05D	SFM(Vc)	455	510	620	630	655	785	785	755	805
				IPT(fz)	.0027	.0034	.0040	.0044	.0047	.0051	.0055	.0056	.0070
				RPM	13910	10390	9470	7700	6670	6000	4800	3850	3080
				IPM(FEED)	76	72	76	67	63	62	53	43	43
	38.2	Hardened steel	0.05D	SFM(Vc)	445	490	595	605	625	750	750	715	760
				IPT(fz)	.0027	.0034	.0040	.0043	.0046	.0050	.0053	.0053	.0067
				RPM	13600	9980	9090	7400	6370	5730	4580	3640	2900
				IPM(FEED)	72	68	72	63	59	58	49	39	39
	41	Hardened Cast Iron	0.05D	SFM(Vc)	445	490	595	605	625	750	750	715	760
				IPT(fz)	.0027	.0034	.0040	.0043	.0046	.0050	.0053	.0053	.0067
				RPM	13600	9980	9090	7400	6370	5730	4580	3640	2900
				IPM(FEED)	72	68	72	63	59	58	49	39	39

SFM = Surface Feet per Minute  
RPM = Revolutions Per Minute  
IPT = Inches Per Tooth  
IPM = Inches Per Minute  
Ap : Inch (Axial Depth of Cut)  
Ae : Inch (Radial Depth of Cut)

Ap
D1/8 = .006
D3/16~D5/16 = .010
D3/8~D1 = .012



RECOMMENDED CUTTING CONDITIONS



RECOMMENDED CUTTING CONDITIONS

**GM963 SERIES 2FLUTE BALL NOSE - PROFILE**

**(NORMAL SPEED)**

ISO	VDI 3323	Material Description	Ae	Parameter	Diameter (Ø)						
					1/16	1/8	3/16	1/4	5/16	3/8	1/2
P	1-11.2	Non-alloy steel Low alloy steel High alloyed steel, and tool steel	0.2D	SFM(Vc)	175	290	315	365	320	325	340
				IPT(fz)	.0004	.0009	.0016	.0019	.0029	.0037	.0044
				RPM	10700	8860	6420	5580	3910	3310	2600
				IPM(FEED)	9	16	20	22	23	25	23
H	38.1	Hardened steel	0.1D	SFM(Vc)	250	365	405	495	505	525	625
				IPT(fz)	.0007	.0017	.0023	.0026	.0029	.0032	.0036
				RPM	15280	11150	8250	7560	6170	5350	4780
				IPM(FEED)	22	38	38	40	36	35	35
H	38.2	Hardened steel	0.1D	SFM(Vc)	245	355	390	470	475	505	600
				IPT(fz)	.0007	.0017	.0023	.0027	.0030	.0032	.0036
				RPM	14970	10850	7950	7180	5810	5140	4580
				IPM(FEED)	20	37	37	38	35	33	33
H	40	Chilled Cast Iron	0.2D	SFM(Vc)	175	290	315	365	320	325	340
				IPT(fz)	.0004	.0009	.0016	.0019	.0029	.0037	.0044
				RPM	10700	8860	6420	5580	3910	3310	2600
				IPM(FEED)	9	16	20	22	23	25	23
H	41	Hardened Cast Iron	0.1D	SFM(Vc)	245	355	390	470	475	505	600
				IPT(fz)	.0007	.0017	.0023	.0027	.0030	.0032	.0036
				RPM	14970	10850	7950	7180	5810	5140	4580
				IPM(FEED)	20	37	37	38	35	33	33

SFM = Surface Feet per Minute  
 RPM = Revolutions Per Minute  
 IPT = Inches Per Tooth  
 IPM = Inches Per Minute  
 Ap : Inch (Axial Depth of Cut)  
 Ae : Inch (Radial Depth of Cut)

AP	~HRc45	HRc45~55
	D1/8 ~ D1/4 = .008 D5/16 ~ D5/8 = .012	D1/8 = .006 D3/16 ~ D5/16 = .010 D3/8 ~ D1 = .012

**(HIGH SPEED)**

ISO	VDI 3323	Material Description	Ae	Parameter	Diameter (Ø)						
					1/16	1/8	3/16	1/4	5/16	3/8	1/2
P	1-11.2	Non-alloy steel Low alloy steel High alloyed steel, and tool steel	0.05D	SFM(Vc)	330	605	905	1210	1135	1180	1210
				IPT(fz)	.0006	.0009	.0017	.0022	.0035	.0044	.0049
				RPM	20170	18490	18440	18490	13870	12020	9240
				IPM(FEED)	24	35	62	80	98	106	91
H	38.1	Hardened steel	0.05D	SFM(Vc)	250	365	405	495	505	525	625
				IPT(fz)	.0010	.0027	.0035	.0040	.0044	.0047	.0051
				RPM	15280	11150	8250	7560	6170	5350	4780
				IPM(FEED)	32	61	57	61	54	50	49
H	38.2	Hardened steel	0.05D	SFM(Vc)	245	355	390	470	475	505	600
				IPT(fz)	.0011	.0026	.0034	.0041	.0043	.0046	.0050
				RPM	14970	10850	7950	7180	5810	5140	4580
				IPM(FEED)	33	56	54	58	50	48	45
H	40	Chilled Cast Iron	0.05D	SFM(Vc)	330	605	905	1210	1135	1180	1210
				IPT(fz)	.0006	.0009	.0017	.0022	.0035	.0044	.0049
				RPM	20170	18490	18440	18490	13870	12020	9240
				IPM(FEED)	24	35	62	80	98	106	91
H	41	Hardened Cast Iron	0.05D	SFM(Vc)	245	355	390	470	475	505	600
				IPT(fz)	.0011	.0026	.0034	.0041	.0043	.0046	.0050
				RPM	14970	10850	7950	7180	5810	5140	4580
				IPM(FEED)	33	56	54	58	50	48	45

AP	~HRc45	HRc45~55
	D1/8 ~ D1/4 = .008 D5/16 ~ D5/8 = .012	D1/8 = .006 D3/16 ~ D5/16 = .010 D3/8 ~ D1 = .012

**GM666 SERIES 3-5FLUTE Roughing - Side Cutting**

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø)						
						1/4	5/16	3/8	1/2	5/8	3/4	1
P	1-4	Non-alloy steel	0.3D	1.5D	SFM(Vc)	1105	1025	975	1130	1060	1105	1355
					IPT(fz)	.0019	.0026	.0033	.0030	.0039	.0044	.0036
					RPM	16880	12530	9930	8630	6480	5630	5180
					IPM(FEED)	99	99	99	102	102	99	92
					SFM(Vc)	875	815	805	850	850	935	1020
					IPT(fz)	.0009	.0012	.0015	.0013	.0016	.0016	.0012
	5	Non-alloy steel	0.3D	1.5D	SFM(Vc)	1105	1025	975	1130	1060	1105	1355
					IPT(fz)	.0019	.0026	.0033	.0030	.0039	.0044	.0036
					RPM	16880	12530	9930	8630	6480	5630	5180
					IPM(FEED)	99	99	99	102	102	99	92
					SFM(Vc)	875	815	805	850	850	935	1020
					IPT(fz)	.0009	.0012	.0015	.0013	.0016	.0016	.0012
6-7	Low alloy steel	0.3D	1.5D	SFM(Vc)	1105	1025	975	1130	1060	1105	1355	
				IPT(fz)	.0019	.0026	.0033	.0030	.0039	.0044	.0036	
				RPM	16880	12530	9930	8630	6480	5630	5180	
				IPM(FEED)	99	99	99	102	102	99	92	
				SFM(Vc)	875	815	805	850	850	935	1020	
				IPT(fz)	.0009	.0012	.0015	.0013	.0016	.0016	.0012	
8-9	High alloyed steel, and tool steel	0.3D	1.5D	SFM(Vc)	1105	1025	975	1130	1060	1105	1355	
				IPT(fz)	.0019	.0026	.0033	.0030	.0039	.0044	.0036	
				RPM	16880	12530	9930	8630	6480	5630	5180	
				IPM(FEED)	99	99	99	102	102	99	92	
				SFM(Vc)	875	815	805	850	850	935	1020	
				IPT(fz)	.0009	.0012	.0015	.0013	.0016	.0016	.0012	
10	High alloyed steel, and tool steel	0.3D	1.5D	SFM(Vc)	1105	1025	975	1130	1060	1105	1355	
				IPT(fz)	.0019	.0026	.0033	.0030	.0039	.0044	.0036	
				RPM	16880	12530	9930	8630	6480	5630	5180	
				IPM(FEED)	99	99	99	102	102	99	92	
				SFM(Vc)	875	815	805	850	850	935	1020	
				IPT(fz)	.0009	.0012	.0015	.0013	.0016	.0016	.0012	
11.1	High alloyed steel, and tool steel	0.3D	1.5D	SFM(Vc)	1105	1025	975	1130	1060	1105	1355	
				IPT(fz)	.0019	.0026	.0033	.0030	.0039	.0044	.0036	
				RPM	16880	12530	9930	8630	6480	5630	5180	
				IPM(FEED)	99	99	99	102	102	99	92	
				SFM(Vc)	875	815	805	850	850	935	1020	
				IPT(fz)	.0009	.0012	.0015	.0013	.0016	.0016	.0012	
11.2	High alloyed steel, and tool steel	0.3D	1.5D	SFM(Vc)	595	555	540	595	580	575	680	
				IPT(fz)	.0009	.0012	.0015	.0013	.0015	.0015	.0012	
				RPM	9090	6780	5500	4550	3550	2930	2600	
				IPM(FEED)	24	24	24	24	22	18	15	
				SFM(Vc)	240	210	210	235	215	235	285	
				IPT(fz)	.0010	.0013	.0019	.0015	.0013	.0013	.0012	
K	38.1-38.2	Hardened steel	0.05D	1.0D	SFM(Vc)	240	210	210	235	215	235	285
					IPT(fz)	.0010	.0013	.0019	.0015	.0013	.0013	.0012
					RPM	3670	2570	2140	1800	1310	1200	1090
					IPM(FEED)	11	10	12	11	7	6	6
					SFM(Vc)	595	555	540	595	580	575	680
					IPT(fz)	.0009	.0012	.0015	.0013	.0015	.0015	.0012
K	40	Chilled Cast Iron	0.3D	1.5D	SFM(Vc)	595	555	540	595	580	575	680
					IPT(fz)	.0009	.0012	.0015	.0013	.0015	.0015	.0012
					RPM	9090	6780	5500	4550	3550	2930	2600
					IPM(FEED)	24	24	24	24	22	18	15
					SFM(Vc)	240	210	210	235	215	235	285
					IPT(fz)	.0010	.0013	.0019	.0015	.0013	.0013	.0012
K	41	Hardened Cast Iron	0.05D	1.0D	SFM(Vc)	240	210	210	235	215	235	285
					IPT(fz)	.0010	.0013	.0019	.0015	.0013	.0013	.0012
					RPM	3670	2570	2140	1800	1310	1200	1090
					IPM(FEED)	11	10	12	11	7	6	6
					SFM(Vc)	240	210	210	235	215	235	285
					IPT(fz)	.0010	.0013	.0019	.0015	.0013	.0013	.0012

SFM = Surface Feet per Minute  
 RPM = Revolutions Per Minute  
 IPT = Inches Per Tooth  
 IPM = Inches Per Minute  
 Ap : Inch (Axial Depth of Cut)  
 Ae : Inch (Radial Depth of Cut)





# X-POWER PRO END MILLS

### RECOMMENDED CUTTING CONDITIONS



# X-POWER PRO END MILLS

### RECOMMENDED CUTTING CONDITIONS

## GM156 SERIES

### 3-5FLUTE Roughing - Side Cutting

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø)									
						1/4	5/16	3/8	1/2	5/8	3/4	1			
P	1-4	Non-alloy steel	0.3D	1.5D	SFM(Vc)	1070	995	950	1100	1030	1070	1320			
					IPT(fz)	.0020	.0026	.0033	.0030	.0039	.0044	.0035			
					RPM	16350	12160	9680	8400	6300	5450	5040			
					IPM(FEED)	96	96	96	99	99	96	89			
	5	Non-alloy steel	0.3D	1.5D	SFM(Vc)	850	790	785	825	825	905	990			
					IPT(fz)	.0009	.0012	.0015	.0013	.0016	.0016	.0012			
					RPM	12990	9660	8000	6300	5040	4610	3780			
					IPM(FEED)	35	35	35	33	31	30	23			
	6-7	Low alloy steel	0.3D	1.5D	SFM(Vc)	1070	995	950	1100	1030	1070	1320			
					IPT(fz)	.0020	.0026	.0033	.0030	.0039	.0044	.0035			
					RPM	16350	12160	9680	8400	6300	5450	5040			
					IPM(FEED)	96	96	96	99	99	96	89			
8-9	Low alloy steel	0.3D	1.5D	SFM(Vc)	850	790	785	825	825	905	990				
				IPT(fz)	.0009	.0012	.0015	.0013	.0016	.0016	.0012				
				RPM	12990	9660	8000	6300	5040	4610	3780				
				IPM(FEED)	35	35	35	33	31	30	23				
10	High alloyed steel, and tool steel	0.3D	1.5D	SFM(Vc)	1070	995	950	1100	1030	1070	1320				
				IPT(fz)	.0020	.0026	.0033	.0030	.0039	.0044	.0035				
				RPM	16350	12160	9680	8400	6300	5450	5040				
				IPM(FEED)	96	96	96	99	99	96	89				
11.1	High alloyed steel, and tool steel	0.3D	1.5D	SFM(Vc)	850	790	785	825	825	905	990				
				IPT(fz)	.0009	.0012	.0015	.0013	.0016	.0016	.0012				
				RPM	12990	9660	8000	6300	5040	4610	3780				
				IPM(FEED)	35	35	35	33	31	30	23				
11.2	High alloyed steel, and tool steel	0.3D	1.5D	SFM(Vc)	575	540	525	575	570	560	660				
				IPT(fz)	.0009	.0012	.0015	.0013	.0015	.0015	.0012				
				RPM	8790	6600	5350	4390	3480	2850	2520				
				IPM(FEED)	24	24	24	24	21	17	15				
K	38.1-38.2	Hardened steel	0.05D	1.0D	SFM(Vc)	235	205	205	230	205	230	275			
					IPT(fz)	.0010	.0013	.0019	.0015	.0013	.0013	.0012			
					RPM	3590	2510	2090	1760	1250	1170	1050			
	40	Chilled Cast Iron	0.3D	1.5D	SFM(Vc)	575	540	525	575	570	560	660			
					IPT(fz)	.0009	.0012	.0015	.0013	.0015	.0015	.0012			
					RPM	8790	6600	5350	4390	3480	2850	2520			
					IPM(FEED)	24	24	24	24	21	17	15			
41	Hardened Cast Iron	0.05D	1.0D	SFM(Vc)	235	205	205	230	205	230	275				
				IPT(fz)	.0010	.0013	.0019	.0015	.0013	.0013	.0012				
				RPM	3590	2510	2090	1760	1250	1170	1050				

SFM = Surface Feet per Minute  
RPM = Revolutions Per Minute  
IPT = Inches Per Tooth  
IPM = Inches Per Minute  
Ap : Inch (Axial Depth of Cut)  
Ae : Inch (Radial Depth of Cut)

## GM967 SERIES

### 2FLUTE BALL NOSE - PROFILE

ISO	VDI 3323	Material Description	Parameter	Diameter (Ø)							
				1/32	3/64	1/16	5/64	3/32	1/8		
P	1-4	Non-alloy steel	SFM(Vc)	230~300	240~305	240~310	260~310	245~310	275~345		
			IPT(fz)	.0001~.0002	.0002~.0005	.0003~.0007	.0003~.0008	.0004~.0010	.0005~.0012		
			RPM	28120~36670	19560~24860	14670~18950	12710~15160	9980~12630	8400~10540		
			IPM(FEED)	8~17	8~25	8~25	8~25	8~25	8~25		
	5	Non-alloy steel	SFM(Vc)	170~210	165~215	175~220	180~225	175~220	190~240		
			IPT(fz)	.0001~.0002	.0002~.0004	.0002~.0005	.0002~.0006	.0003~.0007	.0003~.0009		
			RPM	20780~25670	13450~17520	10700~13450	8800~11000	7130~8960	5810~7330		
			IPM(FEED)	3~10	4~12	4~12	4~12	4~12	4~12		
	6-7	Low alloy steel	SFM(Vc)	230~300	240~305	240~310	260~310	245~310	275~345		
			IPT(fz)	.0001~.0002	.0002~.0005	.0003~.0007	.0003~.0008	.0004~.0010	.0005~.0012		
			RPM	28120~36670	19560~24860	14670~18950	12710~15160	9980~12630	8400~10540		
			IPM(FEED)	8~17	8~25	8~25	8~25	8~25	8~25		
8-9	Low alloy steel	SFM(Vc)	170~210	165~215	175~220	180~225	175~220	190~240			
		IPT(fz)	.0001~.0002	.0002~.0004	.0002~.0005	.0002~.0006	.0003~.0007	.0003~.0009			
		RPM	20780~25670	13450~17520	10700~13450	8800~11000	7130~8960	5810~7330			
		IPM(FEED)	3~10	4~12	4~12	4~12	4~12	4~12			
10	High alloyed steel, and tool steel	SFM(Vc)	230~300	240~305	240~310	260~310	245~310	275~345			
		IPT(fz)	.0001~.0002	.0002~.0005	.0003~.0007	.0003~.0008	.0004~.0010	.0005~.0012			
		RPM	28120~36670	19560~24860	14670~18950	12710~15160	9980~12630	8400~10540			
		IPM(FEED)	8~17	8~25	8~25	8~25	8~25	8~25			
11.1-11.2	High alloyed steel, and tool steel	SFM(Vc)	170~210	165~215	175~220	180~225	175~220	190~240			
		IPT(fz)	.0001~.0002	.0002~.0004	.0002~.0005	.0002~.0006	.0003~.0007	.0003~.0009			
		RPM	20780~25670	13450~17520	10700~13450	8800~11000	7130~8960	5810~7330			
		IPM(FEED)	3~10	4~12	4~12	4~12	4~12	4~12			
H	38.1-38.2	Hardened steel	SFM(Vc)	105~125	105~135	110~135	115~140	110~135	120~150		
			IPT(fz)	.00006~.00013	.0001~.0002	.0002~.0003	.0002~.0003	.0002~.0004	.0003~.0005		
			RPM	12840~15280	8560~11000	6720~8250	5620~6850	4480~5500	3670~4580		
	40	Chilled Cast Iron	SFM(Vc)	170~210	165~215	175~220	180~225	175~220	190~240		
			IPT(fz)	.0001~.0002	.0002~.0004	.0002~.0005	.0002~.0006	.0003~.0007	.0003~.0009		
			RPM	20780~25670	13450~17520	10700~13450	8800~11000	7130~8960	5810~7330		
			IPM(FEED)	3~10	4~12	4~12	4~12	4~12	4~12		
41	Hardened Cast Iron	SFM(Vc)	105~125	105~135	110~135	115~140	110~135	120~150			
		IPT(fz)	.00006~.00013	.0001~.0002	.0002~.0003	.0002~.0003	.0002~.0004	.0003~.0005			
		RPM	12840~15280	8560~11000	6720~8250	5620~6850	4480~5500	3670~4580			

SFM = Surface Feet per Minute  
RPM = Revolutions Per Minute  
IPT = Inches Per Tooth  
IPM = Inches Per Minute  
Ap : Inch (Axial Depth of Cut)  
Ae : Inch (Radial Depth of Cut)



RECOMMENDED CUTTING CONDITIONS



RECOMMENDED CUTTING CONDITIONS

GM876, GM813 SERIES 2 FLUTE BALL NOSE

GM876, GM813 SERIES 2 FLUTE BALL NOSE

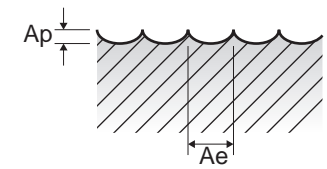
NORMAL SPEED

HIGH SPEED

Table with columns for ISO, VDI 3323, Material Description, Ae, Parameter, and Diameter (Ø) from 1.0 to 20.0. Rows include Non-alloy steel, Low alloy steel, High alloyed steel, and Grey cast iron.

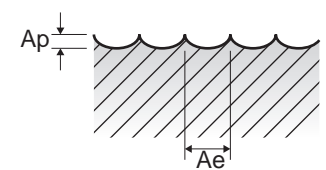
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SFM = Surface Feet per Minute
RPM = Revolutions Per Minute
IPT = Inches Per Tooth
IPM = Inches Per Minute
Ap : mm (Axial Depth of Cut)
Ae : Inch (Radial Depth of Cut)



SFM = Surface Feet per Minute
RPM = Revolutions Per Minute
IPT = Inches Per Tooth
IPM = Inches Per Minute
Ap : mm (Axial Depth of Cut)
Ae : Inch (Radial Depth of Cut)

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RECOMMENDED CUTTING CONDITIONS



RECOMMENDED CUTTING CONDITIONS

GM886 SERIES 2 FLUTE BALL NOSE RIB PROCESSING

GM886 SERIES 2 FLUTE BALL NOSE RIB PROCESSING

Table with columns: ISO, VDI 3323, Material Description, Parameter, Diameter (Ø) (0.5, 0.6, 0.8, 1.0, 1.2, 1.4). Rows include Non-alloy steel, Low alloy steel, High alloyed steel, and tool steel.

SFM = Surface Feet per Minute
RPM = Revolutions Per Minute
IPT = Inches Per Tooth
IPM = Inches Per Minute
Ap : mm (Axial Depth of Cut)
Ae : Inch (Radial Depth of Cut)

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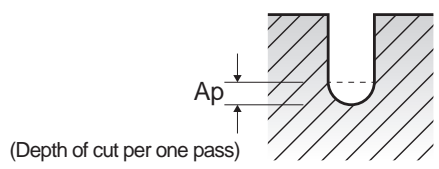
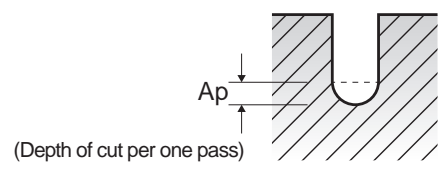


Table with columns: VDI 3323, Parameter, Diameter (Ø) (1.5, 1.6, 1.8, 2.0, 3.0, 4.0, 5.0, 6.0). Rows include 1-4, 5, 6-7, 8-9, 10, 11.1-11.2, 15-20, 38.1-38.2, 40, 41.

SFM = Surface Feet per Minute
RPM = Revolutions Per Minute
IPT = Inches Per Tooth
IPM = Inches Per Minute
Ap : mm (Axial Depth of Cut)
Ae : Inch (Radial Depth of Cut)







RECOMMENDED CUTTING CONDITIONS



RECOMMENDED CUTTING CONDITIONS

GM902 SERIES 2 FLUTE BALL NOSE with TAPER NECK

GM902 SERIES 2 FLUTE BALL NOSE with TAPER NECK

NORMAL SPEED

Table with columns: ISO, VDI 3323, Material Description, Ae, Parameter, Diameter (Ø) [1.0, 2.0, 3.0, 4.0, 5.0, 6.0, 8.0]. Rows include categories 5, 8-9, 11.1, 11.2, H, and 38.1, 38.2, 40, 41.

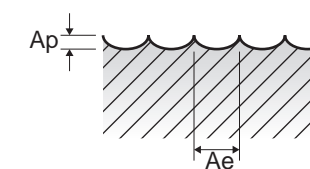
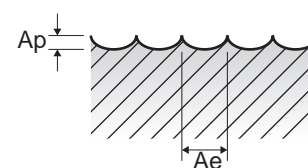
HIGH SPEED

Table with columns: ISO, VDI 3323, Material Description, Ae, Parameter, Diameter (Ø) [1.0, 2.0, 3.0, 4.0, 5.0, 6.0, 8.0]. Rows include categories P, K, and H.

SFM = Surface Feet per Minute
RPM = Revolutions Per Minute
IPT = Inches Per Tooth
IPM = Inches Per Minute
Ap : mm (Axial Depth of Cut)
Ae : Inch (Radial Depth of Cut)

SFM = Surface Feet per Minute
RPM = Revolutions Per Minute
IPT = Inches Per Tooth
IPM = Inches Per Minute
Ap : mm (Axial Depth of Cut)
Ae : Inch (Radial Depth of Cut)

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RECOMMENDED CUTTING CONDITIONS



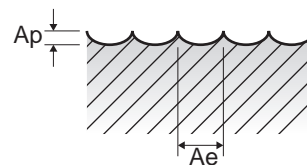
RECOMMENDED CUTTING CONDITIONS

GM815 SERIES 4 FLUTE BALL NOSE

NORMAL SPEED

ISO	VDI 3323	Material Description	Ae	Parameter	Diameter (Ø)								
					2.0	3.0	4.0	5.0	6.0	8.0	10.0	12.0	16.0
P	1-4	Non-alloy steel	0.2D	SFM(Vc)	345	425	460	490	560	625	690	755	820
				IPT(fz)	.0005	.0008	.0010	.0013	.0018	.0027	.0035	.0044	.0054
				RPM	16740	13750	11160	9510	9060	7580	6700	6110	4970
				IPM(FEED)	34	41	46	51	64	81	95	107	107
				Ap	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3
				SFM(Vc)	245	330	360	395	445	490	560	605	655
	5	Non-alloy steel	0.2D	IPT(fz)	.0004	.0007	.0009	.0012	.0018	.0024	.0029	.0035	.0042
				RPM	11890	10670	8730	7670	7200	5940	5430	4890	3970
				IPM(FEED)	19	28	33	36	51	56	64	69	66
				Ap	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3
				SFM(Vc)	345	425	460	490	560	625	690	755	820
				IPT(fz)	.0005	.0008	.0010	.0013	.0018	.0027	.0035	.0044	.0054
6-7	Low alloy steel	0.2D	RPM	16740	13750	11160	9510	9060	7580	6700	6110	4970	
			IPM(FEED)	34	41	46	51	64	81	95	107	107	
			Ap	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3	
			SFM(Vc)	245	330	360	395	445	490	560	605	655	
			IPT(fz)	.0004	.0007	.0009	.0012	.0018	.0024	.0029	.0035	.0042	
			RPM	11890	10670	8730	7670	7200	5940	5430	4890	3970	
8-9	Low alloy steel	0.2D	IPM(FEED)	19	28	33	36	51	56	64	69	66	
			Ap	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3	
			SFM(Vc)	345	425	460	490	560	625	690	755	820	
			IPT(fz)	.0005	.0008	.0010	.0013	.0018	.0027	.0035	.0044	.0054	
			RPM	16740	13750	11160	9510	9060	7580	6700	6110	4970	
			IPM(FEED)	34	41	46	51	64	81	95	107	107	
10	High alloyed steel, and tool steel	0.2D	Ap	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3	
			SFM(Vc)	245	330	360	395	445	490	560	605	655	
			IPT(fz)	.0004	.0007	.0009	.0012	.0018	.0024	.0029	.0035	.0042	
			RPM	11890	10670	8730	7670	7200	5940	5430	4890	3970	
			IPM(FEED)	19	28	33	36	51	56	64	69	66	
			Ap	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3	
K	15-20	Grey cast iron Nodular cast iron Malleable cast iron	0.2D	SFM(Vc)	345	425	460	490	560	625	690	755	820
				IPT(fz)	.0005	.0008	.0010	.0013	.0018	.0027	.0035	.0044	.0054
				RPM	16740	13750	11160	9510	9060	7580	6700	6110	4970
				IPM(FEED)	34	41	46	51	64	81	95	107	107
				Ap	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3
				SFM(Vc)	100	150	180	195	215	215	215	230	230
H	38.1 - 39.2	Hardened steel	0.1D	IPT(fz)	.0003	.0005	.0006	.0007	.0009	.0013	.0016	.0021	.0027
				RPM	4850	4850	4370	3780	3480	2610	2090	1860	1400
				IPM(FEED)	6	9	11	11	12	13	13	16	15
				Ap	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3
				SFM(Vc)	245	330	360	395	445	490	560	605	655
				IPT(fz)	.0004	.0007	.0009	.0012	.0018	.0024	.0029	.0035	.0042
	40	Chilled Cast Iron	0.2D	RPM	11890	10670	8730	7670	7200	5940	5430	4890	3970
				IPM(FEED)	19	28	33	36	51	56	64	69	66
				Ap	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3
				SFM(Vc)	100	150	180	195	215	215	215	230	230
				IPT(fz)	.0003	.0005	.0006	.0007	.0009	.0013	.0016	.0021	.0027
				RPM	4850	4850	4370	3780	3480	2610	2090	1860	1400
41	Hardened Cast Iron	0.1D	IPM(FEED)	6	9	11	11	12	13	13	16	15	
			Ap	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3	

SFM = Surface Feet per Minute  
 RPM = Revolutions Per Minute  
 IPT = Inches Per Tooth  
 IPM = Inches Per Minute  
 Ap : mm (Axial Depth of Cut)  
 Ae : Inch (Radial Depth of Cut)



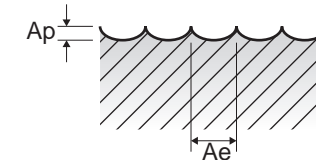
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GM815 SERIES 4 FLUTE BALL NOSE

HIGH SPEED

ISO	VDI 3323	Material Description	Ae	Parameter	Diameter (Ø)								
					2.0	3.0	4.0	5.0	6.0	8.0	10.0	12.0	16.0
P	1-5	Non-alloy steel	0.05D	SFM(Vc)	460	690	900	1130	1360	1445	1510	1590	1655
				IPT(fz)	.0010	.0014	.0021	.0025	.0028	.0035	.0041	.0047	.0054
				RPM	22320	22320	21830	21930	21990	17530	14650	12860	10040
				IPM(FEED)	91	126	179	221	246	248	242	243	215
				Ap	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3
				SFM(Vc)	460	690	900	1130	1360	1445	1510	1590	1655
	6-9	Low alloy steel	0.05D	IPT(fz)	.0010	.0014	.0021	.0025	.0028	.0035	.0041	.0047	.0054
				RPM	22320	22320	21830	21930	21990	17530	14650	12860	10040
				IPM(FEED)	91	126	179	221	246	248	242	243	215
				Ap	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3
				SFM(Vc)	460	690	900	1130	1360	1445	1510	1590	1655
				IPT(fz)	.0010	.0014	.0021	.0025	.0028	.0035	.0041	.0047	.0054
10 - 11.2	High alloyed steel, and tool steel	0.05D	RPM	22320	22320	21830	21930	21990	17530	14650	12860	10040	
			IPM(FEED)	91	126	179	221	246	248	242	243	215	
			Ap	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3	
			SFM(Vc)	460	690	900	1130	1360	1445	1510	1590	1655	
			IPT(fz)	.0010	.0014	.0021	.0025	.0028	.0035	.0041	.0047	.0054	
			RPM	22320	22320	21830	21930	21990	17530	14650	12860	10040	
K	15-20	Grey cast iron Nodular cast iron Malleable cast iron	0.05D	IPM(FEED)	91	126	179	221	246	248	242	243	215
				Ap	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3
				SFM(Vc)	460	690	900	1130	1360	1445	1510	1590	1655
				IPT(fz)	.0010	.0014	.0021	.0025	.0028	.0035	.0041	.0047	.0054
				RPM	22320	22320	21830	21930	21990	17530	14650	12860	10040
				IPM(FEED)	91	126	179	221	246	248	242	243	215
H	38.1 - 39.2	Hardened steel	0.05D	SFM(Vc)	460	560	590	655	690	720	755	785	820
				IPT(fz)	.0007	.0009	.0013	.0015	.0018	.0022	.0025	.0028	.0031
				RPM	22320	18110	14310	12710	11160	8730	7330	6350	4970
				IPM(FEED)	60	65	72	76	79	77	74	71	62
				Ap	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3
				SFM(Vc)	460	690	900	1130	1360	1445	1510	1590	1655
	40	Chilled Cast Iron	0.05D	IPT(fz)	.0010	.0014	.0021	.0025	.0028	.0035	.0041	.0047	.0054
				RPM	22320	22320	21830	21930	21990	17530	14650	12860	10040
				IPM(FEED)	91	126	179	221	246	248	242	243	215
				Ap	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3
				SFM(Vc)	460	560	590	655	690	720	755	785	820
				IPT(fz)	.0007	.0009	.0013	.0015	.0018	.0022	.0025	.0028	.0031
41	Hardened Cast Iron	0.05D	RPM	22320	18110	14310	12710	11160	8730	7330	6350	4970	
			IPM(FEED)	60	65	72	76	79	77	74	71	62	
			Ap	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3	

SFM = Surface Feet per Minute  
 RPM = Revolutions Per Minute  
 IPT = Inches Per Tooth  
 IPM = Inches Per Minute  
 Ap : mm (Axial Depth of Cut)  
 Ae : Inch (Radial Depth of Cut)





# X-POWER PRO END MILLS

## RECOMMENDED CUTTING CONDITIONS



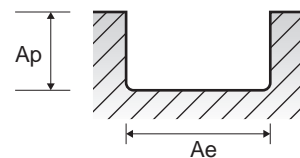
# X-POWER PRO END MILLS

## RECOMMENDED CUTTING CONDITIONS

### GM818 SERIES 2 FLUTE CORNER RADIUS - SLOTTING

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø)							
						4.0	5.0	6.0	8.0	10.0	12.0		
<b>P</b>	1-4	Non-alloy steel	1.0D	0.3D	SFM(Vc)	245	260	260	280	280	280		
					IPT(fz)	.0006	.0009	.0013	.0018	.0021	.0020		
					RPM	5940	5050	4210	3400	2720	2260		
	IPM(FEED)				8	9	11	12	11	9			
	SFM(Vc)				150	165	165	180	180	195			
	IPT(fz)				.0005	.0007	.0010	.0013	.0015	.0016			
	RPM	3640	3200	2670	2180	1750	1580						
	IPM(FEED)	4	4	5	6	5	5						
	6-7	Low alloy steel	1.0D	0.3D	SFM(Vc)	245	260	260	280	280	280		
					IPT(fz)	.0006	.0009	.0013	.0018	.0021	.0020		
					RPM	5940	5050	4210	3400	2720	2260		
	IPM(FEED)				8	9	11	12	11	9			
SFM(Vc)	150				165	165	180	180	195				
IPT(fz)	.0005				.0007	.0010	.0013	.0015	.0016				
RPM	3640	3200	2670	2180	1750	1580							
IPM(FEED)	4	4	5	6	5	5							
8-9	High alloyed steel, and tool steel	1.0D	0.3D	SFM(Vc)	245	260	260	280	280	280			
				IPT(fz)	.0006	.0009	.0013	.0018	.0021	.0020			
				RPM	5940	5050	4210	3400	2720	2260			
IPM(FEED)				8	9	11	12	11	9				
SFM(Vc)				150	165	165	180	180	195				
IPT(fz)				.0005	.0007	.0010	.0013	.0015	.0016				
RPM	3640	3200	2670	2180	1750	1580							
IPM(FEED)	4	4	5	6	5	5							
10	Grey cast iron Nodular cast iron Malleable cast iron	1.0D	0.3D	SFM(Vc)	245	260	260	280	280	280			
				IPT(fz)	.0006	.0009	.0013	.0018	.0021	.0020			
				RPM	5940	5050	4210	3400	2720	2260			
IPM(FEED)				8	9	11	12	11	9				
SFM(Vc)				150	165	165	180	180	195				
IPT(fz)				.0005	.0007	.0010	.0013	.0015	.0016				
RPM	3640	3200	2670	2180	1750	1580							
IPM(FEED)	4	4	5	6	5	5							
11.1 11.2	Hardened steel	1.0D	0.3D	SFM(Vc)	100	115	115	115	115	115			
				IPT(fz)	.0002	.0003	.0004	.0005	.0006	.0008			
				RPM	2430	2230	1860	1400	1120	930			
IPM(FEED)				1	1	2	1	1	1				
40				Chilled Cast Iron	1.0D	0.3D	SFM(Vc)	150	165	165	180	180	195
							IPT(fz)	.0005	.0007	.0010	.0013	.0015	.0016
	RPM	3640	3200				2670	2180	1750	1580			
IPM(FEED)	4	4	5				6	5	5				
41	Hardened Cast Iron	1.0D	0.3D				SFM(Vc)	100	115	115	115	115	115
							IPT(fz)	.0002	.0003	.0004	.0005	.0006	.0008
				RPM	2430	2230	1860	1400	1120	930			
IPM(FEED)				1	1	2	1	1	1				

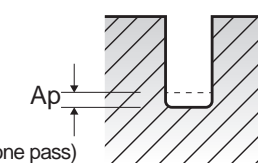
SFM = Surface Feet per Minute  
 RPM = Revolutions Per Minute  
 IPT = Inches Per Tooth  
 IPM = Inches Per Minute  
 Ap : Inch (Axial Depth of Cut)  
 Ae : Inch (Radial Depth of Cut)



### GM8A1 SERIES 2 FLUTE CORNER RADIUS RIB PROCESSING

ISO	VDI 3323	Material Description	Parameter	Diameter (Ø)							
				1.0	1.2	1.4	1.5	1.6	1.8		
<b>P</b>	1-4	Non-alloy steel	SFM(Vc)	245~305	240~290	240~305	235~300	240~310	255~320		
			IPT(fz)	.0002~.0006	.0003~.0008	.0003~.0009	.0004~.0010	.0004~.0010	.0004~.0011		
			RPM	23770~29590	19410~23450	16630~21140	15200~19410	14550~18800	13750~17250		
	IPM(FEED)		12~34	12~37	12~37	12~37	12~37	12~37			
	Ap		0.045~0.090	0.055~0.100	0.062~0.125	0.070~0.135	0.075~0.145	0.080~0.160			
	SFM(Vc)		170~215	170~215	175~210	170~220	175~220	180~225			
	IPT(fz)	.0002~.0006	.0003~.0007	.0003~.0009	.0004~.0010	.0004~.0010	.0004~.0011				
	RPM	16500~20860	13750~17380	12130~14550	11000~14230	10610~13340	9700~12130				
	IPM(FEED)	8~25	8~25	8~25	8~25	8~25	8~25				
	Ap	0.045~0.090	0.055~0.100	0.062~0.125	0.070~0.135	0.075~0.145	0.080~0.160				
	6-7	Low alloy steel	1.0D	0.3D	SFM(Vc)	245~305	240~290	240~305	235~300	240~310	255~320
					IPT(fz)	.0002~.0006	.0003~.0008	.0003~.0009	.0004~.0010	.0004~.0010	.0004~.0011
RPM					23770~29590	19410~23450	16630~21140	15200~19410	14550~18800	13750~17250	
IPM(FEED)	12~34				12~37	12~37	12~37	12~37	12~37		
Ap	0.045~0.090				0.055~0.100	0.062~0.125	0.070~0.135	0.075~0.145	0.080~0.160		
SFM(Vc)	170~215				170~215	175~210	170~220	175~220	180~225		
IPT(fz)	.0002~.0006	.0003~.0007	.0003~.0009	.0004~.0010	.0004~.0010	.0004~.0011					
RPM	16500~20860	13750~17380	12130~14550	11000~14230	10610~13340	9700~12130					
IPM(FEED)	8~25	8~25	8~25	8~25	8~25	8~25					
Ap	0.045~0.090	0.055~0.100	0.062~0.125	0.070~0.135	0.075~0.145	0.080~0.160					
8-9	High alloyed steel, and tool steel	1.0D	0.3D	SFM(Vc)	245~305	240~290	240~305	235~300	240~310	255~320	
				IPT(fz)	.0002~.0006	.0003~.0008	.0003~.0009	.0004~.0010	.0004~.0010	.0004~.0011	
				RPM	23770~29590	19410~23450	16630~21140	15200~19410	14550~18800	13750~17250	
IPM(FEED)				12~34	12~37	12~37	12~37	12~37	12~37		
Ap				0.045~0.090	0.055~0.100	0.062~0.125	0.070~0.135	0.075~0.145	0.080~0.160		
SFM(Vc)				170~215	170~215	175~210	170~220	175~220	180~225		
IPT(fz)	.0002~.0006	.0003~.0007	.0003~.0009	.0004~.0010	.0004~.0010	.0004~.0011					
RPM	16500~20860	13750~17380	12130~14550	11000~14230	10610~13340	9700~12130					
IPM(FEED)	8~25	8~25	8~25	8~25	8~25	8~25					
Ap	0.045~0.090	0.055~0.100	0.062~0.125	0.070~0.135	0.075~0.145	0.080~0.160					
10	Grey cast iron Nodular cast iron Malleable cast iron	1.0D	0.3D	SFM(Vc)	245~305	240~290	240~305	235~300	240~310	255~320	
				IPT(fz)	.0002~.0006	.0003~.0008	.0003~.0009	.0004~.0010	.0004~.0010	.0004~.0011	
				RPM	23770~29590	19410~23450	16630~21140	15200~19410	14550~18800	13750~17250	
IPM(FEED)				12~34	12~37	12~37	12~37	12~37	12~37		
Ap				0.045~0.090	0.055~0.100	0.062~0.125	0.070~0.135	0.075~0.145	0.080~0.160		
SFM(Vc)				170~215	170~215	175~210	170~220	175~220	180~225		
IPT(fz)	.0002~.0006	.0003~.0007	.0003~.0009	.0004~.0010	.0004~.0010	.0004~.0011					
RPM	16500~20860	13750~17380	12130~14550	11000~14230	10610~13340	9700~12130					
IPM(FEED)	8~25	8~25	8~25	8~25	8~25	8~25					
Ap	0.045~0.090	0.055~0.100	0.062~0.125	0.070~0.135	0.075~0.145	0.080~0.160					
11.1 11.2	Hardened steel	1.0D	0.3D	SFM(Vc)	110~135	110~135	110~135	110~135	110~140	110~140	
				IPT(fz)	.0001~.0002	.0002~.0002	.0002~.0003	.0002~.0003	.0002~.0003	.0002~.0004	
				RPM	10670~13100	8890~10920	7620~9360	7120~8730	6670~8490	5930~7550	
IPM(FEED)				3~5	3~5	3~5	3~5	3~5	3~5		
Ap				0.009~0.018	0.010~0.022	0.012~0.025	0.014~0.028	0.015~0.030	0.016~0.032		
40				Chilled Cast Iron	1.0D	0.3D	SFM(Vc)	170~215	170~215	175~210	170~220
	IPT(fz)	.0002~.0006	.0003~.0007				.0003~.0009	.0004~.0010	.0004~.0010	.0004~.0011	
	RPM	16500~20860	13750~17380				12130~14550	11000~14230	10610~13340	9700~12130	
IPM(FEED)	8~25	8~25	8~25				8~25	8~25	8~25		
Ap	0.045~0.090	0.055~0.100	0.062~0.125				0.070~0.135	0.075~0.145	0.080~0.160		
41	Hardened Cast Iron	1.0D	0.3D				SFM(Vc)	110~135	110~135	110~135	110~135
				IPT(fz)	.0001~.0002	.0002~.0002	.0002~.0003	.0002~.0003	.0002~.0003	.0002~.0004	
				RPM	10670~13100	8890~10920	7620~9360	7120~8730	6670~8490	5930~7550	
IPM(FEED)				3~5	3~5	3~5	3~5	3~5	3~5		
Ap				0.009~0.018	0.010~0.022	0.012~0.025	0.014~0.028	0.015~0.030	0.016~0.032		

SFM = Surface Feet per Minute  
 RPM = Revolutions Per Minute  
 IPT = Inches Per Tooth  
 IPM = Inches Per Minute  
 Ap : mm (Axial Depth of Cut)  
 Ae : Inch (Radial Depth of Cut)



(Depth of cut per one pass)

▶ NEXT PAGE





RECOMMENDED CUTTING CONDITIONS

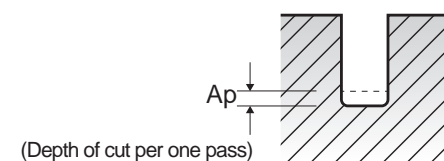


RECOMMENDED CUTTING CONDITIONS

**GM8A1 SERIES** 2 FLUTE CORNER RADIUS RIB PROCESSING

ISO	VDI 3323	Material Description	Parameter	Diameter (Ø)					
				2.0	2.5	3.0	4.0	5.0	6.0
P	1-4	Non-alloy steel	SFM(Vc)	260~315	255~325	260~325	260~325	260~325	260~325
			IPT(fz)	.0005~.0012	.0006~.0015	.0007~.0018	.0009~.0024	.0011~.0029	.0014~.0035
			RPM	12610~15280	9900~12610	8410~10510	6310~7880	5050~6310	4210~5260
			IPM(FEED)	12~37	12~37	12~37	12~37	12~37	12~37
			Ap	0.090~0.180	0.112~0.235	0.135~0.270	0.180~0.360	0.225~0.450	0.270~0.540
			Ap	0.090~0.180	0.112~0.235	0.135~0.270	0.180~0.360	0.225~0.450	0.270~0.540
	5	Non-alloy steel	SFM(Vc)	180~225	180~230	180~225	180~230	180~225	180~230
			IPT(fz)	.0005~.0011	.0006~.0014	.0007~.0017	.0009~.0022	.0011~.0028	.0014~.0033
			RPM	8730~10920	6990~8930	5820~7280	4370~5580	3490~4370	2910~3720
			IPM(FEED)	8~25	8~25	8~25	8~25	8~25	8~25
			Ap	0.090~0.180	0.112~0.235	0.135~0.270	0.180~0.360	0.225~0.450	0.270~0.540
			Ap	0.090~0.180	0.112~0.235	0.135~0.270	0.180~0.360	0.225~0.450	0.270~0.540
6-7	Low alloy steel	SFM(Vc)	260~315	255~325	260~325	260~325	260~325	260~325	
		IPT(fz)	.0005~.0012	.0006~.0015	.0007~.0018	.0009~.0024	.0011~.0029	.0014~.0035	
		RPM	12610~15280	9900~12610	8410~10510	6310~7880	5050~6310	4210~5260	
		IPM(FEED)	12~37	12~37	12~37	12~37	12~37	12~37	
		Ap	0.090~0.180	0.112~0.235	0.135~0.270	0.180~0.360	0.225~0.450	0.270~0.540	
		Ap	0.090~0.180	0.112~0.235	0.135~0.270	0.180~0.360	0.225~0.450	0.270~0.540	
8-9	Low alloy steel	SFM(Vc)	180~225	180~230	180~225	180~230	180~225	180~230	
		IPT(fz)	.0005~.0011	.0006~.0014	.0007~.0017	.0009~.0022	.0011~.0028	.0014~.0033	
		RPM	8730~10920	6990~8930	5820~7280	4370~5580	3490~4370	2910~3720	
		IPM(FEED)	8~25	8~25	8~25	8~25	8~25	8~25	
		Ap	0.090~0.180	0.112~0.235	0.135~0.270	0.180~0.360	0.225~0.450	0.270~0.540	
		Ap	0.090~0.180	0.112~0.235	0.135~0.270	0.180~0.360	0.225~0.450	0.270~0.540	
10	High alloyed steel, and tool steel	SFM(Vc)	260~315	255~325	260~325	260~325	260~325	260~325	
		IPT(fz)	.0005~.0012	.0006~.0015	.0007~.0018	.0009~.0024	.0011~.0029	.0014~.0035	
		RPM	12610~15280	9900~12610	8410~10510	6310~7880	5050~6310	4210~5260	
		IPM(FEED)	12~37	12~37	12~37	12~37	12~37	12~37	
		Ap	0.090~0.180	0.112~0.235	0.135~0.270	0.180~0.360	0.225~0.450	0.270~0.540	
		Ap	0.090~0.180	0.112~0.235	0.135~0.270	0.180~0.360	0.225~0.450	0.270~0.540	
11.1 - 11.2	High alloyed steel, and tool steel	SFM(Vc)	180~225	180~230	180~225	180~230	180~225	180~230	
		IPT(fz)	.0005~.0011	.0006~.0014	.0007~.0017	.0009~.0022	.0011~.0028	.0014~.0033	
		RPM	8730~10920	6990~8930	5820~7280	4370~5580	3490~4370	2910~3720	
		IPM(FEED)	8~25	8~25	8~25	8~25	8~25	8~25	
		Ap	0.090~0.180	0.112~0.235	0.135~0.270	0.180~0.360	0.225~0.450	0.270~0.540	
		Ap	0.090~0.180	0.112~0.235	0.135~0.270	0.180~0.360	0.225~0.450	0.270~0.540	
K	15-20	Grey cast iron Nodular cast iron Malleable cast iron	SFM(Vc)	260~315	255~325	260~325	260~325	260~325	260~325
			IPT(fz)	.0005~.0012	.0006~.0015	.0007~.0018	.0009~.0024	.0011~.0029	.0014~.0035
			RPM	12610~15280	9900~12610	8410~10510	6310~7880	5050~6310	4210~5260
			IPM(FEED)	12~37	12~37	12~37	12~37	12~37	12~37
			Ap	0.090~0.180	0.112~0.235	0.135~0.270	0.180~0.360	0.225~0.450	0.270~0.540
			Ap	0.090~0.180	0.112~0.235	0.135~0.270	0.180~0.360	0.225~0.450	0.270~0.540
H	38.1 - 38.2	Hardened steel	SFM(Vc)	115~145	115~145	115~145	115~145	115~140	115~170
			IPT(fz)	.0003~.0004	.0003~.0005	.0004~.0006	.0005~.0008	.0006~.001	.0008~.001
			RPM	5580~7040	4460~5630	3720~4690	2790~3520	2230~2720	1860~2750
			IPM(FEED)	3~5	3~5	3~5	3~5	3~5	3~5
			Ap	0.018~0.035	0.022~0.045	0.028~0.055	0.036~0.072	0.045~0.090	0.054~0.108
			Ap	0.018~0.035	0.022~0.045	0.028~0.055	0.036~0.072	0.045~0.090	0.054~0.108
	40	Chilled Cast Iron	SFM(Vc)	180~225	180~230	180~225	180~230	180~225	180~230
			IPT(fz)	.0005~.0011	.0006~.0014	.0007~.0017	.0009~.0022	.0011~.0028	.0014~.0033
			RPM	8730~10920	6990~8930	5820~7280	4370~5580	3490~4370	2910~3720
			IPM(FEED)	8~25	8~25	8~25	8~25	8~25	8~25
			Ap	0.090~0.180	0.112~0.235	0.135~0.270	0.180~0.360	0.225~0.450	0.270~0.540
			Ap	0.090~0.180	0.112~0.235	0.135~0.270	0.180~0.360	0.225~0.450	0.270~0.540
41	Hardened Cast Iron	SFM(Vc)	115~145	115~145	115~145	115~145	115~140	115~170	
		IPT(fz)	.0003~.0004	.0003~.0005	.0004~.0006	.0005~.0008	.0006~.001	.0008~.001	
		RPM	5580~7040	4460~5630	3720~4690	2790~3520	2230~2720	1860~2750	
		IPM(FEED)	3~5	3~5	3~5	3~5	3~5	3~5	
		Ap	0.018~0.035	0.022~0.045	0.028~0.055	0.036~0.072	0.045~0.090	0.054~0.108	
		Ap	0.018~0.035	0.022~0.045	0.028~0.055	0.036~0.072	0.045~0.090	0.054~0.108	

SFM = Surface Feet per Minute  
 RPM = Revolutions Per Minute  
 IPT = Inches Per Tooth  
 IPM = Inches Per Minute  
 Ap : mm (Axial Depth of Cut)  
 Ae : Inch (Radial Depth of Cut)



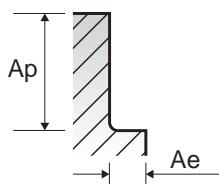
**GM839 SERIES** 4 FLUTE CORNER RADIUS - SIDE CUTTING

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø)						
						2.0	3.0	4.0	6.0	8.0	10.0	12.0
P	1-4	Non-alloy steel	0.05D	1.0D	SFM(Vc)	310	360	410	460	460	445	445
					IPT(fz)	.0002	.0004	.0007	.0012	.0017	.0018	.0019
					RPM	15040	11640	9950	7440	5580	4320	3600
					IPM(FEED)	14	17	30	35	37	32	27
					Ap	0.090~0.180	0.112~0.235	0.135~0.270	0.180~0.360	0.225~0.450	0.270~0.540	0.270~0.540
					Ap	0.090~0.180	0.112~0.235	0.135~0.270	0.180~0.360	0.225~0.450	0.270~0.540	0.270~0.540
	5	Non-alloy steel	0.05D	1.0D	SFM(Vc)	215	230	245	280	280	280	280
					IPT(fz)	.0002	.0004	.0008	.0012	.0015	.0014	.0014
					RPM	10430	7440	5940	4530	3400	2720	2260
					IPM(FEED)	10	11	18	21	20	16	13
					Ap	0.090~0.180	0.112~0.235	0.135~0.270	0.180~0.360	0.225~0.450	0.270~0.540	0.270~0.540
					Ap	0.090~0.180	0.112~0.235	0.135~0.270	0.180~0.360	0.225~0.450	0.270~0.540	0.270~0.540
6-7	Low alloy steel	0.05D	1.0D	SFM(Vc)	310	360	410	460	460	445	445	
				IPT(fz)	.0002	.0004	.0007	.0012	.0017	.0018	.0019	
				RPM	15040	11640	9950	7440	5580	4320	3600	
				IPM(FEED)	14	17	30	35	37	32	27	
				Ap	0.090~0.180	0.112~0.235	0.135~0.270	0.180~0.360	0.225~0.450	0.270~0.540	0.270~0.540	
				Ap	0.090~0.180	0.112~0.235	0.135~0.270	0.180~0.360	0.225~0.450	0.270~0.540	0.270~0.540	
8-9	Low alloy steel	0.05D	1.0D	SFM(Vc)	215	230	245	280	280	280	280	
				IPT(fz)	.0002	.0004	.0008	.0012	.0015	.0014	.0014	
				RPM	10430	7440	5940	4530	3400	2720	2260	
				IPM(FEED)	10	11	18	21	20	16	13	
				Ap	0.090~0.180	0.112~0.235	0.135~0.270	0.180~0.360	0.225~0.450	0.270~0.540	0.270~0.540	
				Ap	0.090~0.180	0.112~0.235	0.135~0.270	0.180~0.360	0.225~0.450	0.270~0.540	0.270~0.540	
10	High alloyed steel, and tool steel	0.05D	1.0D	SFM(Vc)	310	360	410	460	460	445	445	
				IPT(fz)	.0002	.0004	.0007	.0012	.0017	.0018	.0019	
				RPM	15040	11640	9950	7440	5580	4320	3600	
				IPM(FEED)	14	17	30	35	37	32	27	
				Ap	0.090~0.180	0.112~0.235	0.135~0.270	0.180~0.360	0.225~0.450	0.270~0.540	0.270~0.540	
				Ap	0.090~0.180	0.112~0.235	0.135~0.270	0.180~0.360	0.225~0.450	0.270~0.540	0.270~0.540	
K	15-20	Grey cast iron Nodular cast iron Malleable cast iron	0.05D	1.0D	SFM(Vc)	310	360	410	460	460	445	445
					IPT(fz)	.0002	.0004	.0007	.0012	.0017	.0018	.0019
					RPM	15040	11640	9950	7440	5580	4320	3600
					IPM(FEED)	14	17	30	35	37	32	27
					Ap	0.090~0.180	0.112~0.235	0.135~0.270	0.180~0.360	0.225~0.450	0.270~0.540	0.270~0.540
					Ap	0.090~0.180	0.112~0.235	0.135~0.270	0.180~0.360	0.225~0.450	0.270~0.540	0.270~0.540
H	38.1 - 38.2	Hardened steel	0.05D	1.0D	SFM(Vc)	130	130	165	165	180	180	195
					IPT(fz)	.0001	.0002	.0002	.0004	.0006	.0007	.0007
					RPM	6310	4210	4000	2670	2180	1750	1580
					IPM(FEED)	2	3	3	4	6	5	4
					Ap	0.018~0.035	0.022~0.045	0.028~0.055	0.036~0.072	0.045~0.090	0.054~0.108	0.054~0.108
					Ap	0.018~0.035	0.022~0.045	0.028~0.055	0.036~0.072	0.045~0.090	0.054~0.108	0.054~0.108
	40	Chilled Cast Iron	0.05D	1.0D	SFM(Vc)	215	230	245	280	280	280	280
					IPT(fz)	.0002	.0004	.0008	.0012	.0015	.0014	.0014
					RPM	10430	7440	5940				

## GM819 SERIES 4 FLUTE CORNER RADIUS - SIDE CUTTING

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø)								
						3.0	4.0	5.0	6.0	8.0	10.0	12.0	16.0	20.0
P	1-4	Non-alloy steel	0.05D	2.5D	SFM(Vc)	230	245	260	260	280	280	310	280	
					IPT(fz)	.0002	.0004	.0005	.0006	.0007	.0009	.0009	.0009	.0009
					RPM	7440	5940	5050	4210	3400	2720	2260	1880	1360
					IPM(FEED)	7	9	10	9	10	10	8	7	5
	5	Non-alloy steel	0.05D	2.5D	SFM(Vc)	150	150	165	165	180	180	195	180	
					IPT(fz)	.0003	.0004	.0006	.0007	.0010	.0011	.0012	.0012	.0011
					RPM	4850	3640	3200	2670	2180	1750	1580	1180	870
					IPM(FEED)	6	6	8	8	8	8	7	6	4
	6-7	Low alloy steel	0.05D	2.5D	SFM(Vc)	230	245	260	260	280	280	310	280	
					IPT(fz)	.0002	.0004	.0005	.0006	.0007	.0009	.0009	.0009	.0009
					RPM	7440	5940	5050	4210	3400	2720	2260	1880	1360
					IPM(FEED)	7	9	10	9	10	10	8	7	5
8-9	Low alloy steel	0.05D	2.5D	SFM(Vc)	150	150	165	165	180	180	195	180		
				IPT(fz)	.0003	.0004	.0006	.0007	.0010	.0011	.0012	.0012	.0011	
				RPM	4850	3640	3200	2670	2180	1750	1580	1180	870	
				IPM(FEED)	6	6	8	8	8	8	7	6	4	
10	High alloyed steel, and tool steel	0.05D	2.5D	SFM(Vc)	230	245	260	260	280	280	310	280		
				IPT(fz)	.0002	.0004	.0005	.0006	.0007	.0009	.0009	.0009	.0009	
				RPM	7440	5940	5050	4210	3400	2720	2260	1880	1360	
				IPM(FEED)	7	9	10	9	10	10	8	7	5	
11.1 11.2	High alloyed steel, and tool steel	0.05D	2.5D	SFM(Vc)	150	150	165	165	180	180	195	180		
				IPT(fz)	.0003	.0004	.0006	.0007	.0010	.0011	.0012	.0012	.0011	
				RPM	4850	3640	3200	2670	2180	1750	1580	1180	870	
				IPM(FEED)	6	6	8	8	8	8	7	6	4	
K	15-20 Grey cast iron Nodular cast iron Malleable cast iron	0.05D	2.5D	SFM(Vc)	230	245	260	260	280	280	310	280		
				IPT(fz)	.0002	.0004	.0005	.0006	.0007	.0009	.0009	.0009	.0009	
				RPM	7440	5940	5050	4210	3400	2720	2260	1880	1360	
				IPM(FEED)	7	9	10	9	10	10	8	7	5	
H	38.1 - 38.2 Hardened steel	0.02D	2.0D	SFM(Vc)	80	100	115	115	115	115	115	115		
				IPT(fz)	.0002	.0003	.0004	.0005	.0007	.0008	.0008	.0009	.0009	
				RPM	2590	2430	2230	1860	1400	1120	930	700	560	
				IPM(FEED)	3	3	4	4	4	4	3	2	2	
H	40 Chilled Cast Iron	0.05D	2.5D	SFM(Vc)	150	150	165	165	180	180	195	180		
				IPT(fz)	.0003	.0004	.0006	.0007	.0010	.0011	.0012	.0012	.0011	
				RPM	4850	3640	3200	2670	2180	1750	1580	1180	870	
				IPM(FEED)	6	6	8	8	8	8	7	6	4	
H	41 Hardened Cast Iron	0.02D	2.0D	SFM(Vc)	80	100	115	115	115	115	115	115		
				IPT(fz)	.0002	.0003	.0004	.0005	.0007	.0008	.0008	.0009	.0009	
				RPM	2590	2430	2230	1860	1400	1120	930	700	560	
				IPM(FEED)	3	3	4	4	4	4	3	2	2	

SFM = Surface Feet per Minute  
RPM = Revolutions Per Minute  
IPT = Inches Per Tooth  
IPM = Inches Per Minute  
Ap : Inch (Axial Depth of Cut)  
Ae : Inch (Radial Depth of Cut)



SFM = Surface Feet per Minute  
RPM = Revolutions Per Minute  
IPT = Inches Per Tooth  
IPM = Inches Per Minute  
Ap : Inch (Axial Depth of Cut)  
Ae : Inch (Radial Depth of Cut)

## GM810 SERIES 2 FLUTE - SLOTTING

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø)				
						0.4	0.8	1.0	1.2	1.5
P	5	Non-alloy steel	1.0D	D<1:0.15D D≥1:0.25D	SFM(Vc)	130	215	230	215	195
					IPT(fz)	.0001	.0001	.0002	.0002	.0002
					RPM	31530	26080	22320	17380	12610
	8-9	Low alloy steel	1.0D	D<1:0.15D D≥1:0.25D	SFM(Vc)	130	215	230	215	195
					IPT(fz)	.0001	.0001	.0002	.0002	.0002
					RPM	31530	26080	22320	17380	12610
11.1 11.2	High alloyed steel, and tool steel	1.0D	D<1:0.15D D≥1:0.25D	SFM(Vc)	130	215	230	215	195	
				IPT(fz)	.0001	.0001	.0002	.0002	.0002	
				RPM	31530	26080	22320	17380	12610	
H	38.1 - 38.2	Hardened steel	1.0D	D<1:0.02D D≥1:0.05D	SFM(Vc)	100	165	165	165	150
					IPT(fz)	.00004	.0001	.0001	.0001	.0002
					RPM	24260	20010	16010	13340	9700
	40	Chilled Cast Iron	1.0D	D<1:0.15D D≥1:0.25D	SFM(Vc)	130	215	230	215	195
					IPT(fz)	.0001	.0001	.0002	.0002	.0002
					RPM	31530	26080	22320	17380	12610
41	Hardened Cast Iron	1.0D	D<1:0.02D D≥1:0.05D	SFM(Vc)	100	165	165	165	150	
				IPT(fz)	.00004	.0001	.0001	.0001	.0002	
				RPM	24260	20010	16010	13340	9700	

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø)									
						2.0	3.0	4.0	5.0	6.0	8.0	10.0	12.0	16.0	20.0
P	1-4	Non-alloy steel	1.0D	D≤3:0.2D D>3:0.5D	SFM(Vc)	215	245	280	295	310	310	295	310	330	310
					IPT(fz)	.0004	.0006	.0010	.0013	.0015	.0023	.0025	.0025	.0024	.0025
	5	Non-alloy steel	1.0D	D≤3:0.2D D>3:0.5D	SFM(Vc)	150	150	165	180	180	180	180	180	195	195
					IPT(fz)	.0004	.0006	.0009	.0013	.0016	.0020	.0020	.0019	.0020	.0018
	6-7	Low alloy steel	1.0D	D≤3:0.2D D>3:0.5D	SFM(Vc)	215	245	280	295	310	310	295	310	330	310
					IPT(fz)	.0004	.0006	.0010	.0013	.0015	.0023	.0025	.0025	.0024	.0025
	8-9	Low alloy steel	1.0D	D≤3:0.2D D>3:0.5D	SFM(Vc)	150	150	165	180	180	180	180	180	195	195
					IPT(fz)	.0004	.0006	.0009	.0013	.0016	.0020	.0020	.0019	.0020	.0018
	10	High alloyed steel, and tool steel	1.0D	D≤3:0.2D D>3:0.5D	SFM(Vc)	215	245	280	295	310	310	295	310	330	310
					IPT(fz)	.0004	.0006	.0010	.0013	.0015	.0023	.0025	.0025	.0024	.0025
	11.1 11.2	High alloyed steel, and tool steel	1.0D	D≤3:0.2D D>3:0.5D	SFM(Vc)	150	150	165	180	180	180	180	180	195	195
					IPT(fz)	.0004	.0006	.0009	.0013	.0016	.0020	.0020	.0019	.0020	.0018
M	14.1	Stainless steel	1.0D	D≤3:0.2D D>3:0.5D	SFM(Vc)	115	130	150	150	165	150	150	150	165	150
					IPT(fz)	.0003	.0006	.0009	.0012	.0015	.0021	.0023	.0023	.0023	.0026
K	15-20	Grey cast iron Nodular cast iron Malleable cast iron	1.0D	D≤3:0.2D D>3:0.5D	SFM(Vc)	215	245	280	295	310	310	295	310	330	310
					IPT(fz)	.0004	.0006	.0010	.0013	.0015	.0023	.0025	.0025	.0024	.0025
H	38.1 - 38.2	Hardened steel	1.0D	0.05D	SFM(Vc)	100	100	115	115	115	130	130	130	130	
					IPT(fz)	.0002	.0003	.0004	.0005	.0007	.0011	.0011	.0011	.0011	
					RPM	4850	3230	2790	2230	1860	1580	1260	1050	790	
	40	Chilled Cast Iron	1.0D	D≤3:0.2D D>3:0.5D	SFM(Vc)	150	150	165	180	180	180	180	180	195	
					IPT(fz)	.0004	.0006	.0009	.0013	.0016	.0020	.0020	.0019	.0020	
					RPM	7280	4850	4000	3490	2910	2180	1750	1460	1180	
	41	Hardened Cast Iron	1.0D	0.05D	SFM(Vc)	100	100	115	115	115	130	130	130	130	
					IPT(fz)	.0002	.0003	.0004	.0005	.0007	.0011	.0011	.0011	.0011	
					RPM	4850	3230	2790	2230	1860	1580	1260	1050	790	

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RECOMMENDED CUTTING CONDITIONS

RECOMMENDED CUTTING CONDITIONS

GM883 SERIES 2 FLUTE RIB PROCESSING

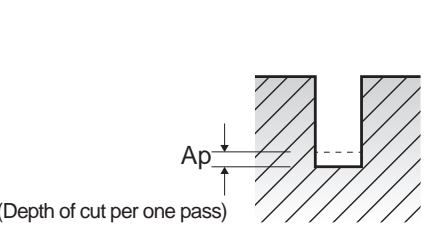
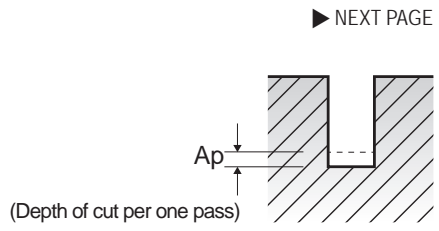
GM883 SERIES 2 FLUTE RIB PROCESSING

Table with columns for ISO, VDI 3323, Material Description, Parameter, and Diameter (Ø) from 0.4 to 1.2. It lists cutting conditions for Non-alloy steel, Low alloy steel, High alloyed steel, and tool steel.

Table with columns for VDI 3323, Parameter, and Diameter (Ø) from 1.4 to 6.0. It lists cutting conditions for various materials including Grey cast iron, Nodular cast iron, Malleable cast iron, Hardened steel, Chilled Cast Iron, and Hardened Cast Iron.

SFM = Surface Feet per Minute
RPM = Revolutions Per Minute
IPT = Inches Per Tooth
IPM = Inches Per Minute
Ap : mm (Axial Depth of Cut)
Ae : Inch (Radial Depth of Cut)

SFM = Surface Feet per Minute
RPM = Revolutions Per Minute
IPT = Inches Per Tooth
IPM = Inches Per Minute
Ap : mm (Axial Depth of Cut)
Ae : Inch (Radial Depth of Cut)



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RECOMMENDED CUTTING CONDITIONS



RECOMMENDED CUTTING CONDITIONS

GM895 SERIES 3 FLUTE - SLOTTING

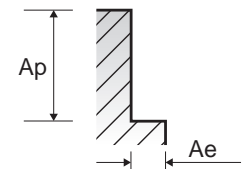
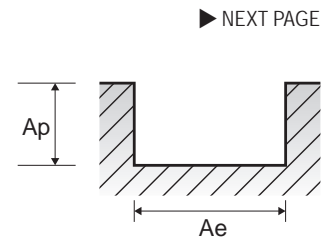
GM895 SERIES 3 FLUTE - SIDE CUTTING

Table with columns: ISO, VDI 3323, Material Description, Ae, Ap, Parameter, Diameter (Ø) [2.0, 3.0, 4.0, 5.0, 6.0, 8.0, 10.0, 12.0, 16.0]. Rows include Non-alloy steel, Low alloy steel, High alloyed steel, and tool steel, and Stainless steel, Grey cast iron, and Hardened steel.

Table with columns: ISO, VDI 3323, Material Description, Ae, Ap, Parameter, Diameter (Ø) [2.0, 3.0, 4.0, 5.0, 6.0, 8.0, 10.0, 12.0, 16.0]. Rows include Non-alloy steel, Low alloy steel, High alloyed steel, and tool steel, and Stainless steel, Grey cast iron, and Hardened steel.

SFM = Surface Feet per Minute
RPM = Revolutions Per Minute
IPT = Inches Per Tooth
IPM = Inches Per Minute
Ap : Inch (Axial Depth of Cut)
Ae : Inch (Radial Depth of Cut)

SFM = Surface Feet per Minute
RPM = Revolutions Per Minute
IPT = Inches Per Tooth
IPM = Inches Per Minute
Ap : Inch (Axial Depth of Cut)
Ae : Inch (Radial Depth of Cut)



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RECOMMENDED CUTTING CONDITIONS



RECOMMENDED CUTTING CONDITIONS

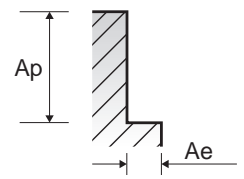
GM811 SERIES 4 FLUTE - SIDE CUTTING

GM817 SERIES 4 FLUTE - SIDE CUTTING

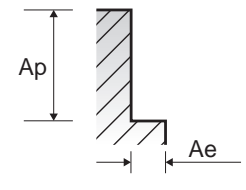
Table with columns: ISO, VDI 3323, Material Description, Ae, Ap, Parameter, Diameter (Ø) (2.0 to 25.0). Rows include Non-alloy steel, Low alloy steel, High alloyed steel, and tool steel, and Stainless steel.

Table with columns: ISO, VDI 3323, Material Description, Ae, Ap, Parameter, Diameter (Ø) (2.0 to 20.0). Rows include Non-alloy steel, Low alloy steel, High alloyed steel, and tool steel, and Grey cast iron, Nodular cast iron, Malleable cast iron, Hardened steel, Chilled Cast Iron, and Hardened Cast Iron.

SFM = Surface Feet per Minute
RPM = Revolutions Per Minute
IPT = Inches Per Tooth
IPM = Inches Per Minute
Ap : Inch (Axial Depth of Cut)
Ae : Inch (Radial Depth of Cut)



SFM = Surface Feet per Minute
RPM = Revolutions Per Minute
IPT = Inches Per Tooth
IPM = Inches Per Minute
Ap : Inch (Axial Depth of Cut)
Ae : Inch (Radial Depth of Cut)



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RECOMMENDED CUTTING CONDITIONS



RECOMMENDED CUTTING CONDITIONS

HSS

GM812 SERIES 6&8 FLUTE - SIDE CUTTING

NORMAL SPEED

Table with columns: ISO, VDI 3323, Material Description, Ae, Ap, Parameter, Diameter (Ø) [6.0, 8.0, 10.0, 12.0, 16.0, 20.0]. Rows include Non-alloy steel, Low alloy steel, High alloyed steel, and Hardened steel.

SFM = Surface Feet per Minute
RPM = Revolutions Per Minute
IPT = Inches Per Tooth
IPM = Inches Per Minute
Ap : Inch (Axial Depth of Cut)
Ae : Inch (Radial Depth of Cut)

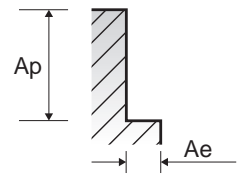
HIGH SPEED

Table with columns: ISO, VDI 3323, Material Description, Ae, Ap, Parameter, Diameter (Ø) [6.0, 8.0, 10.0, 12.0, 16.0, 20.0]. Rows include Non-alloy steel, Low alloy steel, High alloyed steel, and Hardened steel.

GM834 SERIES 6 FLUTE - SIDE CUTTING

Table with columns: ISO, VDI 3323, Material Description, Ae, Ap, Parameter, Diameter (Ø) [6.0, 8.0, 10.0, 12.0, 16.0, 20.0, 25.0]. Rows include Non-alloy steel, Low alloy steel, High alloyed steel, Grey cast iron, and Hardened steel.

SFM = Surface Feet per Minute
RPM = Revolutions Per Minute
IPT = Inches Per Tooth
IPM = Inches Per Minute
Ap : Inch (Axial Depth of Cut)
Ae : Inch (Radial Depth of Cut)



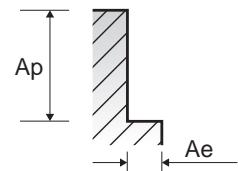




**GM814** SERIES **3&4 FLUTE ROUGHING - SIDE CUTTING**

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø)																																									
						6.0	8.0	10.0	12.0	16.0	20.0																																				
P	1-4	Non-alloy steel	0.3D	1.5D	SFM(Vc)	1015	1000	1000	1035	1035	1035																																				
					IPT(fz)	.0020	.0026	.0025	.0029	.0039	.0044																																				
					RPM	16410	12130	9700	8370	6280	5020																																				
					IPM(FEED)	97	96	96	99	99	89																																				
					SFM(Vc)	805	805	820	785	835	785																																				
					IPT(fz)	.0009	.0012	.0011	.0013	.0016	.0015																																				
	5	Non-alloy steel	0.3D	1.5D	RPM	13020	9760	7960	6350	5060	3810																																				
					IPM(FEED)	35	35	35	33	32	24																																				
					SFM(Vc)	1015	1000	1000	1035	1035	1035																																				
					IPT(fz)	.0020	.0026	.0025	.0029	.0039	.0044																																				
					RPM	16410	12130	9700	8370	6280	5020																																				
					IPM(FEED)	97	96	96	99	99	89																																				
6-7	Low alloy steel	0.3D	1.5D	SFM(Vc)	805	805	820	785	835	785																																					
				IPT(fz)	.0009	.0012	.0011	.0013	.0016	.0015																																					
				RPM	13020	9760	7960	6350	5060	3810																																					
				IPM(FEED)	35	35	35	33	32	24																																					
				SFM(Vc)	1015	1000	1000	1035	1035	1035																																					
				IPT(fz)	.0020	.0026	.0025	.0029	.0039	.0044																																					
8-9	Low alloy steel	0.3D	1.5D	RPM	16410	12130	9700	8370	6280	5020																																					
				IPM(FEED)	97	96	96	99	99	89																																					
				SFM(Vc)	805	805	820	785	835	785																																					
				IPT(fz)	.0009	.0012	.0011	.0013	.0016	.0015																																					
				RPM	13020	9760	7960	6350	5060	3810																																					
				IPM(FEED)	35	35	35	33	32	24																																					
10	High alloyed steel, and tool steel	0.3D	1.5D	SFM(Vc)	1015	1000	1000	1035	1035	1035																																					
				IPT(fz)	.0020	.0026	.0025	.0029	.0039	.0044																																					
				RPM	16410	12130	9700	8370	6280	5020																																					
				IPM(FEED)	97	96	96	99	99	89																																					
				SFM(Vc)	805	805	820	785	835	785																																					
				IPT(fz)	.0009	.0012	.0011	.0013	.0016	.0015																																					
11.1 - 11.2	High alloyed steel, and tool steel	0.3D	1.5D	RPM	13020	9760	7960	6350	5060	3810																																					
				IPM(FEED)	35	35	35	33	32	24																																					
				SFM(Vc)	540	540	560	540	575	525																																					
				IPT(fz)	8733	6549	5434	4366	3487	2547																																					
				RPM	.0009	.0012	.0011	.0013	.0015	.0015																																					
				IPM(FEED)	23.8	23.3	23.9	23.4	21.4	15.2																																					
M	14.1	Stainless steel	0.3D	1.5D	SFM(Vc)	1015	1000	1000	1035	1035	1035																																				
					IPT(fz)	.0020	.0026	.0025	.0029	.0039	.0044																																				
					RPM	16410	12130	9700	8370	6280	5020																																				
K	15-20	Grey cast iron Nodular cast iron Malleable cast iron	0.3D	1.5D	IPM(FEED)	97	96	96	99	99	89																																				
					SFM(Vc)	215	215	215	215	215	215																																				
					IPT(fz)	.0010	.0013	.0014	.0015	.0013	.0015																																				
H	38.1 - 38.2	Hardened steel	0.05D	1.0D	RPM	3480	2610	2090	1740	1300	1040																																				
					IPM(FEED)	11	10	12	11	7	6																																				
					SFM(Vc)	805	805	820	785	835	785																																				
H	40	Chilled Cast Iron	0.3D	1.5D	IPT(fz)	.0009	.0012	.0011	.0013	.0016	.0015																																				
					RPM	13020	9760	7960	6350	5060	3810																																				
					IPM(FEED)	35	35	35	33	32	24																																				
H	41	Hardened Cast Iron	0.05D	1.0D	SFM(Vc)	215	215	215	215	215	215																																				
					IPT(fz)	.0010	.0013	.0014	.0015	.0013	.0015																																				
					RPM	3480	2610	2090	1740	1300	1040																																				
						IPM(FEED)						11						10						12						11						7						6					

SFM = Surface Feet per Minute  
 RPM = Revolutions Per Minute  
 IPT = Inches Per Tooth  
 IPM = Inches Per Minute  
 Ap : Inch (Axial Depth of Cut)  
 Ae : Inch (Radial Depth of Cut)





Being the best through innovation

SOLID CARBIDE

# TitaNox-POWER END MILLS

- High Speed Machining for Exotic Materials:  
Titanium, Inconel and Stainless Steels



SELECTION GUIDE

SERIES	Inch		
	UGMG42	UGMG43	UGMH12
SHANK	Plain	Weldon Flat	Plain
FLUTE	4		5
HELIX ANGLE	43° / 45° (MULTIPLE HELIX)		43°/44°/45° (MULTIPLE HELIX)
CUTTING EDGE SHAPE	CORNER RADIUS	CORNER RADIUS	SQUARE
SIZE MIN	1/4	3/8	1/8
SIZE MAX	1	1	1-1/4
PAGE	C474	C475	C476-C477
	DOUBLE CORE STANDARD LENGTH		STANDARD LENGTH
	Y-Coating		Y-Coating

**SOLID CARBIDE**  
**TitaNox-Power**  
**END MILLS**

High Speed Machining for Exotic Materials:  
 Titanium, Inconel and Stainless Steels



Recommended cutting conditions : p.C484

◎ : Excellent ○ : Good

ISO	VDI 3323	Material Description	Composition / Structure / Heat Treatment	HB	HRc	UGMG42	UGMG43	UGMH12
P	1	Non-alloy steel	About 0.15% C Annealed	125		○	○	○
	2		About 0.45% C Annealed	190	13	○	○	○
	3		About 0.45% C Quenched & Tempered	250	25	○	○	○
	4		About 0.75% C Annealed	270	28	○	○	○
	5		About 0.75% C Quenched & Tempered	300	32	○	○	○
	6	Low alloy steel	Annealed	180	10	○	○	○
	7		Quenched & Tempered	275	29	○	○	○
	8		Quenched & Tempered	300	32	○	○	○
	9		Quenched & Tempered	350	38	○	○	○
	10		High alloyed steel, and tool steel	200	15	○	○	○
	11		Quenched & Tempered	325	35	○	○	○
M	12	Stainless steel	Ferritic / Martensitic Annealed	200	15	◎	◎	◎
	13		Martensitic Quenched & Tempered	240	23	◎	◎	◎
	14	Austenitic	180	10	◎	◎	◎	
	K	15	Grey cast iron	Pearlitic / ferritic	180	10	○	○
16		Pearlitic (Martensitic)		260	26	○	○	○
17		Nodular cast iron	Ferritic	160	3	○	○	○
18			Pearlitic	250	25	○	○	○
19			Malleable cast iron	130		○	○	○
20		Pearlitic	230	21	○	○	○	
N	21	Aluminum-wrought alloy	Not Curable	60				
	22		Curable Hardened	100				
	23	Aluminum-cast, alloyed	≤ 12% Si, Not Curable	75				
	24		≤ 12% Si, Curable Hardened	90				
	25		> 12% Si, Not Curable	130				
	26	Copper and Copper Alloys (Bronze / Brass)	Cutting Alloys, PB>1%	110				
	27		CuZn, CuSnZn (Brass)	90				
	28		CuSn, lead-free copper and electrolytic copper	100				
	29		Non Metallic Materials	Duroplastic, Fiber Reinforced Plastic				
	30	Rubber, Wood, etc.						
S	31	Heat Resistant Super Alloys	Fe Based Annealed	200	15	○	○	○
	32		Cured	280	30	○	○	○
	33		Annealed	250	25	○	○	○
	34		Ni or Co Based Cured	350	38	○	○	○
	35		Cast	320	34	○	○	○
	36	Titanium Alloys	Pure Titanium	400 Rm		◎	◎	◎
	37		Alpha + Beta Alloys Hardened	1050 Rm		◎	◎	◎
H	38	Hardened steel	Hardened	550	55			
	39		Hardened	630	60			
	40	Chilled Cast Iron	Cast	400	42			
	41	Hardened Cast Iron	Hardened	550	55			

Inch						Metric		
UGMG32	UGMG34	UGMH06	UGMH07	EMI42	EMI43	GMG40	GMG24, GMG26	GMG28, GMG30
Plain		Plain		Plain		Plain	Plain	
5		5		5		4	5	
43°/44°/45° (MULTIPLE HELIX)		43°/44°/45° (MULTIPLE HELIX)		38°		43° / 45° (MULTIPLE HELIX)	43°/44°/45° (MULTIPLE HELIX)	
CHAMFER	CORNER RADIUS	SQUARE	CORNER RADIUS	SQUARE	CORNER RADIUS	CORNER RADIUS	CHAMFER	CORNER RADIUS
1/8	1/8	1/8	1/8	1/4	1/4	6.0	6.0	6.0
1	1-1/4	1	1	1	1	25.0	25.0	25.0
C476-C477		C478-C479		C480-C481		C482	C483	
STANDARD LENGTH		EXTENDED LENGTH		STANDARD LENGTH		EXTENDED LENGTH	STANDARD LENGTH	
Y-Coating		Y-Coating		AITIN		Y-Coating	Y-Coating	
TitaNox-Power HPC								



○	○	○	○	○	○	○	○	○	1
○	○	○	○	○	○	○	○	○	2
○	○	○	○	○	○	○	○	○	3
○	○	○	○	○	○	○	○	○	4
○	○	○	○	○	○	○	○	○	5
○	○	○	○	○	○	○	○	○	6
○	○	○	○	○	○	○	○	○	7
○	○	○	○	○	○	○	○	○	8
○	○	○	○	○	○	○	○	○	9
○	○	○	○	○	○	○	○	○	10
○	○	○	○	○	○	○	○	○	11
◎	◎	◎	◎	◎	◎	◎	◎	◎	12
◎	◎	◎	◎	◎	◎	◎	◎	◎	13
◎	◎	◎	◎	◎	◎	◎	◎	◎	14
○	○	○	○	○	○	○	○	○	15
○	○	○	○	○	○	○	○	○	16
○	○	○	○	○	○	○	○	○	17
○	○	○	○	○	○	○	○	○	18
○	○	○	○	○	○	○	○	○	19
○	○	○	○	○	○	○	○	○	20
									21
									22
									23
									24
									25
									26
									27
									28
									29
									30
○	○	○	○	◎	◎	○	○	○	31
○	○	○	○	◎	◎	○	○	○	32
○	○	○	○	◎	◎	○	○	○	33
○	○	○	○	◎	◎	○	○	○	34
○	○	○	○	◎	◎	○	○	○	35
◎	◎	◎	◎	◎	◎	◎	◎	◎	36
◎	◎	◎	◎	◎	◎	◎	◎	◎	37
									38
									39
									40
									41



HSS

HSS

# TitaNox-POWER END MILLS

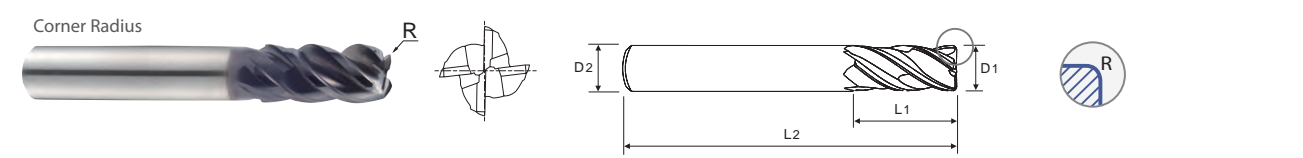
CORNER RADIUS UGMG42 SERIES

# TitaNox-POWER END MILLS

CORNER RADIUS UGMG43 SERIES

## CARBIDE, 4-FLUTE DOUBLE CORE STANDARD LENGTH (PLAIN SHANK)

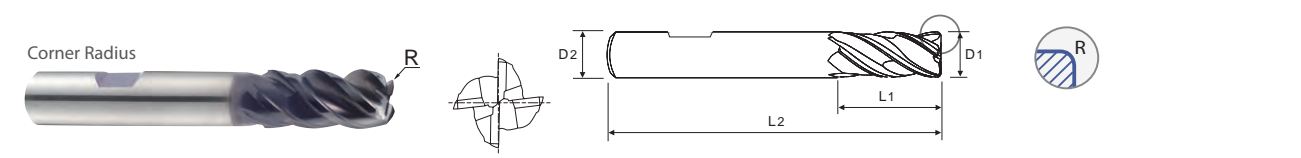
- ▶ Double core end mill has a unique flute design for excellent chip evacuation and higher rigidity.
- ▶ The double core adds stability and aids chip flow, reducing tool deflection, improving dimensional stability and workpiece accuracy.



CARBIDE 4 43°/45° PLAIN Coating Y p.C484-C485

## CARBIDE, 4-FLUTE STANDARD LENGTH (WELDON FLAT SHANK)

- ▶ Double core end mill has a unique flute design for excellent chip evacuation and higher rigidity.
- ▶ The double core adds stability and aids chip flow, reducing tool deflection, improving dimensional stability and workpiece accuracy.



CARBIDE 4 43°/45° FLAT Coating Y p.C484-C485

Unit : Inch

OD (D1)	SD (D2)	LOC (L1)	OAL (L2)	Corner Radius									
				.010	.015	.030	.060	.090	.125	.190	.250		
				EDP No.	EDP No.	EDP No.	EDP No.	EDP No.	EDP No.	EDP No.	EDP No.		
1/4	1/4	9/16	2-1/2	UGMG42802	UGMG42016	UGMG42901	UGMG42902	-	-	-	-	-	-
		3/4	2-1/2	-	-	UGMG42924	UGMG42925	-	-	-	-	-	-
		1	3	-	-	UGMG425926*	UGMG425927*	-	-	-	-	-	-
3/8	3/8	1/2	2-1/2	-	-	UGMG42K998	UGMG42K999	UGMG42K801	-	-	-	-	-
		7/8	2-1/2	-	-	UGMG42928	UGMG42929	UGMG42930	-	-	-	-	-
		13/16	2-1/2	UGMG42931	-	UGMG42905	UGMG42906	UGMG42907	-	-	-	-	-
		1	3	UGMG42932	UGMG42803	UGMG42933	UGMG42934	UGMG42935	-	-	-	-	-
		1-1/4	3	UGMG425936*	UGMG425804*	UGMG425937*	UGMG425938*	UGMG425939*	-	-	-	-	-
		1	3	UGMG42940	-	UGMG42908	UGMG42909	UGMG42910	UGMG42911	-	-	-	-
1/2	1/2	1-1/4	3	UGMG42810	UGMG42811	UGMG42813	UGMG42815	UGMG42816	UGMG42817	-	-	-	
		1-1/4	3-1/2	-	UGMG42805	UGMG42912	UGMG42941	UGMG42942	UGMG42943	-	-	-	
		1-5/8	4	-	-	UGMG425944*	UGMG425945*	UGMG425946*	UGMG425947*	-	-	-	
		2	4	-	-	UGMG425806*	UGMG425807*	UGMG425808*	UGMG425809*	-	-	-	
		2	4	-	-	UGMG42040	UGMG42913	UGMG42914	UGMG42915	-	-	-	
5/8	5/8	1-1/4	3-1/2	-	-	UGMG42948	UGMG42949	UGMG42950	UGMG42951	-	-	-	
		1-5/8	4	-	-	UGMG42948	UGMG42949	UGMG42950	UGMG42951	-	-	-	
		2	4	-	-	UGMG425952*	UGMG425953*	UGMG425954*	UGMG425955*	-	-	-	
		3-1/4	6	-	-	UGMG425956*	UGMG425957*	UGMG425958*	UGMG425959*	-	-	-	
3/4	3/4	1-1/2	4	-	-	UGMG42048	UGMG42916	UGMG42917	UGMG42918	UGMG42919	UGMG42960		
		1-7/8	4	-	-	UGMG42961	UGMG42962	UGMG42963	UGMG42964	UGMG42965	UGMG42966		
		2-1/4	5	-	-	UGMG42967	UGMG42968	UGMG42969	UGMG42970	UGMG42971	UGMG42972		
		3-1/4	6	-	-	UGMG425973*	UGMG425974*	UGMG425975*	UGMG425976*	UGMG425977*	UGMG425978*		
1	1	2	5	-	-	UGMG42064	UGMG42920	UGMG42921	UGMG42922	UGMG42923	UGMG42979		
		2-5/8	5	-	-	UGMG42980	UGMG42981	UGMG42982	UGMG42983	UGMG42984	UGMG42985		
		3	6	-	-	UGMG42986	UGMG42987	UGMG42988	UGMG42989	UGMG42990	UGMG42991		
		4-1/4	7	-	-	UGMG425992*	UGMG425993*	UGMG425994*	UGMG425995*	UGMG425996*	UGMG425997*		

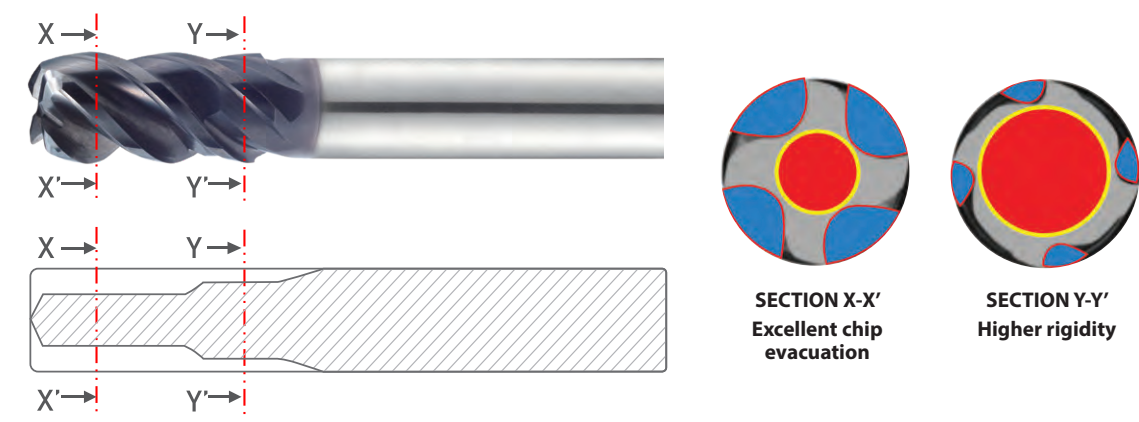
Mill Dia.Tolerance (in)	Shank Dia.Tolerance
0 ~ - .0012	h5 * Shank Dia. ≥ Ø1/2 : h6

\* Feed to be reduced by approximately 50% if L.O.C. (Length Of Cut) is over 3xD

Unit : Inch

OD (D1)	SD (D2)	LOC (L1)	OAL (L2)	Corner Radius					
				.010	.030	.060	.090	.125	.190
				EDP No.	EDP No.	EDP No.	EDP No.	EDP No.	EDP No.
3/8	3/8	13/16	2-1/2	UGMG43024	UGMG43905	UGMG43906	UGMG43907	-	-
1/2	1/2	1	3	-	UGMG43908	UGMG43909	UGMG43910	UGMG43911	-
		1-1/4	3	-	UGMG43926	UGMG43927	UGMG43928	UGMG43929	-
		1-1/4	3-1/2	-	UGMG43912	UGMG43924	UGMG43930	UGMG43931	-
5/8	5/8	1-1/4	3-1/2	-	UGMG43040	UGMG43913	UGMG43914	UGMG43915	-
3/4	3/4	1-1/2	4	-	UGMG43048	UGMG43916	UGMG43917	UGMG43818	UGMG43919
1	1	2	5	-	UGMG43064	UGMG43920	UGMG43921	UGMG43922	UGMG43923

Mill Dia.Tolerance (in)	Shank Dia.Tolerance
0 ~ - .0012	h5 * Shank Dia. ≥ Ø1/2 : h6



◎ : Excellent ○ : Good

ISO	P										M				K					
	Non-alloy steel					Low alloy steel					High alloyed steel, and tool steel		Stainless steel		Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRC	13	25	28	32	30	10	29	32	38	15	35	15	23	10	10	26	3	25	40	21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend	○	○	○	○	○	○	○	○	○	○	◎	◎	◎	◎	○	○	○	○	○	○

ISO	N										S				H							
	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys				Titanium Alloys		Hardened steel		Chilled Cast Iron			
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40		
HRC	15	30	25	38	34	15	30	25	38	34	55	60	42	55	55	60	42	55	40	41		
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550	
Recommend	○	○	○	○	○	○	○	○	○	○	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎

◎ : Excellent ○ : Good

ISO	P										M				K					
	Non-alloy steel					Low alloy steel					High alloyed steel, and tool steel		Stainless steel		Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRC	13	25	28	32	30	10	29	32	38	15	35	15	23	10	10	26	3	25	40	21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend	○	○	○	○	○	○	○	○	○	○	◎	◎	◎	◎	○	○	○	○	○	○

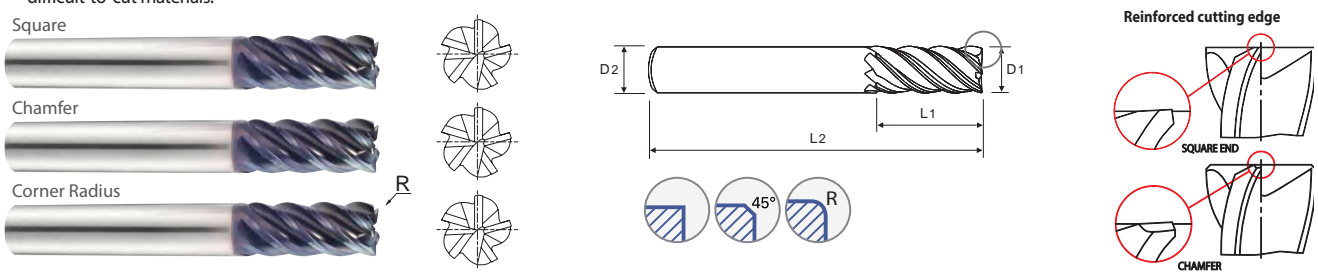
ISO	N										S				H							
	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys				Titanium Alloys		Hardened steel		Chilled Cast Iron			
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40		
HRC	15	30	25	38	34	15	30	25	38	34	55	60	42	55	55	60	42	55	40	41		
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550	
Recommend	○	○	○	○	○	○	○	○	○	○	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎



SQUARE UGMH12 SERIES  
 CHAMFER UGMG32 SERIES  
 CORNER RADIUS UGMG34 SERIES

### CARBIDE, 5-FLUTE STANDARD LENGTH (PLAIN SHANK)

- Suitable for Titanium, Titanium Alloys, Inconel and Stainless Steels.
- Optimized flute design for chip evacuation and rigidity when machining difficult-to-cut materials.
- Special roughing profile for machining Titanium and Titanium Alloys.
- Longer tool life with special coating.



OD (D1)	SD (D2)	LOC (L1)	OAL (L2)	Corner Radius						
				Square EDP No.	Chamfer EDP No.	Corner Radius				
						.015 EDP No.	.030 EDP No.	.060 EDP No.	.090 EDP No.	.125 EDP No.
1/8	1/8	1/4	1-1/2	UGMH12008	UGMG32008	UGMG34008	UGMG34950	-	-	-
		3/8	1-1/2	UGMH12901	UGMG32901	UGMG34901	UGMG34951	-	-	-
		1/2	2-1/2	UGMH125907*	-	UGMG345952*	UGMG345953*	-	-	-
		3/4	2-1/2	UGMH125903*	-	UGMG345954*	UGMG345955*	-	-	-
3/16	3/16	5/16	2	UGMH12012	UGMG32012	UGMG34012	UGMG34956	-	-	-
		9/16	2	UGMH12904	UGMG32902	UGMG34902	UGMG34957	-	-	-
		3/4	2-1/2	UGMH125905*	-	UGMG345958*	UGMG345959*	-	-	-
		3/8	2	UGMH12016	UGMG32016	UGMG34960	UGMG34016	UGMG34961	-	-
1/4	1/4	1/2	2-1/2	UGMH12906	-	UGMG34962	UGMG34963	UGMG34964	-	-
		3/4	2-1/2	UGMH12907	UGMG32903	UGMG34903	UGMG34904	UGMG34905	-	-
		1	3	UGMH125908*	-	UGMG345965*	UGMG345966*	UGMG345967*	-	-
		1-1/4	3	UGMH125909*	-	UGMG345968*	UGMG345969*	UGMG345970*	-	-
5/16	5/16	7/16	2"	UGMH12020	UGMG32020	UGMG34971	UGMG34020	UGMG34972	-	-
		13/16	2-1/2	UGMH12910	UGMG32904	UGMG34906	UGMG34907	UGMG34908	-	-
		1	3	UGMH125911*	-	UGMG345973*	UGMG345974*	UGMG345975*	-	-
		1/2	2-1/2	UGMH12024	UGMG32024	UGMG34976	UGMG34024	UGMG34909	UGMG34977	-
3/8	3/8	1	3	UGMH12912	UGMG32905	UGMG34910	UGMG34911	UGMG34912	UGMG34978	-
		1-1/4	3	UGMH125913*	-	UGMG345979*	UGMG345980*	UGMG345981*	UGMG345982*	-
		1-1/2	4	UGMH125914*	-	UGMG345983*	UGMG345984*	UGMG345985*	UGMG345986*	-
		5/8	2-1/2	UGMH12032	UGMG32032	UGMG34913	UGMG34914	UGMG34987	UGMG34988	-
1/2	1/2	1	3	UGMH12915	UGMG32906	UGMG34915	UGMG34916	UGMG34917	UGMG34918	UGMG34919
		1-1/4	3-1/2	UGMH12916	UGMG32907	UGMG34920	UGMG34921	UGMG34922	UGMG34923	UGMG34924
		1-5/8	4	UGMH125917*	-	UGMG345989*	UGMG345990*	UGMG345991*	UGMG345992*	UGMG345993*
		2	4	UGMH125918*	-	UGMG345994*	UGMG345995*	UGMG345996*	UGMG345997*	UGMG345998*

**CHAMFER KEY UGMG32**

Mill Diameter (in.)	Chamfer Size
1/8	.004
3/16	.006
1/4	.007
5/16	.007
3/8	.011
1/2	.015
5/8	.015
3/4	.019
1	.019

Mill Dia. Tolerance (in) 0 ~ .0012  
 Shank Dia. Tolerance h5 \* Shank Dia. ≥ Ø1/2 : h6  
 \* Feed to be reduced by approximately 50% if L.O.C. (Length Of Cut) is over 3xD  
 NEXT PAGE ►

◎ : Excellent ○ : Good

ISO Material Description	P										M				K			H		
	Non-alloy steel					Low alloy steel					High alloyed steel, and tool steel				Stainless steel		Grey cast iron	Nodular cast iron		Malleable cast iron
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc	13	25	28	32	30	10	29	32	38	15	35	15	23	10	10	26	3	25	40	21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend	○	○	○	○	○	○	○	○	○	○	○	○	◎	◎	○	○	○	○	○	○

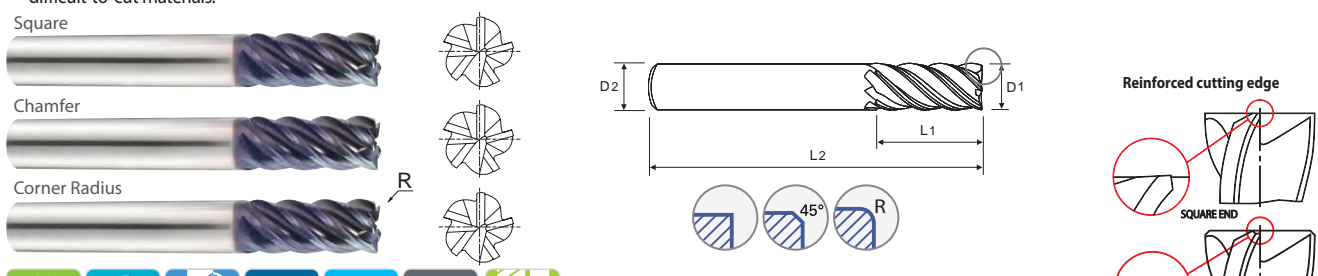
ISO Material Description	N					S					H										
	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)		Non Metallic Materials			Heat Resistant Super Alloys		Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron				
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc	15	30	25	38	34	15	30	25	38	34	55	60	42	55	55	60	40	42	55		
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	◎	◎	○	○	○	○



SQUARE UGMH12 SERIES  
 CHAMFER UGMG32 SERIES  
 CORNER RADIUS UGMG34 SERIES

### CARBIDE, 5-FLUTE STANDARD LENGTH (PLAIN SHANK)

- Suitable for Titanium, Titanium Alloys, Inconel and Stainless Steels.
- Optimized flute design for chip evacuation and rigidity when machining difficult-to-cut materials.
- Special roughing profile for machining Titanium and Titanium Alloys.
- Longer tool life with special coating.



OD (D1)	SD (D2)	LOC (L1)	OAL (L2)	Corner Radius											
				Square EDP No.	Chamfer EDP No.	Corner Radius									
						.015 EDP No.	.030 EDP No.	.060 EDP No.	.090 EDP No.	.125 EDP No.	.190 EDP No.	.250 EDP No.			
5/8	5/8	3/4	3	UGMH12040	UGMG32040	-	UGMG34040	UGMG34925	UGMG34999	UGMG34801	-	-			
		1-1/4	3-1/2	UGMH12919	UGMG32908	UGMG34926	UGMG34927	UGMG34928	UGMG34929	UGMG34930	-	-			
		1-5/8	4	UGMH12920	-	-	UGMG34802	UGMG34803	UGMG34804	UGMG34805	-	-			
		2-1/8	4-1/2	UGMH125921*	-	-	UGMG345806*	UGMG345807*	UGMG345808*	UGMG345809*	-	-			
		2-1/2	5	UGMH125922*	-	-	UGMG345810*	UGMG345811*	UGMG345812*	UGMG345813*	-	-			
3/4	3/4	1	3-1/2	UGMH12048	UGMG32048	-	UGMG34048	UGMG34931	UGMG34932	UGMG34814	UGMG34815	UGMG34816			
		1-1/2	4	UGMH12923	UGMG32909	UGMG34933	UGMG34934	UGMG34935	UGMG34936	UGMG34937	UGMG34938	UGMG34817			
		1-7/8	5	UGMH12924	-	-	UGMG34818	UGMG34819	UGMG34820	UGMG34821	UGMG34822	UGMG34823			
		2-1/4	5	UGMH12925	-	-	UGMG34824	UGMG34825	UGMG34826	UGMG34827	UGMG34828	UGMG34829			
		2-3/4	5	UGMH125926*	-	-	UGMG345830*	UGMG345831*	UGMG345832*	UGMG345833*	UGMG345834*	UGMG34835*			
		3-1/4	6	UGMH125927*	-	-	UGMG345836*	UGMG345837*	UGMG345838*	UGMG345839*	UGMG345840*	UGMG34841*			
		1-1/8	4	UGMH12064	UGMG32064	-	UGMG34064	UGMG34939	UGMG34940	UGMG34842	UGMG34843	UGMG34844			
1	1	1-1/2	4	UGMH12928	UGMG32910	UGMG34941	UGMG34942	UGMG34943	UGMG34944	UGMG34945	UGMG34946	UGMG34845			
		2	5	UGMH12929	UGMG32911	-	UGMG34947	UGMG34948	UGMG34949	UGMG34846	UGMG34847	UGMG34848			
		2-5/8	5	UGMH12930	-	-	UGMG34849	UGMG34850	UGMG34851	UGMG34852	UGMG34853	UGMG34854			
		3-1/4	6	UGMH125931*	-	-	UGMG345855*	UGMG345856*	UGMG345857*	UGMG345858*	UGMG345859*	UGMG34860*			
		4-1/4	7	UGMH125932*	-	-	UGMG345861*	UGMG345862*	UGMG345863*	UGMG345864*	UGMG345865*	UGMG34866*			
1-1/4	1-1/4	1-1/2	4-1/2	UGMH12116	-	-	UGMG34116	UGMG34867	UGMG34868	UGMG34869	UGMG34870				
		2	4-1/2	UGMH12933	-	-	UGMG34871	UGMG34872	UGMG34873	UGMG34874	UGMG34875				
		2-5/8	5-1/2	UGMH12934	-	-	UGMG34876	UGMG34877	UGMG34878	UGMG34879	UGMG34880				
		3-1/4	6	UGMH12935	-	-	UGMG34881	UGMG34882	UGMG34883	UGMG34884	UGMG34885				
		4-1/2	7	UGMH125936*	-	-	UGMG345886*	UGMG345887*	UGMG345888*	UGMG345889*	UGMG34890*				

Mill Dia. Tolerance (in) 0 ~ .0012  
 Shank Dia. Tolerance h5 \* Shank Dia. ≥ Ø1/2 : h6  
 \* Feed to be reduced by approximately 50% if L.O.C. (Length Of Cut) is over 3xD

◎ : Excellent ○ : Good

ISO Material Description	P										M				K			H		
	Non-alloy steel					Low alloy steel					High alloyed steel, and tool steel				Stainless steel		Grey cast iron	Nodular cast iron		Malleable cast iron
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc	13	25	28	32	30	10	29	32	38	15	35	15	23	10	10	26	3	25	40	21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend	○	○	○	○	○	○	○	○	○	○	○	○	◎	◎	○	○	○	○	○	○

ISO Material Description	N					S					H										
	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)		Non Metallic Materials			Heat Resistant Super Alloys		Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron				
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc	15	30	25	38	34	15	30	25	38	34	55	60	42	55	55	60	40	42	55		
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	◎	◎	○	○	○	○

HSS

HSS



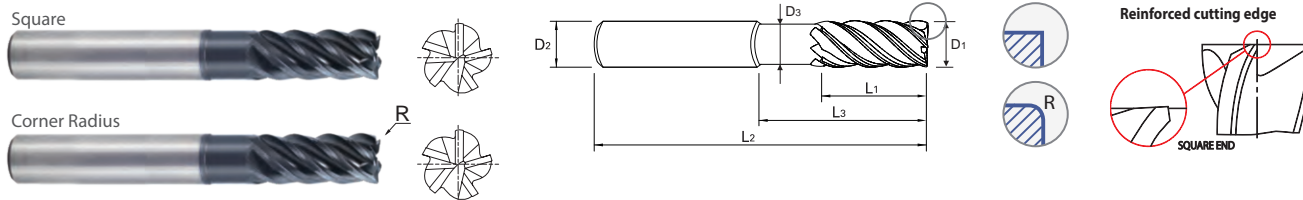
SQUARE UGMH06 SERIES
CORNER RADIUS UGMH07 SERIES



SQUARE UGMH06 SERIES
CORNER RADIUS UGMH07 SERIES

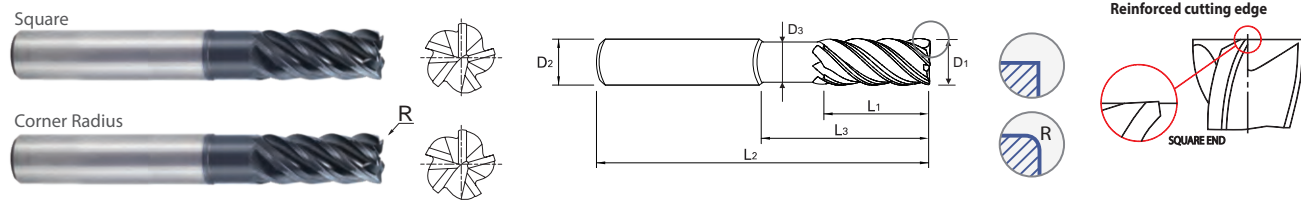
CARBIDE, 5-FLUTE EXTENDED LENGTH (PLAIN SHANK)

- Suitable for Titanium, Titanium Alloys, Inconel and Stainless Steels.
Optimized flute design for chip evacuation and rigidity when machining difficult-to-cut materials.
Special roughing profile for machining Titanium and Titanium Alloys.
Longer tool life with special coating.



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Unit : Inch

Table with columns: OD (D1), SD (D2), LOC (L1), LBS (L3), OAL (L2), Neck Dia (D3), Square EDP No., and Corner Radius EDP No. (.030, .060, .090, .125, .190, .250).

Table with columns: Mill Dia. Tolerance (in) and Shank Dia. Tolerance. Values: 0 ~ .0012, h5 \* Shank Dia. ≥ Ø1/2 : h6.

Feed to be reduced by approximately 50% if L.O.C. (Length Of Cut) is over 3xD

NEXT PAGE ▶

ISO material compatibility chart with columns for P (Non-alloy steel, Low alloy steel, High alloyed steel), M (Stainless steel, Grey cast iron, Nodular cast iron, Malleable cast iron), K (Titanium Alloys, Hardened steel, Chilled Cast Iron, Hardened Cast Iron), and H (Aluminum-wrought alloy, Aluminum-cast, alloyed, Copper and Copper Alloys, Non Metallic Materials, Heat Resistant Super Alloys).

HSS

CBN END MILLS

i-Xmill END MILLS

i-SMART MODULAR END MILLS

X5070 END MILLS

4G MILL END MILLS

X-POWER PRO END MILLS

TitaNox-POWER END MILLS

JET-POWER END MILLS

V7 PLUS A END MILLS

V7 MILL INOX

ALU-POWER HPC END MILLS

ALU-POWER END MILLS

D-POWER GRAPHITE END MILLS

STANDARD CARBIDE

ONLY ONE COATED PM60 END MILLS

SINE-POWER

TANK-POWER END MILLS

STANDARD COBALT & HSS

TECHNICAL DATA

Unit : Inch

Unit : Inch

Table with columns: OD (D1), SD (D2), LOC (L1), LBS (L3), OAL (L2), Neck Dia (D3), Square EDP No., and Corner Radius EDP No. (.030, .060, .090, .125, .190, .250).

Table with columns: Mill Dia. Tolerance (in) and Shank Dia. Tolerance. Values: 0 ~ .0012, h5 \* Shank Dia. ≥ Ø1/2 : h6.

Feed to be reduced by approximately 50% if L.O.C. (Length Of Cut) is over 3xD

ISO material compatibility chart with columns for P (Non-alloy steel, Low alloy steel, High alloyed steel), M (Stainless steel, Grey cast iron, Nodular cast iron, Malleable cast iron), K (Titanium Alloys, Hardened steel, Chilled Cast Iron, Hardened Cast Iron), and H (Aluminum-wrought alloy, Aluminum-cast, alloyed, Copper and Copper Alloys, Non Metallic Materials, Heat Resistant Super Alloys).

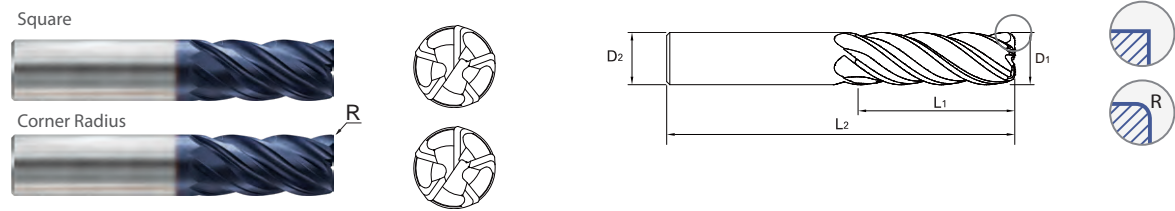




SQUARE EMI42 SERIES
CORNER RADIUS EMI43 SERIES

CARBIDE, 5-FLUTE STANDARD LENGTH (PLAIN SHANK) - TitaNox-Power HPC

- New design enhances chip space in heavy cuts, while still maintaining rigidity in peel milling.
Unequal index design for Chatter-Free cutting
high performance milling of Stainless Steel, Titanium, and Heat-Resistant Super Alloys



p.C487-C489

Table with columns for OD (D1), SD (D2), LOC (L1), OAL (L2), Square (EDP No.), and Corner Radius (.015 to .250 EDP No.).

Unit : Inch

Table with columns: Mill Dia. Tolerance (in) 0 ~ .0012, Shank Dia. Tolerance h5 \* Shank Dia. ≥ 1/2 : h6

Feed to be reduced by approximately 50% if L.O.C. (Length Of Cut) is over 3x D
TitaNox-Power HPC Square Tools are designed with a true sharp corner while TitaNox-Power Square tools feature a dubbed corner for extra protection

NEXT PAGE >

Material compatibility chart showing ISO Material Description, Material Groups (P, M, K, N, S, H), and Performance indicators (Circled O for Good, Circled X for Excellent).

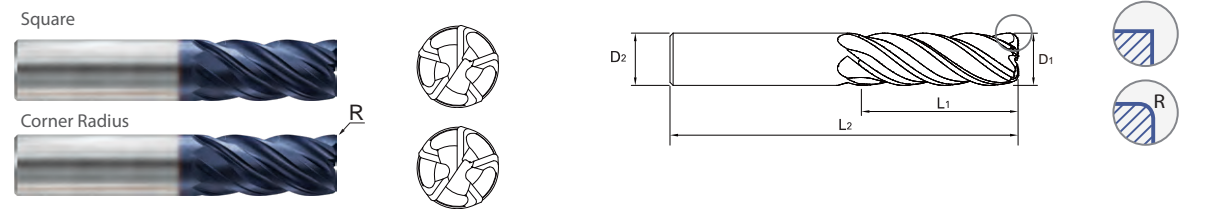
©: Excellent ○: Good



SQUARE EMI42 SERIES
CORNER RADIUS EMI43 SERIES

CARBIDE, 5-FLUTE STANDARD LENGTH (PLAIN SHANK) - TitaNox-Power HPC

- New design enhances chip space in heavy cuts, while still maintaining rigidity in peel milling.
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p.C487-C489

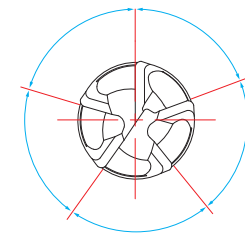
Table with columns for OD (D1), SD (D2), LOC (L1), OAL (L2), Square (EDP No.), and Corner Radius (.015 to .250 EDP No.).

Unit : Inch

Table with columns: Mill Dia. Tolerance (in) 0 ~ .0012, Shank Dia. Tolerance h5 \* Shank Dia. ≥ 1/2 : h6

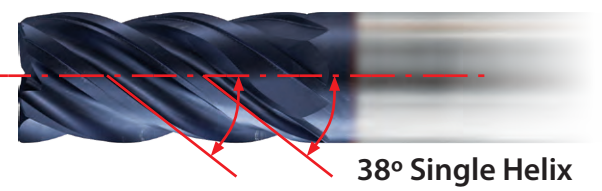
Feed to be reduced by approximately 50% if L.O.C. (Length Of Cut) is over 3x D

- TitaNox-Power HPC Square Tools are designed with a true sharp corner while TitaNox-Power Square tools feature a dubbed corner for extra protection



Unequal Index

Exclusively Designed Unique Geometry applied to Reduce Vibration and also to achieve Excellent surface finish



Core Design

YG-1's High Performance Core Geometries is designed for superior chip evacuation. It's excellent at Slotting & Heavy Profiling.

Material compatibility chart showing ISO Material Description, Material Groups (P, M, K, N, S, H), and Performance indicators (Circled O for Good, Circled X for Excellent).

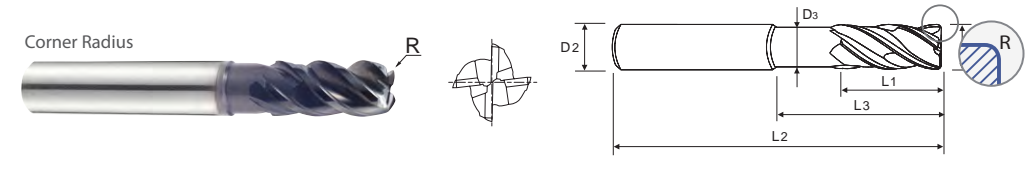
©: Excellent ○: Good



CORNER RADIUS GMG40 SERIES

**CARBIDE, 4-FLUTE DOUBLE CORE EXTENDED LENGTH (PLAIN SHANK)**

- ▶ Double core end mill has a unique flute design for excellent chip evacuation and higher rigidity.
- ▶ The double core adds stability and aids chip flow, reducing tool deflection, improving dimensional stability and workpiece accuracy.



CARBIDE 4 43°/45° PLAIN Y Coating p.C490-C491

Unit : Metric

OD (D <sub>1</sub> )	SD (D <sub>2</sub> )	LOC (L <sub>1</sub> )	LBS (L <sub>3</sub> )	OAL (L <sub>2</sub> )	Neck Dia (D <sub>3</sub> )	Corner Radius						
						0.50	1.00	1.50	2.00	3.00	3.50	4.00
Metric	Inch					EDP No.	EDP No.	EDP No.	EDP No.	EDP No.	EDP No.	EDP No.
6	.2362	6	13	20	57	5.5	GMG40060	GMG40901	-	-	-	-
8	.315	8	19	25	63	7.5	GMG40080	GMG40902	GMG40903	GMG40904	-	-
10	.3937	10	22	30	72	9.2	GMG40100	GMG40905	GMG40906	GMG40907	-	-
12	.4724	12	26	35	83	11.0	GMG40120	GMG40908	GMG40909	GMG40910	GMG40911	-
14	.5512	14	26	35	83	13.0	-	GMG40140	-	GMG40912	-	-
16	.6299	16	35	43	92	15.0	-	GMG40160	GMG40913	GMG40914	GMG40915	GMG40916
20	.7874	20	44	56	110	19.0	-	GMG40200	GMG40917	GMG40918	GMG40919	GMG40920
25	.9843	25	55	70	130	24.0	-	GMG40250	GMG40922	GMG40923	GMG40924	GMG40925

Mill Dia. Tolerance (mm)	Shank Dia. Tolerance
0 ~ -0.03	h5 * Shank Dia. ±0.12 : h6

◎ : Excellent ○ : Good

ISO	P										M				K					
	Non-alloy steel					Low alloy steel					High alloyed steel, and tool steel		Stainless steel		Grey cast iron	Nodular cast iron	Malleable cast iron			
Material Description	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend	○	○	○	○	○	○	○	○	○	○	○	◎	◎	◎	○	○	○	○	○	○

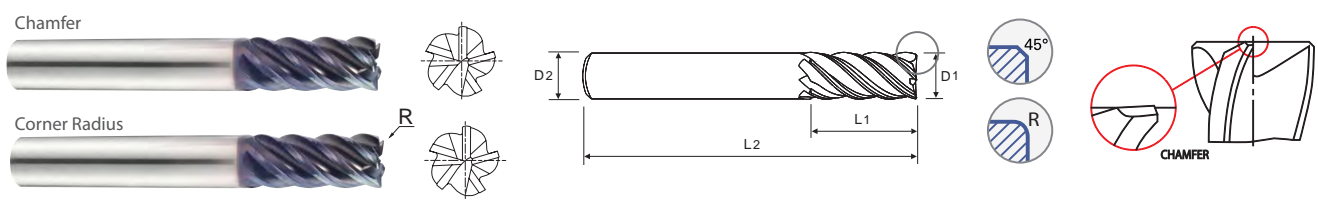
ISO	N						S					H									
	Aluminum-wrought alloy		Aluminum-cast, alloyed		Copper and Copper Alloys (Bronze / Brass)		Non Metallic Materials		Heat Resistant Super Alloys			Titanium Alloys	Hardened steel	Chilled Cast Iron	Hardened Cast Iron						
Material Description	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend											○	○	○	○	○	◎	◎				



CHAMFER GMG24, GMG26 SERIES  
CORNER RADIUS GMG28, GMG30 SERIES

**CARBIDE, 5-FLUTE EXTENDED LENGTH (PLAIN SHANK)**

- ▶ Suitable for Titanium, Titanium Alloys, Inconel and Stainless Steels.
- ▶ Optimized flute design for chip evacuation and rigidity when machining difficult-to-cut materials.
- ▶ Special roughing profile for machining Titanium and Titanium Alloys.
- ▶ Longer tool life with special coating.



CARBIDE 5 43°/44°/45° C x 45° PLAIN Y Coating p.C492

Unit : Metric

OD (D <sub>1</sub> )	SD (D <sub>2</sub> )	LOC (L <sub>1</sub> )	OAL (L <sub>2</sub> )	Chamfer	Corner Radius								
					0.30	0.50	1.00	1.50	2.00	2.50	3.00	4.00	5.00
Metric	Inch			EDP No.	EDP No.	EDP No.	EDP No.	EDP No.	EDP No.	EDP No.	EDP No.	EDP No.	EDP No.
6	.2362	6	10	54	GMG24060	-	GMG28060	-	-	-	-	-	-
		6	13	57	GMG26060	GMG30060	GMG30901	GMG30902	-	-	-	-	-
8	.315	8	12	58	GMG24080	-	GMG28080	-	-	-	-	-	-
		8	19	63	GMG26080	-	GMG30080	GMG30903	GMG30904	GMG30905	-	-	-
10	.3937	10	14	66	GMG24100	-	GMG28100	-	-	-	-	-	-
		10	22	72	GMG26100	-	GMG30100	GMG30906	GMG30907	GMG30908	-	-	-
12	.4724	12	16	73	GMG24120	-	GMG28120	-	-	-	-	-	-
		12	26	83	GMG26120	-	GMG30120	GMG30909	GMG30910	GMG30911	GMG30912	GMG30913	-
16	.6299	16	22	82	GMG24160	-	-	GMG28160	-	-	-	-	-
		16	36	92	GMG26160	-	-	GMG30160	GMG30914	GMG30915	GMG30916	GMG30917	GMG30918
20	.7874	20	26	92	GMG24200	-	-	GMG28200	-	-	-	-	-
		20	44	104	GMG26200	-	-	GMG30200	GMG30919	GMG30920	GMG30921	GMG30922	GMG30923
25	.9843	25	29	100	GMG24250	-	-	GMG28250	-	-	-	-	-
		25	54	121	GMG26250	-	-	GMG30250	GMG30925	GMG30926	GMG30927	GMG30928	GMG30929

Mill Dia. Tolerance (mm)	Shank Dia. Tolerance
0 ~ -0.03	h5 * Shank Dia. ±0.12 : h6

**CHAMFER KEY GMG24 | GMG26**

Mill Diameter	Chamfer Size (mm)	
	Metric	Inch
6	.2362	0.20
8	.315	0.20
10	.3937	0.30
12	.4724	0.35
16	.6299	0.40
20	.7478	0.50
25	.9843	0.50

◎ : Excellent ○ : Good

ISO	P										M				K					
	Non-alloy steel					Low alloy steel					High alloyed steel, and tool steel		Stainless steel		Grey cast iron	Nodular cast iron	Malleable cast iron			
Material Description	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend	○	○	○	○	○	○	○	○	○	○	○	◎	◎	◎	○	○	○	○	○	○

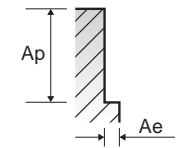
  

ISO	N						S					H									
	Aluminum-wrought alloy		Aluminum-cast, alloyed		Copper and Copper Alloys (Bronze / Brass)		Non Metallic Materials		Heat Resistant Super Alloys			Titanium Alloys	Hardened steel	Chilled Cast Iron	Hardened Cast Iron						
Material Description	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend											○	○	○	○	○	◎	◎				

**UGMG42, UGMG43 SERIES 4 FLUTES DOUBLE CORE - Side Cutting**

SFM(Vc) = ft./min.  
IPT(fz) = in./tooth  
RPM = rev./min.  
IPM(Feed) = in./min.

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø)							
						1/4	5/16	3/8	1/2	5/8	3/4	1	
P	1-5	Non-alloy steel	0.4D	1.0D (0.7D)*	SFM(Vc)	525	525	525	525	525	525	525	
					IPT(fz)	.0011	.0014	.0017	.0021	.0025	.0030	.0033	
					RPM	8020	6420	5350	4010	3210	2670	2010	
	6-8	Low alloy steel	0.4D	1.0D (0.7D)*	SFM(Vc)	525	525	525	525	525	525	525	
					IPT(fz)	.0011	.0014	.0017	.0021	.0025	.0030	.0033	
					RPM	8020	6420	5350	4010	3210	2670	2010	
	9	High alloyed steel, and tool steel	0.4D	1.0D (0.7D)*	SFM(Vc)	490	490	490	490	490	490	490	
					IPT(fz)	.0010	.0014	.0017	.0019	.0025	.0028	.0033	
					RPM	7490	5990	4990	3740	2990	2500	1870	
	10	High alloyed steel, and tool steel	0.4D	1.0D (0.7D)*	SFM(Vc)	490	490	490	490	490	490	490	
					IPT(fz)	.0011	.0014	.0018	.0021	.0026	.0030	.0033	
					RPM	7490	5990	4990	3740	2990	2500	1870	
11.1	High alloyed steel, and tool steel	0.4D	1.0D (0.7D)*	SFM(Vc)	490	490	490	490	490	490	490		
				IPT(fz)	.0010	.0014	.0017	.0019	.0025	.0028	.0033		
				RPM	7490	5990	4990	3740	2990	2500	1870		
M	12-13	Stainless steel (SUS 420, X40Cr13, 420)	0.4D	1.0D (0.7D)	SFM(Vc)	510	510	510	510	510	510	510	
					IPT(fz)	.0013	.0018	.0022	.0026	.0034	.0037	.0045	
					RPM	7790	6230	5190	3900	3120	2600	1950	
	14.1	Stainless steel (SUS 316, 316, X5CrNiMo 17 12 2)	0.4D	1.0D (0.7D)*	SFM(Vc)	345	345	345	345	345	345	345	
					IPT(fz)	.0010	.0013	.0016	.0019	.0024	.0028	.0032	
					RPM	5270	4220	3510	2640	2110	1760	1320	
	14.2	Stainless steel (SUS 630, PH 15-5)	0.4D	0.6D	SFM(Vc)	145	145	145	145	145	145	145	
					IPT(fz)	.0006	.0008	.0010	.0013	.0016	.0018	.0021	
					RPM	2220	1770	1480	1110	890	740	550	
	K	15-20	Grey cast iron	0.4D	1.0D (0.7D)*	SFM(Vc)	575	575	575	575	575	575	575
						IPT(fz)	.0008	.0011	.0014	.0017	.0021	.0024	.0028
						RPM	8790	7030	5860	4390	3510	2930	2200
31-35		Heat Resistant Super Alloys (X12 NiCrSi 36-16, 1.4864, Inconel 718, NiCr20TiAl 2.4631, NiCu30Al 2.4375, G-X120Mn12, 1.3401)	0.3D	0.6D	SFM(Vc)	105	105	105	105	105	105	105	
					IPT(fz)	.0008	.0010	.0013	.0015	.0019	.0022	.0026	
					RPM	1600	1280	1070	800	640	530	400	
36-37		Titanium Alloys (HB 400 Rm, HB 1050Rm TiAl6V4, 3.7165)	0.4D	1.0D (0.7D)*	SFM(Vc)	230	230	230	230	230	230	230	
					IPT(fz)	.0013	.0019	.0022	.0026	.0034	.0037	.0045	
					RPM	3510	2810	2340	1760	1410	1170	880	



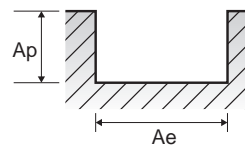
**NOTES:** ▶ Maximum recommended depth shown  
 ▶ Finish cuts typically require reduced feed rates and/or higher spindle speed, with radial width of 2% x D1 or less  
 ▶ Feed to be reduced by approximately 50% if L.O.C.(length of cut) is over 3xD  
 ▶ Reduce speed and feed recommendations for materials harder than listed  
 ▶ Recommendations above are based on ideal conditions.  
 Adjust parameters accordingly for smaller taper machining centers or less rigid conditions

\* (0.7D): UGMG42K998, UGMG42K999, UGMGK801  
 0.7D cutting depth for slotting and side cutting applications due to short double-core length

**UGMG42, UGMG43 SERIES 4 FLUTES DOUBLE CORE - Slotting**

SFM(Vc) = ft./min.  
IPT(fz) = in./tooth  
RPM = rev./min.  
IPM(Feed) = in./min.

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø)							
						1/4	5/16	3/8	1/2	5/8	3/4	1	
P	1-5	Non-alloy steel	1.0D	1.0D (0.7D)*	SFM(Vc)	410	410	410	410	410	410	410	
					IPT(fz)	.0010	.0013	.0017	.0019	.0025	.0028	.0033	
					RPM	6260	5010	4180	3130	2510	2090	1570	
	6-8	Low alloy steel	1.0D	1.0D (0.7D)*	SFM(Vc)	410	410	410	410	410	410	410	
					IPT(fz)	.0010	.0013	.0017	.0019	.0025	.0028	.0033	
					RPM	6260	5010	4180	3130	2510	2090	1570	
	9	High alloyed steel, and tool steel	1.0D	1.0D (0.7D)*	SFM(Vc)	395	395	395	395	395	395	395	
					IPT(fz)	.0010	.0013	.0017	.0019	.0025	.0028	.0030	
					RPM	6040	4830	4020	3020	2410	2010	1510	
	10	High alloyed steel, and tool steel	1.0D	1.0D (0.7D)*	SFM(Vc)	410	410	410	410	410	410	410	
					IPT(fz)	.0010	.0013	.0017	.0019	.0025	.0028	.0033	
					RPM	6260	5010	4180	3130	2510	2090	1570	
11.1	High alloyed steel, and tool steel	1.0D	1.0D (0.7D)*	SFM(Vc)	395	395	395	395	395	395	395		
				IPT(fz)	.0010	.0013	.0017	.0019	.0025	.0028	.0030		
				RPM	6040	4830	4020	3020	2410	2010	1510		
M	12-13	Stainless steel (SUS 420, X40Cr13, 420)	1.0D	1.0D (0.7D)	SFM(Vc)	410	410	410	410	410	410	410	
					IPT(fz)	.0013	.0018	.0022	.0026	.0034	.0037	.0045	
					RPM	6260	5010	4180	3130	2510	2090	1570	
	14.1	Stainless steel (SUS 316, 316, X5CrNiMo 17 12 2)	1.0D	1.0D (0.7D)*	SFM(Vc)	280	280	280	280	280	280	280	
					IPT(fz)	.0010	.0013	.0016	.0019	.0024	.0028	.0032	
					RPM	4280	3420	2850	2140	1710	1430	1070	
	14.2	Stainless steel (SUS 630, PH 15-5)	1.0D	0.5D	SFM(Vc)	120	120	120	120	120	120	120	
					IPT(fz)	.0006	.0008	.0010	.0013	.0016	.0018	.0021	
					RPM	1830	1470	1220	920	730	610	460	
	K	15-20	Grey cast iron	1.0D	1.0D (0.7D)*	SFM(Vc)	460	460	460	460	460	460	460
						IPT(fz)	.0008	.0011	.0014	.0017	.0021	.0024	.0026
						RPM	7030	5620	4690	3510	2810	2340	1760
31-35		Heat Resistant Super Alloys (X12 NiCrSi 36-16, 1.4864, Inconel 718, NiCr20TiAl 2.4631, NiCu30Al 2.4375, G-X120Mn12, 1.3401)	1.0D	0.4D	SFM(Vc)	80	80	80	80	80	80	80	
					IPT(fz)	.0007	.0009	.0012	.0014	.0017	.0020	.0022	
					RPM	1220	980	810	610	490	410	310	
36-37		Titanium Alloys (HB 400 Rm, HB 1050Rm TiAl6V4, 3.7165)	1.0D	1.0D (0.7D)*	SFM(Vc)	180	180	180	180	180	180	180	
					IPT(fz)	.0013	.0018	.0022	.0026	.0034	.0037	.0041	
					RPM	2750	2200	1830	1380	1100	920	690	



**NOTES:** ▶ Maximum recommended depth shown  
 ▶ Finish cuts typically require reduced feed rates and/or higher spindle speed, with radial width of 2% x D1 or less  
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\* (0.7D): UGMG42K998, UGMG42K999, UGMGK801  
 0.7D cutting depth for slotting and side cutting applications due to short double-core length

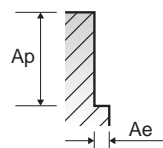


UGMH12, UGMG32, UGMG34, UGMH06, UGMH07 SERIES

5 FLUTES - Side Cutting

SFM(Vc) = ft./min.  
IPT(fz) = in./tooth  
RPM = rev./min.  
IPM(Feed) = in./min.

Table with columns for ISO, VDI 3323, Material Description, Ae, Ap, Parameter, and Diameter (Ø) with sub-columns for various diameters (1/8 to 1 1/4). Rows are categorized by material groups P, M, K, and S.

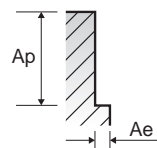


- NOTES: ▶ Maximum recommended depth shown
▶ Finish cuts typically require reduced feed rates and/or higher spindle speed, with radial width of 2% x D1 or less
▶ Feed to be reduced by approximately 50% if L.O.C.(length of cut) is over 3xD
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EMI42, EMI43 SERIES 5 FLUTES (TitaNox-Power HPC) Heavy Side Cutting

SFM(Vc) = ft./min.  
IPT(fz) = in./tooth  
RPM = rev./min.  
IPM(Feed) = in./min.

Table with columns for ISO, VDI 3323, Material Description, Ae, Ap, Parameter, and Diameter (Ø) with sub-columns for various diameters (3/16 to 1). Rows are categorized by material groups P, M, K, and S.



- NOTES: ▶ Maximum recommended depth shown
▶ Finish cuts typically require reduced feed rates and/or higher spindle speed, with radial width of 2% x D1 or less
▶ Feed to be reduced by approximately 50% if L.O.C.(length of cut) is over 3xD
▶ Reduce speed and feed recommendations for materials harder than listed
▶ Recommendations above are based on ideal conditions. Adjust parameters accordingly for smaller taper machining centers or less rigid conditions

HSS

HSS



RECOMMENDED CUTTING CONDITIONS



RECOMMENDED CUTTING CONDITIONS

EMI42, EMI43 SERIES 5 FLUTES (TitaNox-Power HPC) Side Cutting (Peel Milling)

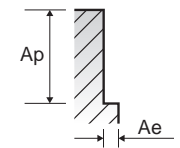
EMI42, EMI43 SERIES 5 FLUTES (TitaNox-Power HPC) Slotting

SFM(Vc) = ft./min. IPT(fz) = in./tooth RPM = rev./min. IPM(Feed) = in./min.

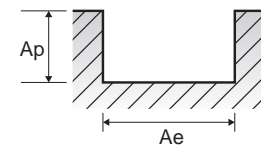
SFM(Vc) = ft./min. IPT(fz) = in./tooth RPM = rev./min. IPM(Feed) = in./min.

Table with columns: ISO, VDI 3323, Material Description, Ae, Ap, Parameter, Diameter (Ø) (3/16, 1/4, 5/16, 3/8, 1/2, 5/8, 3/4, 1). Rows include Non-alloy steel, Low alloy steel, High alloyed steel, Stainless steel, Grey cast iron, Heat Resistant Super Alloys, and Titanium Alloys.

Table with columns: ISO, VDI 3323, Material Description, Ae, Ap, Parameter, Diameter (Ø) (3/16, 1/4, 5/16, 3/8, 1/2, 5/8, 3/4, 1). Rows include Non-alloy steel, Low alloy steel, High alloyed steel, Stainless steel, Grey cast iron, Heat Resistant Super Alloys, and Titanium Alloys.



NOTES: ▶ Maximum recommended depth shown ▶ Finish cuts typically require reduced feed rates and/or higher spindle speed, with radial width of 2% x D1 or less ▶ Feed to be reduced by approximately 50% if L.O.C.(length of cut) is over 3xD ▶ Reduce speed and feed recommendations for materials harder than listed ▶ Recommendations above are based on ideal conditions. Adjust parameters accordingly for smaller taper machining centers or less rigid conditions



NOTES: ▶ Maximum recommended depth shown ▶ Finish cuts typically require reduced feed rates and/or higher spindle speed, with radial width of 2% x D1 or less ▶ Feed to be reduced by approximately 50% if L.O.C.(length of cut) is over 3xD ▶ Reduce speed and feed recommendations for materials harder than listed ▶ Recommendations above are based on ideal conditions. Adjust parameters accordingly for smaller taper machining centers or less rigid conditions

HSS

HSS



RECOMMENDED CUTTING CONDITIONS



RECOMMENDED CUTTING CONDITIONS

GMG40 SERIES 4 FLUTES DOUBLE CORE - Side Cutting

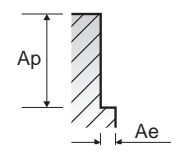
GMG40 SERIES 4 FLUTES DOUBLE CORE - Slotting

SFM(Vc) = ft./min.
IPT(fz) = in./tooth
RPM = rev./min.
IPM(Feed) = in./min.

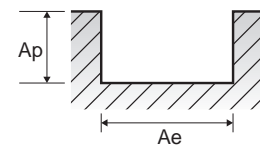
SFM(Vc) = ft./min.
IPT(fz) = in./tooth
RPM = rev./min.
IPM(Feed) = in./min.

Table with columns: ISO, VDI 3323, Material Description, Ae, Ap, Parameter, Diameter (Ø) (6.0, 8.0, 10.0, 12.0, 14.0, 16.0, 20.0, 25.0). Rows include Non-alloy steel, Low alloy steel, High alloyed steel, Stainless steel, Grey cast iron, Heat Resistant Super Alloys, Titanium Alloys.

Table with columns: ISO, VDI 3323, Material Description, Ae, Ap, Parameter, Diameter (Ø) (6.0, 8.0, 10.0, 12.0, 14.0, 16.0, 20.0, 25.0). Rows include Non-alloy steel, Low alloy steel, High alloyed steel, Stainless steel, Grey cast iron, Heat Resistant Super Alloys, Titanium Alloys.



- NOTES: ▶ Maximum recommended depth shown
▶ Finish cuts typically require reduced feed rates and/or higher spindle speed, with radial width of 2% x D1 or less
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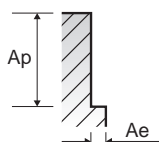


**GMG24, GMG26, GMG28, GMG30 SERIES**

**5 FLUTES - Side Cutting**

SFM(Vc) = ft./min.  
IPT(fz) = in./tooth  
RPM = rev./min.  
IPM(Feed) = in./min.

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø)										
						6.0	8.0	10.0	12.0	14.0	16.0	18.0	20.0	25.0		
<b>P</b>	1-4	Non-alloy steel	0.3D	1.5D	SFM (Vc)	475	475	475	475	475	475	475	475	475		
					IPT (fz)	.0013	.0015	.0020	.0025	.0027	.0030	.0033	.0035	.0040		
					RPM	7680	5760	4610	3840	3290	2880	2560	2300	1840		
	IPM (FEED)				50	43	46	48	44	43	42	40	37			
	SFM (Vc)				330	330	330	330	330	330	330	330	330			
	IPT (fz)				.0013	.0015	.0020	.0025	.0027	.0030	.0033	.0035	.0040			
	RPM	5340	4000	3200	2670	2290	2000	1780	1600	1280						
	IPM (FEED)	35	30	32	33	31	30	29	28	26						
	5	Low alloy steel	0.3D	1.5D	SFM (Vc)	475	475	475	475	475	475	475	475	475		
					IPT (fz)	.0013	.0015	.0020	.0025	.0027	.0030	.0033	.0035	.0040		
					RPM	7680	5760	4610	3840	3290	2880	2560	2300	1840		
	IPM (FEED)				50	43	46	48	44	43	42	40	37			
SFM (Vc)	330				330	330	330	330	330	330	330	330				
IPT (fz)	.0013				.0015	.0020	.0025	.0027	.0030	.0033	.0035	.0040				
RPM	5340	4000	3200	2670	2290	2000	1780	1600	1280							
IPM (FEED)	35	30	32	33	31	30	29	28	26							
6-7	High alloyed steel, and tool steel	0.3D	1.5D	SFM (Vc)	200	200	200	200	200	200	200	200	200			
				IPT (fz)	.0009	.0011	.0014	.0017	.0019	.0021	.0023	.0024	.0028			
				RPM	3230	2430	1940	1620	1390	1210	1080	970	780			
IPM (FEED)				15	13	14	14	13	13	12	12	11				
SFM (Vc)				385	385	385	385	385	385	385	385	385				
IPT (fz)				.0009	.0010	.0012	.0018	.0020	.0021	.0022	.0024	.0028				
RPM	6230	4670	3740	3110	2670	2330	2080	1870	1490							
IPM (FEED)	28	23	22	28	27	24	23	22	21							
12-13	Stainless steel (SUS 420, X40Cr13, 420)	0.3D	1.5D	SFM (Vc)	270	270	270	270	270	270	270	270	270			
				IPT (fz)	.0012	.0013	.0015	.0025	.0026	.0027	.0028	.0030	.0035			
				RPM	4370	3270	2620	2180	1870	1640	1460	1310	1050			
IPM (FEED)				26	21	20	27	24	22	20	20	18				
SFM (Vc)				195	195	195	195	195	195	195	195	195				
IPT (fz)				.0012	.0013	.0015	.0025	.0026	.0027	.0028	.0030	.0035				
RPM	3150	2360	1890	1580	1350	1180	1050	950	760							
IPM (FEED)	19	15	14	20	18	16	15	14	13							
14.1	Stainless steel (SUS 316, 316L, X5CrNiMo 17 12 2)	0.3D	1.5D	SFM (Vc)	350	350	350	350	350	350	350	350	350			
				IPT (fz)	.0017	.0019	.0025	.0031	.0034	.0038	.0041	.0044	.0050			
				RPM	5660	4240	3400	2830	2430	2120	1890	1700	1360			
IPM (FEED)				48	40	43	44	41	40	39	37	34				
SFM (Vc)				100	100	100	100	100	100	100	100	100				
IPT (fz)				.0008	.0009	.0011	.0017	.0018	.0019	.0019	.0021	.0024				
RPM	1620	1210	970	810	690	610	540	490	390							
IPM (FEED)	6	5	5	7	6	6	5	5	5							
14.2	Stainless steel (SUS 630, PH 15-5)	0.3D	1.5D	SFM (Vc)	225	225	225	225	225	225	225	225	225			
				IPT (fz)	.0011	.0011	.0013	.0022	.0023	.0024	.0025	.0027	.0031			
				RPM	3640	2730	2180	1820	1560	1360	1210	1090	870			
IPM (FEED)				20	15	14	20	18	16	15	15	13				
15-20				Grey cast iron	0.3D	1.5D	SFM (Vc)	100	100	100	100	100	100	100	100	100
							IPT (fz)	.0008	.0009	.0011	.0017	.0018	.0019	.0019	.0021	.0024
	RPM	1620	1210				970	810	690	610	540	490	390			
IPM (FEED)	6	5	5				7	6	6	5	5	5				
31-35	Heat Resistant Super Alloys (X12 NiCrSi 36-16, 1.4864, Inconel 718, NiCr20TiAl, 2.4631, NiCu30Al, 2.4375, G-X120Mn12, 1.3401)	0.1D	1.5D				SFM (Vc)	225	225	225	225	225	225	225	225	225
							IPT (fz)	.0011	.0011	.0013	.0022	.0023	.0024	.0025	.0027	.0031
				RPM	3640	2730	2180	1820	1560	1360	1210	1090	870			
IPM (FEED)				20	15	14	20	18	16	15	15	13				
36-37				Titanium Alloys (HB 400 Rm, HB 1050Rm TiAl6V4, 3.7165)	0.3D	1.5D	SFM (Vc)	225	225	225	225	225	225	225	225	225
							IPT (fz)	.0011	.0011	.0013	.0022	.0023	.0024	.0025	.0027	.0031
	RPM	3640	2730				2180	1820	1560	1360	1210	1090	870			
IPM (FEED)	20	15	14				20	18	16	15	15	13				

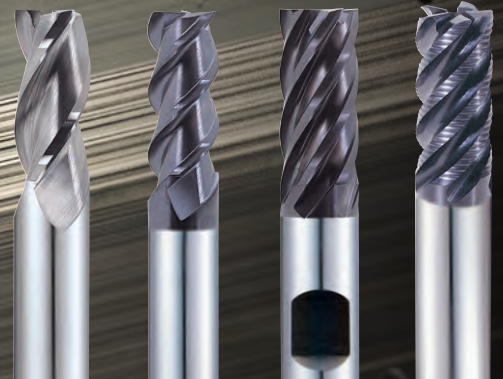


- NOTES:**
- ▶ Maximum recommended depth shown
  - ▶ Finish cuts typically require reduced feed rates and/or higher spindle speed, with radial width of 2% x D1 or less
  - ▶ Feed to be reduced by approximately 50% if L.O.C.(length of cut) is over 3xD
  - ▶ Reduce speed and feed recommendations for materials harder than listed
  - ▶ Recommendations above are based on ideal conditions. Adjust parameters accordingly for smaller taper machining centers or less rigid conditions



Being the best through innovation

SOLID CARBIDE



# JET-POWER END MILLS

- Exotic materials like Stainless Steels, Nickel alloys and Titanium







**CARBIDE, 3&4 FLUTE 50° HELIX REGULAR LENGTH**

- ▶ Suitable for low hardness materials (under HRc 45), alloy steels, tool steels, carbon steels, prehardened steels, stainless steels, inconel, nimonic, etc.
- ▶ Corner Protection against chipping.

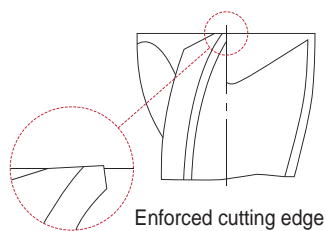


◆ U.S.A Stock

Unit : Inch

EDP No.	PLAIN		Mill Diameter	Shank Diameter	Length of Cut	Overall Length	No. of Flute
	PLAIN	FLAT					
95063	—	—	1/8	1/8	1/2	1-1/2	3
95064	—	—	3/16	3/16	5/8	2	3
95065	—	—	1/4	1/4	3/4	2-1/2	3
95066	—	—	5/16	5/16	13/16	2-1/2	3
—	95067	—	3/8	3/8	1	2-1/2	3
95115	—	—	7/16	7/16	1	2-3/4	3
—	95068	—	1/2	1/2	1	3	3
—	95069	—	5/8	5/8	1-1/4	3-1/2	3
—	95070	—	3/4	3/4	1-1/2	4	4
—	95071	—	1	1	1-1/2	4	4

Mill Dia. Tolerance (inch)	Shank Dia. Tolerance
0~-0.0012	0~-0.0003



◎ : Excellent ○ : Good

ISO	P										M				K											
Material Description	Non-alloy steel					Low alloy steel					High alloyed steel, and tool steel				Stainless steel		Grey cast iron		Nodular cast iron		Malleable cast iron					
VDI 3323	1	2	3	4	5	6	7	8	9	10	11.1	11.2	12	13	14	15	16	17	18	19	20	21	22	23	24	25
HRc	13	25	28	32	30	10	29	32	38	15	35	15	23	10	10	26	3	25	130	230	180	260	160	250	130	
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	275	300	350	200	325	200	240	180	180	260	
Recommend	○	○	◎	◎	◎	○	◎	◎	◎	○	◎	◎	◎	◎	◎	○	◎	◎	◎	◎	○	◎	◎	◎	◎	

ISO	N					S					H										
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys			Titanium Alloys		Hardened steel		Chilled Cast Iron		Hardened Cast Iron	
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend	○	○	○	○	○	○	○	○	○	○	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎

**HSS-PM, 6 FLUTE 35° HELIX REGULAR LENGTH**

- ▶ Designed to machine low hardness materials (under HRc45), alloy steels, tool steels, carbon steels, prehardened steels, stainless steel, inconel, nimonic, etc.
- ▶ High velocity milling operation and good surface finishes.



◇ Call for availability

Unit : Inch

EDP No.	Mill Diameter	Shank Diameter	Length of Cut	Overall Length
95094	3/4	3/4	1-5/8	3-7/8
95095	7/8	7/8	1-7/8	4-1/8
95096	1	1	2	4-1/2
95097	1-1/4	1-1/4	2	4-1/2
95098	1-1/2	1-1/4	2	4-1/2

Mill Dia. Tolerance (inch)	Shank Dia. Tolerance
0~+.0010	0~-0.0003

◎ : Excellent ○ : Good

ISO	P										M				K											
Material Description	Non-alloy steel					Low alloy steel					High alloyed steel, and tool steel				Stainless steel		Grey cast iron		Nodular cast iron		Malleable cast iron					
VDI 3323	1	2	3	4	5	6	7	8	9	10	11.1	11.2	12	13	14	15	16	17	18	19	20	21	22	23	24	25
HRc	13	25	28	32	30	10	29	32	38	15	35	15	23	10	10	26	3	25	130	230	180	260	160	250	130	
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	275	300	350	200	325	200	240	180	180	260	
Recommend	○	○	◎	◎	◎	○	◎	◎	◎	○	◎	◎	◎	◎	◎	○	◎	◎	◎	◎	○	◎	◎	◎	◎	

ISO	N					S					H										
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys			Titanium Alloys		Hardened steel		Chilled Cast Iron		Hardened Cast Iron	
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend	○	○	○	○	○	○	○	○	○	○	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎

HSS

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PLAIN SHANK Ø1/8-Ø5/16 E5075 SERIES
FLAT SHANK Ø11/32-Ø1 E5105 SERIES



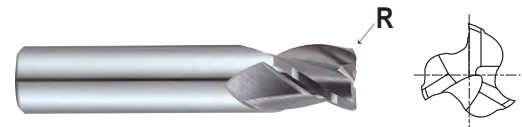
PLAIN SHANK Ø1/8-Ø5/16 E5074 SERIES
FLAT SHANK Ø11/32-Ø1 E5104 SERIES

CARBIDE, 3 FLUTE 35° HELIX STUB LENGTH CORNER RADIUS - "HOSS"

CARBIDE, 3 FLUTE 35° HELIX REGULAR LENGTH CORNER RADIUS - "HOSS"

- #1 Choice for slotting, ramping & pocket work on stainless, monel & other alloys up to HRC35.
Dry milling is recommended on steel alloys to reduce thermal shock and increase the life (YG:TYLON F or E COATING).

- #1 Choice for slotting, ramping & pocket work on stainless, monel & other alloys up to HRC35.
Dry milling is recommended on steel alloys to reduce thermal shock and increase the life (YG:TYLON F or E COATING).



p.C514-515 U.S.A Stock

p.C514-515 U.S.A Stock

Table with columns: UNCOATED, TIN COATED, TiCN COATED, YG:TYLON F, YG:TYLON E, Corner Radius R, Mill Diameter, Shank Diameter, Length of Cut, Overall Length. Lists various part numbers like 57558, 57561, etc.

Table with columns: UNCOATED, TiN COATED, TiCN COATED, YG:TYLON F, YG:TYLON E, Corner Radius R, Mill Diameter, Shank Diameter, Length of Cut, Overall Length. Lists various part numbers like 56558, 56561, etc.

Table with 2 columns: Mill Dia. Tolerance (inch), Shank Dia. Tolerance. Values: 0~-0.012, 0~-0.003

Table with 2 columns: Mill Dia. Tolerance (inch), Shank Dia. Tolerance. Values: 0~-0.012, 0~-0.003

ISO material compatibility chart for E5075/E5105 series. Columns include Material Description, P (Non-alloy steel, Low alloy steel, High alloyed steel), M (Stainless steel), K (Grey cast iron, Nodular cast iron, Malleable cast iron), S (Aluminum, Copper, Titanium, Heat Resistant Super Alloys), H (Hardened steel, Chilled Cast Iron, Hardened Cast Iron).

ISO material compatibility chart for E5074/E5104 series. Columns include Material Description, P (Non-alloy steel, Low alloy steel, High alloyed steel), M (Stainless steel), K (Grey cast iron, Nodular cast iron, Malleable cast iron), S (Aluminum, Copper, Titanium, Heat Resistant Super Alloys), H (Hardened steel, Chilled Cast Iron, Hardened Cast Iron).



PLAIN SHANK EH094 SERIES

CARBIDE, MULTI FLUTE STUB LENGTH FINE PITCH ROUGHING

- ▶ Designed to machine low hardness materials (under HRc45), alloy steels, tool steels, carbon steels, prehardened steels, stainless steel, inconel, nimonic, etc.
- ▶ High velocity milling operation.
- ▶ Fast chip ejection.

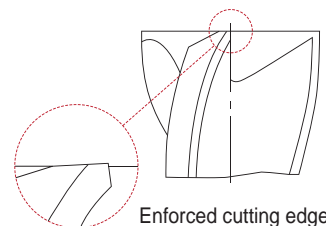


◆ U.S.A Stock

Unit : Inch

EDP No.	Mill Diameter	Shank Diameter	Length of Cut	Overall Length	No. of Flute
95072	1/4	1/4	5/16	2-1/8	3
95073	5/16	5/16	3/8	2-1/4	3
95074	3/8	3/8	9/16	2-1/2	3
95075	1/2	1/2	5/8	3	4
95076	5/8	5/8	7/8	3-1/4	4
95077	3/4	3/4	1	3-3/4	4
95078	1	1	1	4	5

Mill Dia. (inch)	Mill Dia. Tolerance (inch)	Shank Dia. Tolerance
1/4~3/8	0 ~ -.0022	0 ~ -.0003
1/2~5/8	0 ~ -.0027	
3/4~1	0 ~ -.0033	



◎ : Excellent ○ : Good

ISO	P										M				K											
	Non-alloy steel					Low alloy steel					High alloyed steel, and tool steel				Stainless steel		Grey cast iron		Nodular cast iron		Malleable cast iron					
Material Description	1	2	3	4	5	6	7	8	9	10	11.1	11.2	12	13	14	15	16	17	18	19	20	21	22	23	24	25
VDI 3323	1	2	3	4	5	6	7	8	9	10	11.1	11.2	12	13	14	15	16	17	18	19	20	21	22	23	24	25
HRc	13	25	28	32	30	10	29	32	38	15	35	15	23	10	10	10	26	3	25	130	230	15	35	15	23	10
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	180	260	160	250	130	230	15	35	15	23	10
Recommend	○	○	◎	◎	◎	○	◎	◎	◎	○	◎	◎	◎	◎	◎	○	◎	◎	◎	◎	◎	○	◎	◎	◎	◎

ISO	N					S					H													
	Aluminum-wrought alloy		Aluminum-cast, alloyed		Copper and Copper Alloys (Bronze / Brass)	Heat Resistant Super Alloys			Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron											
Material Description	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44
HRc	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550	550	630	400
Recommend	○	○	○	○	○	○	○	○	○	○	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎



PLAIN SHANK EH095 SERIES

CARBIDE, MULTI FLUTE LONG LENGTH FINE PITCH ROUGHING

- ▶ Suitable for low hardness materials (under HRc45), alloy steels, tool steels, carbon steels, prehardened steels, stainless steel, inconel, nimonic, etc.
- ▶ High velocity milling operation.
- ▶ Fast chip ejection.

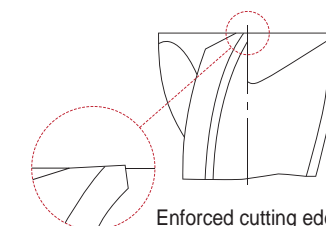


◆ U.S.A Stock

Unit : Inch

EDP No.	Mill Diameter	Shank Diameter	Length of Cut	Overall Length	No. of Flute
95079	1/4	1/4	3/4	2-1/2	3
95080	5/16	5/16	3/4	2-1/2	3
95081	3/8	3/8	7/8	2-1/2	3
95082	1/2	1/2	1	3	4
95083	5/8	5/8	1-1/4	3-1/2	4
95084	3/4	3/4	1-5/8	4	4
95085	1	1	1-3/4	4	5

Mill Dia. (inch)	Mill Dia. Tolerance (inch)	Shank Dia. Tolerance
1/4~3/8	0 ~ -.0022	0 ~ -.0003
1/2~5/8	0 ~ -.0027	
3/4~1	0 ~ -.0033	



◎ : Excellent ○ : Good

ISO	P										M				K											
	Non-alloy steel					Low alloy steel					High alloyed steel, and tool steel				Stainless steel		Grey cast iron		Nodular cast iron		Malleable cast iron					
Material Description	1	2	3	4	5	6	7	8	9	10	11.1	11.2	12	13	14	15	16	17	18	19	20	21	22	23	24	25
VDI 3323	1	2	3	4	5	6	7	8	9	10	11.1	11.2	12	13	14	15	16	17	18	19	20	21	22	23	24	25
HRc	13	25	28	32	30	10	29	32	38	15	35	15	23	10	10	10	26	3	25	130	230	15	35	15	23	10
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	180	260	160	250	130	230	15	35	15	23	10
Recommend	○	○	◎	◎	◎	○	◎	◎	◎	○	◎	◎	◎	◎	◎	○	◎	◎	◎	◎	◎	○	◎	◎	◎	◎

ISO	N					S					H													
	Aluminum-wrought alloy		Aluminum-cast, alloyed		Copper and Copper Alloys (Bronze / Brass)	Heat Resistant Super Alloys			Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron											
Material Description	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44
HRc	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550	550	630	400
Recommend	○	○	○	○	○	○	○	○	○	○	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎

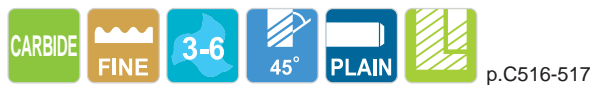
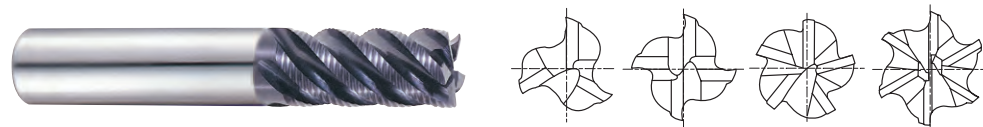




PLAIN SHANK EH969 SERIES

**CARBIDE, MULTI FLUTE 45° HELIX LONG LENGTH FINE PITCH ROUGHING**

- Suitable for low hardness materials (under HRC45), alloy steels, tool steels, carbon steels, prehardened steels, stainless steel, titanium, inconel, nimonic, etc.
- High chip removed and minimizing breakages of cutting edges.
- Corner Protection against chipping.

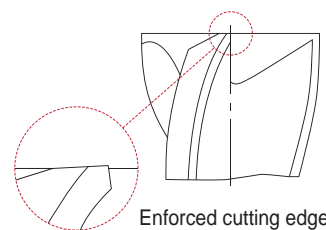


◆ U.S.A Stock

Unit : Inch

EDP No.	Mill Diameter	Shank Diameter	Length of Cut	Overall Length	No. of Flute
95107	3/16	1/4	1/2	2-1/4	3
95108	1/4	1/4	3/4	2-1/2	4
95109	5/16	5/16	3/4	2-1/2	4
95110	3/8	3/8	7/8	2-1/2	4
95111	1/2	1/2	1	3	4
95112	5/8	5/8	1-1/4	3-1/2	5
95113	3/4	3/4	1-5/8	4	6
95114	1	1	1-3/4	4	6

Mill Dia. (inch)	Mill Dia. Tolerance (inch)	Shank Dia. Tolerance
3/16	0 ~ -.0019	0 ~ -.0003
1/4~3/8	0 ~ -.0022	
1/2~5/8	0 ~ -.0027	
3/4~1	0 ~ -.0033	



◎ : Excellent ○ : Good

ISO Material Description	P										M				K											
	Non-alloy steel					Low alloy steel					High alloyed steel, and tool steel				Stainless steel		Grey cast iron		Nodular cast iron		Malleable cast iron					
VDI 3323	1	2	3	4	5	6	7	8	9	10	11.1	11.2	12	13	14	15	16	17	18	19	20	21	22	23	24	25
HRc	13	25	28	32	30	10	29	32	38	15	35	15	23	10	10	26	3	25	130	230						
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	275	160	250	130	230						
Recommend	○	○	◎	◎	◎	○	◎	◎	◎	○	◎	◎	◎	◎	◎	○	◎	◎	◎	◎	○	◎	◎	◎	◎	

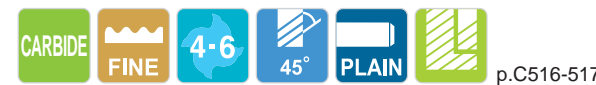
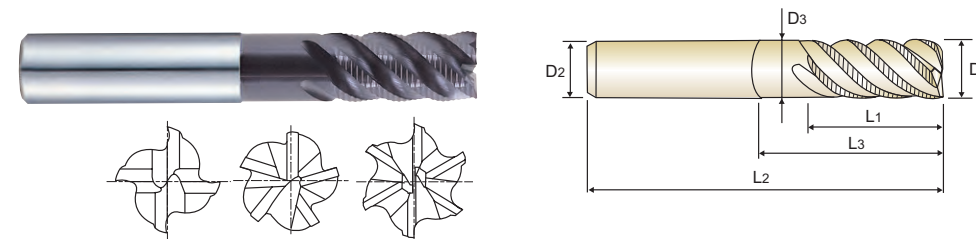
ISO Material Description	N					S					H										
	Aluminum-wrought alloy		Aluminum-cast, alloyed		Copper and Copper Alloys (Bronze / Brass)	Heat Resistant Super Alloys			Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron								
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend	○	○	○	○	○	○	○	○	○	○	◎	◎	◎	◎	◎	◎	◎	○	○	○	○



PLAIN SHANK EH970 SERIES

**CARBIDE, MULTI FLUTE 45° HELIX LONG REACH FINE PITCH ROUGHING**

- Suitable for low hardness materials (under HRC45), alloy steels, tool steels, carbon steels, prehardened steels, stainless steel, titanium, inconel, nimonic, etc.
- High chip removed and minimizing breakages of cutting edges.
- Corner Protection against chipping.

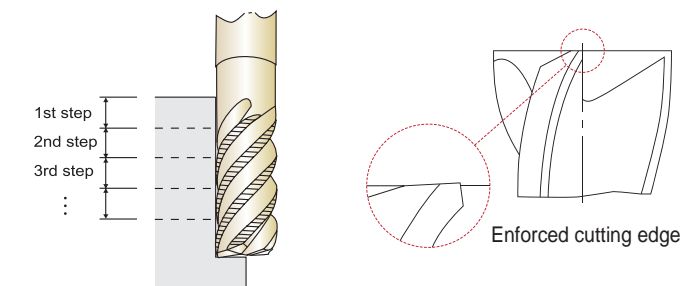


◆ U.S.A Stock

Unit : Inch

EDP No.	Mill Diameter	Shank Diameter	Length of Cut	Length Below Shank	Overall Length	Neck Diameter	No. of Flute
	D1	D2	L1	L3	L2	D3	
95101	1/4	1/4	3/4	7/8	2-1/2	.230	4
95102	5/16	5/16	3/4	1	2-1/2	.292	4
95103	3/8	3/8	7/8	1-1/4	2-1/2	.355	4
95104	1/2	1/2	1	1-1/2	3	.480	4
95105	5/8	5/8	1-1/4	2	4	.605	5
95106	3/4	3/4	1-5/8	2-3/8	4-3/8	.719	6

Mill Dia. (inch)	Mill Dia. Tolerance (inch)	Shank Dia. Tolerance
1/4~3/8	0 ~ -.0022	0 ~ -.0003
1/2~5/8	0 ~ -.0027	
3/4~1	0 ~ -.0033	



◎ : Excellent ○ : Good

ISO Material Description	P										M				K											
	Non-alloy steel					Low alloy steel					High alloyed steel, and tool steel				Stainless steel		Grey cast iron		Nodular cast iron		Malleable cast iron					
VDI 3323	1	2	3	4	5	6	7	8	9	10	11.1	11.2	12	13	14	15	16	17	18	19	20	21	22	23	24	25
HRc	13	25	28	32	30	10	29	32	38	15	35	15	23	10	10	26	3	25	130	230						
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	275	160	250	130	230						
Recommend	○	○	◎	◎	◎	○	◎	◎	◎	○	◎	◎	◎	◎	◎	○	◎	◎	◎	◎	○	◎	◎	◎	◎	

ISO Material Description	N					S					H										
	Aluminum-wrought alloy		Aluminum-cast, alloyed		Copper and Copper Alloys (Bronze / Brass)	Heat Resistant Super Alloys			Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron								
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend	○	○	○	○	○	○	○	○	○	○	◎	◎	◎	◎	◎	◎	◎	○	○	○	○

**CARBIDE, 3&4 FLUTE 50° HELIX LONG LENGTH**

- ▶ Reduces chipping of corner edges
- ▶ Suitable for low hardness materials (under HRc45), alloy steels, tool steels, carbon steels, prehardened steels, stainless steels, Inconel, nimonic, etc



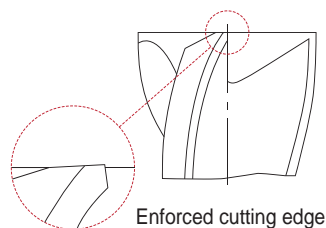
p.C518-519

◇ Call for Availability

Unit : mm

EDP No.	Mill Diameter		Shank Diameter	Length of Cut	Overall Length	No. of Flute
	Metric	Inch				
<a href="#">EH830060</a>	6.0	.2362	6	13	50	3
<a href="#">EH830901</a>	6.0	.2362	6	13	50	4
<a href="#">EH830080</a>	8.0	.3150	8	19	60	3
<a href="#">EH830100</a>	10.0	.3937	10	22	70	3
<a href="#">EH830120</a>	12.0	.4724	12	25	75	3
<a href="#">EH830160</a>	16.0	.6299	16	32	90	3
<a href="#">EH830180</a>	18.0	.7087	18	32	90	3
<a href="#">EH830200</a>	20.0	.7874	20	38	100	4
<a href="#">EH830250</a>	25.0	.9843	25	45	120	4

Mill Dia. Tolerance (mm)	Shank Dia. Tolerance
0~-0.03	h6



Enforced cutting edge

◎ : Excellent ○ : Good

ISO Material Description	P										M				K						
	Non-alloy steel					Low alloy steel					High alloyed steel, and tool steel				Stainless steel		Grey cast iron		Nodular cast iron		Malleable cast iron
VDI 3323	1	2	3	4	5	6	7	8	9	10	11.1	11.2	12	13	14	15	16	17	18	19	20
HRc	13	25	28	32	30	10	29	32	38	15	35	15	23	10	10	26	3	25	130	21	
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230	
Recommend	○	○	◎	◎	◎	○	◎	◎	◎	○	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	

ISO Material Description	N					S					H										
	Aluminum-wrought alloy		Aluminum-cast, alloyed		Copper and Copper Alloys (Bronze / Brass)	Non Metallic Materials		Heat Resistant Super Alloys			Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron						
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc	15	30	25	38	34	15	30	25	38	34	55	60	42	55	550	630	400	400	400	550	
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend	○	○	○	○	○	○	○	○	○	○	◎	◎	○	○	◎	◎	○	○	○	○	

**HSS-PM, 4&6 FLUTE SHORT LENGTH**

- ▶ Designed to machine low hardness materials (under HRc45), alloy steels, tool steels, carbon steels, prehardened steels, stainless steel, inconel, nimonic, etc.
- ▶ High velocity milling operation and good surface finishes.



p.C520

◇ Call for Availability

Unit : mm

EDP No.	Mill Diameter		Shank Diameter	Length of Cut	Overall Length	No. of Flute
	Metric	Inch				
<a href="#">EE515030</a>	3.0	.1181	6	8	52	4
<a href="#">EE515040</a>	4.0	.1575	6	11	55	4
<a href="#">EE515050</a>	5.0	.1969	6	13	57	4
<a href="#">EE515060</a>	6.0	.2362	6	13	57	4
<a href="#">EE515080</a>	8.0	.3150	10	19	69	4
<a href="#">EE515100</a>	10.0	.3937	10	22	72	4
<a href="#">EE515120</a>	12.0	.4724	12	26	83	4
<a href="#">EE515140</a>	14.0	.5512	12	26	83	4
<a href="#">EE515160</a>	16.0	.6299	16	32	92	6
<a href="#">EE515180</a>	18.0	.7087	16	32	92	6
<a href="#">EE515200</a>	20.0	.7874	20	38	104	6
<a href="#">EE515250</a>	25.0	.9843	25	45	121	6

Mill Dia. Tolerance (mm)	Shank Dia. Tolerance
0~+0.03	h6

◎ : Excellent ○ : Good

ISO Material Description	P										M				K						
	Non-alloy steel					Low alloy steel					High alloyed steel, and tool steel				Stainless steel		Grey cast iron		Nodular cast iron		Malleable cast iron
VDI 3323	1	2	3	4	5	6	7	8	9	10	11.1	11.2	12	13	14	15	16	17	18	19	20
HRc	13	25	28	32	30	10	29	32	38	15	35	15	23	10	10	26	3	25	130	21	
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230	
Recommend	○	○	◎	◎	◎	○	◎	◎	◎	○	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	

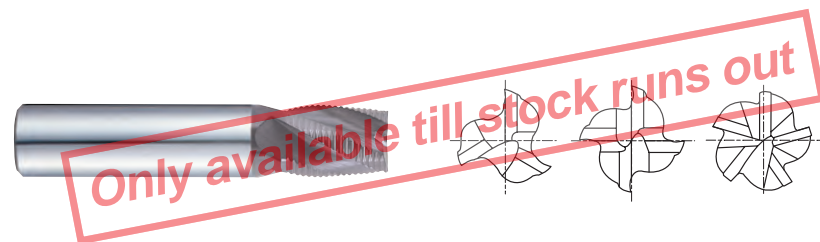
ISO Material Description	N					S					H										
	Aluminum-wrought alloy		Aluminum-cast, alloyed		Copper and Copper Alloys (Bronze / Brass)	Non Metallic Materials		Heat Resistant Super Alloys			Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron						
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc	15	30	25	38	34	15	30	25	38	34	55	60	42	55	550	630	400	400	400	550	
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend	○	○	○	○	○	○	○	○	○	○	◎	◎	○	○	◎	◎	○	○	○	○	



PLAIN SHANK **EH852** SERIES

**CARBIDE, MULTI FLUTE STUB LENGTH FINE PITCH ROUGHING**

- ▶ Designed to machine low hardness materials (under HRc45), alloy steels, tool steels, carbon steels, prehardened steels, stainless steel, inconel, nimonic.
- ▶ High velocity milling operation.
- ▶ Fast chip ejection.



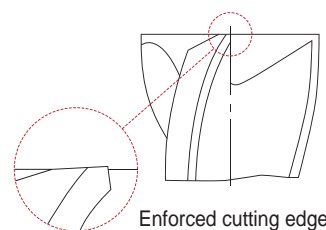
◇ Call for Availability

Unit : mm

EDP No.	Mill Diameter		Shank Diameter h6	Length of Cut	Overall Length	No. of Flute
	Metric h10	Inch				
<a href="#">EH852060</a>	6.0	.2362	6	7	54	3
<a href="#">EH852070</a>	7.0	.2756	8	8	58	3
<a href="#">EH852080</a>	8.0	.3150	8	9	58	3
<a href="#">EH852090</a>	9.0	.3543	10	13	66	4
<a href="#">EH852100</a>	10.0	.3937	10	14	66	4
<a href="#">EH852120</a>	12.0	.4724	12	16	73	4
<a href="#">EH852140</a>	14.0	.5512	14	18	75	4
<a href="#">EH852160</a>	16.0	.6299	16	22	82	4
<a href="#">EH852180</a>	18.0	.7087	18	24	84	4
<a href="#">EH852200</a>	20.0	.7874	20	26	92	4
<a href="#">EH852250</a>	25.0	.9843	25	25	110	5

**Tolerances according to DIN 7160 & 7161**

Tolerance range in μm					
Nominal-Diameter in mm					
	from 1 to 3	over 3 to 6	over 6 to 10	over 10 to 18	over 18 to 30
<b>h10</b>	0 - 40	0 - 48	0 - 58	0 - 70	0 - 84
<b>h6</b>	0 - 6	0 - 8	0 - 9	0 - 11	0 - 13



◎ : Excellent ○ : Good

ISO Material Description	P										M				K											
	Non-alloy steel					Low alloy steel					High alloyed steel, and tool steel				Stainless steel		Grey cast iron		Nodular cast iron		Malleable cast iron					
VDI 3323	1	2	3	4	5	6	7	8	9	10	11.1	11.2	12	13	14	15	16	17	18	19	20	21	22	23	24	25
HRc	13	25	28	32	30	10	29	32	38	15	35	15	23	10	10	10	26	3	25	130	230	10	26	3	25	21
HB	125	190	250	270	300	180	275	300	350	200	325	200	270	240	180	180	260	160	250	130	230	180	260	160	250	130
Recommend	○	○	◎	◎	◎	○	◎	◎	◎	○	◎	○	◎	◎	◎	○	◎	◎	◎	◎	◎	○	◎	◎	◎	◎

ISO Material Description	N										S				H										
	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys				Titanium Alloys		Hardened steel		Chilled Cast Iron		Hardened Cast Iron				
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45
HRc	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550	550	630	400	550
Recommend	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	◎	◎	◎	◎	◎	◎	○	○	○	○



PLAIN SHANK **EH831** SERIES

**CARBIDE, MULTI FLUTE LONG LENGTH FINE PITCH ROUGHING**

- ▶ Designed to machine low hardness materials (under HRc45), alloy steels, tool steels, carbon steels, prehardened steels, stainless steel, inconel, nimonic.
- ▶ High velocity milling operation.
- ▶ Fast chip ejection.



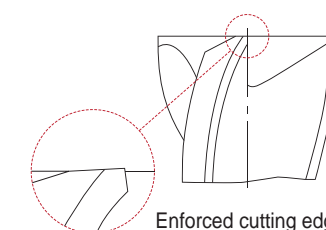
◇ Call for Availability

Unit : mm

EDP No.	Mill Diameter		Shank Diameter h6	Length of Cut	Overall Length	No. of Flute
	Metric h10	Inch				
<a href="#">EH831060</a>	6.0	.2362	6	16	57	3
<a href="#">EH831070</a>	7.0	.2756	8	16	63	3
<a href="#">EH831080</a>	8.0	.3150	8	16	63	3
<a href="#">EH831090</a>	9.0	.3543	10	19	72	4
<a href="#">EH831100</a>	10.0	.3937	10	22	72	4
<a href="#">EH831120</a>	12.0	.4724	12	26	83	4
<a href="#">EH831140</a>	14.0	.5512	14	26	83	4
<a href="#">EH831160</a>	16.0	.6299	16	32	92	4
<a href="#">EH831180</a>	18.0	.7087	18	32	92	4
<a href="#">EH831200</a>	20.0	.7874	20	38	104	4
<a href="#">EH831250</a>	25.0	.9843	25	45	121	5

**Tolerances according to DIN 7160 & 7161**

Tolerance range in μm					
Nominal-Diameter in mm					
	from 1 to 3	over 3 to 6	over 6 to 10	over 10 to 18	over 18 to 30
<b>h10</b>	0 - 40	0 - 48	0 - 58	0 - 70	0 - 84
<b>h6</b>	0 - 6	0 - 8	0 - 9	0 - 11	0 - 13



◎ : Excellent ○ : Good

ISO Material Description	P										M				K											
	Non-alloy steel					Low alloy steel					High alloyed steel, and tool steel				Stainless steel		Grey cast iron		Nodular cast iron		Malleable cast iron					
VDI 3323	1	2	3	4	5	6	7	8	9	10	11.1	11.2	12	13	14	15	16	17	18	19	20	21	22	23	24	25
HRc	13	25	28	32	30	10	29	32	38	15	35	15	23	10	10	10	26	3	25	130	230	10	26	3	25	21
HB	125	190	250	270	300	180	275	300	350	200	325	200	270	240	180	180	260	160	250	130	230	180	260	160	250	130
Recommend	○	○	◎	◎	◎	○	◎	◎	◎	○	◎	○	◎	◎	◎	○	◎	◎	◎	◎	◎	○	◎	◎	◎	◎

ISO Material Description	N										S				H										
	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys				Titanium Alloys		Hardened steel		Chilled Cast Iron		Hardened Cast Iron				
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45
HRc	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550	550	630	400	550
Recommend	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	◎	◎	◎	◎	◎	◎	○	○	○	○





PLAIN SHANK EH917 SERIES

CARBIDE, MULTI FLUTE 45° HELIX FINE PITCH ROUGHING

- ▶ High chip removal and minimizing breakages of cutting edges.
- ▶ Suitable for low hardness materials (under HRc45), alloy steels, tool steels, carbon steels, prehardened steels, stainless steels, Inconel, nimonic, etc



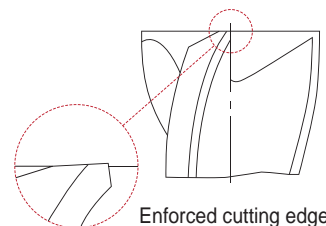
◇ Call for Availability

Unit : mm

EDP No.	Mill Diameter		Shank Diameter	Length of Cut	Overall Length	No. of Flute
	Metric	Inch				
<a href="#">EH917060</a>	6.0	.2362	6	7	54	4
<a href="#">EH917080</a>	8.0	.3150	8	9	58	4
<a href="#">EH917100</a>	10.0	.3937	10	14	66	4
<a href="#">EH917120</a>	12.0	.4724	12	16	73	4
<a href="#">EH917160</a>	16.0	.6299	16	22	82	5
<a href="#">EH917200</a>	20.0	.7874	20	26	92	6

Tolerances according to DIN 7160 & 7161

Tolerance range in $\mu\text{m}$					
Nominal-Diameter in mm					
	from 1 to 3	over 3 to 6	over 6 to 10	over 10 to 18	over 18 to 30
<b>h10</b>	0 - 40	0 - 48	0 - 58	0 - 70	0 - 84
<b>h6</b>	0 - 6	0 - 8	0 - 9	0 - 11	0 - 13



◎ : Excellent ○ : Good

ISO	P										M				K						
	Non-alloy steel					Low alloy steel					High alloyed steel, and tool steel				Stainless steel		Grey cast iron		Nodular cast iron		Malleable cast iron
Material Description	1	2	3	4	5	6	7	8	9	10	11.1	11.2	12	13	14	15	16	17	18	19	20
VDI 3323	1	2	3	4	5	6	7	8	9	10	11.1	11.2	12	13	14	15	16	17	18	19	20
HRc	13	25	28	32	30	10	29	32	38	15	35	15	23	10	10	26	3	25	3	25	21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230	
Recommend	○	○	◎	◎	◎	○	◎	◎	◎	○	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎

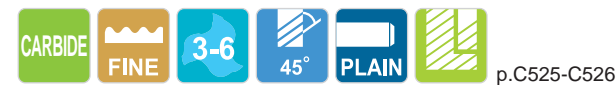
ISO	N						S						H								
	Aluminum-wrought alloy		Aluminum-cast, alloyed		Copper and Copper Alloys (Bronze / Brass)		Non Metallic Materials			Heat Resistant Super Alloys			Titanium Alloys			Hardened steel	Chilled Cast Iron	Hardened Cast Iron			
Material Description	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	◎	◎	○	○	○	○



PLAIN SHANK EH919 SERIES

CARBIDE, MULTI FLUTE 45° HELIX LONG LENGTH FINE PITCH ROUGHING

- ▶ High chip removal and minimizing breakages of cutting edges.
- ▶ Suitable for low hardness materials (under HRc45), alloy steels, tool steels, carbon steels, prehardened steels, stainless steels, Inconel, nimonic, etc



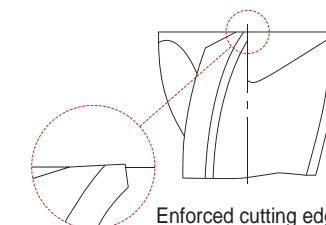
◇ Call for Availability

Unit : mm

EDP No.	Mill Diameter		Shank Diameter	Length of Cut	Overall Length	No. of Flute
	Metric	Inch				
<a href="#">EH919040</a>	4.0	.1575	6	11	57	3
<a href="#">EH919050</a>	5.0	.1969	6	13	57	4
<a href="#">EH919060</a>	6.0	.2362	6	16	57	4
<a href="#">EH919070</a>	7.0	.2756	8	16	63	4
<a href="#">EH919080</a>	8.0	.3150	8	16	63	4
<a href="#">EH919090</a>	9.0	.3543	10	19	72	4
<a href="#">EH919100</a>	10.0	.3937	10	22	72	4
<a href="#">EH919120</a>	12.0	.4724	12	26	83	4
<a href="#">EH919140</a>	14.0	.5512	14	26	83	5
<a href="#">EH919160</a>	16.0	.6299	16	32	92	5
<a href="#">EH919200</a>	20.0	.7874	20	38	104	6
<a href="#">EH919250</a>	25.0	.9843	25	45	121	6

Tolerances according to DIN 7160 & 7161

Tolerance range in $\mu\text{m}$					
Nominal-Diameter in mm					
	from 1 to 3	over 3 to 6	over 6 to 10	over 10 to 18	over 18 to 30
<b>h10</b>	0 - 40	0 - 48	0 - 58	0 - 70	0 - 84
<b>h6</b>	0 - 6	0 - 8	0 - 9	0 - 11	0 - 13



◎ : Excellent ○ : Good

ISO	P										M				K						
	Non-alloy steel					Low alloy steel					High alloyed steel, and tool steel				Stainless steel		Grey cast iron		Nodular cast iron		Malleable cast iron
Material Description	1	2	3	4	5	6	7	8	9	10	11.1	11.2	12	13	14	15	16	17	18	19	20
VDI 3323	1	2	3	4	5	6	7	8	9	10	11.1	11.2	12	13	14	15	16	17	18	19	20
HRc	13	25	28	32	30	10	29	32	38	15	35	15	23	10	10	26	3	25	3	25	21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230	
Recommend	○	○	◎	◎	◎	○	◎	◎	◎	○	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎

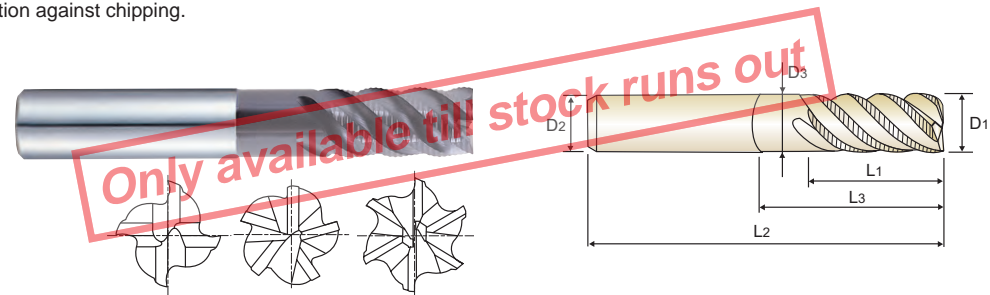
ISO	N						S						H								
	Aluminum-wrought alloy		Aluminum-cast, alloyed		Copper and Copper Alloys (Bronze / Brass)		Non Metallic Materials			Heat Resistant Super Alloys			Titanium Alloys			Hardened steel	Chilled Cast Iron	Hardened Cast Iron			
Material Description	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	◎	◎	○	○	○	○



PLAIN SHANK EH921 SERIES

**CARBIDE, MULTI FLUTE 45° HELIX LONG REACH FINE PITCH ROUGHING**

- Suitable for low hardness materials (under HRC45), alloy steels, tool steels, carbon steels, prehardened steels, stainless steel, titanium, inconel, nimonic, etc.
- High chip removed and minimizing breakages of cutting edges.
- Corner Protection against chipping.



p.C523-C524

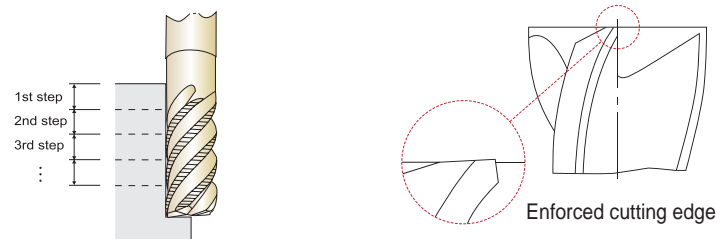
◇ Call for Availability

Unit : mm

EDP No.	Mill Diameter		Shank Diameter D2	Length of Cut L1	Length Below Shank L3	Overall Length L2	Neck Diameter D3	No. of Flute
	Metric D1	Inch						
<b>EH921060</b>	6.0	.2362	6	16	20	57	5.5	4
<b>EH921080</b>	8.0	.3150	8	16	26	63	7.5	4
<b>EH921100</b>	10.0	.3937	10	22	31	72	9.5	4
<b>EH921120</b>	12.0	.4724	12	26	37	83	11.5	4
<b>EH921160</b>	16.0	.6299	16	32	51	100	15.5	5
<b>EH921200</b>	20.0	.7874	20	38	59	110	19.2	6

**Tolerances according to DIN 7160 & 7161**

	Tolerance range in μm				
	Nominal-Diameter in mm				
	from 1 to 3	over 3 to 6	over 6 to 10	over 10 to 18	over 18 to 30
<b>h10</b>	0 - 40	0 - 48	0 - 58	0 - 70	0 - 84
<b>h6</b>	0 - 6	0 - 8	0 - 9	0 - 11	0 - 13



◎ : Excellent ○ : Good

ISO	P										M				K											
	Non-alloy steel					Low alloy steel					High alloyed steel, and tool steel				Stainless steel		Grey cast iron		Nodular cast iron		Malleable cast iron					
Material Description	1	2	3	4	5	6	7	8	9	10	11.1	11.2	12	13	14	15	16	17	18	19	20	21	22	23	24	25
VDI 3323	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230						
HRc																										
HB																										
Recommend	○	○	◎	◎	◎	○	◎	◎	◎	◎	○	◎	◎	◎	◎	○	◎	◎	◎	◎	◎	○	○	○	○	○

ISO	N						S						H								
	Aluminum-wrought alloy		Aluminum-cast, alloyed		Copper and Copper Alloys (Bronze / Brass)		Non Metallic Materials		Heat Resistant Super Alloys			Titanium Alloys			Hardened steel	Chilled Cast Iron	Hardened Cast Iron				
Material Description	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
VDI 3323																					
HRc																					
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend											○	○	○	○	○	◎	◎			○	

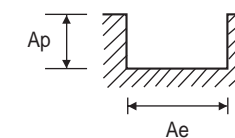


RECOMMENDED CUTTING CONDITIONS

**EH108 SERIES 3&4 FLUTE - SLOTTING**

SFM(Vc) = ft./min.  
IPT(fz) = in./tooth  
RPM = rev./min.  
IPM(Feed) = in./min.

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø)						
						1/4	5/16	3/8	1/2	5/8	3/4	1
P	1-4	Non-alloy steel	1.0D	0.5D	SFM(Vc)	365	345	320	360	360	345	355
					IPT(fz)	.0007	.0011	.0012	.0012	.0012	.0010	.0008
	RPM		5560	4200	3260	2740	2200	1750	1360			
	IPM(Feed)		12	13	12	10	8	7	5			
	5		SFM(Vc)	220	205	195	220	225	215	220		
			IPT(fz)	.0008	.0009	.0009	.0009	.0010	.0008	.0007		
	RPM		3360	2520	2000	1680	1360	1100	840			
	IPM(Feed)		8	7	6	5	4	3	2			
	6-7		SFM(Vc)	365	345	320	360	360	345	355		
			IPT(fz)	.0007	.0011	.0012	.0012	.0012	.0010	.0008		
RPM	5560	4200	3260	2740	2200	1750	1360					
IPM(Feed)	12	13	12	10	8	7	5					
8-9	SFM(Vc)	220	205	195	220	225	215	220				
	IPT(fz)	.0008	.0009	.0009	.0009	.0010	.0008	.0007				
RPM	3360	2520	2000	1680	1360	1100	840					
IPM(Feed)	8	7	6	5	4	3	2					
10	SFM(Vc)	365	345	320	360	360	345	355				
	IPT(fz)	.0007	.0011	.0012	.0012	.0012	.0010	.0008				
RPM	5560	4200	3260	2740	2200	1750	1360					
IPM(Feed)	12	13	12	10	8	7	5					
11.1-11.2	SFM(Vc)	220	205	195	220	225	215	220				
	IPT(fz)	.0008	.0009	.0009	.0009	.0010	.0008	.0007				
RPM	3360	2520	2000	1680	1360	1100	840					
IPM(Feed)	8	7	6	5	4	3	2					
M	12-14.2	Stainless steel	1.0D	0.05D	SFM(Vc)	185	170	165	180	170	175	175
					IPT(fz)	.0007	.0010	.0011	.0011	.0013	.0010	.0009
RPM	2840	2100	1680	1370	1050	880	670					
IPM(Feed)	6	6	6	5	4	3	2					
S	31-35	Heat Resistant Super Alloys	1.0D	0.05D	SFM(Vc)	75	70	65	75	70	70	70
					IPT(fz)	.0005	.0006	.0008	.0007	.0008	.0009	.0006
RPM	1160	840	670	560	420	350	270					
IPM(Feed)	2	2	2	1	1	1	1					
S	36-37	Titanium Alloys	1.0D	0.05D	SFM(Vc)	100	90	85	95	90	95	90
					IPT(fz)	.0005	.0007	.0008	.0008	.0008	.0006	.0006
RPM	1500	1090	870	730	550	480	350					
IPM(Feed)	2	2	2	2	1	1	1					
H	40	Chilled Cast Iron	1.0D	0.5D	SFM(Vc)	220	205	195	220	225	215	220
					IPT(fz)	.0008	.0009	.0009	.0009	.0010	.0008	.0007
RPM	3360	2520	2000	1680	1360	1100	840					
IPM(Feed)	8	7	6	5	4	3	2					



\* The Feed, in long & extra long types, should be reduced by around 50%.



RECOMMENDED CUTTING CONDITIONS



RECOMMENDED CUTTING CONDITIONS

**EH108 SERIES 3&4 FLUTE - SIDE CUTTING**

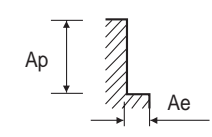
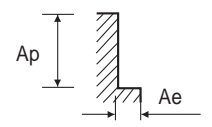
**EE882 SERIES 6FLUTE - SIDE CUTTING**

SFM(Vc) = ft./min.  
IPT (fz) = in./tooth  
RPM = rev./min.  
IPM(Feed) = in./min.

SFM(Vc) = ft./min.  
IPT (fz) = in./tooth  
RPM = rev./min.  
IPM(Feed) = in./min.

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø)						
						1/4	5/16	3/8	1/2	5/8	3/4	1
P	1-4	Non-alloy steel	0.5D	1.5D	SFM(Vc)	365	345	320	360	360	345	355
					IPT (fz)	.0009	.0013	.0015	.0015	.0015	.0012	.0011
					RPM	5560	4200	3260	2740	2200	1750	1360
					IPM(Feed)	16	17	15	12	10	9	6
					SFM(Vc)	220	205	195	220	225	215	220
					IPT (fz)	.0010	.0012	.0012	.0012	.0012	.0010	.0009
	5	Non-alloy steel	0.5D	1.5D	SFM(Vc)	365	345	320	360	360	345	355
					IPT (fz)	.0009	.0013	.0015	.0015	.0015	.0012	.0011
					RPM	5560	4200	3260	2740	2200	1750	1360
					IPM(Feed)	16	17	15	12	10	9	6
					SFM(Vc)	220	205	195	220	225	215	220
					IPT (fz)	.0010	.0012	.0012	.0012	.0012	.0010	.0009
6-7	Low alloy steel	0.5D	1.5D	SFM(Vc)	365	345	320	360	360	345	355	
				IPT (fz)	.0009	.0013	.0015	.0015	.0015	.0012	.0011	
				RPM	5560	4200	3260	2740	2200	1750	1360	
				IPM(Feed)	16	17	15	12	10	9	6	
				SFM(Vc)	220	205	195	220	225	215	220	
				IPT (fz)	.0010	.0012	.0012	.0012	.0012	.0010	.0009	
8-9	Low alloy steel	0.5D	1.5D	SFM(Vc)	365	345	320	360	360	345	355	
				IPT (fz)	.0009	.0013	.0015	.0015	.0015	.0012	.0011	
				RPM	5560	4200	3260	2740	2200	1750	1360	
				IPM(Feed)	16	17	15	12	10	9	6	
				SFM(Vc)	220	205	195	220	225	215	220	
				IPT (fz)	.0010	.0012	.0012	.0012	.0012	.0010	.0009	
10	High alloyed steel, and tool steel	0.5D	1.5D	SFM(Vc)	365	345	320	360	360	345	355	
				IPT (fz)	.0009	.0013	.0015	.0015	.0015	.0012	.0011	
				RPM	5560	4200	3260	2740	2200	1750	1360	
				IPM(Feed)	16	17	15	12	10	9	6	
				SFM(Vc)	220	205	195	220	225	215	220	
				IPT (fz)	.0010	.0012	.0012	.0012	.0012	.0010	.0009	
11.1-11.2	High alloyed steel, and tool steel	0.5D	1.5D	SFM(Vc)	220	205	195	220	225	215	220	
				IPT (fz)	.0010	.0012	.0012	.0012	.0012	.0010	.0009	
				RPM	3360	2520	2000	1680	1360	1100	840	
				IPM(Feed)	10	9	7	6	5	4	3	
				SFM(Vc)	185	170	165	180	170	175	175	
				IPT (fz)	.0010	.0014	.0017	.0017	.0017	.0015	.0017	
M	12-14.2	Stainless steel	0.5D	1.5D	SFM(Vc)	185	170	165	180	170	175	175
					IPT (fz)	.0010	.0014	.0017	.0017	.0017	.0015	.0017
					RPM	2840	2100	1680	1370	1050	880	670
					IPM(Feed)	8	9	9	7	5	5	5
					SFM(Vc)	70	70	65	75	70	70	70
					IPT (fz)	.0007	.0008	.0010	.0011	.0011	.0009	.0009
S	31-35	Heat Resistant Super Alloys	0.05D	1.0D	SFM(Vc)	70	70	65	75	70	70	70
					IPT (fz)	.0007	.0008	.0010	.0011	.0011	.0009	.0009
					RPM	1050	840	680	560	420	350	270
					IPM(Feed)	2	2	2	2	1	1	1
					SFM(Vc)	90	90	85	95	90	95	90
					IPT (fz)	.0007	.0009	.0011	.0012	.0012	.0008	.0010
S	36-37	Titanium Alloys	0.05D	1.0D	SFM(Vc)	90	90	85	95	90	95	90
					IPT (fz)	.0007	.0009	.0011	.0012	.0012	.0008	.0010
					RPM	1360	1090	880	730	550	480	350
					IPM(Feed)	3	3	3	3	2	2	1
					SFM(Vc)	220	205	195	220	225	215	220
					IPT (fz)	.0010	.0012	.0012	.0012	.0012	.0010	.0009
H	40	Chilled Cast Iron	0.5D	1.5D	SFM(Vc)	220	205	195	220	225	215	220
					IPT (fz)	.0010	.0012	.0012	.0012	.0012	.0010	.0009
					RPM	3360	2520	2000	1680	1360	1100	840
					IPM(Feed)	10	9	7	6	5	4	3

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø)				
						3/4	7/8	1	1 1/4	1 1/2
P	1-4	Non-alloy steel	0.1D	1.5D	SFM(Vc)	190	165	170	170	170
					IPT (fz)	.0014	.0017	.0017	.0017	.0017
					RPM	960	730	640	520	430
					IPM(Feed)	8	7	7	5	4
					SFM(Vc)	40	40	45	45	40
					IPT (fz)	.0006	.0006	.0006	.0006	.0006
	5	Non-alloy steel	0.1D	1.5D	SFM(Vc)	190	165	170	170	170
					IPT (fz)	.0014	.0017	.0017	.0017	.0017
					RPM	960	730	640	520	430
					IPM(Feed)	8	7	7	5	4
					SFM(Vc)	40	40	45	45	40
					IPT (fz)	.0006	.0006	.0006	.0006	.0006
6-7	Low alloy steel	0.1D	1.5D	SFM(Vc)	190	165	170	170	170	
				IPT (fz)	.0014	.0017	.0017	.0017	.0017	
				RPM	960	730	640	520	430	
				IPM(Feed)	8	7	7	5	4	
				SFM(Vc)	40	40	45	45	40	
				IPT (fz)	.0006	.0006	.0006	.0006	.0006	
8-9	Low alloy steel	0.1D	1.5D	SFM(Vc)	190	165	170	170	170	
				IPT (fz)	.0014	.0017	.0017	.0017	.0017	
				RPM	960	730	640	520	430	
				IPM(Feed)	8	7	7	5	4	
				SFM(Vc)	40	40	45	45	40	
				IPT (fz)	.0006	.0006	.0006	.0006	.0006	
10	High alloyed steel, and tool steel	0.1D	1.5D	SFM(Vc)	190	165	170	170	170	
				IPT (fz)	.0014	.0017	.0017	.0017	.0017	
				RPM	960	730	640	520	430	
				IPM(Feed)	8	7	7	5	4	
				SFM(Vc)	40	40	45	45	40	
				IPT (fz)	.0006	.0006	.0006	.0006	.0006	
11.1-11.2	High alloyed steel, and tool steel	0.1D	1.5D	SFM(Vc)	190	165	170	170	170	
				IPT (fz)	.0014	.0017	.0017	.0017	.0017	
				RPM	960	730	640	520	430	
				IPM(Feed)	8	7	7	5	4	
				SFM(Vc)	40	40	45	45	40	
				IPT (fz)	.0006	.0006	.0006	.0006	.0006	
M	12-14.2	Stainless steel	0.1D	1.5D	SFM(Vc)	95	85	85	85	85
					IPT (fz)	.0017	.0020	.0021	.0021	.0020
					RPM	480	365	320	260	215
					IPM(Feed)	5	4	4	3	3
					SFM(Vc)	35	35	35	35	35
					IPT (fz)	.0010	.0009	.0009	.0010	.0010
S	31-35	Heat Resistant Super Alloys	0.05D	1.0D	SFM(Vc)	35	35	35	35	35
					IPT (fz)	.0010	.0009	.0009	.0010	.0010
					RPM	170	145	130	105	85
					IPM(Feed)	1	1	1	1	1
					SFM(Vc)	45	45	45	45	45
					IPT (fz)	.0011	.0010	.0010	.0010	.0009
S	36-37	Titanium Alloys	0.05D	1.0D	SFM(Vc)	45	45	45	45	45
					IPT (fz)	.0011	.0010	.0010	.0010	.0009
					RPM	220	190	170	140	110
					IPM(Feed)	1	1	1	1	1
					SFM(Vc)	40	40	45	45	40
					IPT (fz)	.0006	.0006	.0006	.0006	.0006
H	40	Chilled Cast Iron	0.1D	1.5D	SFM(Vc)	40	40	45	45	40
					IPT (fz)	.0006	.0006	.0006	.0006	.0006
					RPM	215	180	165	130	105
					IPM(Feed)	1	1	1	1	1



※ The Feed, in long & extra long types, should be reduced by around 50%.



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RECOMMENDED CUTTING CONDITIONS



RECOMMENDED CUTTING CONDITIONS

**E5075, E5105, E5074, E5104 SERIES 3 FLUTE - SLOTTING**

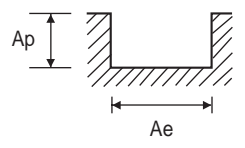
**E5075, E5105, E5074, E5104 SERIES 3 FLUTE - SIDE CUTTING**

SFM(Vc) = ft./min.  
IPT(fz) = in./tooth  
RPM = rev./min.  
IPM(Feed) = in./min.

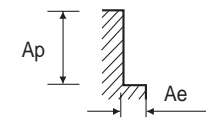
SFM(Vc) = ft./min.  
IPT(fz) = in./tooth  
RPM = rev./min.  
IPM(Feed) = in./min.

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø)										
						1/8	3/16	1/4	5/16	3/8	7/16	1/2	5/8	3/4	1	
P	1-2	Non-alloy steel	1.0D	0.5D	SFM(Vc)	110	110	110	110	110	110	110	110	110	110	
					IPT(fz)	.0009	.0012	.0017	.0022	.0025	.0030	.0035	.0037	.0045	.0050	
					RPM	3360	2240	1680	1340	1120	960	840	670	560	420	
	3-4		SFM(Vc)	90	90	90	90	90	90	90	90	90	90	90		
			IPT(fz)	.0009	.0012	.0017	.0022	.0025	.0030	.0035	.0037	.0045	.0050			
			RPM	2750	1830	1380	1100	920	790	690	550	460	340			
	5		SFM(Vc)	70	70	70	70	70	70	70	70	70	70	70		
			IPT(fz)	.0009	.0012	.0017	.0022	.0025	.0030	.0035	.0037	.0045	.0050			
			RPM	2140	1430	1070	860	710	610	530	430	360	270			
	6		SFM(Vc)	110	110	110	110	110	110	110	110	110	110	110		
			IPT(fz)	.0009	.0012	.0017	.0022	.0025	.0030	.0035	.0037	.0045	.0050			
			RPM	3360	2240	1680	1340	1120	960	840	670	560	420			
7	SFM(Vc)	90	90	90	90	90	90	90	90	90	90	90				
	IPT(fz)	.0009	.0012	.0017	.0022	.0025	.0030	.0035	.0037	.0045	.0050					
	RPM	2750	1830	1380	1100	920	790	690	550	460	340					
8-9	SFM(Vc)	70	70	70	70	70	70	70	70	70	70	70				
	IPT(fz)	.0009	.0012	.0017	.0022	.0025	.0030	.0035	.0037	.0045	.0050					
	RPM	2140	1430	1070	860	710	610	530	430	360	270					
10	SFM(Vc)	110	110	110	110	110	110	110	110	110	110	110				
	IPT(fz)	.0009	.0012	.0017	.0022	.0025	.0030	.0035	.0037	.0045	.0050					
	RPM	3360	2240	1680	1340	1120	960	840	670	560	420					
11.1	SFM(Vc)	70	70	70	70	70	70	70	70	70	70	70				
	IPT(fz)	.0009	.0012	.0017	.0022	.0025	.0030	.0035	.0037	.0045	.0050					
	RPM	2140	1430	1070	860	710	610	530	430	360	270					
M	12-14.2	Stainless steel	1.0D	0.5D	SFM(Vc)	60	60	60	60	60	60	60	60	60		
					IPT(fz)	.0009	.0012	.0017	.0022	.0025	.0030	.0035	.0037	.0045	.0050	
					RPM	1830	1220	920	730	610	520	460	370	310	230	
K	15-20	Grey cast iron Nodular cast iron Malleable cast iron	1.0D	0.5D	SFM(Vc)	90	90	90	90	90	90	90	90	90		
					IPT(fz)	.0009	.0012	.0017	.0022	.0025	.0030	.0035	.0037	.0045	.0050	
					RPM	2750	1830	1380	1100	920	790	690	550	460	340	

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø)										
						1/8	3/16	1/4	5/16	3/8	7/16	1/2	5/8	3/4	1	
P	1-2	Non-alloy steel	0.5D	1.5D	SFM(Vc)	110	110	110	110	110	110	110	110	110		
					IPT(fz)	.0009	.0012	.0017	.0022	.0025	.0030	.0035	.0037	.0045	.0050	
					RPM	3360	2240	1680	1340	1120	960	840	670	560	420	
	3-4		SFM(Vc)	90	90	90	90	90	90	90	90	90	90	90		
			IPT(fz)	.0009	.0012	.0017	.0022	.0025	.0030	.0035	.0037	.0045	.0050			
			RPM	2750	1830	1380	1100	920	790	690	550	460	340			
	5		SFM(Vc)	70	70	70	70	70	70	70	70	70	70	70		
			IPT(fz)	.0009	.0012	.0017	.0022	.0025	.0030	.0035	.0037	.0045	.0050			
			RPM	2140	1430	1070	860	710	610	530	430	360	270			
	6		SFM(Vc)	110	110	110	110	110	110	110	110	110	110	110		
			IPT(fz)	.0009	.0012	.0017	.0022	.0025	.0030	.0035	.0037	.0045	.0050			
			RPM	3360	2240	1680	1340	1120	960	840	670	560	420			
7	SFM(Vc)	90	90	90	90	90	90	90	90	90	90	90				
	IPT(fz)	.0009	.0012	.0017	.0022	.0025	.0030	.0035	.0037	.0045	.0050					
	RPM	2750	1830	1380	1100	920	790	690	550	460	340					
8-9	SFM(Vc)	70	70	70	70	70	70	70	70	70	70	70				
	IPT(fz)	.0009	.0012	.0017	.0022	.0025	.0030	.0035	.0037	.0045	.0050					
	RPM	2140	1430	1070	860	710	610	530	430	360	270					
10	SFM(Vc)	110	110	110	110	110	110	110	110	110	110	110				
	IPT(fz)	.0009	.0012	.0017	.0022	.0025	.0030	.0035	.0037	.0045	.0050					
	RPM	3360	2240	1680	1340	1120	960	840	670	560	420					
11.1	SFM(Vc)	70	70	70	70	70	70	70	70	70	70	70				
	IPT(fz)	.0009	.0012	.0017	.0022	.0025	.0030	.0035	.0037	.0045	.0050					
	RPM	2140	1430	1070	860	710	610	530	430	360	270					
M	12-14.2	Stainless steel	0.05D	1.0D	SFM(Vc)	60	60	60	60	60	60	60	60	60		
					IPT(fz)	.0009	.0012	.0017	.0022	.0025	.0030	.0035	.0037	.0045	.0050	
					RPM	1830	1220	920	730	610	520	460	370	310	230	
K	15-20	Grey cast iron Nodular cast iron Malleable cast iron	0.5D	1.5D	SFM(Vc)	90	90	90	90	90	90	90	90	90		
					IPT(fz)	.0009	.0012	.0017	.0022	.0025	.0030	.0035	.0037	.0045	.0050	
					RPM	2750	1830	1380	1100	920	790	690	550	460	340	



※ The Feed, in long & extra long types, should be reduced by around 50%.



※ The Feed, in long & extra long types, should be reduced by around 50%.

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RECOMMENDED CUTTING CONDITIONS



RECOMMENDED CUTTING CONDITIONS

**EH094, EH095, EH969, EH970 SERIES MULTI FLUTE - SLOTTING**

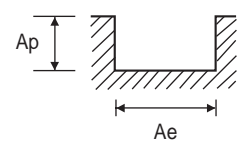
**EH094, EH095, EH969, EH970 SERIES MULTI FLUTE - SIDE CUTTING**

SFM(Vc) = ft./min.  
IPT (fz) = in./tooth  
RPM = rev./min.  
IPM(Feed) = in./min.

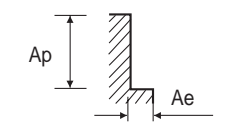
SFM(Vc) = ft./min.  
IPT (fz) = in./tooth  
RPM = rev./min.  
IPM(Feed) = in./min.

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø)						
						1/4	5/16	3/8	1/2	5/8	3/4	1
P	1-4	Non-alloy steel	1.0D	0.5D	SFM(Vc)	1020	950	905	1045	980	1020	1125
					IPT (fz)	.0015	.0020	.0025	.0030	.0032	.0029	.0033
					RPM	15600	11600	9200	8000	6000	5200	4300
					IPM (FEED)	91	91	91	95	95	91	85
					SFM(Vc)	810	755	745	785	785	865	840
					IPT (fz)	.0007	.0009	.0011	.0013	.0012	.0011	.0013
	5	Non-alloy steel	1.0D	0.5D	SFM(Vc)	12400	9200	7600	6000	4800	4400	3200
					RPM	33	33	33	32	30	28	24
					SFM(Vc)	1020	950	905	1045	980	1020	1125
					IPT (fz)	.0015	.0020	.0025	.0030	.0032	.0029	.0033
					RPM	15600	11600	9200	8000	6000	5200	4300
					IPM (FEED)	91	91	91	95	95	91	85
6-7	Low alloy steel	1.0D	0.5D	SFM(Vc)	810	755	745	785	785	865	840	
				IPT (fz)	.0007	.0009	.0011	.0013	.0012	.0011	.0013	
				RPM	12400	9200	7600	6000	4800	4400	3200	
				IPM (FEED)	33	33	33	32	30	28	24	
				SFM(Vc)	1020	950	905	1045	980	1020	1125	
				IPT (fz)	.0015	.0020	.0025	.0030	.0032	.0029	.0033	
8-9	Low alloy steel	1.0D	0.5D	SFM(Vc)	15600	11600	9200	8000	6000	5200	4300	
				RPM	91	91	91	95	95	91	85	
				SFM(Vc)	810	755	745	785	785	865	840	
				IPT (fz)	.0007	.0009	.0011	.0013	.0012	.0011	.0013	
				RPM	12400	9200	7600	6000	4800	4400	3200	
				IPM (FEED)	33	33	33	32	30	28	24	
10	High alloyed steel, and tool steel	1.0D	0.5D	SFM(Vc)	1020	950	905	1045	980	1020	1125	
				IPT (fz)	.0015	.0020	.0025	.0030	.0032	.0029	.0033	
				RPM	15600	11600	9200	8000	6000	5200	4300	
				IPM (FEED)	91	91	91	95	95	91	85	
				SFM(Vc)	810	755	745	785	785	865	840	
				IPT (fz)	.0007	.0009	.0011	.0013	.0012	.0011	.0013	
11.1-11.2	High alloyed steel, and tool steel	1.0D	0.5D	RPM	12400	9200	7600	6000	4800	4400	3200	
				IPM (FEED)	33	33	33	32	30	28	24	
				SFM(Vc)	550	515	500	550	540	490	565	
				IPT (fz)	.0007	.0009	.0011	.0013	.0012	.0011	.0013	
				RPM	8400	6300	5100	4200	3300	2500	2160	
				IPM (FEED)	23	23	23	23	20	17	16	
M	12-14.2	Stainless steel	1.0D	D1/4 ~ D3/8 : 0.25D D1/2 ~ D5/8 : 0.15D D3/4 ~ D1 : 0.1D	SFM(Vc)	155	145	130	155	130	135	155
					IPT (fz)	.0008	.0010	.0014	.0016	.0011	.0010	.0012
					RPM	2400	1800	1300	1200	800	675	600
					IPM (FEED)	8	7	8	8	4	4	4
					SFM(Vc)	205	190	165	205	170	180	205
					IPT (fz)	.0008	.0010	.0015	.0016	.0011	.0010	.0011
S	31-35	Heat Resistant Super Alloys	1.0D	0.05D	RPM	3150	2350	1700	1560	1040	910	780
					IPM (FEED)	11	10	10	10	6	6	5
					SFM(Vc)	810	755	745	785	785	865	840
					IPT (fz)	.0007	.0009	.0011	.0013	.0012	.0011	.0013
					RPM	12400	9200	7600	6000	4800	4400	3200
					IPM (FEED)	33	33	33	32	30	28	24
H	40	Chilled Cast Iron	1.0D	0.5D	SFM(Vc)	205	190	165	205	170	180	205
					IPT (fz)	.0008	.0010	.0015	.0016	.0011	.0010	.0011
					RPM	3150	2350	1700	1560	1040	910	780
					IPM (FEED)	11	10	10	10	6	6	5
					SFM(Vc)	810	755	745	785	785	865	840
					IPT (fz)	.0007	.0009	.0011	.0013	.0012	.0011	.0013

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø)						
						1/4	5/16	3/8	1/2	5/8	3/4	1
P	1-4	Non-alloy steel	0.3D	1.5D	SFM(Vc)	1020	950	905	1045	980	1020	1125
					IPT (fz)	.0015	.0020	.0025	.0030	.0032	.0029	.0033
					RPM	15600	11600	9200	8000	6000	5200	4300
					IPM (FEED)	91	91	91	95	95	91	85
					SFM(Vc)	810	755	745	785	785	865	840
					IPT (fz)	.0007	.0009	.0011	.0013	.0012	.0011	.0013
	5	Non-alloy steel	0.3D	1.5D	SFM(Vc)	12400	9200	7600	6000	4800	4400	3200
					RPM	33	33	33	32	30	28	24
					SFM(Vc)	1020	950	905	1045	980	1020	1125
					IPT (fz)	.0015	.0020	.0025	.0030	.0032	.0029	.0033
					RPM	15600	11600	9200	8000	6000	5200	4300
					IPM (FEED)	91	91	91	95	95	91	85
6-7	Low alloy steel	0.3D	1.5D	SFM(Vc)	810	755	745	785	785	865	840	
				IPT (fz)	.0007	.0009	.0011	.0013	.0012	.0011	.0013	
				RPM	12400	9200	7600	6000	4800	4400	3200	
				IPM (FEED)	33	33	33	32	30	28	24	
				SFM(Vc)	1020	950	905	1045	980	1020	1125	
				IPT (fz)	.0015	.0020	.0025	.0030	.0032	.0029	.0033	
8-9	Low alloy steel	0.3D	1.5D	SFM(Vc)	15600	11600	9200	8000	6000	5200	4300	
				RPM	91	91	91	95	95	91	85	
				SFM(Vc)	810	755	745	785	785	865	840	
				IPT (fz)	.0007	.0009	.0011	.0013	.0012	.0011	.0013	
				RPM	12400	9200	7600	6000	4800	4400	3200	
				IPM (FEED)	33	33	33	32	30	28	24	
10	High alloyed steel, and tool steel	0.3D	1.5D	SFM(Vc)	1020	950	905	1045	980	1020	1125	
				IPT (fz)	.0015	.0020	.0025	.0030	.0032	.0029	.0033	
				RPM	15600	11600	9200	8000	6000	5200	4300	
				IPM (FEED)	91	91	91	95	95	91	85	
				SFM(Vc)	810	755	745	785	785	865	840	
				IPT (fz)	.0007	.0009	.0011	.0013	.0012	.0011	.0013	
11.1-11.2	High alloyed steel, and tool steel	0.3D	1.5D	RPM	12400	9200	7600	6000	4800	4400	3200	
				IPM (FEED)	33	33	33	32	30	28	24	
				SFM(Vc)	550	515	500	550	540	490	565	
				IPT (fz)	.0007	.0009	.0011	.0013	.0012	.0011	.0013	
				RPM	8400	6300	5100	4200	3300	2500	2160	
				IPM (FEED)	23	23	23	23	20	17	16	
M	12-14.2	Stainless steel	D1/4 ~ D3/8 : 0.15D D1/2 ~ D5/8 : 0.1D D3/4 ~ D1 : 0.05D	1.5D	SFM(Vc)	155	145	130	155	130	135	155
					IPT (fz)	.0008	.0010	.0014	.0016	.0011	.0010	.0012
					RPM	2400	1800	1300	1200	800	675	600
					IPM (FEED)	8	7	8	8	4	4	4
					SFM(Vc)	205	190	165	205	170	180	205
					IPT (fz)	.0008	.0010	.0015	.0016	.0011	.0010	.0011
S	31-35	Heat Resistant Super Alloys	0.05D	1.0D	RPM	3150	2350	1700	1560	1040	910	780
					IPM (FEED)	11	10	10	10	6	6	5
					SFM(Vc)	810	755	745	785	785	865	840
					IPT (fz)	.0007	.0009	.0011	.0013	.0012	.0011	.0013
					RPM	12400	9200	7600	6000	4800	4400	3200
					IPM (FEED)	33	33	33	32	30	28	24
H	40	Chilled Cast Iron	0.3D	1.5D	SFM(Vc)	205	190	165	205	170	180	205
					IPT (fz)	.0008	.0010	.0015	.0016	.0011	.0010	.0011
					RPM	3150	2350	1700	1560	1040	910	780
					IPM (FEED)	11	10	10	10	6	6	5
					SFM(Vc)	810	755	745	785	785	865	840
					IPT (fz)	.0007	.0009	.0011	.0013	.0012	.0011	.0013



※ The Feed, in long & extra long types, should be reduced by around 50%.

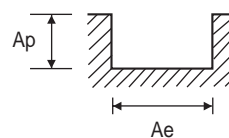


※ The Feed, in long & extra long types, should be reduced by around 50%.

SFM(Vc) = ft./min.  
IPT(fz) = in./tooth  
RPM = rev./min.  
IPM(Feed) = in./min.

**EH830 SERIES 3&4 FLUTE - SLOTTING**

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø)							
						6.0	8.0	10.0	12.0	16.0	18.0	20.0	25.0
P	1-4	Non-alloy steel	1.0D	0.5D	SFM(Vc)	345	345	330	345	360	360	345	345
					IPT(fz)	.0007	.0011	.0012	.0012	.0012	.0012	.0007	.0007
					RPM	5570	4180	3180	2790	2190	1950	1670	1340
					IPM(Feed)	13	13	12	10	8	7	6	4
	5	Non-alloy steel	1.0D	0.5D	SFM(Vc)	215	215	215	215	230	230	215	215
					IPT(fz)	.0008	.0009	.0009	.0009	.0010	.0009	.0007	.0007
					RPM	3450	2590	2070	1720	1390	1240	1040	830
					IPM(Feed)	8	7	6	5	4	3	3	2
	6-7	Low alloy steel	1.0D	0.5D	SFM(Vc)	345	345	330	345	360	360	345	345
					IPT(fz)	.0007	.0011	.0012	.0012	.0012	.0012	.0007	.0007
					RPM	5570	4180	3180	2790	2190	1950	1670	1340
					IPM(Feed)	13	13	12	10	8	7	6	4
8-9	Low alloy steel	1.0D	0.5D	SFM(Vc)	215	215	215	215	230	230	215	215	
				IPT(fz)	.0008	.0009	.0009	.0009	.0010	.0009	.0007	.0007	
				RPM	3450	2590	2070	1720	1390	1240	1040	830	
				IPM(Feed)	8	7	6	5	4	3	3	2	
10	High alloyed steel, and tool steel	1.0D	0.5D	SFM(Vc)	345	345	330	345	360	360	345	345	
				IPT(fz)	.0007	.0011	.0012	.0012	.0012	.0012	.0007	.0007	
				RPM	5570	4180	3180	2790	2190	1950	1670	1340	
				IPM(Feed)	13	13	12	10	8	7	6	4	
11.1-11.2	High alloyed steel, and tool steel	1.0D	0.5D	SFM(Vc)	215	215	215	215	230	230	215	215	
				IPT(fz)	.0008	.0009	.0009	.0009	.0010	.0009	.0007	.0007	
				RPM	3450	2590	2070	1720	1390	1240	1040	830	
				IPM(Feed)	8	7	6	5	4	3	3	2	
M	12-14.2	Stainless steel	1.0D	0.5D	SFM(Vc)	180	180	180	165	180	180	180	180
					IPT(fz)	.0007	.0010	.0011	.0011	.0013	.0012	.0008	.0009
					RPM	2920	2190	1750	1330	1090	970	880	700
					IPM(Feed)	7	6	6	5	4	3	3	2
S	31-35	Heat Resistant Super Alloys	1.0D	0.05D	SFM(Vc)	65	65	65	65	65	65	65	65
					IPT(fz)	.0004	.0006	.0008	.0007	.0008	.0007	.0006	.0005
					RPM	1060	800	640	530	400	350	320	260
					IPM(Feed)	1	1	1	1	1	1	1	1
	36-37	Titanium Alloys	1.0D	0.05D	SFM(Vc)	175	175	175	170	175	175	175	175
					IPT(fz)	.0007	.0010	.0011	.0011	.0012	.0012	.0008	.0009
					RPM	2840	2100	1680	1370	1050	950	840	670
					IPM(Feed)	6	6	6	5	4	3	3	2
H	40	Chilled Cast Iron	1.0D	0.5D	SFM(Vc)	215	215	215	215	230	230	215	215
					IPT(fz)	.0008	.0009	.0009	.0009	.0010	.0009	.0007	.0007
					RPM	3450	2590	2070	1720	1390	1240	1040	830
					IPM(Feed)	8	7	6	5	4	3	3	2

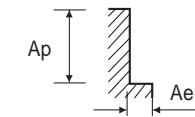


※ The Feed, in long & extra long types, should be reduced by around 50%.

SFM(Vc) = ft./min.  
IPT(fz) = in./tooth  
RPM = rev./min.  
IPM(Feed) = in./min.

**EH830 SERIES 3&4 FLUTE - SIDE CUTTING**

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø)							
						6.0	8.0	10.0	12.0	16.0	18.0	20.0	25.0
P	1-4	Non-alloy steel	0.5D	1.5D	SFM(Vc)	345	345	330	345	360	360	345	345
					IPT(fz)	.0009	.0013	.0015	.0015	.0015	.0015	.0011	.0011
					RPM	5570	4180	3180	2790	2190	1950	1670	1340
					IPM(Feed)	16	16	14	13	10	9	7	6
	5	Non-alloy steel	0.5D	1.5D	SFM(Vc)	215	215	215	215	230	230	215	215
					IPT(fz)	.0010	.0012	.0012	.0012	.0011	.0012	.0009	.0009
					RPM	3450	2590	2070	1720	1390	1240	1040	830
					IPM(Feed)	10	9	7	6	5	4	4	3
	6-7	Low alloy steel	0.5D	1.5D	SFM(Vc)	345	345	330	345	360	360	345	345
					IPT(fz)	.0009	.0013	.0015	.0015	.0015	.0015	.0011	.0011
					RPM	5570	4180	3180	2790	2190	1950	1670	1340
					IPM(Feed)	16	16	14	13	10	9	7	6
8-9	Low alloy steel	0.5D	1.5D	SFM(Vc)	215	215	215	215	230	230	215	215	
				IPT(fz)	.0010	.0012	.0012	.0012	.0011	.0012	.0009	.0009	
				RPM	3450	2590	2070	1720	1390	1240	1040	830	
				IPM(Feed)	10	9	7	6	5	4	4	3	
10	High alloyed steel, and tool steel	0.5D	1.5D	SFM(Vc)	345	345	330	345	360	360	345	345	
				IPT(fz)	.0009	.0013	.0015	.0015	.0015	.0015	.0011	.0011	
				RPM	5570	4180	3180	2790	2190	1950	1670	1340	
				IPM(Feed)	16	16	14	13	10	9	7	6	
11.1-11.2	High alloyed steel, and tool steel	0.5D	1.5D	SFM(Vc)	215	215	215	215	230	230	215	215	
				IPT(fz)	.0010	.0012	.0012	.0012	.0011	.0012	.0009	.0009	
				RPM	3450	2590	2070	1720	1390	1240	1040	830	
				IPM(Feed)	10	9	7	6	5	4	4	3	
M	12-14.2	Stainless steel	0.5D	1.5D	SFM(Vc)	180	180	180	165	180	180	180	180
					IPT(fz)	.0011	.0017	.0018	.0017	.0019	.0018	.0013	.0013
					RPM	2920	2190	1750	1330	1090	970	880	700
					IPM(Feed)	10	11	10	7	6	5	5	4
S	31-35	Heat Resistant Super Alloys	0.05D	1.0D	SFM(Vc)	65	65	65	65	65	65	65	65
					IPT(fz)	.0007	.0008	.0010	.0011	.0011	.0011	.0009	.0009
					RPM	1060	800	640	530	400	350	320	260
					IPM(Feed)	2	2	2	2	1	1	1	1
	36-37	Titanium Alloys	0.05D	1.0D	SFM(Vc)	180	180	180	165	180	180	180	180
					IPT(fz)	.0011	.0017	.0018	.0017	.0019	.0018	.0013	.0013
					RPM	2920	2190	1750	1330	1090	970	880	700
					IPM(Feed)	10	11	10	7	6	5	5	4
H	40	Chilled Cast Iron	0.5D	1.5D	SFM(Vc)	215	215	215	215	230	230	215	215
					IPT(fz)	.0010	.0012	.0012	.0012	.0011	.0012	.0009	.0009
					RPM	3450	2590	2070	1720	1390	1240	1040	830
					IPM(Feed)	10	9	7	6	5	4	4	3



※ The Feed, in long & extra long types, should be reduced by around 50%.





RECOMMENDED CUTTING CONDITIONS



RECOMMENDED CUTTING CONDITIONS

EE515 SERIES 4&6 FLUTE - SIDE CUTTING

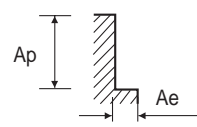
EH52, EH831 SERIES MULTI FLUTE - SLOTTING

SFM(Vc) = ft./min. IPT(fz) = in./tooth RPM = rev./min. IPM(Feed) = in./min.

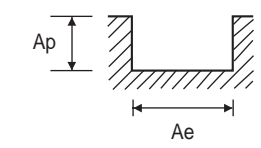
SFM(Vc) = ft./min. IPT(fz) = in./tooth RPM = rev./min. IPM(Feed) = in./min.

Table with columns: ISO, VDI 3323, Material Description, Ae, Ap, Parameter, Diameter (Ø) (3.0 to 25.0), SFM(Vc), IPT(fz), RPM, IPM(Feed). Rows include Non-alloy steel, Low alloy steel, High alloyed steel, Stainless steel, Heat Resistant Super Alloys, Chilled Cast Iron.

Table with columns: ISO, VDI 3323, Material Description, Ae, Ap, Parameter, Diameter (Ø) (6.0 to 25.0), SFM(Vc), IPT(fz), RPM, IPM(Feed). Rows include Non-alloy steel, Low alloy steel, High alloyed steel, Stainless steel, Heat Resistant Super Alloys, Titanium Alloys, Chilled Cast Iron.



※ The Feed, in long & extra long types, should be reduced by around 50%.



※ The Feed, in long & extra long types, should be reduced by around 50%.

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RECOMMENDED CUTTING CONDITIONS



RECOMMENDED CUTTING CONDITIONS

**EH852, EH831 SERIES MULTI FLUTE - SIDE CUTTING**

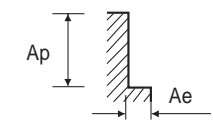
**EH917, EH921 SERIES MULTI FLUTE - SLOTING**

SFM(Vc) = ft./min.  
IPT(fz) = in./tooth  
RPM = rev./min.  
IPM(Feed) = in./min.

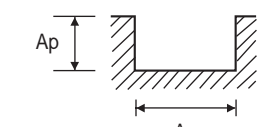
SFM(Vc) = ft./min.  
IPT(fz) = in./tooth  
RPM = rev./min.  
IPM(Feed) = in./min.

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø)								
						6.0	8.0	10.0	12.0	14.0	16.0	18.0	20.0	25.0
P	1-4	Non-alloy steel	0.3D	1.5D	SFM(Vc)	965	960	950	990	980	990	965	990	1110
					IPT(fz)	.0020	.0026	.0025	.0030	.0035	.0039	.0044	.0044	.0039
					RPM	15600	11620	9200	8010	6800	6010	5200	4810	4300
					IPM(Feed)	92	92	91	95	94	95	92	86	85
					SFM(Vc)	765	760	785	740	750	790	815	740	825
					IPT(fz)	.0009	.0012	.0011	.0013	.0016	.0016	.0016	.0015	.0015
	5	Non-alloy steel	0.3D	1.5D	SFM(Vc)	12410	9190	7610	6000	5210	4800	4400	3600	3200
					RPM	34	33	34	31	33	30	28	22	25
					SFM(Vc)	965	960	950	990	980	990	965	990	1110
					IPT(fz)	.0020	.0026	.0025	.0030	.0035	.0039	.0044	.0044	.0039
					RPM	15600	11620	9200	8010	6800	6010	5200	4810	4300
					IPM(Feed)	92	92	91	95	94	95	92	86	85
6-7	Low alloy steel	0.3D	1.5D	SFM(Vc)	765	760	785	740	750	790	815	740	825	
				IPT(fz)	.0009	.0012	.0011	.0013	.0016	.0016	.0016	.0015	.0015	
				RPM	12410	9190	7610	6000	5210	4800	4400	3600	3200	
				IPM(Feed)	34	33	34	31	33	30	28	22	25	
				SFM(Vc)	965	960	950	990	980	990	965	990	1110	
				IPT(fz)	.0020	.0026	.0025	.0030	.0035	.0039	.0044	.0044	.0039	
8-9	Low alloy steel	0.3D	1.5D	SFM(Vc)	15600	11620	9200	8010	6800	6010	5200	4810	4300	
				RPM	92	92	91	95	94	95	92	86	85	
				SFM(Vc)	765	760	785	740	750	790	815	740	825	
				IPT(fz)	.0009	.0012	.0011	.0013	.0016	.0016	.0016	.0015	.0015	
				RPM	12410	9190	7610	6000	5210	4800	4400	3600	3200	
				IPM(Feed)	34	33	34	31	33	30	28	22	25	
10	High alloyed steel, and tool steel	0.3D	1.5D	SFM(Vc)	965	960	950	990	980	990	965	990	1110	
				IPT(fz)	.0020	.0026	.0025	.0030	.0035	.0039	.0044	.0044	.0039	
				RPM	15600	11620	9200	8010	6800	6010	5200	4810	4300	
				IPM(Feed)	92	92	91	95	94	95	92	86	85	
				SFM(Vc)	765	760	785	740	750	790	815	740	825	
				IPT(fz)	.0009	.0012	.0011	.0013	.0016	.0016	.0016	.0015	.0015	
11.1-11.2	High alloyed steel, and tool steel	0.3D	1.5D	SFM(Vc)	12410	9190	7610	6000	5210	4800	4400	3600	3200	
				RPM	34	33	34	31	33	30	28	22	25	
				SFM(Vc)	520	520	525	520	520	545	505	495	560	
				IPT(fz)	.0009	.0012	.0011	.0013	.0016	.0015	.0015	.0015	.0015	
				RPM	8380	6290	5090	4190	3590	3300	2710	2400	2170	
				IPM(Feed)	23	22	22	22	23	20	17	14	16	
M	12-14.2	Stainless steel	D4~10:0.15D D12~16:0.1D D18~25:0.05D	1.5D	SFM(Vc)	150	150	135	145	130	130	130	135	155
					IPT(fz)	.0010	.0013	.0015	.0016	.0014	.0013	.0014	.0015	.0015
					RPM	2390	1790	1310	1190	910	800	710	650	600
					IPM(Feed)	7	7	8	8	5	4	4	4	4
					SFM(Vc)	520	520	525	520	520	545	505	495	560
					IPT(fz)	.0009	.0012	.0011	.0013	.0016	.0015	.0015	.0015	.0015
S	31-35	Heat Resistant Super Alloys	0.05D	1.0D	SFM(Vc)	8380	6290	5090	4190	3590	3300	2710	2400	2170
					RPM	23	22	22	22	23	20	17	14	16
					SFM(Vc)	520	520	525	520	520	545	505	495	560
					IPT(fz)	.0004	.0005	.0007	.0008	.0007	.0007	.0006	.0006	.0006
					RPM	13	13	14	13	13	12	9	9	9
					IPM(Feed)	13	13	14	13	13	12	9	9	9
H	40	Chilled Cast Iron	0.3D	1.5D	SFM(Vc)	8380	6290	5090	4190	3590	3300	2710	2400	2170
					RPM	23	22	22	22	23	20	17	14	16
					SFM(Vc)	765	760	785	740	750	790	815	740	825
					IPT(fz)	.0009	.0012	.0011	.0013	.0016	.0016	.0016	.0015	.0015
					RPM	12410	9190	7610	6000	5210	4800	4400	3600	3200
					IPM(Feed)	34	33	34	31	33	30	28	22	25

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø)								
						6.0	8.0	10.0	12.0	16.0	20.0			
P	1-4	Non-alloy steel	1.0D	0.5D	SFM(Vc)	965	960	950	990	990	990			
					IPT(fz)	.0009	.0012	.0011	.0013	.0016	.0016			
					RPM	15600	11620	9200	8010	6010	5200			
					IPM(Feed)	54	55	55	57	57	51			
					SFM(Vc)	765	760	785	740	790	740			
					IPT(fz)	.0004	.0006	.0006	.0008	.0007	.0006			
	5	Non-alloy steel	1.0D	0.5D	SFM(Vc)	12410	9190	7610	6000	4800	3600			
					RPM	20	20	19	19	18	14			
					SFM(Vc)	965	960	950	990	990	990			
					IPT(fz)	.0009	.0012	.0015	.0018	.0019	.0018			
					RPM	15600	11620	9200	8010	6010	4810			
					IPM(Feed)	54	55	55	57	57	51			
6-7	Low alloy steel	1.0D	0.5D	SFM(Vc)	765	760	785	740	790	740				
				IPT(fz)	.0004	.0006	.0006	.0008	.0007	.0006				
				RPM	12410	9190	7610	6000	4800	3600				
				IPM(Feed)	20	20	19	19	18	14				
				SFM(Vc)	965	960	950	990	990	990				
				IPT(fz)	.0009	.0012	.0015	.0018	.0019	.0018				
8-9	Low alloy steel	1.0D	0.5D	SFM(Vc)	15600	11620	9200	8010	6010	4810				
				RPM	54	55	55	57	57	51				
				SFM(Vc)	765	760	785	740	790	740				
				IPT(fz)	.0004	.0006	.0006	.0008	.0007	.0006				
				RPM	12410	9190	7610	6000	4800	3600				
				IPM(Feed)	20	20	19	19	18	14				
10	High alloyed steel, and tool steel	1.0D	0.5D	SFM(Vc)	965	960	950	990	990	990				
				IPT(fz)	.0009	.0012	.0015	.0018	.0019	.0018				
				RPM	15600	11620	9200	8010	6010	4810				
				IPM(Feed)	54	55	55	57	57	51				
				SFM(Vc)	765	760	785	740	790	740				
				IPT(fz)	.0004	.0006	.0006	.0008	.0007	.0006				
11.1-11.2	High alloyed steel, and tool steel	1.0D	0.5D	SFM(Vc)	12410	9190	7610	6000	4800	3600				
				RPM	20	20	19	19	18	14				
				SFM(Vc)	520	520	525	520	545	495				
				IPT(fz)	.0004	.0005	.0007	.0008	.0007	.0006				
				RPM	8380	6290	5090	4190	3300	2400				
				IPM(Feed)	13	13	14	13	12	9				
M	12-14.2	Stainless steel	1.0D	D4~10:0.25D D12~16:0.15D D18~25:0.1D	SFM(Vc)	150	150	135	145	130	135	155		
					IPT(fz)	.0010	.0013	.0015	.0016	.0014	.0013	.0014	.0015	.0015
					RPM	2390	1790	1310	1190	910	800	710	650	600
					IPM(Feed)	7	7	8	8	5	4	4	4	4
					SFM(Vc)	520	520	525	520	520	545	505	495	560
					IPT(fz)	.0004	.0005	.0007	.0008	.0007	.0007	.0006	.0006	.0006
S	31-35	Heat Resistant Super Alloys	1.0D	0.05D	SFM(Vc)	8380	6290	5090	4190	3590	3300	2710	2400	2170
					RPM	23	22	22	22	23	20	17	14	16
					SFM(Vc)	520	520	525	520	520	545	505	495	560
					IPT(fz)	.0004	.0005	.0007	.0008	.0007	.0007	.0006	.0006	.0006
					RPM	13	13	14	13	13	12	9	9	9
					IPM(Feed)	13	13	14	13	13	12	9	9	9
H	40	Chilled Cast Iron	1.0D	0.5D	SFM(Vc)	8380	6290	5090	4190	3590	3300	2710	2400	2170
					RPM	23	22	22	22	23	20	17	14	16
					SFM(Vc)	765	760	785	740	750	790	815	740	825
					IPT(fz)	.0004	.0006	.0006	.0008	.0007	.0007	.0006	.0006	.0006
					RPM	12410	9190	7610	6000	5210	4800	4400	3600	3200
					IPM(Feed)	20	20	19	19	18	14	14	14	14



※ The Feed, in long & extra long types, should be reduced by around 50%.



※ The Feed, in long & extra long types, should be reduced by around 50%.

HSS

HSS



RECOMMENDED CUTTING CONDITIONS



RECOMMENDED CUTTING CONDITIONS

**EH917, EH921 SERIES MULTI FLUTE - SIDE CUTTING**

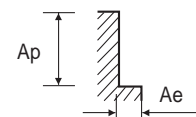
**EH919 SERIES MULTI FLUTE - SLOTTING**

SFM(Vc) = ft./min.  
IPT(fz) = in./tooth  
RPM = rev./min.  
IPM(Feed) = in./min.

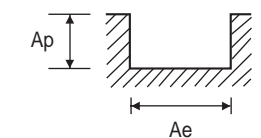
SFM(Vc) = ft./min.  
IPT(fz) = in./tooth  
RPM = rev./min.  
IPM(Feed) = in./min.

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø)					
						6.0	8.0	10.0	12.0	16.0	20.0
P	1-4	Non-alloy steel	0.3D	1.5D	SFM(Vc)	965	960	950	990	990	990
					IPT(fz)	.0015	.0020	.0025	.0030	.0031	.0030
					RPM	15600	11620	9200	8010	6010	4810
					IPM(Feed)	91	91	91	95	95	85
					SFM(Vc)	765	760	785	740	790	740
					IPT(fz)	.0007	.0009	.0011	.0013	.0013	.0010
	5	Non-alloy steel	0.3D	1.5D	SFM(Vc)	12410	9190	7610	6000	4800	3600
					IPT(fz)	33	33	34	31	30	22
					RPM	965	960	950	990	990	990
					IPM(Feed)	.0015	.0020	.0025	.0030	.0031	.0030
					SFM(Vc)	15600	11620	9200	8010	6010	4810
					IPT(fz)	91	91	91	95	95	85
6-7	Low alloy steel	0.3D	1.5D	SFM(Vc)	765	760	785	740	790	740	
				IPT(fz)	.0007	.0009	.0011	.0013	.0013	.0010	
				RPM	12410	9190	7610	6000	4800	3600	
				IPM(Feed)	33	33	34	31	30	22	
				SFM(Vc)	965	960	950	990	990	990	
				IPT(fz)	.0015	.0020	.0025	.0030	.0031	.0030	
8-9	Low alloy steel	0.3D	1.5D	SFM(Vc)	15600	11620	9200	8010	6010	4810	
				IPT(fz)	91	91	91	95	95	85	
				RPM	765	760	785	740	790	740	
				IPM(Feed)	.0007	.0009	.0011	.0013	.0013	.0010	
				SFM(Vc)	12410	9190	7610	6000	4800	3600	
				IPT(fz)	33	33	34	31	30	22	
10	High alloyed steel, and tool steel	0.3D	1.5D	SFM(Vc)	965	960	950	990	990	990	
				IPT(fz)	.0015	.0020	.0025	.0030	.0031	.0030	
				RPM	15600	11620	9200	8010	6010	4810	
				IPM(Feed)	91	91	91	95	95	85	
				SFM(Vc)	765	760	785	740	790	740	
				IPT(fz)	.0007	.0009	.0011	.0013	.0013	.0010	
11.1-11.2	High alloyed steel, and tool steel	0.3D	1.5D	SFM(Vc)	12410	9190	7610	6000	4800	3600	
				IPT(fz)	33	33	34	31	30	22	
				RPM	965	960	950	990	990	990	
				IPM(Feed)	.0015	.0020	.0025	.0030	.0031	.0030	
				SFM(Vc)	15600	11620	9200	8010	6010	4810	
				IPT(fz)	91	91	91	95	95	85	
M	12-14.2	Stainless steel	D4~10:0.15D D12~16:0.1D D18~25:0.05D	1.5D	SFM(Vc)	520	520	525	520	545	495
					IPT(fz)	.0007	.0009	.0011	.0013	.0012	.0010
					RPM	8380	6290	5090	4190	3300	2400
					IPM(Feed)	22	23	22	22	20	14
					SFM(Vc)	150	150	135	145	130	135
					IPT(fz)	.0008	.0010	.0015	.0016	.0011	.0010
S	31-35	Heat Resistant Super Alloys	0.05D	1.0D	SFM(Vc)	2390	1790	1310	1190	800	650
					IPT(fz)	8	7	8	8	4	4
					RPM	520	520	525	520	545	495
					IPM(Feed)	.0007	.0009	.0011	.0013	.0012	.0010
					SFM(Vc)	8380	6290	5090	4190	3300	2400
					IPT(fz)	22	23	22	22	20	14
H	40	Chilled Cast Iron	0.3D	1.5D	SFM(Vc)	765	760	785	740	790	740
					IPT(fz)	.0007	.0009	.0011	.0013	.0013	.0010
					RPM	12410	9190	7610	6000	4800	3600
					IPM(Feed)	33	33	34	31	30	22
					SFM(Vc)	965	960	950	990	990	990
					IPT(fz)	.0015	.0020	.0025	.0030	.0031	.0030

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø)								
						4.0	6.0	8.0	10.0	12.0	14.0	16.0	20.0	25.0
P	1-4	Non-alloy steel	1.0D	0.5D	SFM(Vc)	965	965	960	950	990	980	990	990	1110
					IPT(fz)	.0008	.0009	.0012	.0015	.0018	.0017	.0019	.0018	.0020
					RPM	23400	15600	11620	9200	8010	6800	6010	4810	4300
					IPM(Feed)	55	54	55	55	57	56	57	51	51
					SFM(Vc)	770	765	760	785	740	750	790	740	825
					IPT(fz)	.0004	.0004	.0006	.0006	.0008	.0007	.0007	.0006	.0007
	5	Non-alloy steel	1.0D	0.5D	SFM(Vc)	18620	12410	9190	7610	6000	5210	4800	3600	3200
					IPT(fz)	20	20	20	19	19	19	18	14	14
					RPM	965	965	960	950	990	980	990	990	1110
					IPM(Feed)	.0008	.0009	.0012	.0015	.0018	.0017	.0019	.0018	.0020
					SFM(Vc)	23400	15600	11620	9200	8010	6800	6010	4810	4300
					IPT(fz)	55	54	55	55	57	56	57	51	51
6-7	Low alloy steel	1.0D	0.5D	SFM(Vc)	770	765	760	785	740	750	790	740	825	
				IPT(fz)	.0004	.0004	.0006	.0006	.0008	.0007	.0007	.0006	.0007	
				RPM	18620	12410	9190	7610	6000	5210	4800	3600	3200	
				IPM(Feed)	20	20	20	19	19	19	18	14	14	
				SFM(Vc)	965	965	960	950	990	980	990	990	1110	
				IPT(fz)	.0008	.0009	.0012	.0015	.0018	.0017	.0019	.0018	.0020	
8-9	Low alloy steel	1.0D	0.5D	SFM(Vc)	23400	15600	11620	9200	8010	6800	6010	4810	4300	
				IPT(fz)	55	54	55	55	57	56	57	51	51	
				RPM	770	765	760	785	740	750	790	740	825	
				IPM(Feed)	.0004	.0004	.0006	.0006	.0008	.0007	.0007	.0006	.0007	
				SFM(Vc)	18620	12410	9190	7610	6000	5210	4800	3600	3200	
				IPT(fz)	20	20	20	19	19	19	18	14	14	
10	High alloyed steel, and tool steel	1.0D	0.5D	SFM(Vc)	965	965	960	950	990	980	990	990	1110	
				IPT(fz)	.0008	.0009	.0012	.0015	.0018	.0017	.0019	.0018	.0020	
				RPM	23400	15600	11620	9200	8010	6800	6010	4810	4300	
				IPM(Feed)	55	54	55	55	57	56	57	51	51	
				SFM(Vc)	770	765	760	785	740	750	790	740	825	
				IPT(fz)	.0004	.0004	.0006	.0006	.0008	.0007	.0007	.0006	.0007	
11.1-11.2	High alloyed steel, and tool steel	1.0D	0.5D	SFM(Vc)	18620	12410	9190	7610	6000	5210	4800	3600	3200	
				IPT(fz)	20	20	20	19	19	19	18	14	14	
				RPM	965	965	960	950	990	980	990	990	1110	
				IPM(Feed)	.0008	.0009	.0012	.0015	.0018	.0017	.0019	.0018	.0020	
				SFM(Vc)	23400	15600	11620	9200	8010	6800	6010	4810	4300	
				IPT(fz)	55	54	55	55	57	56	57	51	51	
M	12-14.2	Stainless steel	1.0D	D4~10:0.25D D12~16:0.15D D18~25:0.1D	SFM(Vc)	520	520	520	525	520	520	545	495	560
					IPT(fz)	.0004	.0004	.0005	.0007	.0008	.0007	.0007	.0006	.0007
					RPM	12570	8380	6290	5090	4190	3590	3300	2400	2170
					IPM(Feed)	13	13	13	14	13	13	12	9	10
					SFM(Vc)	150	150	150	135	145	130	130	135	155
					IPT(fz)	.0004	.0005	.0006	.0009	.0010	.0007	.0006	.0006	.0007
S	31-35	Heat Resistant Super Alloys	1.0D	0.05D	SFM(Vc)	3580	2390	1790	1310	1190	910	800	650	600
					IPT(fz)	5	5	4	5	5	3	3	2	3
					RPM	520	520	520	525	520	520	545	495	560
					IPM(Feed)	.0004	.0004	.0005	.0007	.0008	.0007	.0007	.0006	.0007
					SFM(Vc)	12570	8380	6290	5090	4190	3590	3300	2400	2170
					IPT(fz)	13	13	13	14	13	13	12	9	10
H	40	Chilled Cast Iron	1.0D	0.5D	SFM(Vc)	770	765	760	785	740	750	790	740	825
					IPT(fz)	.0004	.0004	.0006	.0006	.0008	.0007	.0007	.0006	.0007
					RPM	18620	12410	9190	7610	6000	5210	4800	3600	3200
					IPM(Feed)	20	20	20	19	19	19	18	14	14
					SFM(Vc)	965	965	960	950	990	980	990	990	1110
					IPT(fz)	.0008	.0009	.0012	.0015	.0018	.0017	.0019	.0018	.0020



※ The Feed, in long & extra long types, should be reduced by around 50%.



※ The Feed, in long & extra long types, should be reduced by around 50%.

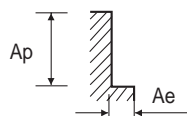


EH919 SERIES

MULTI FLUTE - SIDE CUTTING

SFM(Vc) = ft./min.  
 IPT (fz) = in./tooth  
 RPM = rev./min.  
 IPM(Feed) = in./min.

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø)								
						4.0	6.0	8.0	10.0	12.0	14.0	16.0	20.0	25.0
P	1	Non-alloy steel	0.3D	1.5D	SFM(Vc)	965	965	960	950	990	980	990	990	1110
					IPT (fz)	.0013	.0015	.0020	.0025	.0030	.0028	.0031	.0030	.0033
					RPM	23400	15600	11620	9200	8010	6800	6010	4810	4300
	2-4		0.3D	1.5D	SFM(Vc)	965	965	960	950	990	980	990	990	1110
					IPT (fz)	.0008	.0009	.0012	.0015	.0018	.0017	.0019	.0018	.0020
					RPM	23400	15600	11620	9200	8010	6800	6010	4810	4300
	5		0.3D	1.5D	SFM(Vc)	770	765	760	785	740	750	790	740	825
					IPT (fz)	.0006	.0007	.0009	.0011	.0013	.0013	.0013	.0010	.0013
					RPM	18620	12410	9190	7610	6000	5210	4800	3600	3200
	6-7		0.3D	1.5D	SFM(Vc)	965	965	960	950	990	980	990	990	1110
IPT (fz)		.0008			.0009	.0012	.0015	.0018	.0017	.0019	.0018	.0020		
RPM		23400			15600	11620	9200	8010	6800	6010	4810	4300		
8-9	0.3D	1.5D	SFM(Vc)	770	765	760	785	740	750	790	740	825		
			IPT (fz)	.0006	.0007	.0009	.0011	.0013	.0013	.0013	.0010	.0013		
			RPM	18620	12410	9190	7610	6000	5210	4800	3600	3200		
10	0.3D	1.5D	SFM(Vc)	965	965	960	950	990	980	990	990	1110		
			IPT (fz)	.0008	.0009	.0012	.0015	.0018	.0017	.0019	.0018	.0020		
			RPM	23400	15600	11620	9200	8010	6800	6010	4810	4300		
11.1-11.2	0.3D	1.5D	SFM(Vc)	770	765	760	785	740	750	790	740	825		
			IPT (fz)	.0006	.0007	.0009	.0011	.0013	.0013	.0013	.0010	.0013		
			RPM	18620	12410	9190	7610	6000	5210	4800	3600	3200		
M	12-14.2	Stainless steel	D4~10:0.15D D12~16:0.1D D18~25:0.05D	1.5D	SFM(Vc)	520	520	520	525	520	520	545	495	560
					IPT (fz)	.0006	.0007	.0009	.0011	.0013	.0013	.0012	.0010	.0013
					RPM	12570	8380	6290	5090	4190	3590	3300	2400	2170
					IPM (FEED)	22	22	23	22	22	23	20	14	16
S	31-35	Heat Resistant Super Alloys	D4~10:0.15D D12~16:0.1D D18~25:0.05D	1.0D	SFM(Vc)	150	150	150	135	145	130	130	135	155
					IPT (fz)	.0007	.0008	.0010	.0015	.0016	.0011	.0011	.0010	.0012
	36-37	Titanium Alloys		SFM(Vc)	520	520	520	525	520	520	545	495	560	
				IPT (fz)	.0006	.0007	.0009	.0011	.0013	.0013	.0012	.0010	.0013	
H	40	Chilled Cast Iron	0.3D	1.5D	SFM(Vc)	770	765	760	785	740	750	790	740	825
					IPT (fz)	.0004	.0004	.0006	.0006	.0008	.0007	.0007	.0006	.0007
					RPM	18620	12410	9190	7610	6000	5210	4800	3600	3200
					IPM (FEED)	20	20	20	19	19	19	18	14	14



※ The Feed, in long & extra long types, should be reduced by around 50%.



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# V7 PLUS A END MILLS

- High performance carbide end mills for Steels, Cast Iron and Stainless Steels



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END MILLS

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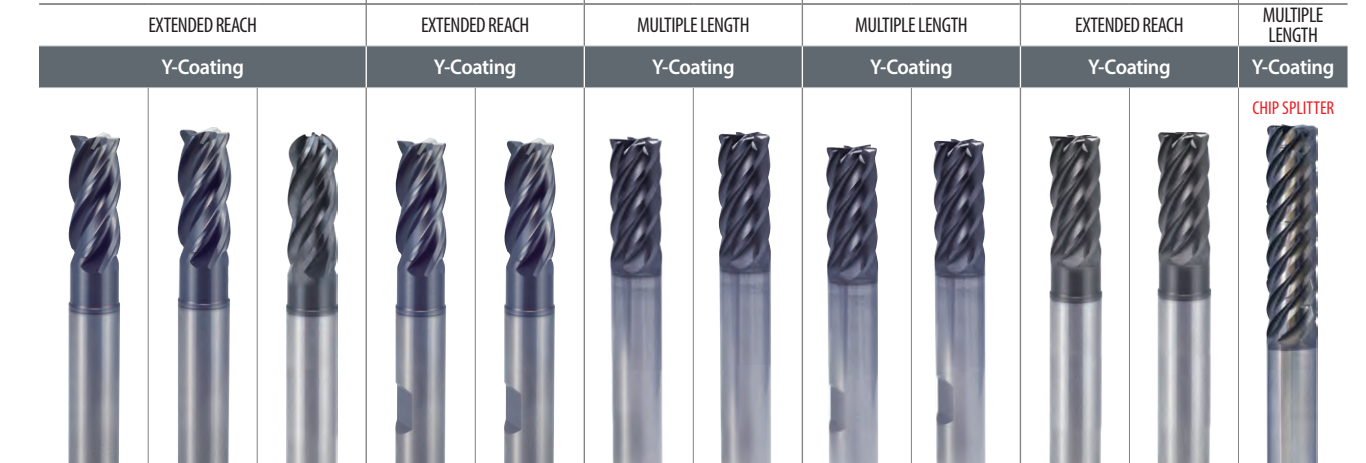
ISO	VDI 3323	Material Description	Composition / Structure / Heat Treatment	HB	HRC	
P	1	Non-alloy steel	About 0.15% C Annealed	125		
	2		About 0.45% C Annealed	190	13	
	3		About 0.45% C Quenched & Tempered	250	25	
	4		About 0.75% C Annealed	270	28	
	5		About 0.75% C Quenched & Tempered	300	32	
	6	Low alloy steel	Annealed	180	10	
	7		Quenched & Tempered	275	29	
	8		Quenched & Tempered	300	32	
	9		Quenched & Tempered	350	38	
	10		High alloyed steel, and tool steel	Annealed	200	15
	11	Quenched & Tempered	325	35		
M	12	Stainless steel	Ferritic / Martensitic Annealed	200	15	
	13		Martensitic Quenched & Tempered	240	23	
	14		Austenitic	180	10	
	15		Pearlitic / ferritic	180	10	
K	16	Grey cast iron	Pearlitic (Martensitic)	260	26	
	17		Ferritic	160	3	
	18		Pearlitic	250	25	
	19		Ferritic	130		
	20		Malleable cast iron	Pearlitic	230	21
N	21	Aluminum-wrought alloy	Not Curable	60		
	22		Curable Hardened	100		
	23	Aluminum-cast, alloyed	≤ 12% Si, Not Curable	75		
	24		≤ 12% Si, Curable Hardened	90		
	25		> 12% Si, Not Curable	130		
	26	Copper and Copper Alloys	Cutting Alloys, PB>1%	110		
	27		CuZn, CuSnZn (Brass)	90		
	28	Bronze / Brass	CuSn, lead free copper and electrolytic copper	100		
	29		Non Metallic Materials	Duroplastic, Fiber Reinforced Plastic		
	30		Rubber, Wood, etc.			
S	31	Heat Resistant Super Alloys	Fe Based Annealed	200	15	
	32		Cured	280	30	
	33		Annealed	250	25	
	34		Ni or Co Based Cured	350	38	
	35		Cast	320	34	
	36		Titanium Alloys	Pure Titanium	400 Rm	
	37			Alpha + Beta Alloys Hardened	1050 Rm	
H	38	Hardened steel	Hardened	550	55	
	39		Hardened	630	60	
	40		Chilled Cast Iron	Cast	400	42
	41		Hardened Cast Iron	Hardened	550	55

SERIES	UGMF68	UGMF76	UGMF70	UGMG53	UGMF69	UGMF77	UGMF71	UGMG54
FLUTE(Shank)	4 (Plain Shank)				4 (Weldon Flat)			
HELIX ANGLE	35°/37° (MULTIPLE HELIX)	35°/37° (MULTIPLE HELIX)	35°/37° (MULTIPLE HELIX)	35°/37° (MULTIPLE HELIX)	35°/37° (MULTIPLE HELIX)	35°/37° (MULTIPLE HELIX)	35°/37° (MULTIPLE HELIX)	35°/37° (MULTIPLE HELIX)
CUTTING EDGE SHAPE	SQUARE	CHAMFER	CORNER RADIUS	BALL NOSE	SQUARE	CHAMFER	CORNER RADIUS	BALL NOSE
SIZE MIN	1/8	1/4	1/8	1/8	11/32	3/8	3/8	11/32
SIZE MAX	1	1	1	1	1	1	1	1
PAGE	C532-C534				C535			

MULTIPLE LENGTH



UGMF72	UGMF74	UGMH10	UGMF73	UGMF75	UGMG20	UGMG22	UGMG21	UGMG23	UGMH08	UGMH09	GMH72
4 (Plain Shank)			4 (Weldon Flat)		6 (Plain Shank)		6 (Weldon Flat)		6 (Plain Shank)		
35°/37° (MULTIPLE HELIX)	35°/37° (MULTIPLE HELIX)	35°/37° (MULTIPLE HELIX)	35°/37° (MULTIPLE HELIX)	35°/37° (MULTIPLE HELIX)	45°	45°	45°	45°	45°	45°	45°
SQUARE	CORNER RADIUS	BALL NOSE	SQUARE	CORNER RADIUS	SQUARE	CORNER RADIUS	SQUARE	CORNER RADIUS	SQUARE	CORNER RADIUS	CORNER RADIUS
1/8	1/8	1/8	3/8	3/8	1/4	1/4	3/8	3/8	1/4	1/4	3/8
1	1	1	1	1	1	1	1	1	1	1	1
C536-C537			C538		C543-C544		C545		C546-C547		C550
EXTENDED REACH			EXTENDED REACH		MULTIPLE LENGTH		MULTIPLE LENGTH		EXTENDED REACH		MULTIPLE LENGTH
Y-Coating			Y-Coating		Y-Coating		Y-Coating		Y-Coating		CHIP SPLITTER



○	○	○	○	○	○	○	○	○	○	○	○	1
○	○	○	○	○	○	○	○	○	○	○	○	2
○	○	○	○	○	○	○	○	○	○	○	○	3
○	○	○	○	○	○	○	○	○	○	○	○	4
○	○	○	○	○	○	○	○	○	○	○	○	5
○	○	○	○	○	○	○	○	○	○	○	○	6
○	○	○	○	○	○	○	○	○	○	○	○	7
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○	○	○	○	○	○	○	○	○	○	○	○	10
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○	○	○	○	○	○	○	○	○	○	○	○	12
○	○	○	○	○	○	○	○	○	○	○	○	13
○	○	○	○	○	○	○	○	○	○	○	○	14
○	○	○	○	○	○	○	○	○	○	○	○	15
○	○	○	○	○	○	○	○	○	○	○	○	16
○	○	○	○	○	○	○	○	○	○	○	○	17
○	○	○	○	○	○	○	○	○	○	○	○	18
○	○	○	○	○	○	○	○	○	○	○	○	19
○	○	○	○	○	○	○	○	○	○	○	○	20
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○	○	○	○	○	○	○	○	○	○	○	○	31
○	○	○	○	○	○	○	○	○	○	○	○	32
○	○	○	○	○	○	○	○	○	○	○	○	33
○	○	○	○	○	○	○	○	○	○	○	○	34
○	○	○	○	○	○	○	○	○	○	○	○	35
○	○	○	○	○	○	○	○	○	○	○	○	36
○	○	○	○	○	○	○	○	○	○	○	○	37
												38
												39
												40
												41





SELECTION GUIDE METRIC

Table with columns for SERIES, FLUTE(Shank), HELIX ANGLE, CUTTING EDGE SHAPE, SIZE MIN, SIZE MAX, and PAGE. It lists specifications for GMF52, GMF54, GMG55, GMF53, GMF55, and GMG56.

SOLID CARBIDE V7 PLUS A END MILLS

High performance carbide end mills for Steels, Cast Iron and Stainless Steels

Please visit global.yg1.com/mat for material search. Recommended cutting conditions: P 36

Material selection table with columns for ISO, VDI 3323, Material Description, Composition / Structure / Heat Treatment, HB, HRC, and application suitability icons.

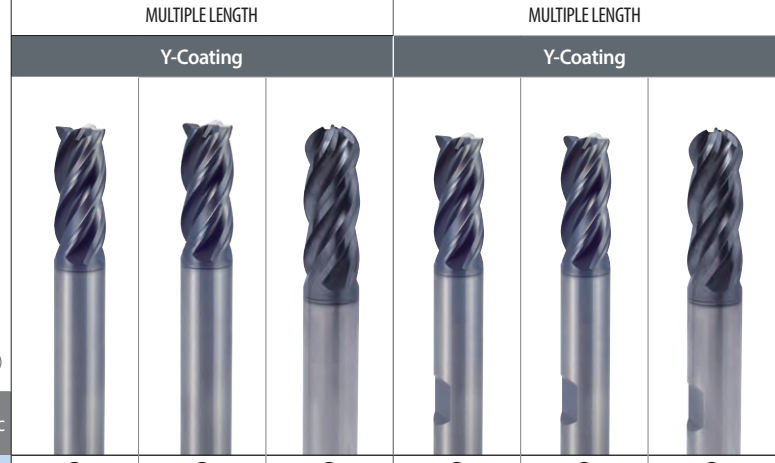
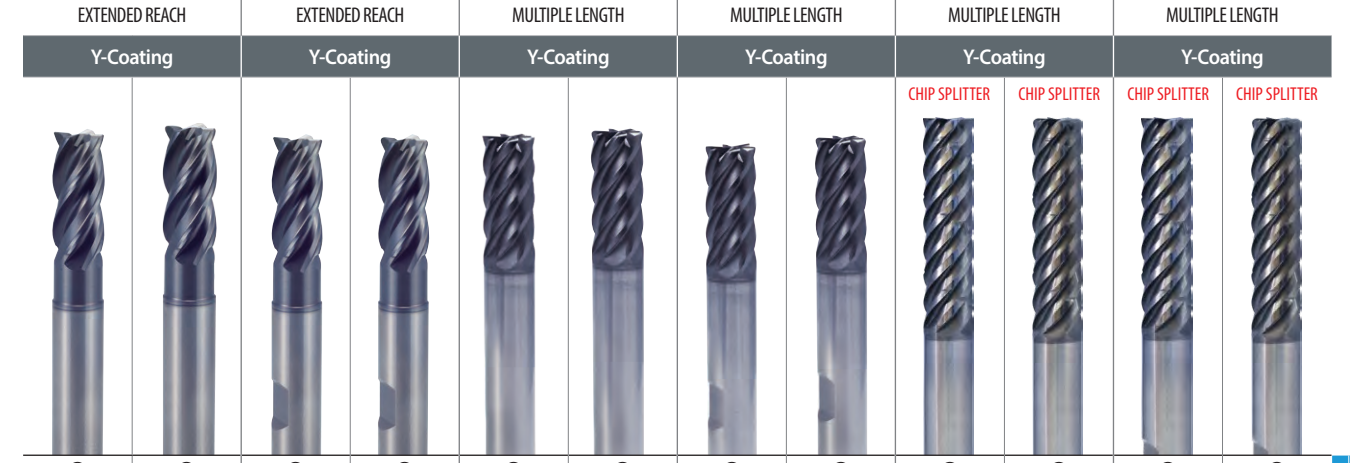


Table with columns for GMF60, GMF62, GMF61, GMF63, GMG12, GMG16, GMG13, GMG17, GMH56, GMH58, GMH57, and GMH59. It lists specifications for 4, 6, and 8-flute end mills.



Material selection table for the right page, similar to the left page, with columns for ISO, VDI 3323, Material Description, Composition / Structure / Heat Treatment, HB, HRC, and application suitability icons.

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HSS



SQUARE UGMF68 CHAMFER UGMF76
CORNER RADIUS UGMF70 BALL NOSE UGMG53



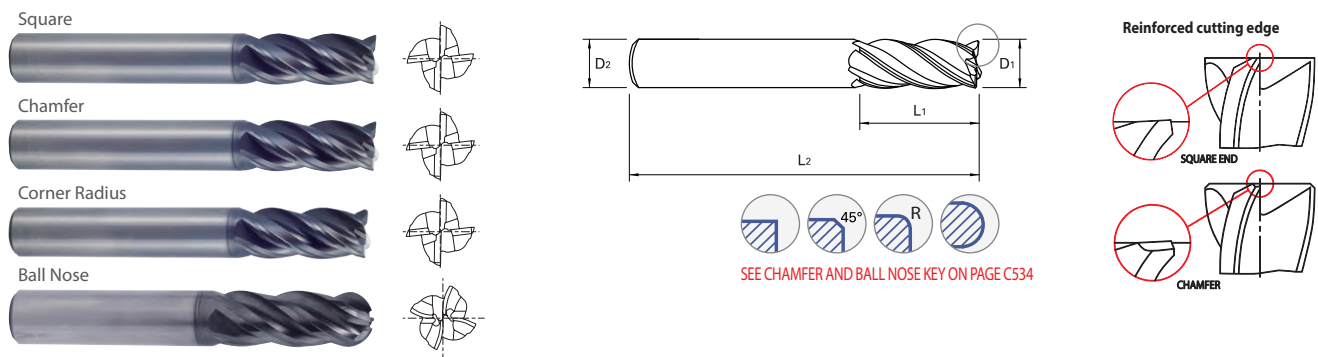
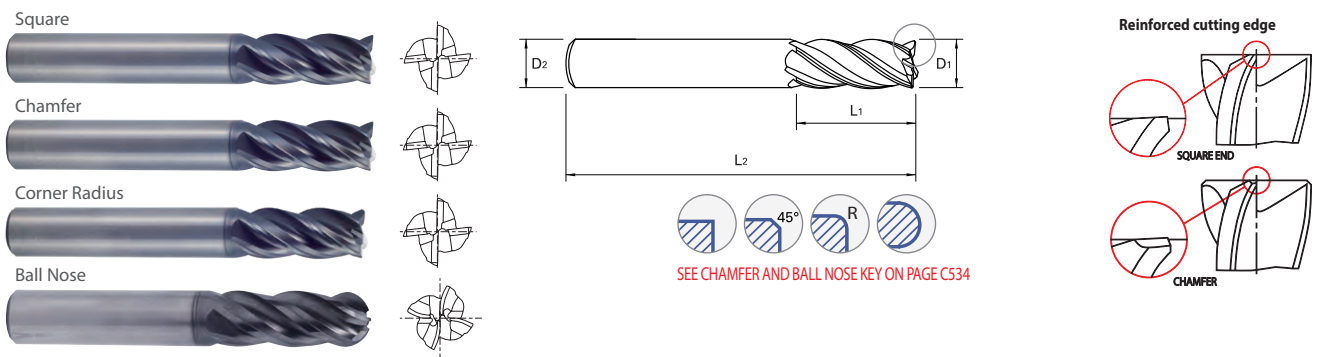
SQUARE UGMF68 CHAMFER UGMF76
CORNER RADIUS UGMF70 BALL NOSE UGMG53

CARBIDE, 4 FLUTE MULTIPLE LENGTH (PLAIN SHANK)

CARBIDE, 4 FLUTE MULTIPLE LENGTH (PLAIN SHANK)

- Special flute geometry and multiple helix eliminate vibrations
Excellent performance for stainless steels, mild steels, cast iron, low/medium hardness materials and all exotic materials up to HRC40
Advanced coating for superior performance and tool life

- Special flute geometry and multiple helix eliminate vibrations
Excellent performance for stainless steels, mild steels, cast iron, low/medium hardness materials and all exotic materials up to HRC40
Advanced coating for superior performance and tool life



CARBIDE 4 35°/37° PLAIN ±.0008 C x 45° p.C553-C555

CARBIDE 4 35°/37° PLAIN ±.0008 C x 45° p.C553-C555

Table with columns: OD (D1), SD (D2), LOC (L1), OAL (L2), Square End, Chamfer, Corner Radius (.010 to .250), Ball Nose. Lists various end mill models and their specifications.

Table with columns: OD (D1), SD (D2), LOC (L1), OAL (L2), Square End, Chamfer, Corner Radius (.010 to .250), Ball Nose. Lists various end mill models and their specifications.

Mill Dia. Tolerance (inch) Shank Dia. Tolerance Length of cut in excess of 3xD on 37° single-helix requires feed reduction of approximately 50%

Length of cut in excess of 3xD on 37° single-helix requires feed reduction of approximately 50% NEXT PAGE

Material compatibility chart showing ISO, VDI, HRC, HB for various materials like Non-alloy steel, Low alloy steel, High alloyed steel, Stainless steel, Grey cast iron, etc.

Material compatibility chart showing ISO, VDI, HRC, HB for various materials like Non-alloy steel, Low alloy steel, High alloyed steel, Stainless steel, Grey cast iron, etc.



HSS

HSS



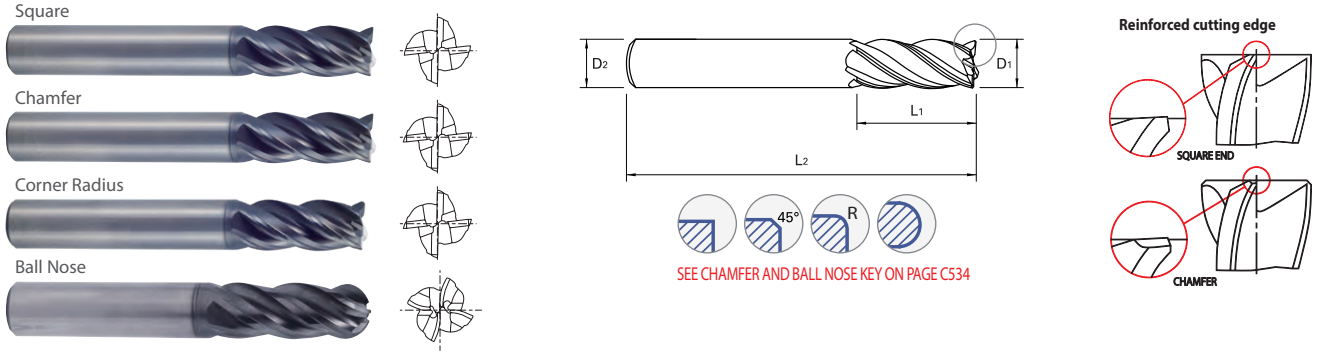
SQUARE UGMF68 CHAMFER UGMF76
CORNER RADIUS UGMF70 BALL NOSE UGMG53



SQUARE UGMF69 CHAMFER UGMF77
CORNER RADIUS UGMF71 BALL NOSE UGMG54

CARBIDE, 4 FLUTE MULTIPLE LENGTH (PLAIN SHANK)

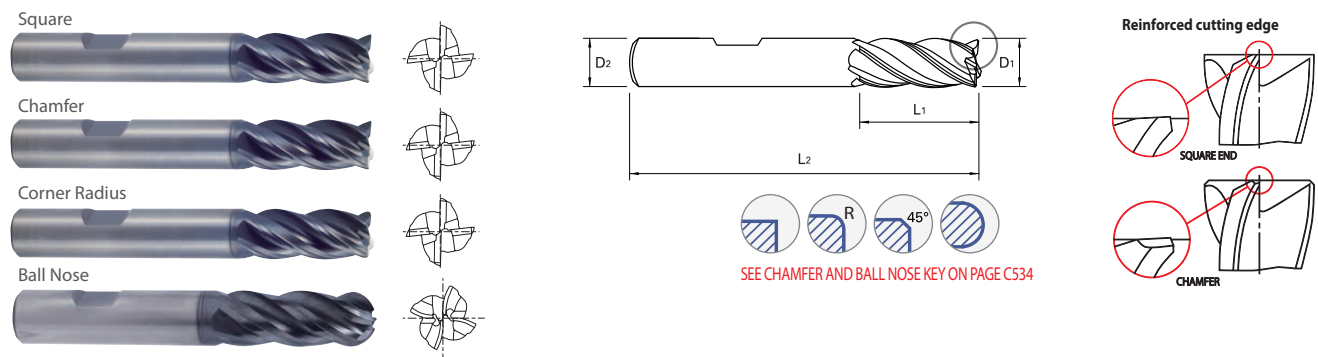
- Special flute geometry and multiple helix eliminate vibrations
Excellent performance for stainless steels, mild steels, cast iron, low/medium hardness materials and all exotic materials up to HRc40
Advanced coating for superior performance and tool life



CARBIDE 4 35°/37° PLAIN ±.0008 C x 45° p.C553-C555

CARBIDE, 4 FLUTE MULTIPLE LENGTH (FLAT SHANK)

- Special flute geometry and multiple helix eliminate vibrations
Excellent performance for stainless steels, mild steels, cast iron, low/medium hardness materials and all exotic materials up to HRc40
Advanced coating for superior performance and tool life



CARBIDE 4 35°/37° FLAT ±.0008 C x 45° p.C553-C555

Table with columns: OD (D1), SD (D2), LOC (L1), OAL (L2), Square End, Chamfer, Corner Radius (.010 to .250), Ball Nose. Lists various part numbers like UGMF68040, UGMF70040, etc.

Table with columns: OD (D1), SD (D2), LOC (L1), OAL (L2), Square End, Chamfer, Corner Radius (.010 to .125), Ball Nose. Lists various part numbers like UGMF69022, UGMF7902, etc.

CHAMFER KEY and BALL NOSE KEY tables showing Mill Diameter, Chamfer Size, Mill Diameter, Radius of Ball, Mill Diameter, Radius of Ball.

Table with columns: Mill Dia. Tolerance (inch), Shank Dia. Tolerance. Values: 0 ~ -.0012, h5 (≥ Ø1/2" : h6)

ISO material compatibility table with columns: ISO, Material Description, P (Non-alloy steel, Low alloy steel, High alloyed steel), M (Stainless steel, Grey cast iron, Nodular cast iron, Malleable cast iron), K (Titanium Alloys, Hardened steel, Chilled Cast Iron, Hardened Cast Iron).

ISO material compatibility table with columns: ISO, Material Description, P (Non-alloy steel, Low alloy steel, High alloyed steel), M (Stainless steel, Grey cast iron, Nodular cast iron, Malleable cast iron), K (Titanium Alloys, Hardened steel, Chilled Cast Iron, Hardened Cast Iron).

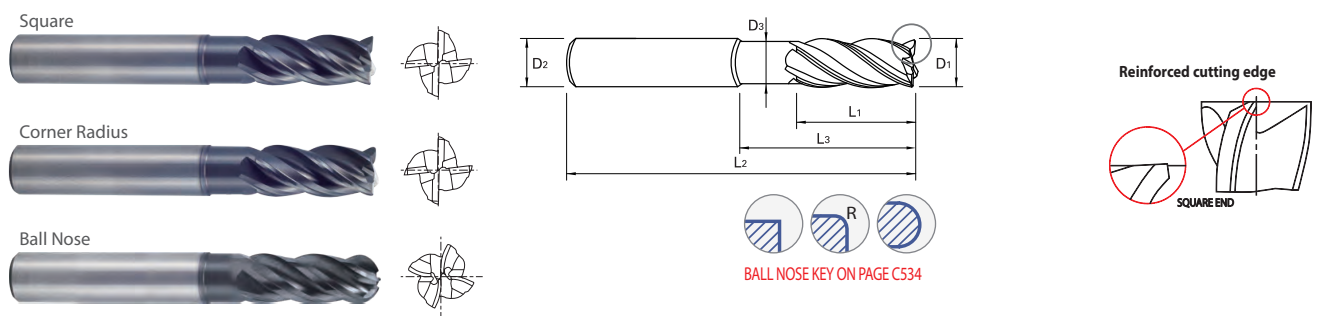




SQUARE UGMF72 SERIES
CORNER RADIUS UGMF74 SERIES
BALL NOSE UGMH10 SERIES

CARBIDE, 4 FLUTE EXTENDED REACH (PLAIN SHANK)

- Special flute geometry and multiple helix eliminate vibrations
Excellent performance for stainless steels, mild steels, cast iron, low/medium hardness materials and all exotic materials up to HRc40
Advanced coating for superior performance and tool life



p.C553-C555

Table with columns: OD (D1), SD (D2), LOC (L1), LBS (L3), OAL (L2), Neck Dia (D3), Square End (EDP No.), Corner Radius (.010 to .250), Ball Nose Mill (EDP No.).

Unit : Inch

Length of cut in excess of 3xD on 37° single-helix requires feed reduction of approximately 50% NEXT PAGE

Table with 2 columns: Mill Dia. Tolerance (inch) and Shank Dia. Tolerance. Values: 0 ~ -.0012, h5 (≥ Ø1/2" : h6)

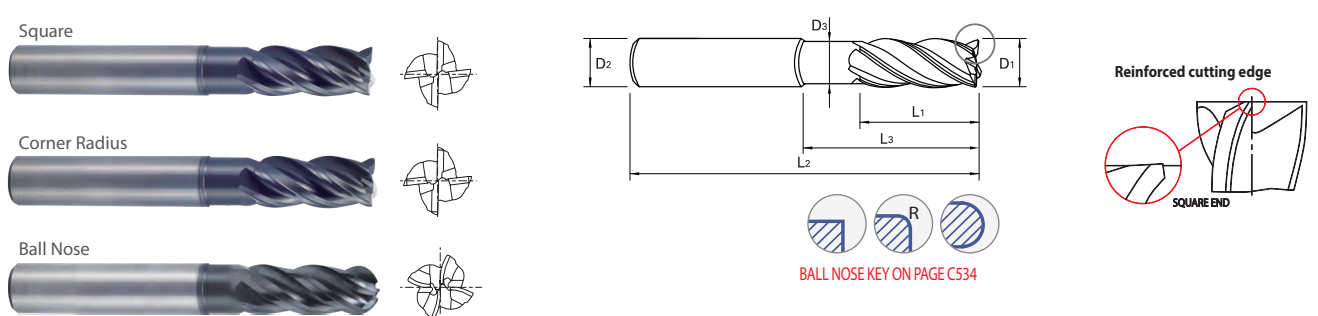
ISO material compatibility chart with columns for Material Description, P (Non-alloy steel, Low alloy steel, High alloyed steel), M (Stainless steel, Grey cast iron, Nodular cast iron, Malleable cast iron), K, S (Aluminum, Copper, Non Metallic, Heat Resistant Super Alloys, Titanium Alloys), H (Hardened steel, Chilled Cast Iron, Hardened Cast Iron).



SQUARE UGMF72 SERIES
CORNER RADIUS UGMF74 SERIES
BALL NOSE UGMH10 SERIES

CARBIDE, 4 FLUTE EXTENDED REACH (PLAIN SHANK)

- Special flute geometry and multiple helix eliminate vibrations
Excellent performance for stainless steels, mild steels, cast iron, low/medium hardness materials and all exotic materials up to HRc40
Advanced coating for superior performance and tool life



p.C553-C555

Table with columns: OD (D1), SD (D2), LOC (L1), LBS (L3), OAL (L2), Neck Dia (D3), Square End (EDP No.), Corner Radius (.010 to .250), Ball Nose Mill (EDP No.).

Unit : Inch

Length of cut in excess of 3xD on 37° single-helix requires feed reduction of approximately 50%

Table with 2 columns: Mill Dia. Tolerance (inch) and Shank Dia. Tolerance. Values: 0 ~ -.0012, h5 (≥ Ø1/2" : h6)

ISO material compatibility chart with columns for Material Description, P (Non-alloy steel, Low alloy steel, High alloyed steel), M (Stainless steel, Grey cast iron, Nodular cast iron, Malleable cast iron), K, S (Aluminum, Copper, Non Metallic, Heat Resistant Super Alloys, Titanium Alloys), H (Hardened steel, Chilled Cast Iron, Hardened Cast Iron).

HSS



SQUARE UGMF73 SERIES
CORNER RADIUS UGMF75 SERIES

CARBIDE, 4 FLUTE EXTENDED REACH (FLAT SHANK)

- Special flute geometry and multiple helix eliminate vibrations
Excellent performance for stainless steels, mild steels, cast iron, low/medium hardness materials and all exotic materials up to HRC40
Advanced coating for superior performance and tool life

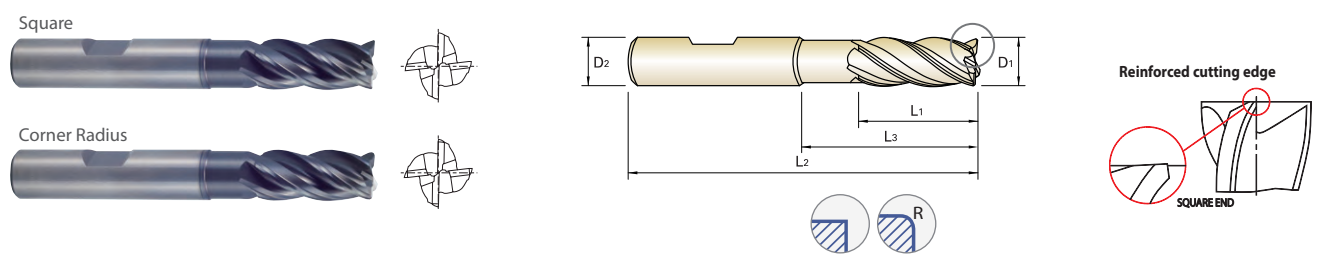


Table with columns: OD (D1), SD (D2), LOC (L1), LBS (L3), OAL (L2), Neck Dia (D3), Square End EDP No., Corner Radius EDP No. (0.30)

Length of cut in excess of 3xD on 37° single-helix requires feed reduction of approximately 50%

Table with columns: Mill Dia. Tolerance (inch), Shank Dia. Tolerance

Material compatibility table with columns: ISO, Material Description, P, M, K, S, H



CHAMFER GMF52 / GMF56 SERIES
CORNER RADIUS GMF54 / GMF58 SERIES
BALL NOSE GMG55 SERIES

CARBIDE, 4 FLUTE MULTIPLE LENGTH (PLAIN SHANK)

- Special flute geometry and multiple helix eliminate vibrations
Excellent performance for stainless steels, mild steels, cast iron, low/medium hardness materials and all exotic materials up to HRC40
Advanced coating for superior performance and tool life

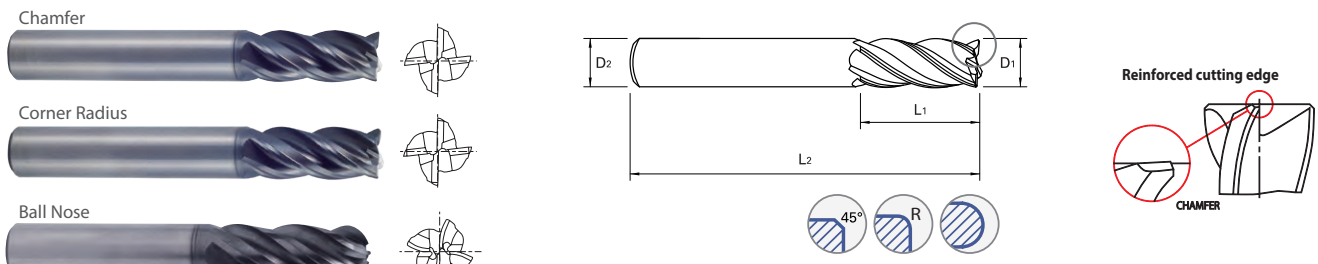


Table with columns: OD (D1), SD (D2), LOC (L1), OAL (L2), Chamfer EDP No., Corner Radius EDP No. (0.30, 0.50, 1.00, 2.00, 3.00), Ball Nose EDP No., CHAMFER KEY, BALL NOSE KEY

Table with columns: Mill Dia. Tolerance (mm), Shank Dia. Tolerance

Material compatibility table with columns: ISO, Material Description, P, M, K, S, H

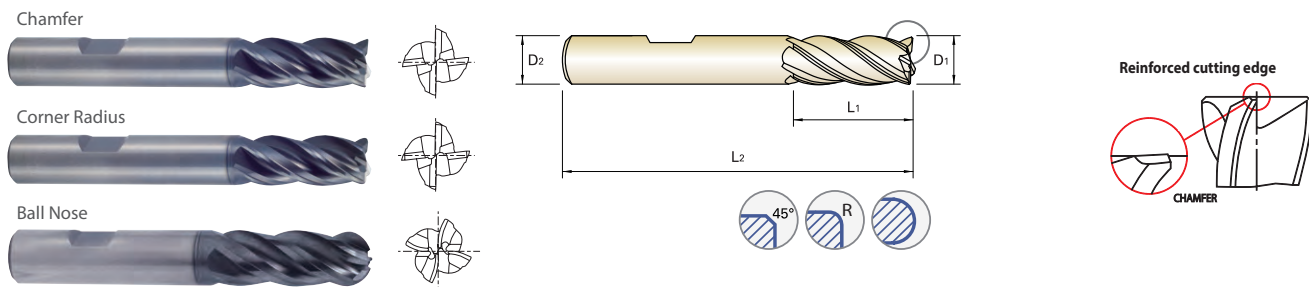




CHAMFER GMF53 / GMF57 SERIES  
 CORNER RADIUS GMF55 / GMF59 SERIES  
 BALL NOSE GMG56 SERIES

### CARBIDE, 4 FLUTE MULTIPLE LENGTH (FLAT SHANK)

- ▶ Special flute geometry and multiple helix eliminate vibrations
- ▶ Excellent performance for stainless steels, mild steels, cast iron, low/medium hardness materials and all exotic materials up to HRc40
- ▶ Advanced coating for superior performance and tool life



CARBIDE 4 35°/37° FLAT ±0.02mm C x 45° p.C558-C560

Metric	Inch	SD (D <sub>2</sub> )	LOC (L <sub>1</sub> )	OAL (L <sub>2</sub> )	Chamfer EDP No.	Corner Radius					Ball Nose EDP No.	CHAMFER KEY					
						0.30 EDP No.	0.50 EDP No.	1.00 EDP No.	2.00 EDP No.	3.00 EDP No.		Mill Diameter Metric	Chamfer Size (mm)	Chamfer Size (mm)			
3.0	.1181	6	7	54	GMF53030	GMF55030	GMF55901										
						GMF57030	GMF59030	GMF59901									
4.0	.1575	6	8	54	GMF53040	GMF55040	GMF59040										
						GMF57040	GMF59040	GMF59902									
5.0	.1969	6	10	54	GMF53050	GMF55050	GMF59050										
						GMF57050	GMF59050	GMF59903									
6.0	.2362	6	10	54	GMF53060	GMF55060	GMF59060										
						GMF57060	GMF59060	GMF59904	GMF59905								
8.0	.3150	8	12	58	GMF53080		GMF55080	GMF59080									
						GMF57080		GMF59080	GMF59906								
10.0	.3937	10	14	66	GMF53100		GMF55100	GMF59100									
						GMF57100		GMF59100	GMF59907								
12.0	.4724	12	16	73	GMF53120		GMF55120	GMF59120	GMF59908	GMF59909							
						GMF57120		GMF59120	GMF59908	GMF59909							
14.0	.5512	14	18	83	GMF53140		GMF55140	GMF59140									
						GMF57140		GMF59140									
16.0	.6299	16	22	82	GMF53160		GMF55160	GMF59160	GMF59912	GMF59913							
						GMF57160		GMF59160	GMF59912	GMF59913	GMG56160						
18.0	.7087	18	24	84	GMF53180		GMF55180	GMF59180									
						GMF57180		GMF59180									
20.0	.7874	20	26	92	GMF53200		GMF55200	GMF59200	GMF59916	GMF59917							
						GMF57200		GMF59200	GMF59916	GMF59917	GMG56200						
25.0	.9843	25	38	104	GMF57250		GMF59250										

Mill Dia. Tolerance (mm)	Shank Dia. Tolerance
Up to Ø12 0 ~ -0.02	h5 (≥ Ø12 : h6)
Over Ø12 0 ~ -0.03	

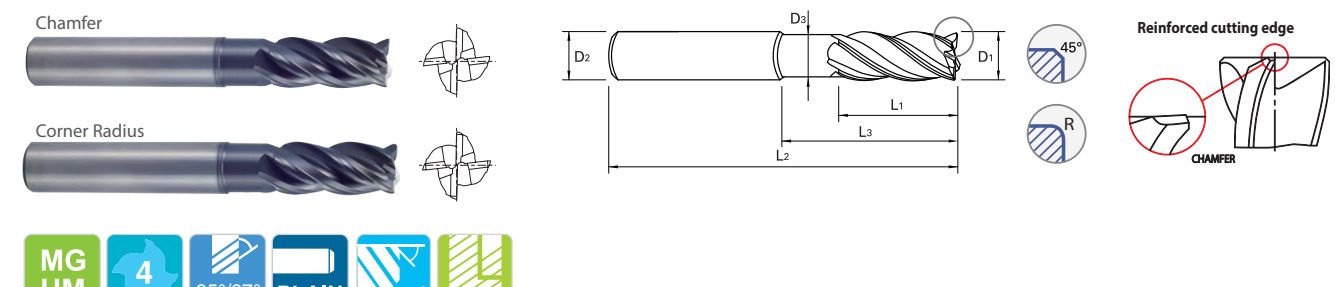
ISO	P											M				K			H										
	Non-alloy steel					Low alloy steel						High alloyed steel, and tool steel				Stainless steel				Grey cast iron		Nodular cast iron		Malleable cast iron					
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20									
HRc	13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25	21	21										
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230									
Recommend	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎



CHAMFER GMF60 SERIES  
 CORNER RADIUS GMF62 SERIES

### CARBIDE, 4 FLUTE EXTENDED REACH (PLAIN SHANK)

- ▶ Special flute geometry and multiple helix eliminate vibrations
- ▶ Excellent performance for stainless steels, mild steels, cast iron, low/medium hardness materials and all exotic materials up to HRc40
- ▶ Advanced coating for superior performance and tool life



MGHM 4 35°/37° PLAIN C x 45° p.C558-C559

Metric	Inch	SD (D <sub>2</sub> )	LOC (L <sub>1</sub> )	LBS (L <sub>3</sub> )	OAL (L <sub>2</sub> )	Neck Dia (D <sub>3</sub> )	Chamfer EDP No.	Corner Radius					CHAMFER KEY						
								0.30 EDP No.	0.50 EDP No.	1.00 EDP No.	2.00 EDP No.	3.00 EDP No.	Mill Diameter Metric	Chamfer Size (mm)	Chamfer Size (mm)				
3.0	.1181	6	7	12	54	2.7	GMF60030	GMF62030	GMF62901										
							GMF60901	GMF62902	GMF62903										
							GMF60902												
							GMF60904	GMF62040	GMF62904										
4.0	.1575	6	8	15	57	3.7	GMF60903	GMF62905	GMF62906										
							GMF60904												
							GMF60905	GMF62050	GMF62907										
							GMF60906												
5.0	.1969	6	10	17	57	4.7	GMF60907	GMF62908	GMF62909										
							GMF60908												
							GMF60909												
							GMF60910	GMF62060	GMF62910	GMF62911									
6.0	.2362	6	10	20	62	5.5	GMF60911	GMF62912	GMF62913	GMF62914									
							GMF60912	GMF62915	GMF62916	GMF62917									
							GMF60913												
							GMF60914												
8.0	.3150	8	12	20	63	7.5	GMF60915												
							GMF60916												
							GMF60917												
							GMF60918												
10.0	.3937	10	14	25	72	9.2	GMF60919												
							GMF60920												
							GMF60921												
							GMF60922												
12.0	.4724	12	16	30	83	11.0	GMF60923												
							GMF60924												
							GMF60925												
							GMF60926												
16.0	.6299	16	22	38	92	15.0	GMF60927												
							GMF60928												
							GMF60929												
							GMF60930												
20.0	.7874	20	26	50	104	19.0	GMF60931												
							GMF60932												
							GMF60933												
							GMF60934												

ISO	P											M				K			H										
	Non-alloy steel					Low alloy steel						High alloyed steel, and tool steel				Stainless steel				Grey cast iron		Nodular cast iron		Malleable cast iron					
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20									
HRc	13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25	21	21										
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230									
Recommend	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎



HSS

HSS



CHAMFER GMF61 SERIES
CORNER RADIUS GMF63 SERIES



SQUARE UGMG20 SERIES
CORNER RADIUS UGMG22 SERIES

CARBIDE, 4 FLUTE EXTENDED REACH(FLAT SHANK)

CARBIDE, 6 FLUTE MULTIPLE LENGTH (PLAIN SHANK)

- Special flute geometry and multiple helix eliminate vibrations
Excellent performance for stainless steels, mild steels, cast iron, low/medium hardness materials and all exotic materials up to HRc40
Advanced coating for superior performance and tool life

- The unique geometry of the variable pitch provides the best chatter free tool for high speed and trochoidal milling
Excellent performance for Stainless Steels, Mild Steels, Cast Iron, Low/Medium hardness materials under HRc40

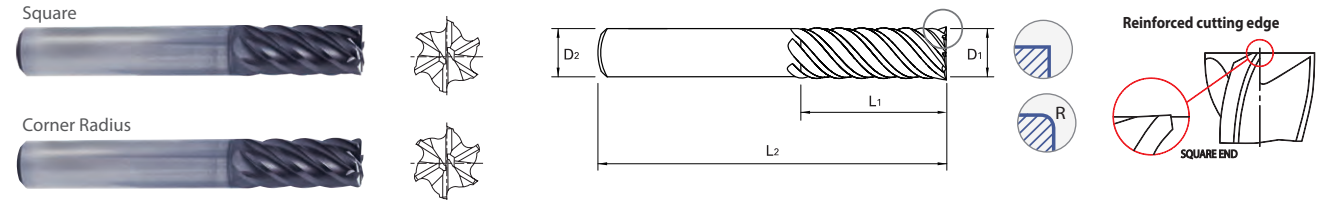
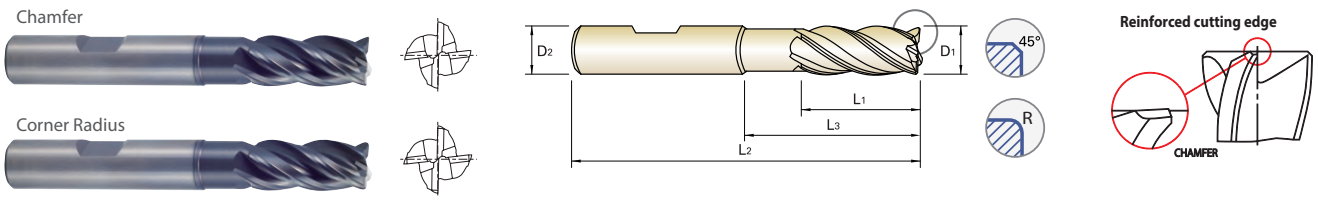


Table with columns: OD (D1), SD (D2), LOC (L1), LBS (L3), OAL (L2), Neck Dia (D3), Chamfer (0.10, 0.30, 0.50, 1.00, 2.00, 3.00), Corner Radius (0.10, 0.30, 0.50, 1.00, 2.00, 3.00), Mill Diameter, Chamfer Size, Mill Dia. Tolerance, Shank Dia. Tolerance.

Table with columns: OD (D1), SD (D2), LOC (L1), OAL (L2), Square End (EDP No.), Corner Radius (.015, .030, .060, .090, .120, .125, .190, .250), Mill Dia. Tolerance, Shank Dia. Tolerance.

Material compatibility table with columns: ISO, Material Description, P (Non-alloy steel, Low alloy steel, High alloyed steel, and tool steel), M (Stainless steel, Grey cast iron, Nodular cast iron, Malleable cast iron), S (Aluminum-wrought alloy, Aluminum-cast, alloyed, Copper and Copper Alloys, Non Metallic Materials, Heat Resistant Super Alloys, Titanium Alloys), H (Hardened steel, Chilled Cast Iron, Hardened Cast Iron).

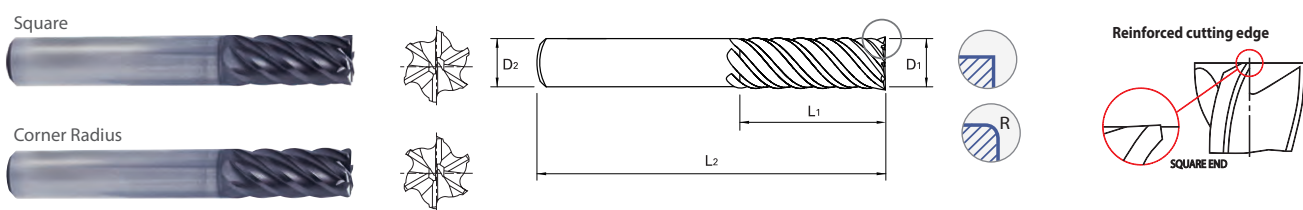
Material compatibility table with columns: ISO, Material Description, P (Non-alloy steel, Low alloy steel, High alloyed steel, and tool steel), M (Stainless steel, Grey cast iron, Nodular cast iron, Malleable cast iron), S (Aluminum-wrought alloy, Aluminum-cast, alloyed, Copper and Copper Alloys, Non Metallic Materials, Heat Resistant Super Alloys, Titanium Alloys), H (Hardened steel, Chilled Cast Iron, Hardened Cast Iron).



SQUARE UGMG20 SERIES  
CORNER RADIUS UGMG22 SERIES

CARBIDE, 6 FLUTE MULTIPLE LENGTH (PLAIN SHANK)

► The unique geometry of the variable pitch provides the best chatter free tool for high speed and trochoidal milling  
► Excellent performance for Stainless Steels, Mild Steels, Cast Iron, Low/Medium hardness materials under HRC40



Unit : Inch

OD (D1)	SD (D2)	LOC (L1)	OAL (L2)	Square End EDP No.	Corner Radius								
					.015	.030	.060	.090	.120	.125	.190	.250	
					EDP No.	EDP No.	EDP No.	EDP No.	EDP No.	EDP No.	EDP No.	EDP No.	
5/8	5/8	3/4	3	UGMG20920	UGMG22993	UGMG22994	UGMG22995	UGMG22996		UGMG22997			
		1-1/4	3-1/2	UGMG20040	UGMG22998	UGMG22040	UGMG22931	UGMG22932	UGMG22933	UGMG22999			
		1-7/8	4	UGMG20921	UGMG22801	UGMG22802	UGMG22803	UGMG22804		UGMG22805			
		2	4	UGMG20910	UGMG22806	UGMG22934	UGMG22935	UGMG22936	UGMG22937	UGMG22807			
		2-5/8	5	UGMG20922	UGMG22808	UGMG22809	UGMG22810	UGMG22811		UGMG22812			
	3	5	UGMG20911	UGMG22813	UGMG22938	UGMG22939	UGMG22940	UGMG22941	UGMG22814				
	3/4	3/4	1	3-1/2	UGMG20923	UGMG22815	UGMG22816	UGMG22817	UGMG22818		UGMG22819	UGMG22820	UGMG22821
			1-1/2	4	UGMG20048	UGMG22822	UGMG22048	UGMG22942	UGMG22943	UGMG22944	UGMG22823	UGMG22824	UGMG22825
			1-7/8	5	UGMG20924	UGMG22826	UGMG22827	UGMG22828	UGMG22829		UGMG22830	UGMG22831	UGMG22832
			2-1/4	5	UGMG20925	UGMG22833	UGMG22834	UGMG22835	UGMG22836		UGMG22837	UGMG22838	UGMG22839
2-3/4			5	UGMG20926	UGMG22840	UGMG22841	UGMG22842	UGMG22843		UGMG22844	UGMG22845	UGMG22846	
3	5-1/2	UGMG20912	UGMG22847	UGMG22945	UGMG22946	UGMG22947	UGMG22948	UGMG22848	UGMG22849	UGMG22850			
1	1	1-1/2	4	UGMG20064	UGMG22851	UGMG22064	UGMG22949	UGMG22950	UGMG22951	UGMG22852	UGMG22853	UGMG22854	
		2	5	UGMG20927	UGMG22855	UGMG22856	UGMG22857	UGMG22858		UGMG22859	UGMG22860	UGMG22861	
		2-5/8	5	UGMG20928	UGMG22862	UGMG22863	UGMG22864	UGMG22865		UGMG22866	UGMG22867	UGMG22868	
		3-1/4	6	UGMG20929	UGMG22869	UGMG22870	UGMG22871	UGMG22872		UGMG22873	UGMG22874	UGMG22875	
4	7	UGMG20913	UGMG22876	UGMG22952	UGMG22953	UGMG22954	UGMG22955	UGMG22877	UGMG22878	UGMG22879			

Mill Dia. Tolerance (mm)	Shank Dia. Tolerance
0~-.0012	h5 (≥ Ø12 : h6)

◎ : Excellent ○ : Good

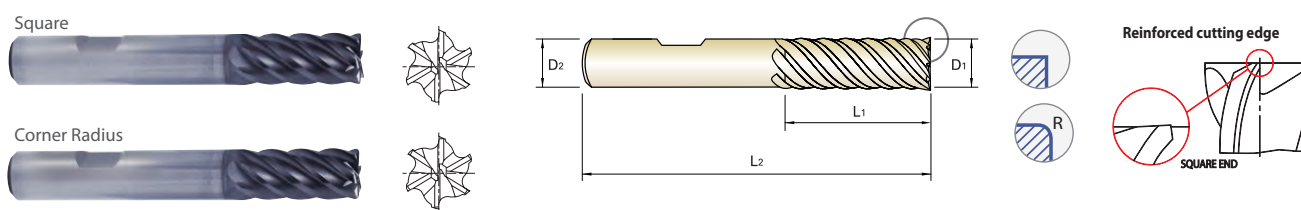
ISO	P										M				K													
Material Description	Non-alloy steel					Low alloy steel					High alloyed steel, and tool steel				Stainless steel				Grey cast iron		Nodular cast iron		Malleable cast iron					
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20								
HRC	13	25	28	32	30	10	29	32	38	15	35	15	23	10	10	26	3	25	21									
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230								
Recommend	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	



SQUARE UGMG21 SERIES  
CORNER RADIUS UGMG23 SERIES

CARBIDE, 6 FLUTE MULTIPLE LENGTH (FLAT SHANK)

► The unique geometry of the variable pitch provides the best chatter free tool for high speed and trochoidal milling  
► Excellent performance for Stainless Steels, Mild Steels, Cast Iron, Low/Medium hardness materials under HRC40



Unit : Inch

OD (D1)	SD (D2)	LOC (L1)	OAL (L2)	Square End EDP No.	Corner Radius						
					.015	.030	.060	.090	.120		
					EDP No.	EDP No.	EDP No.	EDP No.	EDP No.	EDP No.	
3/8	3/8	1	3	UGMG21024	UGMG23024	UGMG23909	UGMG23910				
		1-1/2	4	UGMG21905	UGMG23911	UGMG23912	UGMG23913				
		2	4	UGMG21906	UGMG23914	UGMG23915	UGMG23916				
1/2	1/2	1	3	UGMG21914	UGMG23032	UGMG23917	UGMG23918				
		1	3-1/4	UGMG21032							
		1-1/4	3	UGMG21915	UGMG23956	UGMG23957	UGMG23958	UGMG23959	UGMG23960		
		1-1/4	3-1/2	UGMG21907		UGMG23919	UGMG23920	UGMG23921	UGMG23922		
5/8	5/8	2	4	UGMG21908		UGMG23923	UGMG23924	UGMG23925	UGMG23926		
		3	5	UGMG21909		UGMG23927	UGMG23928	UGMG23929	UGMG23930		
		1-1/4	3-1/2	UGMG21040		UGMG23040	UGMG23931	UGMG23932	UGMG23933		
3/4	3/4	1-1/2	4	UGMG21048		UGMG23048	UGMG23942	UGMG23943	UGMG23944		
		3	5-1/2	UGMG21912		UGMG23945	UGMG23946	UGMG23947	UGMG23948		
1	1	1-1/2	4	UGMG21064		UGMG23064	UGMG23949	UGMG23950	UGMG23951		
		4	7	UGMG21913		UGMG23952	UGMG23953	UGMG23954	UGMG23955		

Mill Dia. Tolerance (mm)	Shank Dia. Tolerance
0~-.0012	h5 (≥ Ø12 : h6)

◎ : Excellent ○ : Good

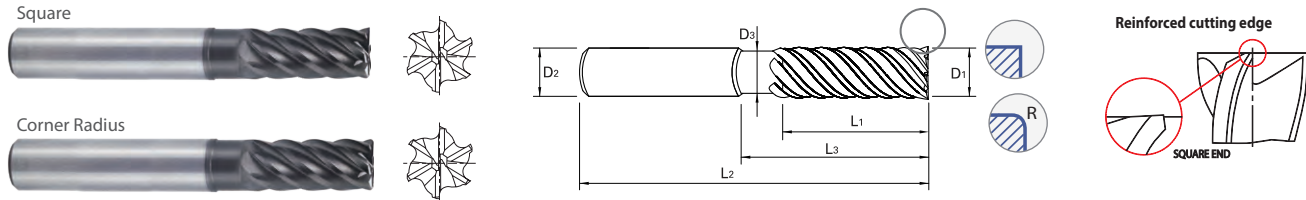
ISO	P										M				K													
Material Description	Non-alloy steel					Low alloy steel					High alloyed steel, and tool steel				Stainless steel				Grey cast iron		Nodular cast iron		Malleable cast iron					
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20								
HRC	13	25	28	32	30	10	29	32	38	15	35	15	23	10	10	26	3	25	21									
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230								
Recommend	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	



SQUARE UGMH08 SERIES  
CORNER RADIUS UGMH09 SERIES

CARBIDE, 6 FLUTE EXTENDED REACH (PLAIN SHANK)

- The unique geometry of the variable pitch provides the best chatter free tool for high speed and trochoidal milling
- Excellent performance for Stainless Steels, Mild Steels, Cast Iron, Low/Medium hardness materials under HRC40



Unit : Inch

OD (D1)	SD (D2)	LOC (L1)	LBS (L3)	OAL (L2)	Neck Dia (D3)	Square End EDP No.	Corner Radius								
							.030	.060	.090	.125	.190	.250			
							EDP No.	EDP No.	EDP No.	EDP No.	EDP No.	EDP No.			
1/4	1/4	3/8	3/4	4	.230	UGMH08016	UGMH09016	UGMH09901							
		3/8	1-1/8	4	.230	UGMH08901	UGMH09902	UGMH09903							
		3/8	2-1/8	4	.230	UGMH08902	UGMH09904	UGMH09905							
3/8	3/8	1/2	1-1/8	4	.344	UGMH08024	UGMH09024	UGMH09906	UGMH09907						
		1/2	2-1/8	4	.344	UGMH08903	UGMH09908	UGMH09909	UGMH09910						
		1/2	3-1/8	5	.344	UGMH08919	UGMH09999	UGMH09801	UGMH09802						
		1/2	3-1/8	6	.344	UGMH08904	UGMH09911	UGMH09912	UGMH09913						
		1/2	4-1/8	6	.344	UGMH08905	UGMH09914	UGMH09915	UGMH09916						
		5/8	1-1/2	4	.461	UGMH08032	UGMH09032	UGMH09917	UGMH09918	UGMH09919					
1/2	1/2	5/8	2-1/4	4	.461	UGMH08906	UGMH09920	UGMH09921	UGMH09922	UGMH09923					
		5/8	3-3/8	5	.461	UGMH08920	UGMH09803	UGMH09804	UGMH09805	UGMH09806					
		5/8	3-3/8	6	.461	UGMH08907	UGMH09924	UGMH09925	UGMH09926	UGMH09927					
		5/8	4-1/8	6	.461	UGMH08908	UGMH09928	UGMH09929	UGMH09930	UGMH09931					
		5/8	4-1/8	6	.461	UGMH08908	UGMH09928	UGMH09929	UGMH09930	UGMH09931					
5/8	5/8	3/4	1-5/8	4	.586	UGMH08040	UGMH09040	UGMH09932	UGMH09933	UGMH09934					
		3/4	2-3/8	5	.586	UGMH08921	UGMH09807	UGMH09808	UGMH09809	UGMH09810					
		3/4	3-3/8	5	.586	UGMH08922	UGMH09811	UGMH09812	UGMH09813	UGMH09814					
		3/4	2-3/8	6	.586	UGMH08909	UGMH09935	UGMH09936	UGMH09937	UGMH09938					
		3/4	3-3/8	6	.586	UGMH08910	UGMH09939	UGMH09940	UGMH09941	UGMH09942					
3/4	4-1/8	6	.586	UGMH08911	UGMH09943	UGMH09944	UGMH09945	UGMH09946							

Mill Dia. Tolerance (mm)	Shank Dia. Tolerance
0~-0.012	h5 (≥ Ø12 : h6)

NEXT PAGE ▶

◎ : Excellent ○ : Good

ISO	P											M				K												
Material Description	Non-alloy steel					Low alloy steel						High alloyed steel, and tool steel	Stainless steel				Grey cast iron		Nodular cast iron		Malleable cast iron							
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20								
HRC	13	25	28	32	30	10	29	32	38	15	35	15	23	10	10	26	3	25		21								
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230								
Recommend	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎

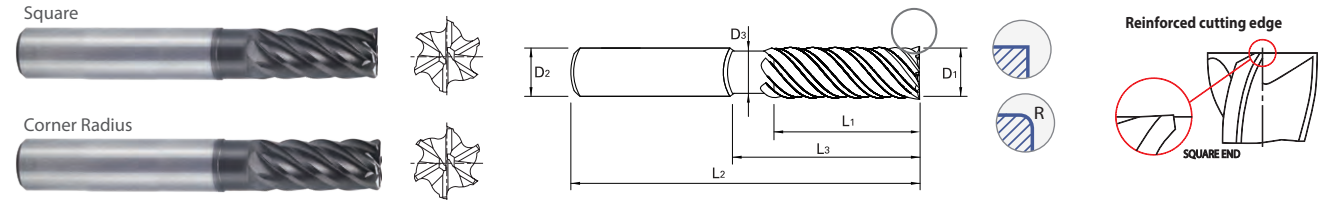
ISO	N					S					H														
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys				Titanium Alloys		Hardened steel		Chilled Cast Iron		Hardened Cast Iron				
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41				
HRC											15	30	25	38	34			55	60	42	55				
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550				
Recommend	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎



SQUARE UGMH08 SERIES  
CORNER RADIUS UGMH09 SERIES

CARBIDE, 6 FLUTE EXTENDED REACH (PLAIN SHANK)

- The unique geometry of the variable pitch provides the best chatter free tool for high speed and trochoidal milling
- Excellent performance for Stainless Steels, Mild Steels, Cast Iron, Low/Medium hardness materials under HRC40



Unit : Inch

OD (D1)	SD (D2)	LOC (L1)	LBS (L3)	OAL (L2)	Neck Dia (D3)	Square End EDP No.	Corner Radius					
							.030	.060	.090	.125	.190	.250
							EDP No.	EDP No.	EDP No.	EDP No.	EDP No.	EDP No.
3/4	3/4	1-1/8	2	4	.711	UGMH08048	UGMH09048	UGMH09947	UGMH09948	UGMH09949	UGMH09950	UGMH09951
		1-1/8	2-5/8	5	.711	UGMH08912	UGMH09952	UGMH09953	UGMH09954	UGMH09955	UGMH09956	UGMH09957
		1-1/8	3-1/4	6	.711	UGMH08913	UGMH09958	UGMH09959	UGMH09960	UGMH09961	UGMH09962	UGMH09963
		1-1/8	4-1/4	7	.711	UGMH08914	UGMH09964	UGMH09965	UGMH09966	UGMH09967	UGMH09968	UGMH09969
1	1	1-1/4	2-1/4	4	.961	UGMH08064	UGMH09064	UGMH09970	UGMH09971	UGMH09972	UGMH09973	UGMH09974
		1-1/4	2-5/8	5	.961	UGMH08915	UGMH09975	UGMH09976	UGMH09977	UGMH09978	UGMH09979	UGMH09980
		1-1/4	3-1/4	6	.961	UGMH08916	UGMH09981	UGMH09982	UGMH09983	UGMH09984	UGMH09985	UGMH09986
		1-1/4	4-1/4	7	.961	UGMH08917	UGMH09987	UGMH09988	UGMH09989	UGMH09990	UGMH09991	UGMH09992
		1-1/4	5-1/4	8	.961	UGMH08918	UGMH09993	UGMH09994	UGMH09995	UGMH09996	UGMH09997	UGMH09998

Mill Dia. Tolerance (mm)	Shank Dia. Tolerance
0~-0.012	h5 (≥ Ø12 : h6)

◎ : Excellent ○ : Good

ISO	P											M				K												
Material Description	Non-alloy steel					Low alloy steel						High alloyed steel, and tool steel	Stainless steel				Grey cast iron		Nodular cast iron		Malleable cast iron							
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20								
HRC	13	25	28	32	30	10	29	32	38	15	35	15	23	10	10	26	3	25		21								
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230								
Recommend	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎

ISO	N					S					H														
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys				Titanium Alloys		Hardened steel		Chilled Cast Iron		Hardened Cast Iron				
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41				
HRC											15	30	25	38	34			55	60	42	55				
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550				
Recommend	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎

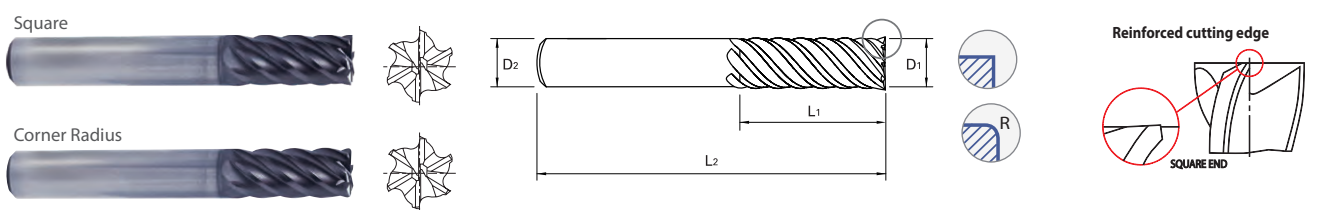




SQUARE GMG12 / GMG14 SERIES  
CORNER RADIUS GMG16 / GMG18 SERIES

CARBIDE, 6 FLUTE MULTIPLE LENGTH (PLAIN SHANK)

► The unique geometry of the variable pitch provides the best chatter free tool for high speed and trochoidal milling  
► Excellent performance for Stainless Steels, Mild Steels, Cast Iron, Low/Medium hardness materials under HRC40



Unit : Metric

Metric	Inch	OD (D <sub>1</sub> )	SD (D <sub>2</sub> )	LOC (L <sub>1</sub> )	OAL (L <sub>2</sub> )	Square End EDP No.	Corner Radius									
							0.50	1.00	1.50	2.00	3.00	4.00	5.00			
							EDP No.	EDP No.	EDP No.	EDP No.	EDP No.	EDP No.	EDP No.			
6.0	0.2362	6	6	13	57	GMG12060	GMG16060	GMG16901								
			6	24	75	GMG14060	GMG18060	GMG18901								
8.0	0.3150	8	8	19	63	GMG12080	GMG16080	GMG16902								
			8	32	75	GMG14080	GMG18080	GMG18902			GMG18903					
10.0	0.3937	10	10	22	72	GMG12100	GMG16100	GMG16903	GMG16904	GMG16905						
			10	40	100	GMG14100	GMG18100	GMG18904	GMG18905	GMG18906						
12.0	0.4724	12	12	26	83	GMG12120	GMG16120	GMG16906	GMG16907	GMG16908	GMG16909					
			12	48	120	GMG14120	GMG18120	GMG18907	GMG18908	GMG18909	GMG18910					
16.0	0.6299	16	16	32	92	GMG12160		GMG16160	GMG16910	GMG16911	GMG16912					
			16	64	140	GMG14160		GMG18160	GMG18911	GMG18912	GMG18913					
20.0	0.7874	20	20	38	104	GMG12200		GMG16200	GMG16913	GMG16914	GMG16915					
			20	80	150	GMG14200		GMG18200	GMG18914	GMG18915	GMG18916	GMG18917	GMG18918			
25.0	0.9843	25	25	44	104	GMG12250		GMG16250	GMG16916	GMG16917	GMG16918					
			25	100	170	GMG14250		GMG18250	GMG18919	GMG18920	GMG18921	GMG18922	GMG18923			

Mill Dia. Tolerance (mm)			Shank Dia. Tolerance	
Up to 3xD			Over 3xD	
Up to Ø12	0 ~ -0.02		h5 (≥ Ø12 : h6)	
Over Ø12	0 ~ -0.03			

◎ : Excellent ○ : Good

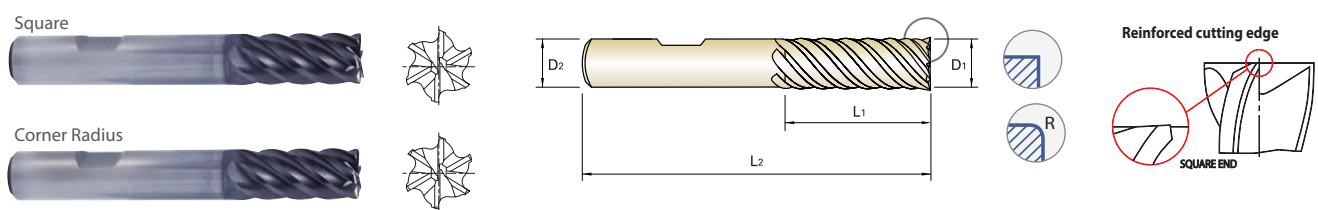
ISO	P										M				K							
Material Description	Non-alloy steel					Low alloy steel					High alloyed steel, and tool steel				Stainless steel		Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20		
HRc	13	25	28	32	32	10	29	32	38	15	35	15	23	10	10	26	3	25				
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230		
Recommend	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎



SQUARE GMG13 / GMG15 SERIES  
CORNER RADIUS GMG17 / GMG19 SERIES

CARBIDE, 6 FLUTE MULTIPLE LENGTH (FLAT SHANK)

► The unique geometry of the variable pitch provides the best chatter free tool for high speed and trochoidal milling  
► Excellent performance for Stainless Steels, Mild Steels, Cast Iron, Low/Medium hardness materials under HRC40



Unit : Metric

Metric	Inch	OD (D <sub>1</sub> )	SD (D <sub>2</sub> )	LOC (L <sub>1</sub> )	OAL (L <sub>2</sub> )	Square End EDP No.	Corner Radius								
							0.50	1.00	1.50	2.00	3.00	4.00	5.00		
							EDP No.	EDP No.	EDP No.	EDP No.	EDP No.	EDP No.	EDP No.		
6.0	0.2362	6	6	13	57	GMG13060	GMG17060	GMG17901							
			6	24	75	GMG15060	GMG19060	GMG19901							
8.0	0.3150	8	8	19	63	GMG13080	GMG17080	GMG17902							
			8	32	75	GMG15080	GMG19080	GMG19902			GMG19903				
10.0	0.3937	10	10	22	72	GMG13100	GMG17100	GMG17903	GMG17904	GMG17905					
			10	40	100	GMG15100	GMG19100	GMG19904	GMG19905	GMG19906					
12.0	0.4724	12	12	26	83	GMG13120	GMG17120	GMG17906	GMG17907	GMG17908	GMG17909				
			12	48	120	GMG15120	GMG19120	GMG19907	GMG19908	GMG19909	GMG19910				
16.0	0.6299	16	16	32	92	GMG13160		GMG17160	GMG17910	GMG17911	GMG17912				
			16	64	140	GMG15160		GMG19160	GMG19911	GMG19912	GMG19913				
20.0	0.7874	20	20	38	104	GMG13200		GMG17200	GMG17913	GMG17914	GMG17915				
			20	80	150	GMG15200		GMG19200	GMG19914	GMG19915	GMG19916	GMG19917	GMG19918		
25.0	0.9843	25	25	44	104	GMG13250		GMG17250	GMG17916	GMG17917	GMG17918				
			25	100	170	GMG15250		GMG19250	GMG19919	GMG19920	GMG19921	GMG19922	GMG19923		

Mill Dia. Tolerance (mm)			Shank Dia. Tolerance	
Up to 3xD			Over 3xD	
Up to Ø12	0 ~ -0.02		h5 (≥ Ø12 : h6)	
Over Ø12	0 ~ -0.03			

◎ : Excellent ○ : Good

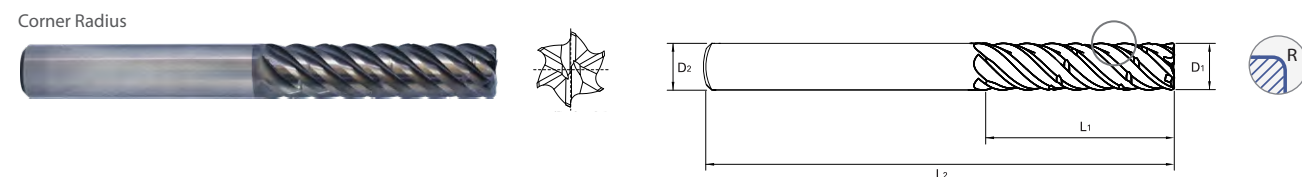
ISO	P										M				K							
Material Description	Non-alloy steel					Low alloy steel					High alloyed steel, and tool steel				Stainless steel		Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20		
HRc	13	25	28	32	32	10	29	32	38	15	35	15	23	10	10	26	3	25				
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230		
Recommend	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎



CORNER RADIUS GMH72 SERIES

CARBIDE, 6 FLUTE CHIP SPLITTER (PLAIN SHANK)

- ▶ Special chip splitter design for better chip removal shortened chip length at high axial machining
- ▶ High Performance for Steels, Stainless Steels and Cast Iron



Unit : Inch

OD (D <sub>1</sub> )	SD (D <sub>2</sub> )	LOC (L <sub>1</sub> )	OAL (L <sub>2</sub> )	Corner Radius			
				.015	.030	.060	.125
				EDP No.	EDP No.	EDP No.	EDP No.
3/8	3/8	5/8	2-1/2	◇ GMH72901	GMH72902		
3/8	3/8	1	2-1/2	◇ GMH72903			
3/8	3/8	1-1/8	3	GMH72024	GMH72904		
1/2	1/2	1-1/4	3		◇ GMH72905	◇ GMH72906	
1/2	1/2	1-1/2	3-1/2		◇ GMH72907	◇ GMH72908	
1/2	1/2	1-5/8	4	GMH72032	GMH72909	GMH72910	
1/2	1/2	2	4		GMH72911	GMH72912	
5/8	5/8	1-1/4	3-1/2		◇ GMH72913	◇ GMH72914	
5/8	5/8	1-7/8	4		◇ GMH72915	◇ GMH72916	
5/8	5/8	2	4	GMH72040	GMH72917	GMH72918	◇ GMH72919
5/8	5/8	2-3/16	4-1/2		◇ GMH72920	◇ GMH72921	
5/8	5/8	2-5/8	5		GMH72922	GMH72923	
3/4	3/4	1-1/2	4		◇ GMH72924	◇ GMH72925	◇ GMH72926
3/4	3/4	1-7/8	4-1/2		GMH72927	GMH72928	
3/4	3/4	2-1/4	5	GMH72048	GMH72929	GMH72930	GMH72931
3/4	3/4	2-3/4	5		◇ GMH72932	GMH72933	◇ GMH72934
3/4	3/4	3	6		GMH72935	◇ GMH72936	
1	1	2	5		◇ GMH72937	◇ GMH72938	◇ GMH72939
1	1	2-1/2	5-1/2		◇ GMH72942	◇ GMH72943	
1	1	3-1/4	6	GMH72064	GMH72944	GMH72945	GMH72946
1	1	3-1/2	6-1/2		◇ GMH72940	◇ GMH72941	
1	1	4	7			◇ GMH72947	

◇ : Call for Availability

Mill Dia. Tolerance (mm)	Shank Dia. Tolerance
0~-0.012	h5 (≥ Ø12 : h6)

◎ : Excellent ○ : Good

ISO	P											M				K				
	Non-alloy steel				Low alloy steel				High alloyed steel, and tool steel			Stainless steel				Grey cast iron		Nodular cast iron	Malleable cast iron	
Material Description	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc	13	25	28	32	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎

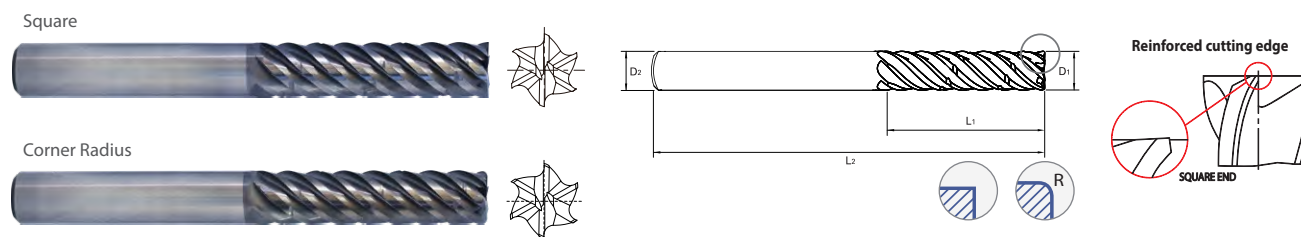
ISO	N				S						H										
	Aluminum-wrought alloy		Aluminum-cast, alloyed		Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials			Heat Resistant Super Alloys			Titanium Alloys	Hardened steel	Chilled Cast Iron	Hardened Cast Iron				
Material Description	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc	21	22	23	24	25	26	27	28	29	30	15	30	25	38	34		55	60	42	55	
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎



SQUARE CORNER RADIUS GMH56 SERIES GMH58 SERIES

CARBIDE, 6 FLUTE CHIP SPLITTER (PLAIN SHANK)

- ▶ Special chip splitter design for better chip removal shortened chip length at high axial machining
- ▶ High Performance for Steels, Stainless Steels and Cast Iron



Unit : Metric

OD (D <sub>1</sub> )	SD (D <sub>2</sub> )	LOC (L <sub>1</sub> )	OAL (L <sub>2</sub> )	Square End	Corner Radius							
					0.50	1.00	1.50	2.00	3.00	4.00	5.00	
					EDP No.	EDP No.	EDP No.	EDP No.	EDP No.	EDP No.	EDP No.	
6.0	.2363	6	24	75	GMH56060	GMH58060	GMH58901					
8.0	.3150	8	32	75	GMH56080	GMH58080	GMH58902		GMH58903			
10.0	.3937	10	40	100	GMH56100	GMH58100	GMH58904	GMH58905	GMH58906			
12.0	.4724	12	48	120	GMH56120	GMH58120	GMH58907	GMH58908	GMH58909	GMH58910		
16.0	.6299	16	64	140	GMH56160		GMH58160	GMH58911	GMH58912	GMH58913		
20.0	.7874	20	80	150	GMH56200		GMH58200	GMH58914	GMH58915	GMH58916	GMH58917	GMH58918
25.0	.9843	25	100	170	GMH56250		GMH58250	GMH58919	GMH58920	GMH58921	GMH58922	GMH58923

Mill Dia. Tolerance (mm)	Shank Dia. Tolerance
0 ~ -0.03	h5 (≥ Ø12 : h6)

◎ : Excellent ○ : Good

ISO	P											M				K				
	Non-alloy steel				Low alloy steel				High alloyed steel, and tool steel			Stainless steel				Grey cast iron		Nodular cast iron	Malleable cast iron	
Material Description	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc	13	25	28	32	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎

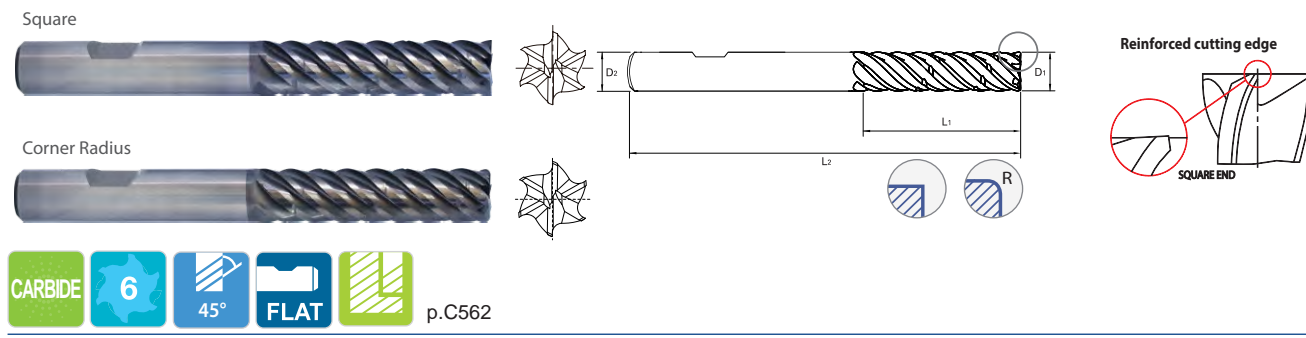
ISO	N				S						H										
	Aluminum-wrought alloy		Aluminum-cast, alloyed		Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials			Heat Resistant Super Alloys			Titanium Alloys	Hardened steel	Chilled Cast Iron	Hardened Cast Iron				
Material Description	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc	21	22	23	24	25	26	27	28	29	30	15	30	25	38	34		55	60	42	55	
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎



SQUARE GMH57 SERIES  
CORNER RADIUS GMH59 SERIES

**CARBIDE, 6 FLUTE CHIP SPLITTER (FLAT SHANK)**

- ▶ Special chip splitter design for better chip removal shortened chip length at high axial machining
- ▶ High Performance for Steels, Stainless Steels and Cast Iron



CARBIDE 6 45° FLAT p.C562

Unit : Metric

OD (D <sub>1</sub> )		SD (D <sub>2</sub> )	LOC (L <sub>1</sub> )	OAL (L <sub>2</sub> )	Square End	Corner Radius						
Metric	Inch					0.50	1.00	1.50	2.00	3.00	4.00	5.00
				EDP No.		EDP No.	EDP No.	EDP No.	EDP No.	EDP No.	EDP No.	EDP No.
6.0	.2363	6	24	75	GMH57060	GMH59060	GMH59901					
8.0	.3150	8	32	75	GMH57080	GMH59080	GMH59902		GMH59903			
10.0	.3937	10	40	100	GMH57100	GMH59100	GMH59904	GMH59905	GMH59906			
12.0	.4724	12	48	120	GMH57120	GMH59120	GMH59907	GMH59908	GMH59909	GMH59910		
16.0	.6299	16	64	140	GMH57160		GMH59160	GMH59911	GMH59912	GMH59913		
20.0	.7874	20	80	150	GMH57200		GMH59200	GMH59914	GMH59915	GMH59916	GMH59917	GMH59918
25.0	.9843	25	100	170	GMH57250		GMH59250	GMH59919	GMH59920	GMH59921	GMH59922	GMH59923

Mill Dia. Tolerance (mm)	Shank Dia. Tolerance
0 ~ -0.03	h5 (≥ Ø12 : h6)

◎ : Excellent ○ : Good

ISO	P											M				K						
	Non-alloy steel					Low alloy steel						High alloyed steel, and tool steel				Stainless steel		Grey cast iron		Nodular cast iron		Malleable cast iron
Material Description	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20		
VDI 3323																						
HRc	13	25	28	32	30	29	32	38	35	15	35	15	23	10	10	26	3	25		21		
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230		
Recommend	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎		

ISO	N					S					H										
	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)		Non Metallic Materials			Heat Resistant Super Alloys		Titanium Alloys	Hardened steel	Chilled Cast Iron	Hardened Cast Iron					
Material Description	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
VDI 3323																					
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend											○	○	○	○	○	○	○				



RECOMMENDED CUTTING CONDITIONS

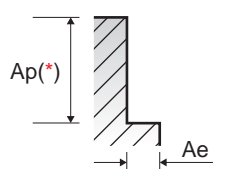
**UGMF68, UGMF69, UGMF70, UGMF71, UGMF72  
UGMF73, UGMF74, UGMF75, UGMF76, UGMF77 SERIES**

SFM(Vc) = ft./min.  
IPT(fz) = in./tooth  
RPM = rev./min.  
IPM(Feed) = in./min.

**4 FLUTE - SIDE CUTTING**

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø)															
						1/8	5/32	3/16	7/32	1/4	9/32	5/16	11/32	3/8	7/16	1/2	5/8	3/4	1		
P	1-4	Non-alloy steel	0.5D	1.5D (1.2D)	SFM	500	500	500	500	500	500	525	550	550	550	550	550	550			
					IPT	.0002	.0003	.0004	.0005	.0006	.0008	.0011	.0013	.0015	.0017	.0019	.0021	.0026	.0025		
					RPM	15250	12200	10170	8710	7630	6780	6100	5830	5620	4810	4210	3370	2810	2110		
					IPM	12	15	18	19	23	26	30	34	32	31	28	29	21			
	5	Low alloy steel	0.5D	1.5D (1.2D)	SFM	350	350	350	350	350	350	370	385	385	385	385	385	385			
					IPT	.0002	.0003	.0004	.0005	.0006	.0008	.0011	.0013	.0015	.0017	.0018	.0021	.0026	.0025		
					RPM	10730	8580	7150	6130	5360	4770	4290	4090	3910	3350	2930	2350	1960	1470		
					IPM	8	11	12	13	14	16	18	21	23	22	22	20	20	15		
	6-7	Low alloy steel	0.5D	1.5D (1.2D)	SFM	500	500	500	500	500	500	525	550	550	550	550	550	550			
					IPT	.0002	.0003	.0004	.0005	.0006	.0008	.0011	.0013	.0015	.0017	.0018	.0021	.0026	.0025		
					RPM	15250	12200	10170	8710	7630	6780	6100	5830	5620	4810	4210	3370	2810	2110		
					IPM	12	15	18	19	23	26	30	34	32	31	28	29	21			
8-9	Low alloy steel	0.5D	1.5D (1.2D)	SFM	350	350	350	350	350	350	370	385	385	385	385	385	385				
				IPT	.0002	.0003	.0004	.0005	.0006	.0008	.0011	.0013	.0015	.0017	.0018	.0021	.0026	.0025			
				RPM	10730	8580	7150	6130	5360	4770	4290	4090	3910	3350	2930	2350	1960	1470			
				IPM	8	11	12	13	14	16	18	21	23	22	22	20	20	15			
10-11.1	High alloyed steel, and tool steel	0.5D	1.5D (1.2D)	SFM	210	210	210	210	210	210	220	230	230	230	230	230	230				
				IPT	.0001	.0002	.0003	.0004	.0004	.0006	.0007	.0009	.0011	.0012	.0013	.0015	.0018	.0018			
				RPM	6420	5130	4280	3670	3210	2850	2570	2450	2340	2010	1760	1410	1170	880			
				IPM	3	5	5	6	7	8	9	10	9	9	8	8	6				
M	12-13	Stainless steel	0.5D	1.5D (1.2D)	SFM	500	500	500	500	500	500	525	550	550	550	550	550				
					IPT	.0002	.0003	.0004	.0005	.0006	.0008	.0011	.0013	.0015	.0017	.0019	.0021	.0026	.0025		
					RPM	15250	12200	10170	8710	7630	6780	6100	5830	5620	4810	4210	3370	2810	2110		
					IPM	12	15	18	19	23	26	30	34	32	31	28	29	21			
	14.1	Stainless steel	0.5D	1.5D (1.2D)	SFM	350	350	350	350	350	350	370	385	385	385	385	385	385			
					IPT	.0002	.0003	.0004	.0005	.0006	.0008	.0011	.0013	.0015	.0017	.0018	.0021	.0026	.0025		
					RPM	10730	8580	7150	6130	5360	4770	4290	4090	3910	3350	2930	2350	1960	1470		
					IPM	8	11	12	13	14	16	18	21	23	22	22	20	20	15		
	14.2	Stainless steel	0.5D	1.5D (1.2D)	SFM	310	310	310	310	310	310	310	310	310	310	310	310	310			
					IPT	.0002	.0003	.0005	.0006	.0007	.0009	.0011	.0015	.0019	.0020	.0022	.0024	.0030	.0030		
					RPM	9540	7630	6360	5450	4770	4240	3810	3470	3180	2720	2380	1910	1590	1190		
					IPM	8	10	13	13	14	15	17	21	24	22	21	19	19	14		
K	Grey cast iron	0.5D	1.5D (1.2D)	SFM	365	365	365	365	365	365	365	405	405	405	405	405	405				
				IPT	.0002	.0004	.0006	.0007	.0008	.0011	.0013	.0016	.0019	.0021	.0023	.0026	.0032	.0031			
				RPM	11220	8970	7480	6410	5610	4990	4490	4290	4120	3530	3090	2470	2060	1540			
				IPM	11	14	16	17	18	21	24	28	31	29	28	25	26	19			
S	Heat Resistant Super Alloys	0.25D	1.0D	SFM	85	85	85	85	85	85	85	85	85	85	85	85	85				
				IPT	.0002	.0003	.0003	.0004	.0005	.0006	.0007	.0010	.0013	.0014	.0015	.0017	.0021	.0020			
				RPM	2600	2080	1730	1480	1300	1150	1040	950	870	740	650	520	430	330			
				IPM	2	2	2	2	2	3	3	4	5	4	4	4	4	3			
S	Titanium Alloys	0.35D	1.0D	SFM	190	190	190	190	190	190	190	190	190	190	190	190	190				
				IPT	.0002	.0003	.0004	.0005	.0006	.0008	.0010	.0013	.0017	.0018	.0020	.0022	.0027	.0027			
				RPM	5810	4650	3870	3320	2900	2580	2320	2110	1940	1660	1450	1160	970	730			
				IPM	4	5	7	7	7	8	9	11	13	12	11	10	10	8			

\* ( ) : Short length & Neck type



- NOTES:**
- ▶ Feed to be reduced by approximately 50% if L.O.C. (Length Of Cut) is over 3xD
  - ▶ The above recommendations are based on ideal conditions; for smaller taper machining centers or less rigid conditions please adjust parameters accordingly on diameters greater than 1/2"
  - ▶ In profile operations, engaging more than 2xD, reduce the radial depth of cut by 50%-60%
  - ▶ Finish cuts typically require reduced cutting feeds and speeds; also, it is recommended the radial width of cut (AE) should not exceed 2%xD1





RECOMMENDED CUTTING CONDITIONS



RECOMMENDED CUTTING CONDITIONS

UGMF68, UGMF69, UGMF70, UGMF71, UGMF72 UGMF73, UGMF74, UGMF75, UGMF76, UGMF77 SERIES

UGMG53, UGMG54, UGMH10 SERIES 4 FLUTE BALL NOSE

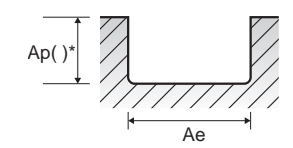
SFM(Vc) = ft./min. IPT(fz) = in./tooth RPM = rev./min. IPM(Feed) = in./min.

4 FLUTE - SLOTTING

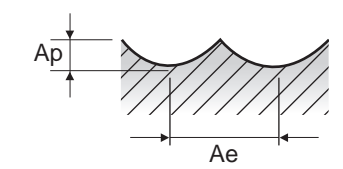
Table with columns for ISO, VDI 3323, Material Description, Ae, Ap, Parameter, and Diameter (Ø) with sub-columns for various diameters (1/8 to 1).

Table with columns for ISO, VDI 3323, Material Description, Ae, Ap, Parameter, and Diameter (Ø) with sub-columns for various diameters (1/8 to 1).

\*( ): Short length & Neck type



- NOTES: ▶ Feed to be reduced by approximately 50% if L.O.C. (Length Of Cut) is over 3xD. ▶ The above recommendations are based on ideal conditions; for smaller taper machining centers or less rigid conditions please adjust parameters accordingly on diameters greater than 1/2". ▶ In profile operations, engaging more than 2xD, reduce the radial depth of cut by 50%-60%. ▶ Finish cuts typically require reduced cutting feeds and speeds; also, it is recommended the radial width of cut (AE) should not exceed 2%xD1

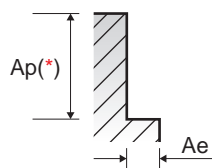


**UGMG20, UGMG21, UGMG22  
UGMG23, UGMH08, UGMH09 SERIES**

**6 FLUTE - SIDE CUTTING**

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø)						
						1/4	5/16	3/8	1/2	5/8	3/4	1
P	1-4	Non-alloy steel	0.05D	2.0D	SFM (Vc)	985	985	985	985	985	985	985
					IPT (fz)	.0027	.0046	.0057	.0068	.0080	.0089	.0091
					RPM	15040	12030	10020	7520	6010	5010	3760
					IPM (FEED)	242	330	341	307	287	266	206
	5	Low alloy steel	0.05D	2.0D	SFM (Vc)	665	665	665	665	665	665	665
					IPT (fz)	.0020	.0034	.0042	.0050	.0059	.0066	.0069
					RPM	10180	8140	6780	5090	4070	3390	2540
					IPM (FEED)	120	163	170	154	143	134	105
	6-7	Low alloy steel	0.05D	2.0D	SFM (Vc)	985	985	985	985	985	985	985
					IPT (fz)	.0027	.0046	.0057	.0068	.0080	.0089	.0091
					RPM	15040	12030	10020	7520	6010	5010	3760
					IPM (FEED)	242	330	341	307	287	266	206
8-9	High alloyed steel, and tool steel	0.05D	2.0D	SFM (Vc)	665	665	665	665	665	665	665	
				IPT (fz)	.0020	.0034	.0042	.0050	.0059	.0066	.0069	
				RPM	10180	8140	6780	5090	4070	3390	2540	
				IPM (FEED)	120	163	170	154	143	134	105	
10-11.1	High alloyed steel, and tool steel	0.05D	2.0D	SFM (Vc)	330	330	330	330	330	330	330	
				IPT (fz)	.0016	.0028	.0035	.0041	.0048	.0054	.0057	
				RPM	5010	4010	3340	2510	2010	1670	1250	
				IPM (FEED)	49	67	69	62	58	54	43	
M	12-13	Stainless steel	0.05D	2.0D	SFM (Vc)	700	700	700	700	700	700	700
					IPT (fz)	.0019	.0033	.0041	.0049	.0058	.0064	.0066
					RPM	10680	8550	7120	5340	4270	3560	2670
					IPM (FEED)	124	170	175	158	147	136	106
14.1	Stainless steel	0.05D	2.0D	SFM (Vc)	480	480	480	480	480	480	480	
				IPT (fz)	.0016	.0028	.0035	.0041	.0048	.0054	.0056	
				RPM	7370	5890	4910	3680	2950	2460	1840	
				IPM (FEED)	71	99	102	91	86	79	62	
14.2	Stainless steel	0.05D	2.0D	SFM (Vc)	440	440	440	440	440	440	440	
				IPT (fz)	.0016	.0028	.0035	.0041	.0048	.0054	.0056	
				RPM	6720	5380	4480	3360	2690	2240	1680	
				IPM (FEED)	65	90	93	83	78	73	56	
K	15-20	Grey cast iron Nodular cast iron Malleable cast iron	0.05D	2.0D	SFM (Vc)	740	740	740	740	740	740	740
					IPT (fz)	.0032	.0055	.0068	.0082	.0095	.0106	.0110
					RPM	11310	9050	7540	5650	4520	3770	2830
					IPM (FEED)	218	297	308	277	259	240	186
S	31-35	Heat Resistant Super Alloys	0.05D	2.0D	SFM (Vc)	110	110	110	110	110	110	110
					IPT (fz)	.0013	.0022	.0028	.0032	.0038	.0044	.0045
					RPM	1650	1320	1100	830	660	550	410
					IPM (FEED)	13	17	18	16	15	15	11
36-37	Titanium Alloys	0.05D	2.0D	SFM (Vc)	380	380	380	380	380	380	380	
				IPT (fz)	.0013	.0022	.0028	.0033	.0038	.0045	.0046	
				RPM	5820	4660	3880	2910	2330	1940	1460	
				IPM (FEED)	45	61	64	57	53	52	40	

SFM(Vc) = ft./min.  
IPT(fz) = in./tooth  
RPM = rev./min.  
IPM(Feed) = in./min.

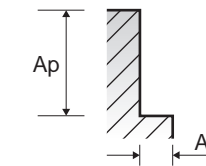


(\*) : If product's Length of Cut(L.O.C) is below 2D, it must be applied L.O.C x 90%

**GMH72 SERIES 6 FLUTE CHIP SPLITTER - SIDE CUTTING**

SFM(Vc) = ft./min.  
IPT(fz) = in./tooth  
RPM = rev./min.  
IPM(Feed) = in./min.

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø)				
						3/8	1/2	5/8	3/4	1
P	1-4	Non-alloy steel	0.05D	3.0D	SFM (Vc)	985	985	985	985	985
					IPT (fz)	.0057	.0068	.0080	.0089	.0091
					RPM	10020	7520	6010	5010	3760
					IPM (FEED)	341	307	287	266	206
	5	Low alloy steel	0.05D	3.0D	SFM (Vc)	665	665	665	665	665
					IPT (fz)	.0042	.0050	.0059	.0066	.0069
					RPM	6780	5090	4070	3390	2540
					IPM (FEED)	170	154	143	134	105
	6-7	Low alloy steel	0.05D	3.0D	SFM (Vc)	985	985	985	985	985
					IPT (fz)	.0057	.0068	.0080	.0089	.0091
					RPM	10020	7520	6010	5010	3760
					IPM (FEED)	341	307	287	266	206
8-9	High alloyed steel, and tool steel	0.05D	3.0D	SFM (Vc)	665	665	665	665	665	
				IPT (fz)	.0042	.0050	.0059	.0066	.0069	
				RPM	6780	5090	4070	3390	2540	
				IPM (FEED)	170	154	143	134	105	
10-11.1	High alloyed steel, and tool steel	0.05D	3.0D	SFM (Vc)	330	330	330	330	330	
				IPT (fz)	.0035	.0041	.0048	.0054	.0057	
				RPM	3340	2510	2010	1670	1250	
				IPM (FEED)	69	62	58	54	43	
M	12-13	Stainless steel	0.05D	3.0D	SFM (Vc)	700	700	700	700	700
					IPT (fz)	.0041	.0049	.0058	.0064	.0066
					RPM	7120	5340	4270	3560	2670
					IPM (FEED)	175	158	147	136	106
14.1	Stainless steel	0.05D	3.0D	SFM (Vc)	480	480	480	480	480	
				IPT (fz)	.0035	.0041	.0048	.0054	.0056	
				RPM	4910	3680	2950	2460	1840	
				IPM (FEED)	102	91	86	79	62	
14.2	Stainless steel	0.05D	3.0D	SFM (Vc)	440	440	440	440	440	
				IPT (fz)	.0035	.0041	.0048	.0054	.0056	
				RPM	4480	3360	2690	2240	1680	
				IPM (FEED)	93	83	78	73	56	
K	15-20	Grey cast iron	0.05D	3.0D	SFM (Vc)	740	740	740	740	740
					IPT (fz)	.0068	.0082	.0095	.0106	.0110
					RPM	7540	5650	4520	3770	2830
					IPM (FEED)	308	277	259	240	186
S	31-35	Heat Resistant Super Alloys	0.05D	3.0D	SFM (Vc)	110	110	110	110	110
					IPT (fz)	.0028	.0032	.0038	.0044	.0045
					RPM	1100	830	660	550	410
					IPM (FEED)	18	16	15	15	11
36-37	Titanium Alloys	0.05D	3.0D	SFM (Vc)	380	380	380	380	380	
				IPT (fz)	.0028	.0033	.0038	.0045	.0046	
				RPM	3880	2910	2330	1940	1460	
				IPM (FEED)	64	57	53	52	40	



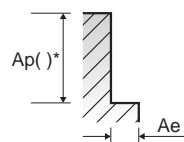
**GMF52, GMF53, GMF54, GMF55, GMF56, GMF57  
GMF58, GMF59, GMF60, GMF61, GMF62, GMF63 SERIES**

SFM(Vc) = ft./min.  
IPT(fz) = in./tooth  
RPM = rev./min.  
IPM(Feed) = in./min.

**4 FLUTE - SIDE CUTTING**

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø)															
						3.0	4.0	5.0	6.0	8.0	10.0	12.0	14.0	16.0	18.0	20.0	25.0				
P	1-4	Non-alloy steel	0.5D	1.5D (1.2D)	SFM(Vc)	500	500	500	500	500	550	550	550	550	550	550	550	550	550		
					IPT(fz)	.0002	.0003	.0004	.0006	.0011	.0015	.0019	.0019	.0021	.0023	.0026	.0025				
	RPM	16130	12100	9680	8060	6050	5350	4460	3820	3340	2970	2670	2140								
	IPM(Feed)	13	15	17	20	26	32	33	29	28	28	27	22								
	5	Low alloy steel	0.5D	1.5D (1.2D)	SFM(Vc)	350	350	350	350	350	385	385	385	385	385	385	385	385	385		
IPT(fz)					.0002	.0003	.0004	.0006	.0011	.0015	.0018	.0019	.0021	.0023	.0026	.0025					
6-7	Low alloy steel	0.5D	1.5D (1.2D)	SFM(Vc)	500	500	500	500	500	550	550	550	550	550	550	550	550	550			
				IPT(fz)	.0002	.0003	.0004	.0006	.0011	.0015	.0019	.0019	.0021	.0023	.0026	.0025					
8-9	Low alloy steel	0.5D	1.5D (1.2D)	SFM(Vc)	350	350	350	350	350	385	385	385	385	385	385	385	385	385			
				IPT(fz)	.0002	.0003	.0004	.0006	.0011	.0015	.0018	.0019	.0021	.0023	.0026	.0025					
10-11.1	High alloyed steel, and tool steel	0.5D	1.5D (1.2D)	SFM(Vc)	210	210	210	210	210	230	230	230	230	230	230	230	230	230			
				IPT(fz)	.0001	.0002	.0003	.0004	.0008	.0011	.0013	.0013	.0015	.0016	.0018	.0018					
M	12-13	Stainless steel	0.5D	1.5D (1.2D)	SFM(Vc)	485	485	485	485	485	485	485	485	485	485	485	485	485			
					IPT(fz)	.0002	.0002	.0004	.0005	.0009	.0013	.0015	.0017	.0018	.0020	.0022	.0022				
	RPM	15700	11780	9420	7850	5890	4710	3930	3370	2940	2620	2360	1880								
	IPM(Feed)	10	11	13	16	20	25	24	21	21	21	20	16								
	14.1	Stainless steel	0.5D	1.5D (1.2D)	SFM(Vc)	350	350	350	350	350	350	350	350	350	350	350	350	350	350		
IPT(fz)					.0002	.0003	.0005	.0007	.0011	.0019	.0022	.0023	.0024	.0028	.0030	.0030					
14.2	Stainless steel	0.5D	1.5D (1.2D)	SFM(Vc)	310	310	310	310	310	310	310	310	310	310	310	310	310	310			
				IPT(fz)	.0002	.0003	.0005	.0007	.0011	.0019	.0022	.0023	.0024	.0027	.0030	.0030					
K	15-20	Grey cast iron	0.5D	1.5D (1.2D)	SFM(Vc)	365	365	365	365	365	405	405	405	405	405	405	405	405			
					IPT(fz)	.0002	.0004	.0006	.0008	.0013	.0019	.0023	.0024	.0026	.0029	.0032	.0031				
	RPM	11880	8910	7130	5940	4460	3920	3260	2800	2450	2180	1960	1570								
	IPM(Feed)	11	14	16	19	24	30	30	27	25	25	25	19								
	31-35	Heat Resistant Super Alloys	0.25D	1.0D	SFM(Vc)	85	85	85	85	85	85	85	85	85	85	85	85	85	85		
IPT(fz)					.0002	.0003	.0003	.0005	.0008	.0013	.0015	.0016	.0017	.0019	.0021	.0021					
36-37	Titanium Alloys	0.35D	1.0D	SFM(Vc)	190	190	190	190	190	190	190	190	190	190	190	190	190	190			
				IPT(fz)	.0002	.0003	.0004	.0006	.0010	.0017	.0020	.0022	.0024	.0027	.0027						

\*( ) : Short length & Neck type



- NOTES:**
- ▶ Feed to be reduced by approximately 50% if L.O.C. (Length Of Cut) is over 3xD
  - ▶ The above recommendations are based on ideal conditions; for smaller taper machining centers or less rigid conditions please adjust parameters accordingly on diameters greater than 1/2"
  - ▶ In profile operations, engaging more than 2xD, reduce the radial depth of cut by 50%-60%
  - ▶ Finish cuts typically require reduced cutting feeds and speeds; also, it is recommended the radial width of cut (AE) should not exceed 2%xD1

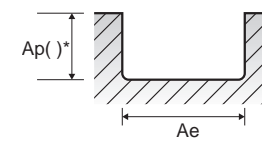
**GMF52, GMF53, GMF54, GMF55, GMF56, GMF57  
GMF58, GMF59, GMF60, GMF61, GMF62, GMF63 SERIES**

SFM(Vc) = ft./min.  
IPT(fz) = in./tooth  
RPM = rev./min.  
IPM(Feed) = in./min.

**4 FLUTE - SLOTTING**

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø)															
						3.0	4.0	5.0	6.0	8.0	10.0	12.0	14.0	16.0	18.0	20.0	25.0				
P	1-4	Non-alloy steel	1.0D	1.0D (0.8D)	SFM(Vc)	500	500	500	500	500	550	550	550	550	550	550	550	550			
					IPT(fz)	.0002	.0003	.0004	.0006	.0011	.0015	.0019	.0019	.0021	.0023	.0026	.0025				
	RPM	16130	12100	9680	8060	6050	5350	4460	3820	3340	2970	2670	2140								
	IPM(Feed)	13	15	17	20	26	32	33	29	28	28	27	22								
	5	Low alloy steel	1.0D	1.0D (0.8D)	SFM(Vc)	350	350	350	350	350	385	385	385	385	385	385	385	385			
IPT(fz)					.0002	.0003	.0004	.0006	.0011	.0015	.0018	.0019	.0021	.0023	.0026	.0025					
6-7	Low alloy steel	1.0D	1.0D (0.8D)	SFM(Vc)	500	500	500	500	500	550	550	550	550	550	550	550	550				
				IPT(fz)	.0002	.0003	.0004	.0006	.0011	.0015	.0019	.0019	.0021	.0023	.0026	.0025					
8-9	Low alloy steel	1.0D	1.0D (0.8D)	SFM(Vc)	350	350	350	350	350	385	385	385	385	385	385	385	385				
				IPT(fz)	.0002	.0003	.0004	.0006	.0011	.0015	.0018	.0019	.0021	.0023	.0026	.0025					
10-11.1	High alloyed steel, and tool steel	1.0D	1.0D (0.8D)	SFM(Vc)	210	210	210	210	210	230	230	230	230	230	230	230	230				
				IPT(fz)	.0001	.0002	.0003	.0004	.0008	.0011	.0013	.0013	.0015	.0016	.0018	.0018					
M	12-13	Stainless steel	1.0D	1.0D (0.8D)	SFM(Vc)	485	485	485	485	485	485	485	485	485	485	485	485	485			
					IPT(fz)	.0002	.0002	.0004	.0005	.0009	.0013	.0015	.0017	.0018	.0020	.0022	.0022				
	RPM	15700	11780	9420	7850	5890	4710	3930	3370	2940	2620	2360	1880								
	IPM(Feed)	10	11	13	16	20	25	24	21	21	21	20	16								
	14.1	Stainless steel	1.0D	1.0D (0.8D)	SFM(Vc)	350	350	350	350	350	350	350	350	350	350	350	350	350			
IPT(fz)					.0002	.0003	.0005	.0007	.0011	.0019	.0022	.0023	.0024	.0028	.0030	.0030					
14.2	Stainless steel	1.0D	1.0D (0.8D)	SFM(Vc)	310	310	310	310	310	310	310	310	310	310	310	310	310				
				IPT(fz)	.0002	.0003	.0005	.0007	.0011	.0019	.0022	.0023	.0024	.0027	.0030	.0030					
K	15-20	Grey cast iron	1.0D	1.0D (0.8D)	SFM(Vc)	365	365	365	365	365	405	405	405	405	405	405	405	405			
					IPT(fz)	.0002	.0004	.0006	.0008	.0013	.0019	.0023	.0024	.0026	.0029	.0032	.0031				
	RPM	11880	8910	7130	5940	4460	3920	3260	2800	2450	2180	1960	1570								
	IPM(Feed)	11	14	16	19	24	30	30	27	25	25	25	19								
	31-35	Heat Resistant Super Alloys	1.0D	0.5D	SFM(Vc)	85	85	85	85	85	85	85	85	85	85	85	85	85			
IPT(fz)					.0002	.0003	.0003	.0005	.0008	.0013	.0015	.0016	.0017	.0019	.0021	.0021					
36-37	Titanium Alloys	1.0D	0.5D	SFM(Vc)	190	190	190	190	190	190	190	190	190	190	190	190	190				
				IPT(fz)	.0002	.0003	.0004	.0006	.0010	.0017	.0020	.0022	.0024	.0027	.0027						

\*( ) : Short length & Neck type

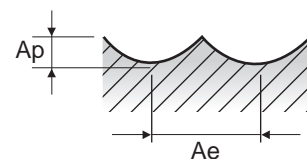


- NOTES:**
- ▶ Feed to be reduced by approximately 50% if L.O.C. (Length Of Cut) is over 3xD
  - ▶ The above recommendations are based on ideal conditions; for smaller taper machining centers or less rigid conditions please adjust parameters accordingly on diameters greater than 1/2"
  - ▶ In profile operations, engaging more than 2xD, reduce the radial depth of cut by 50%-60%
  - ▶ Finish cuts typically require reduced cutting feeds and speeds; also, it is recommended the radial width of cut (AE) should not exceed 2%xD1



**GMG55, GMG56 SERIES 4 FLUTE BALL NOSE**

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø)												
						3.0	4.0	5.0	6.0	8.0	10.0	12.0	16.0	18.0	20.0	25.0		
P	1-4	Non-alloy steel	0.5D	1.0D	SFM (Vc)	530	530	530	530	530	530	530	530	530	530	530	530	530
					IPT (fz)	.0010	.0011	.0012	.0016	.0024	.0026	.0028	.0030	.0032	.0035	.0039		
					RPM	17190	12890	10310	8590	6450	5160	4300	3220	2870	2580	2060		
	5	0.5D	1.0D	SFM (Vc)	370	370	370	370	370	370	370	370	370	370	370	370	370	
				IPT (fz)	.0010	.0011	.0012	.0016	.0024	.0026	.0028	.0029	.0031	.0035	.0039			
				RPM	11990	8990	7190	6000	4500	3600	3000	2250	2000	1800	1440			
	6-7	Low alloy steel	0.5D	1.0D	SFM (Vc)	530	530	530	530	530	530	530	530	530	530	530	530	
					IPT (fz)	.0010	.0011	.0012	.0016	.0024	.0026	.0028	.0030	.0032	.0035	.0039		
					RPM	17190	12890	10310	8590	6450	5160	4300	3220	2870	2580	2060		
	8-9	0.5D	1.0D	SFM (Vc)	370	370	370	370	370	370	370	370	370	370	370	370		
				IPT (fz)	.0010	.0011	.0012	.0016	.0024	.0026	.0028	.0029	.0031	.0035	.0039			
				RPM	11990	8990	7190	6000	4500	3600	3000	2250	2000	1800	1440			
10-11.1	High alloyed steel, and tool steel	0.5D	1.0D	SFM (Vc)	225	225	225	225	225	225	225	225	225	225	225	225		
				IPT (fz)	.0007	.0007	.0008	.0011	.0017	.0018	.0019	.0020	.0022	.0025	.0028			
				RPM	7220	5410	4330	3610	2710	2170	1800	1350	1200	1080	870			
M	12-13	0.5D	1.0D	SFM (Vc)	255	255	255	255	255	255	255	255	255	255	255	255		
				IPT (fz)	.0006	.0006	.0010	.0012	.0016	.0018	.0020	.0021	.0023	.0023	.0023			
				RPM	8170	6130	4900	4090	3060	2450	2040	1530	1360	1230	980			
	14.1	Stainless steel	0.5D	1.0D	SFM (Vc)	280	280	280	280	280	280	280	280	280	280	280		
					IPT (fz)	.0008	.0008	.0010	.0016	.0018	.0020	.0022	.0024	.0025	.0026	.0027		
					RPM	9020	6760	5410	4510	3380	2710	2260	1690	1500	1350	1080		
	14.2	0.5D	1.0D	SFM (Vc)	255	255	255	255	255	255	255	255	255	255	255			
				IPT (fz)	.0008	.0008	.0010	.0016	.0018	.0020	.0022	.0024	.0025	.0026	.0027			
				RPM	8170	6130	4900	4090	3060	2450	2040	1530	1360	1230	980			
	K	15-20	Grey cast iron	0.5D	1.0D	SFM (Vc)	390	390	390	390	390	390	390	390	390	390	390	
						IPT (fz)	.0012	.0013	.0015	.0020	.0029	.0032	.0034	.0037	.0039	.0044	.0049	
						RPM	12630	9470	7580	6310	4740	3790	3160	2370	2100	1890	1520	
31-35		Heat Resistant Super Alloys	0.2D	0.3D	SFM (Vc)	70	70	70	70	70	70	70	70	70	70	70		
					IPT (fz)	.0006	.0006	.0007	.0011	.0012	.0014	.0015	.0017	.0018	.0018	.0019		
					RPM	2230	1670	1340	1110	840	670	560	420	370	330	270		
36-37		Titanium Alloys	0.5D	0.3D	SFM (Vc)	155	155	155	155	155	155	155	155	155	155	155		
					IPT (fz)	.0007	.0007	.0009	.0015	.0016	.0018	.0019	.0021	.0023	.0023	.0024		
					RPM	4990	3740	2990	2490	1870	1500	1250	940	830	750	600		

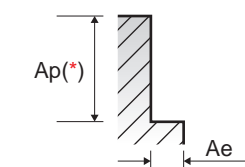


SFM(Vc) = ft./min.  
IPT(fz) = in./tooth  
RPM = rev./min.  
IPM(Feed) = in./min.

**GMG12, GMG13, GMG14, GMG15  
GMG16, GMG17, GMG18, GMG19 SERIES**

**6 FLUTE - SIDE CUTTING**

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø)								
						6.0	8.0	10.0	12.0	16.0	20.0	25.0		
P	1-4	Non-alloy steel	0.05D	2.0D	SFM (Vc)	985	985	985	985	985	985	985	985	
					IPT (fz)	.0027	.0046	.0057	.0068	.0080	.0089	.0091		
					RPM	15920	11940	9550	7960	5970	4780	3820		
	5	0.05D	2.0D	SFM (Vc)	665	665	665	665	665	665	665	665		
				IPT (fz)	.0020	.0034	.0042	.0050	.0059	.0066	.0069			
				RPM	10770	8080	6460	5390	4040	3230	2590			
	6-7	Low alloy steel	0.05D	2.0D	SFM (Vc)	985	985	985	985	985	985	985	985	
					IPT (fz)	.0027	.0046	.0057	.0068	.0080	.0089	.0091		
					RPM	15920	11940	9550	7960	5970	4780	3820		
	8-9	0.05D	2.0D	SFM (Vc)	665	665	665	665	665	665	665	665		
				IPT (fz)	.0020	.0034	.0042	.0050	.0059	.0066	.0069			
				RPM	10770	8080	6460	5390	4040	3230	2590			
10-11.1	High alloyed steel, and tool steel	0.05D	2.0D	SFM (Vc)	330	330	330	330	330	330	330	330		
				IPT (fz)	.0016	.0028	.0035	.0041	.0048	.0054	.0057			
				RPM	5310	3980	3180	2650	1990	1590	1270			
M	12-13	0.05D	2.0D	SFM (Vc)	700	700	700	700	700	700	700	700		
				IPT (fz)	.0019	.0033	.0041	.0049	.0058	.0064	.0066			
				RPM	11300	8480	6780	5650	4240	3390	2710			
	14.1	Stainless steel	0.05D	2.0D	SFM (Vc)	480	480	480	480	480	480	480	480	
					IPT (fz)	.0016	.0028	.0035	.0041	.0048	.0054	.0056		
					RPM	7800	5850	4680	3900	2920	2340	1870		
	14.2	0.05D	2.0D	SFM (Vc)	440	440	440	440	440	440	440	440		
				IPT (fz)	.0016	.0028	.0035	.0041	.0048	.0054	.0056			
				RPM	7110	5330	4270	3550	2670	2130	1710			
	K	15-20	Grey cast iron	0.05D	2.0D	SFM (Vc)	740	740	740	740	740	740	740	740
						IPT (fz)	.0032	.0055	.0068	.0082	.0095	.0106	.0110	
						RPM	11940	8950	7160	5970	4480	3580	2870	
31-35		Heat Resistant Super Alloys	0.05D	2.0D	SFM (Vc)	110	110	110	110	110	110	110	110	
					IPT (fz)	.0013	.0022	.0028	.0032	.0038	.0044	.0045		
					RPM	1750	1310	1050	880	660	530	420		
36-37		Titanium Alloys	0.05D	2.0D	SFM (Vc)	380	380	380	380	380	380	380	380	
					IPT (fz)	.0013	.0022	.0028	.0033	.0038	.0045	.0046		
					RPM	6150	4620	3690	3080	2310	1850	1480		



(\*) : If product's Length of Cut(L.O.C) is below 2D, it must be applied L.O.C x 90%

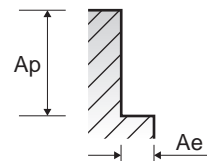


GMH56, GMH58, GMH57, GMH59 SERIES

6 FLUTE CHIP SPLITTER - SIDE CUTTING

SFM(Vc) = ft./min.  
IPT(fz) = in./tooth  
RPM = rev./min.  
IPM(Feed) = in./min.

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø)						
						6.0	8.0	10.0	12.0	16.0	20.0	25.0
P	1-4	Non-alloy steel	0.05D	3.0D	SFM(Vc)	985	985	985	985	985	985	985
					IPT(fz)	.0027	.0046	.0057	.0068	.0080	.0089	.0091
					RPM	15920	11940	9550	7960	5970	4780	3820
					IPM(Feed)	256	327	325	325	285	254	209
	5	Low alloy steel	0.05D	3.0D	SFM(Vc)	665	665	665	665	665	665	665
					IPT(fz)	.0020	.0034	.0042	.0050	.0059	.0066	.0069
					RPM	10770	8080	6460	5390	4040	3230	2590
					IPM(Feed)	127	162	162	163	142	127	106
6-7	Low alloy steel	0.05D	3.0D	SFM(Vc)	985	985	985	985	985	985	985	
				IPT(fz)	.0027	.0046	.0057	.0068	.0080	.0089	.0091	
				RPM	15920	11940	9550	7960	5970	4780	3820	
				IPM(Feed)	256	327	325	325	285	254	209	
8-9	Low alloy steel	0.05D	3.0D	SFM(Vc)	665	665	665	665	665	665	665	
				IPT(fz)	.0020	.0034	.0042	.0050	.0059	.0066	.0069	
				RPM	10770	8080	6460	5390	4040	3230	2590	
				IPM(Feed)	127	162	162	163	142	127	106	
10-11.1	High alloyed steel, and tool steel	0.05D	3.0D	SFM(Vc)	330	330	330	330	330	330	330	
				IPT(fz)	.0016	.0028	.0035	.0041	.0048	.0054	.0057	
				RPM	5310	3980	3180	2650	1990	1590	1270	
				IPM(Feed)	51	67	66	66	58	52	43	
M	12-13	Stainless steel	0.05D	3.0D	SFM(Vc)	700	700	700	700	700	700	700
					IPT(fz)	.0019	.0033	.0041	.0049	.0058	.0064	.0066
					RPM	11300	8480	6780	5650	4240	3390	2710
					IPM(Feed)	131	168	167	167	146	130	108
	14.1	Stainless steel	0.05D	3.0D	SFM(Vc)	480	480	480	480	480	480	480
					IPT(fz)	.0016	.0028	.0035	.0041	.0048	.0054	.0056
					RPM	7800	5850	4680	3900	2920	2340	1870
					IPM(Feed)	76	98	97	97	85	76	63
14.2	Stainless steel	0.05D	3.0D	SFM(Vc)	440	440	440	440	440	440	440	
				IPT(fz)	.0016	.0028	.0035	.0041	.0048	.0054	.0056	
				RPM	7110	5330	4270	3550	2670	2130	1710	
				IPM(Feed)	69	89	89	88	77	69	57	
K	15-20	Grey cast iron	0.05D	3.0D	SFM(Vc)	740	740	740	740	740	740	740
					IPT(fz)	.0032	.0055	.0068	.0082	.0095	.0106	.0110
					RPM	11940	8950	7160	5970	4480	3580	2870
					IPM(Feed)	230	294	292	293	256	228	188
S	31-35	Heat Resistant Super Alloys	0.05D	3.0D	SFM(Vc)	110	110	110	110	110	110	110
					IPT(fz)	.0013	.0022	.0028	.0032	.0038	.0044	.0045
					RPM	1750	1310	1050	880	660	530	420
					IPM(Feed)	14	17	17	17	15	14	11
	36-37	Titanium Alloys	0.05D	3.0D	SFM(Vc)	380	380	380	380	380	380	380
					IPT(fz)	.0013	.0022	.0028	.0033	.0038	.0045	.0046
					RPM	6150	4620	3690	3080	2310	1850	1480
					IPM(Feed)	48	60	61	60	53	49	41





Being the best through innovation



SOLID CARBIDE

# V7 MILL INOX END MILLS

- Silent Cutting of Stainless Steels up to HRc40.  
Designed as Variable Leads, YG-1's Patent.



SELECTION GUIDE



SOLID CARBIDE  
V7 MILL INOX  
END MILLS

- Silent Cutting of Stainless Steels up to HRC40.  
Designed as Variable Leads, YG-1's Patent.

Please visit [globalyg1.com/mat](http://globalyg1.com/mat) for material search  
© : Excellent ○ : Good  
Recommended cutting conditions : C579

SERIES	Inch			
	EMC75 EMD60	EMC76 EMD61	EMB12 EMB37	EMB13 EMB38
FLUTE	4	4	4	4
HELIX ANGLE	SINUSOIDAL	SINUSOIDAL	SINUSOIDAL	SINUSOIDAL
CUTTING EDGE SHAPE	SQUARE	CORNER RADIUS	SQUARE	CORNER RADIUS
SIZE MIN	D1/8	D1/8	D1/8	D1/8
SIZE MAX	D1	D1	D1	D1
PAGE	C566	C567	C568	C569
	STUB LENGTH	STUB LENGTH	REGULAR LENGTH	REGULAR LENGTH

AITiN  
U.S.A Stock



ISO	VDI 3323	Material Description	Composition / Structure / Heat Treatment	HB	HRC	
P	1	Non-alloy steel	About 0.15% C Annealed	125		
	2		About 0.45% C Annealed	190	13	
	3		About 0.45% C Quenched & Tempered	250	25	
	4		About 0.75% C Annealed	270	28	
	5		About 0.75% C Quenched & Tempered	300	32	
	6	Low alloy steel	Annealed	180	10	
	7		Quenched & Tempered	275	29	
	8		Quenched & Tempered	300	32	
	9		Quenched & Tempered	350	38	
	10		High alloyed steel, and tool steel	Annealed	200	15
	11		Quenched & Tempered	325	35	
M	12	Stainless steel	Ferritic / Martensitic Annealed	200	15	
	13		Martensitic Quenched & Tempered	240	23	
	14		Austenitic	180	10	
	15		Pearlitic / ferritic	180	10	
K	16	Grey cast iron	Pearlitic (Martensitic)	260	26	
	17		Ferritic	160	3	
	18		Pearlitic	250	25	
	19		Ferritic	130		
	20		Pearlitic	230	21	
N	21	Aluminum-wrought alloy	Not Curable	60		
	22		Curable Hardened	100		
	23	Aluminum-cast, alloyed	≤ 12% Si, Not Curable	75		
	24		≤ 12% Si, Curable Hardened	90		
	25		> 12% Si, Not Curable	130		
	26		Copper and Cutting Alloys, PB>1%	110		
	27		Copper Alloys (CuZn, CuSnZn (Brass))	90		
	28		(Bronze / Brass) CuSn, lead free copper and electrolytic copper	100		
	29		Non Metallic Materials	Duroplastic, Fiber Reinforced Plastic		
	30			Rubber, Wood, etc.		
S	31	Heat Resistant Super Alloys	Fe Based Annealed	200	15	
	32		Cured	280	30	
	33		Annealed	250	25	
	34		Ni or Co Based Cured	350	38	
	35		Cast	320	34	
	36		Titanium Alloys	Pure Titanium	400 Rm	
	37			Alpha + Beta Alloys Hardened	1050 Rm	
H	38	Hardened steel	Hardened	550	55	
	39		Hardened	630	60	
	40		Chilled Cast Iron	Cast	400	42
	41		Hardened Cast Iron	Hardened	550	55

SERIES	Inch				Metric				
	EMB20	EMB78 EMB79	EMB76 EMB77	EMB41 EMB42	EMB43 EMB44	EMB14 EMB39	EMB15 EMB40	EMB74 EMB75	EMB72 EMB73
FLUTE	4	4	5	4	4	4	4	4	5
HELIX ANGLE	SINUSOIDAL	SINUSOIDAL	SINUSOIDAL	SINUSOIDAL	SINUSOIDAL	SINUSOIDAL	SINUSOIDAL	SINUSOIDAL	SINUSOIDAL
CUTTING EDGE SHAPE	SQUARE	BALL NOSE	SQUARE	SQUARE	CORNER RADIUS	SQUARE	CORNER RADIUS	BALL NOSE	SQUARE
SIZE MIN	D1/4	R1/16	D1/4	D3.0	D3.0	D3.0	D3.0	R1.5	D6.0
SIZE MAX	D1	R1/2	D1	D20.0	D20.0	D25.0	D25.0	R12.5	D25.0
PAGE	C570	C571	C572	C573	C574	C575	C576	C577	C578
	EXTENDED LENGTH LONG REACH	REGULAR LENGTH	REGULAR LENGTH	SHORT LENGTH	SHORT LENGTH	REGULAR LENGTH	REGULAR LENGTH	REGULAR LENGTH	REGULAR LENGTH

AITiN  
U.S.A Stock      Call for Availability



○	○	○	○	○	○	○	○	○	○	1
○	○	○	○	○	○	○	○	○	○	2
○	○	○	○	○	○	○	○	○	○	3
○	○	○	○	○	○	○	○	○	○	4
○	○	○	○	○	○	○	○	○	○	5
○	○	○	○	○	○	○	○	○	○	6
○	○	○	○	○	○	○	○	○	○	7
○	○	○	○	○	○	○	○	○	○	8
○	○	○	○	○	○	○	○	○	○	9
○	○	○	○	○	○	○	○	○	○	10
○	○	○	○	○	○	○	○	○	○	11
○	○	○	○	○	○	○	○	○	○	12
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○	○	○	○	○	○	○	○	○	○	34
○	○	○	○	○	○	○	○	○	○	35
○	○	○	○	○	○	○	○	○	○	36
○	○	○	○	○	○	○	○	○	○	37
										38
										39
										40
										41



PLAIN SHANK EMC75 SERIES  
FLAT SHANK EMD60 SERIES

**CARBIDE, 4 FLUTE STUB LENGTH**

- ▶ Special flute geometry eliminates vibrations
- ▶ Designed for mild steels, stainless steel, cast iron, tool steels, titanium alloys, prehardened steels and low hardness material
- ▶ Excellent work piece finishes
- ▶ Higher speeds, deeper cuts and metal removal rates



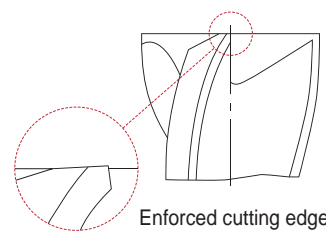
◆ U.S.A Stock

Unit : Inch

EDP No.		Mill Diameter	Shank Diameter	Length of Cut	Overall Length
PLAIN	FLAT				
EMC75008	-	1/8	1/8	1/8	1-1/2
EMC75010	-	5/32	3/16	3/16	2
EMC75012	-	3/16	3/16	3/16	2
EMC75014	-	7/32	1/4	1/4	2
EMC75016	-	1/4	1/4	1/4	2
EMC75020	-	5/16	5/16	5/16	2
-	EMD60024	3/8	3/8	3/8	2
-	EMD60028	7/16	7/16	7/16	2-1/2
-	EMD60032	1/2	1/2	1/2	2-1/2
-	EMD60040	5/8	5/8	5/8	3
-	EMD60048	3/4	3/4	3/4	3
-	EMD60064	1	1	1	4

▶ Shanks 3/8" and over come standard with Flats.

Mill Dia. Tolerance (inch)	Shank Dia. Tolerance
0~-.0012	h6



Enforced cutting edge

◎ : Excellent ○ : Good

ISO Material Description	P										M				K					
	Non-alloy steel					Low alloy steel					High alloyed steel, and tool steel				Stainless steel		Grey cast iron		Nodular cast iron	Malleable cast iron
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc	13	25	28	32	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend	◎	◎	○	○	○	◎	○	○	○	◎	○	◎	◎	◎						

ISO Material Description	N				S						H										
	Aluminum-wrought alloy		Aluminum-cast, alloyed		Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials			Heat Resistant Super Alloys			Titanium Alloys	Hardened steel	Chilled Cast Iron	Hardened Cast Iron				
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend											○	○	○	○	○	◎	◎				



PLAIN SHANK EMC76 SERIES  
FLAT SHANK EMD61 SERIES

**CARBIDE, 4 FLUTE STUB LENGTH CORNER RADIUS**

- ▶ Special flute geometry eliminates vibrations
- ▶ Designed for mild steels, stainless steel, cast iron, tool steels, titanium alloys, prehardened steels and low hardness material
- ▶ Excellent work piece finishes
- ▶ Higher speeds, deeper cuts and metal removal rates



◆ U.S.A Stock

Unit : Inch

EDP No.		Corner Radius R	Mill Diameter	Shank Diameter	Length of Cut	Overall Length
PLAIN	FLAT					
EMC76008	-	R.015	1/8	1/8	1/8	1-1/2
EMC76010	-	R.015	5/32	3/16	3/16	2
EMC76012	-	R.015	3/16	3/16	3/16	2
EMC76014	-	R.020	7/32	1/4	1/4	2
EMC76016	-	R.020	1/4	1/4	1/4	2
EMC76020	-	R.020	5/16	5/16	5/16	2
-	EMD61024	R.020	3/8	3/8	3/8	2
-	EMD61028	R.020	7/16	7/16	7/16	2-1/2
-	EMD61032	R.030	1/2	1/2	1/2	2-1/2
-	EMD61040	R.040	5/8	5/8	5/8	3
-	EMD61048	R.040	3/4	3/4	3/4	3
-	EMD61064	R.040	1	1	1	4

▶ Shanks 3/8" and over come standard with Flats.

Mill Dia. Tolerance (inch)	Shank Dia. Tolerance
0~-.0012	h6

◎ : Excellent ○ : Good

ISO Material Description	P										M				K					
	Non-alloy steel					Low alloy steel					High alloyed steel, and tool steel				Stainless steel		Grey cast iron		Nodular cast iron	Malleable cast iron
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc	13	25	28	32	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend	◎	◎	○	○	○	◎	○	○	○	◎	○	◎	◎	◎						

ISO Material Description	N				S						H										
	Aluminum-wrought alloy		Aluminum-cast, alloyed		Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials			Heat Resistant Super Alloys			Titanium Alloys	Hardened steel	Chilled Cast Iron	Hardened Cast Iron				
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend											○	○	○	○	○	◎	◎				



PLAIN SHANK **EMB12** SERIES  
 FLAT SHANK **EMB37** SERIES

**CARBIDE, 4 FLUTE REGULAR LENGTH**

- ▶ Special flute geometry eliminates vibrations
- ▶ Designed for mild steels, stainless steel, cast iron, tool steels, titanium alloys, prehardened steels and low hardness material
- ▶ Excellent work piece finishes
- ▶ Higher speeds, deeper cuts and metal removal rates



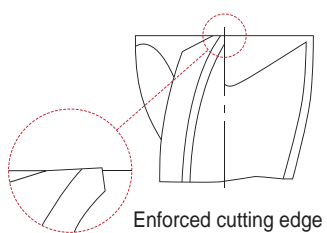
◆ U.S.A Stock

Unit : Inch

EDP No.	Mill Diameter		Shank Diameter	Length of Cut	Overall Length
	PLAIN	FLAT			
<b>EMB12008</b>	-	1/8	1/8	3/8	1-1/2
<b>EMB12010</b>	-	5/32	3/16	7/16	2
<b>EMB12012</b>	-	3/16	3/16	7/16	2
<b>EMB12014</b>	-	7/32	1/4	7/16	2-1/2
<b>EMB12016</b>	-	1/4	1/4	1/2	2-1/2
<b>EMB12018</b>	-	9/32	5/16	5/8	2-1/2
<b>EMB12020</b>	-	5/16	5/16	13/16	2-1/2
<b>EMB12022</b>	-	11/32	3/8	13/16	2-1/2
-	<b>FMB37024</b>	3/8	3/8	7/8	2-1/2
-	<b>FMB37026</b>	13/32	7/16	15/16	2-3/4
-	<b>FMB37028</b>	7/16	7/16	1	2-3/4
-	<b>FMB37030</b>	15/32	1/2	1	3
-	<b>FMB37032</b>	1/2	1/2	1	3
-	<b>FMB37036</b>	9/16	9/16	1-1/8	3-1/2
-	<b>FMB37040</b>	5/8	5/8	1-1/4	3-1/2
-	<b>FMB37048</b>	3/4	3/4	1-1/2	4
-	<b>FMB37064</b>	1	1	1-1/2	4

▶ Shanks 3/8" and over come standard with Flats.

Mill Dia. Tolerance (inch)	Shank Dia. Tolerance
0~-0.0012	h6



◎ : Excellent ○ : Good

ISO Material Description	P										M				K					
	Non-alloy steel					Low alloy steel					High alloyed steel, and tool steel				Stainless steel		Grey cast iron		Nodular cast iron	Malleable cast iron
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc	13	25	28	32	30	10	29	32	38	15	35	15	23	10	10	26	3	25	21	
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend	◎	◎	○	○	○	◎	○	○	○	◎	○	◎	◎	◎						

ISO Material Description	N					S					H										
	Aluminum-wrought alloy		Aluminum-cast, alloyed		Copper and Copper Alloys (Bronze / Brass)	Non Metallic Materials		Heat Resistant Super Alloys			Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron						
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend											○	○	○	○	○	◎	◎				



PLAIN SHANK **EMB13** SERIES  
 FLAT SHANK **EMB38** SERIES

**CARBIDE, 4 FLUTE REGULAR LENGTH CORNER RADIUS**

- ▶ Special flute geometry eliminates vibrations
- ▶ Designed for mild steels, stainless steel, cast iron, tool steels, titanium alloys, prehardened steels and low hardness material
- ▶ Excellent work piece finishes
- ▶ Higher speeds, deeper cuts and metal removal rates



◆ U.S.A Stock

Unit : Inch

EDP No.	Corner Radius R		Mill Diameter	Shank Diameter	Length of Cut	Overall Length
	PLAIN	FLAT				
<b>EMB13008</b>	-	R.015	1/8	1/8	3/8	1-1/2
<b>EMB13012</b>	-	R.015	3/16	3/16	7/16	2
<b>EMB13016</b>	-	R.020	1/4	1/4	1/2	2-1/2
<b>EMB13020</b>	-	R.020	5/16	5/16	13/16	2-1/2
-	<b>FMB38024</b>	R.020	3/8	3/8	7/8	2-1/2
-	<b>FMB38028</b>	R.020	7/16	7/16	1	2-3/4
-	<b>FMB38032</b>	R.030	1/2	1/2	1	3
-	<b>FMB38036</b>	R.030	9/16	9/16	1-1/8	3-1/2
-	<b>FMB38040</b>	R.040	5/8	5/8	1-1/4	3-1/2
-	<b>FMB38048</b>	R.040	3/4	3/4	1-1/2	4
-	<b>FMB38064</b>	R.040	1	1	1-1/2	4

▶ Shanks 3/8" and over come standard with Flats.

Mill Dia. Tolerance (inch)	Shank Dia. Tolerance
0~-0.0012	h6

◎ : Excellent ○ : Good

ISO Material Description	P										M				K					
	Non-alloy steel					Low alloy steel					High alloyed steel, and tool steel				Stainless steel		Grey cast iron		Nodular cast iron	Malleable cast iron
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc	13	25	28	32	30	10	29	32	38	15	35	15	23	10	10	26	3	25	21	
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend	◎	◎	○	○	○	◎	○	○	○	◎	○	◎	◎	◎						

ISO Material Description	N					S					H										
	Aluminum-wrought alloy		Aluminum-cast, alloyed		Copper and Copper Alloys (Bronze / Brass)	Non Metallic Materials		Heat Resistant Super Alloys			Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron						
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend											○	○	○	○	○	◎	◎				





PLAIN SHANK FLAT SHANK EMB20 SERIES

**CARBIDE, 4 FLUTE EXTENDED LENGTH, LONG REACH**

- ▶ Higher speeds, deeper cuts and metal removal rates.
- ▶ Improved surface finishes
- ▶ New "NANO" AlTiN coating



◆ U.S.A Stock

Unit : Inch

EDP No.	Mill Diameter		Shank Diameter	Length of Cut	Reach Length	Overall Length
	PLAIN	FLAT				
<b>EMB20160</b>	-	1/4	1/4	3/8	1-1/4	4
-	<b>EMB20240</b>	3/8	3/8	1/2	1-7/8	4
-	<b>EMB20320</b>	1/2	1/2	5/8	2-1/4	4
-	<b>EMB20400</b>	5/8	5/8	3/4	2-1/4	4-1/8
-	<b>EMB20401</b>	5/8	5/8	3/4	3-1/4	5
-	<b>EMB20480</b>	3/4	3/4	1	2-1/4	4-1/4
-	<b>EMB20481</b>	3/4	3/4	1	3-1/4	5-1/2
-	<b>EMB20640</b>	1	1	1-1/8	2-1/4	4-1/2
-	<b>EMB20641</b>	1	1	1-1/8	3-1/4	5-1/2
-	<b>EMB20642</b>	1	1	1-1/8	4-1/4	6-1/2

▶ Shanks 3/8" and over come standard with Flats.

Mill Dia. Tolerance (inch)	Shank Dia. Tolerance
0~-0.0012	h6

◎ : Excellent ○ : Good

ISO Material Description	P										M				K					
	Non-alloy steel					Low alloy steel					High alloyed steel, and tool steel				Stainless steel		Grey cast iron		Nodular cast iron	Malleable cast iron
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc	13	25	28	32	30	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend	◎	◎	○	○	○	◎	○	○	○	◎	○	◎	◎	◎						

ISO Material Description	N					S					H										
	Aluminum-wrought alloy		Aluminum-cast, alloyed		Copper and Copper Alloys (Bronze / Brass)	Non Metallic Materials		Heat Resistant Super Alloys			Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron						
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34	55	60	42	55		
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend											○	○	○	○	○	◎	◎				



PLAIN SHANK EMB78 SERIES  
FLAT SHANK EMB79 SERIES

**CARBIDE, 4 FLUTE REGULAR LENGTH BALL NOSE**

- ▶ Special flute geometry eliminates vibrations
- ▶ Designed for mild steels, stainless steel, cast iron, tool steels, titanium alloys, prehardened steels and low hardness material
- ▶ Excellent work piece finishes
- ▶ Higher speeds, deeper cuts and metal removal rates



◆ U.S.A Stock

Unit : Inch

EDP No.	Radius of Ball Nose		Mill Diameter	Shank Diameter	Length of Cut	Overall Length
	PLAIN	FLAT				
<b>EMB78008</b>	-	R1/16	1/8	1/8	3/8	1-1/2
<b>EMB78010</b>	-	R5/64	5/32	3/16	7/16	2
<b>EMB78012</b>	-	R3/32	3/16	3/16	7/16	2
<b>EMB78016</b>	-	R1/8	1/4	1/4	1/2	2-1/2
<b>EMB78020</b>	-	R5/32	5/16	5/16	13/16	2-1/2
-	<b>EMB79024</b>	R3/16	3/8	3/8	7/8	2-1/2
-	<b>EMB79032</b>	R1/4	1/2	1/2	1	3
-	<b>EMB79040</b>	R5/16	5/8	5/8	1-1/4	3-1/2
-	<b>EMB79048</b>	R3/8	3/4	3/4	1-1/2	4
-	<b>EMB79064</b>	R1/2	1	1	1-1/2	4

▶ Shanks 3/8" and over come standard with Flats.

Mill Dia. Tolerance (inch)	Shank Dia. Tolerance
0~-0.0012	h6

◎ : Excellent ○ : Good

ISO Material Description	P										M				K					
	Non-alloy steel					Low alloy steel					High alloyed steel, and tool steel				Stainless steel		Grey cast iron		Nodular cast iron	Malleable cast iron
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc	13	25	28	32	30	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend	◎	◎	○	○	○	◎	○	○	○	◎	○	◎	◎	◎						

ISO Material Description	N					S					H										
	Aluminum-wrought alloy		Aluminum-cast, alloyed		Copper and Copper Alloys (Bronze / Brass)	Non Metallic Materials		Heat Resistant Super Alloys			Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron						
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34	55	60	42	55		
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend											○	○	○	○	○	◎	◎				

HSS

HSS

CBN END MILLS

CBN END MILLS

i-Xmill END MILLS

i-Xmill END MILLS

i-SMART MODULAR END MILLS

i-SMART MODULAR END MILLS

X5070 END MILLS

X5070 END MILLS

4G MILL END MILLS

4G MILL END MILLS

X-POWER PRO END MILLS

X-POWER PRO END MILLS

TitaNox-POWER END MILLS

TitaNox-POWER END MILLS

JET-POWER END MILLS

JET-POWER END MILLS

V7 PLUS A END MILLS

V7 PLUS A END MILLS

V7 MILL INOX

V7 MILL INOX

ALU-POWER HPC END MILLS

ALU-POWER HPC END MILLS

ALU-POWER END MILLS

ALU-POWER END MILLS

D-POWER GRAPHITE END MILLS

D-POWER GRAPHITE END MILLS

STANDARD CARBIDE

STANDARD CARBIDE

ONLY ONE COATED PM60 END MILLS

ONLY ONE COATED PM60 END MILLS

SINE-POWER

SINE-POWER

TANK-POWER END MILLS

TANK-POWER END MILLS

STANDARD COBALT & HSS

STANDARD COBALT & HSS

TECHNICAL DATA

TECHNICAL DATA

**YIG V7 MILL INOX END MILLS**

PLAIN SHANK **EMB76** SERIES  
FLAT SHANK **EMB77** SERIES

**CARBIDE, 5 FLUTE REGULAR LENGTH**

- ▶ Special flute geometry eliminates vibrations
- ▶ Designed for mild steels, stainless steel, cast iron, tool steels, titanium alloys, prehardened steels and low hardness material
- ▶ Excellent work piece finishes
- ▶ Higher speeds, deeper cuts and metal removal rates



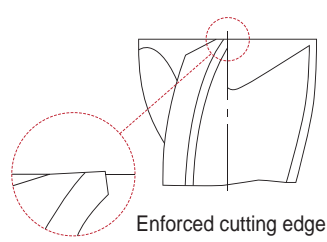
◆ U.S.A Stock

Unit : Inch

EDP No.	Mill Diameter		Shank Diameter	Length of Cut	Overall Length
	PLAIN	FLAT			
<b>EMB76016</b>	-	1/4	1/4	1/2	2-1/2
<b>EMB76020</b>	-	5/16	5/16	13/16	2-1/2
<b>EMB76024</b>		<b>EMB77024</b>	3/8	7/8	2-1/2
-		<b>EMB77032</b>	1/2	1	3
-		<b>EMB77036</b>	9/16	9/16	3-1/2
-		<b>EMB77040</b>	5/8	1-1/4	3-1/2
-		<b>EMB77048</b>	3/4	1-1/2	4
-		<b>EMB77064</b>	1	1-1/2	4

▶ Shanks 3/8" and over come standard with Flats.

Mill Dia. Tolerance (inch)	Shank Dia. Tolerance
0~-0.012	h6



◎ : Excellent ○ : Good

ISO	P											M				K				
	Non-alloy steel				Low alloy steel				High alloyed steel, and tool steel			Stainless steel		Grey cast iron	Nodular cast iron		Malleable cast iron			
Material Description	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc	13	25	28	32	30	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend	◎	◎	○	○	○	◎	○	○	○	◎	○	◎	◎	◎						

ISO	N				S					H											
	Aluminum-wrought alloy		Aluminum-cast, alloyed		Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys		Titanium Alloys	Hardened steel	Chilled Cast Iron	Hardened Cast Iron						
Material Description	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend											○	○	○	○	○	◎	◎				

**YIG V7 MILL INOX END MILLS**

PLAIN SHANK **EMB41** SERIES  
FLAT SHANK **EMB42** SERIES

**CARBIDE, 4 FLUTE SHORT LENGTH**

- ▶ Special flute geometry eliminates vibrations
- ▶ Designed for mild steels, stainless steel, cast iron, tool steels, titanium alloys, prehardened steels and low hardness material
- ▶ Excellent work piece finishes
- ▶ Higher speeds, deeper cuts and metal removal rates

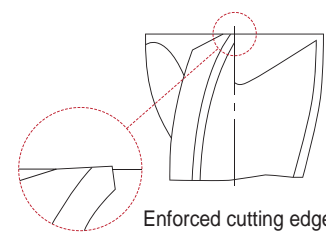


◇ Call for Availability

Unit : mm

EDP No.	Mill Diameter		Shank Diameter	Length of Cut	Overall Length
	PLAIN	FLAT			
<b>EMB41030</b>		<b>EMB42030</b>	6	7	54
<b>EMB41040</b>		<b>EMB42040</b>	6	8	54
<b>EMB41050</b>		<b>EMB42050</b>	6	10	54
<b>EMB41060</b>		<b>EMB42060</b>	6	10	54
<b>EMB41080</b>		<b>EMB42080</b>	8	12	58
<b>EMB41100</b>		<b>EMB42100</b>	10	14	66
<b>EMB41120</b>		<b>EMB42120</b>	12	16	73
<b>EMB41140</b>		<b>EMB42140</b>	14	18	75
<b>EMB41160</b>		<b>EMB42160</b>	16	22	82
<b>EMB41180</b>		<b>EMB42180</b>	18	24	84
<b>EMB41200</b>		<b>EMB42200</b>	20	26	92

Mill Dia. Tolerance (mm)	Shank Dia. Tolerance
0~-0.03	h6



◎ : Excellent ○ : Good

ISO	P											M				K				
	Non-alloy steel				Low alloy steel				High alloyed steel, and tool steel			Stainless steel		Grey cast iron	Nodular cast iron		Malleable cast iron			
Material Description	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc	13	25	28	32	30	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend	◎	◎	○	○	○	◎	○	○	○	◎	○	◎	◎	◎						

ISO	N				S					H											
	Aluminum-wrought alloy		Aluminum-cast, alloyed		Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys		Titanium Alloys	Hardened steel	Chilled Cast Iron	Hardened Cast Iron						
Material Description	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend											○	○	○	○	○	◎	◎				



PLAIN SHANK **EMB43** SERIES  
 FLAT SHANK **EMB44** SERIES

### CARBIDE, 4 FLUTE SHORT LENGTH CORNER RADIUS

- ▶ Special flute geometry eliminates vibrations
- ▶ Designed for mild steels, stainless steel, cast iron, tool steels, titanium alloys, prehardened steels and low hardness material
- ▶ Excellent work piece finishes
- ▶ Higher speeds, deeper cuts and metal removal rates



p.C581-C582

◇ Call for Availability

Unit : mm

EDP No.		Corner Radius R	Mill Diameter		Shank Diameter	Length of Cut	Overall Length
PLAIN	FLAT		Metric	Inch			
<a href="#">EMB43030</a>	<a href="#">EMB44030</a>	R0.3	3.0	.1181	6	7	54
<a href="#">EMB43040</a>	<a href="#">EMB44040</a>	R0.3	4.0	.1575	6	8	54
<a href="#">EMB43050</a>	<a href="#">EMB44050</a>	R0.3	5.0	.1969	6	10	54
<a href="#">EMB43060</a>	<a href="#">EMB44060</a>	R0.5	6.0	.2362	6	10	54
<a href="#">EMB43080</a>	<a href="#">EMB44080</a>	R0.5	8.0	.3150	8	12	58
<a href="#">EMB43100</a>	<a href="#">EMB44100</a>	R0.5	10.0	.3937	10	14	66
<a href="#">EMB43120</a>	<a href="#">EMB44120</a>	R0.7	12.0	.4724	12	16	73
<a href="#">EMB43140</a>	<a href="#">EMB44140</a>	R0.7	14.0	.5512	14	18	75
<a href="#">EMB43160</a>	<a href="#">EMB44160</a>	R1.0	16.0	.6299	16	22	82
<a href="#">EMB43180</a>	<a href="#">EMB44180</a>	R1.0	18.0	.7087	18	24	84
<a href="#">EMB43200</a>	<a href="#">EMB44200</a>	R1.0	20.0	.7874	20	26	92

Mill Dia. Tolerance (mm)	Shank Dia. Tolerance
0~-0.03	h6

◎ : Excellent ○ : Good

ISO Material Description	P										M				K					
	Non-alloy steel					Low alloy steel					High alloyed steel, and tool steel				Stainless steel		Grey cast iron	Nodular cast iron	Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc	13	25	28	32	30	10	29	32	38	15	35	15	23	10	10	26	3	25	21	21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend	◎	◎	○	○	○	◎	○	○	○	◎	○	◎	◎	◎						

ISO Material Description	N					S					H										
	Aluminum-wrought alloy		Aluminum-cast, alloyed		Copper and Copper Alloys (Bronze / Brass)	Non Metallic Materials		Heat Resistant Super Alloys			Titanium Alloys	Hardened steel	Chilled Cast Iron	Hardened Cast Iron							
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend											○	○	○	○	○	◎	◎				



PLAIN SHANK **EMB14** SERIES  
 FLAT SHANK **EMB39** SERIES

### CARBIDE, 4 FLUTE REGULAR LENGTH

- ▶ Special flute geometry eliminates vibrations
- ▶ Designed for mild steels, stainless steel, cast iron, tool steels, titanium alloys, prehardened steels and low hardness material
- ▶ Excellent work piece finishes
- ▶ Higher speeds, deeper cuts and metal removal rates



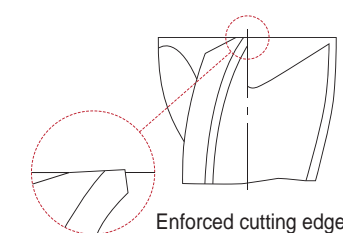
p.C581-C582

◇ Call for Availability

Unit : mm

EDP No.		Mill Diameter		Shank Diameter	Length of Cut	Overall Length
PLAIN	FLAT	Metric	Inch			
<a href="#">EMB14030</a>	-	3.0	.1181	6	8	57
<a href="#">EMB14040</a>	-	4.0	.1575	6	11	57
<a href="#">EMB14050</a>	-	5.0	.1969	6	13	57
<a href="#">EMB14060</a>	-	6.0	.2362	6	13	57
<a href="#">EMB14080</a>	-	8.0	.3150	8	19	63
<a href="#">EMB14100</a>	-	10.0	.3937	10	22	72
-	<a href="#">EMB39120</a>	12.0	.4724	12	26	83
-	<a href="#">EMB39140</a>	14.0	.5512	14	26	83
-	<a href="#">EMB39160</a>	16.0	.6299	16	32	92
-	<a href="#">EMB39180</a>	18.0	.7087	18	32	92
-	<a href="#">EMB39200</a>	20.0	.7874	20	38	104
-	<a href="#">EMB39250</a>	25.0	.9800	25	38	104

Mill Dia. Tolerance (mm)	Shank Dia. Tolerance
0~-0.03	h6



◎ : Excellent ○ : Good

ISO Material Description	P										M				K					
	Non-alloy steel					Low alloy steel					High alloyed steel, and tool steel				Stainless steel		Grey cast iron	Nodular cast iron	Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc	13	25	28	32	30	10	29	32	38	15	35	15	23	10	10	26	3	25	21	21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend	◎	◎	○	○	○	◎	○	○	○	◎	○	◎	◎	◎						

ISO Material Description	N					S					H										
	Aluminum-wrought alloy		Aluminum-cast, alloyed		Copper and Copper Alloys (Bronze / Brass)	Non Metallic Materials		Heat Resistant Super Alloys			Titanium Alloys	Hardened steel	Chilled Cast Iron	Hardened Cast Iron							
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend											○	○	○	○	○	◎	◎				





PLAIN SHANK **EMB15** SERIES  
 FLAT SHANK **EMB40** SERIES

### CARBIDE, 4 FLUTE REGULAR LENGTH CORNER RADIUS

- ▶ Special flute geometry eliminates vibrations
- ▶ Designed for mild steels, stainless steel, cast iron, tool steels, titanium alloys, prehardened steels and low hardness material
- ▶ Excellent work piece finishes
- ▶ Higher speeds, deeper cuts and metal removal rates



◇ Call for Availability

Unit : mm

EDP No.		Corner Radius	Mill Diameter		Shank Diameter	Length of Cut	Overall Length
PLAIN	FLAT	R	Metric	Inch			
<a href="#">EMB15030</a>	-	R0.3	3.0	.1181	6	8	57
<a href="#">EMB15040</a>	-	R0.3	4.0	.1575	6	11	57
<a href="#">EMB15050</a>	-	R0.3	5.0	.1969	6	13	57
<a href="#">EMB15060</a>	-	R0.5	6.0	.2362	6	13	57
<a href="#">EMB15080</a>	-	R0.5	8.0	.3150	8	19	63
<a href="#">EMB15100</a>	-	R0.5	10.0	.3937	10	22	72
-	<a href="#">EMB40120</a>	R0.7	12.0	.4724	12	26	83
-	<a href="#">EMB40140</a>	R0.7	14.0	.5512	14	26	83
-	<a href="#">EMB40160</a>	R1.0	16.0	.6299	16	32	92
-	<a href="#">EMB40180</a>	R1.0	18.0	.7087	18	32	92
-	<a href="#">EMB40200</a>	R1.0	20.0	.7874	20	38	104
-	<a href="#">EMB40250</a>	R1.0	25.0	.9800	25	38	104

Mill Dia. Tolerance (mm)	Shank Dia. Tolerance
0~-0.03	h6

◎ : Excellent ○ : Good

ISO Material Description	P										M				K					
	Non-alloy steel					Low alloy steel					High alloyed steel, and tool steel				Stainless steel		Grey cast iron	Nodular cast iron	Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc	13	25	28	32	30	10	29	32	38	15	35	15	23	10	10	26	3	25	21	21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend	◎	◎	○	○	○	◎	○	○	○	◎	○	◎	◎	◎						

ISO Material Description	N					S					H										
	Aluminum-wrought alloy		Aluminum-cast, alloyed		Copper and Copper Alloys (Bronze / Brass)	Non Metallic Materials		Heat Resistant Super Alloys			Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron						
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc	15	30	25	38	34	15	30	25	38	34	200	280	250	350	320	400 Rm	1050 Rm	55	60	42	55
HB	60	100	75	90	130	110	90	100										550	630	400	550
Recommend											○	○	○	○	○	◎	◎				



PLAIN SHANK **EMB74** SERIES  
 FLAT SHANK **EMB75** SERIES

### CARBIDE, 4 FLUTE REGULAR LENGTH BALL NOSE

- ▶ Special flute geometry eliminates vibrations
- ▶ Designed for mild steels, stainless steel, cast iron, tool steels, titanium alloys, prehardened steels and low hardness material
- ▶ Excellent work piece finishes
- ▶ Higher speeds, deeper cuts and metal removal rates



◇ Call for Availability

Unit : mm

EDP No.		Radius of Ball Nose	Mill Diameter		Shank Diameter	Length of Cut	Overall Length
PLAIN	FLAT	R (±0.01)	Metric	Inch			
<a href="#">EMB74030</a>	<a href="#">EMB75030</a>	R1.5	3.0	.1181	6	8	57
<a href="#">EMB74040</a>	<a href="#">EMB75040</a>	R2.0	4.0	.1575	6	11	57
<a href="#">EMB74050</a>	<a href="#">EMB75050</a>	R2.5	5.0	.1969	6	13	57
<a href="#">EMB74060</a>	<a href="#">EMB75060</a>	R3.0	6.0	.2362	6	13	57
<a href="#">EMB74080</a>	<a href="#">EMB75080</a>	R4.0	8.0	.3150	8	19	63
<a href="#">EMB74100</a>	<a href="#">EMB75100</a>	R5.0	10.0	.3937	10	22	72
<a href="#">EMB74120</a>	<a href="#">EMB75120</a>	R6.0	12.0	.4724	12	26	83
<a href="#">EMB74160</a>	<a href="#">EMB75160</a>	R8.0	16.0	.6299	16	32	92
<a href="#">EMB74200</a>	<a href="#">EMB75200</a>	R10.0	20.0	.7874	20	38	104
<a href="#">EMB74250</a>	<a href="#">EMB75250</a>	R12.5	25.0	.9800	25	38	104

Mill Dia. Tolerance (mm)	Shank Dia. Tolerance
0~-0.03	h6

◎ : Excellent ○ : Good

ISO Material Description	P										M				K					
	Non-alloy steel					Low alloy steel					High alloyed steel, and tool steel				Stainless steel		Grey cast iron	Nodular cast iron	Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc	13	25	28	32	30	10	29	32	38	15	35	15	23	10	10	26	3	25	21	21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend	◎	◎	○	○	○	◎	○	○	○	◎	○	◎	◎	◎						

ISO Material Description	N					S					H										
	Aluminum-wrought alloy		Aluminum-cast, alloyed		Copper and Copper Alloys (Bronze / Brass)	Non Metallic Materials		Heat Resistant Super Alloys			Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron						
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc	15	30	25	38	34	15	30	25	38	34	200	280	250	350	320	400 Rm	1050 Rm	55	60	42	55
HB	60	100	75	90	130	110	90	100										550	630	400	550
Recommend											○	○	○	○	○	◎	◎				



PLAIN SHANK **EMB72** SERIES  
 FLAT SHANK **EMB73** SERIES

**CARBIDE, 5 FLUTE REGULAR LENGTH**

- ▶ Special flute geometry eliminates vibrations
- ▶ Designed for mild steels, stainless steel, cast iron, tool steels, titanium alloys, prehardened steels and low hardness material
- ▶ Excellent work piece finishes
- ▶ Higher speeds, deeper cuts and metal removal rates

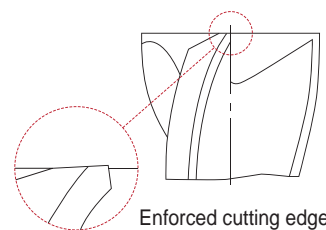


◇ Call for Availability

Unit : mm

EDP No.	Mill Diameter		Shank Diameter	Length of Cut	Overall Length	
	PLAIN	FLAT				Metric
<b>EMB72060</b>	<b>EMB73060</b>	<b>6.0</b>	<b>.2362</b>	<b>6</b>	<b>13</b>	<b>57</b>
<b>EMB72080</b>	<b>EMB73080</b>	<b>8.0</b>	<b>.3150</b>	<b>8</b>	<b>19</b>	<b>63</b>
<b>EMB72100</b>	<b>EMB73100</b>	<b>10.0</b>	<b>.3937</b>	<b>10</b>	<b>22</b>	<b>72</b>
<b>EMB72120</b>	<b>EMB73120</b>	<b>12.0</b>	<b>.4724</b>	<b>12</b>	<b>26</b>	<b>83</b>
<b>EMB72140</b>	<b>EMB73140</b>	<b>14.0</b>	<b>.5512</b>	<b>14</b>	<b>26</b>	<b>83</b>
<b>EMB72160</b>	<b>EMB73160</b>	<b>16.0</b>	<b>.6299</b>	<b>16</b>	<b>32</b>	<b>92</b>
<b>EMB72180</b>	<b>EMB73180</b>	<b>18.0</b>	<b>.7087</b>	<b>18</b>	<b>32</b>	<b>92</b>
<b>EMB72200</b>	<b>EMB73200</b>	<b>20.0</b>	<b>.7874</b>	<b>20</b>	<b>38</b>	<b>104</b>
<b>EMB72250</b>	<b>EMB73250</b>	<b>25.0</b>	<b>.9800</b>	<b>25</b>	<b>38</b>	<b>104</b>

Mill Dia. Tolerance (mm)	Shank Dia. Tolerance
0~-0.03	h6



◎ : Excellent ○ : Good

ISO	P											M				K						
	Non-alloy steel					Low alloy steel						High alloyed steel, and tool steel				Stainless steel		Grey cast iron		Nodular cast iron		Malleable cast iron
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20		
HRc	13	25	28	32	30	10	29	32	38	15	35	15	23	10	10	26	3	25		21		
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230		
Recommend	◎	◎	○	○	○	◎	○	○	○	◎	○	◎	◎	◎								

ISO	N					S					H										
	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)		Non Metallic Materials			Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend											○	○	○	○	○	◎	◎				



RECOMMENDED CUTTING CONDITIONS

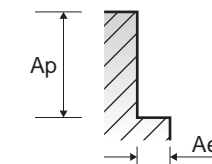
EMC75, EMD60, EMC76, EMD61, EMB12  
 EMB37, EMB13, EMB38, EMB20 SERIES

SFM(Vc) = ft./min.  
 IPT(fz) = in./tooth  
 RPM = rev./min.  
 IPM(Feed) = in./min.

**4 FLUTES - SIDE CUTTING**

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø)										
						1/8	3/16	1/4	5/16	3/8	7/16	1/2	9/16	5/8	3/4	1
P	1-2	Non-alloy steel	0.5D	1.5D (1.2D) [0.6D]	SFM(Vc)	415	415	415	415	415	460	460	460	460	460	460
					IPT(fz)	.0002	.0003	.0005	.0006	.0011	.0015	.0019	.0021	.0023	.0026	.0025
					RPM	12735	8490	6370	5100	4245	4010	3500	3110	2800	2340	1755
	6	Low alloy steel	0.5D	1.5D (1.2D) [0.6D]	SFM(Vc)	415	415	415	415	415	460	460	460	460	460	460
					IPT(fz)	.0002	.0003	.0005	.0006	.0011	.0015	.0019	.0021	.0023	.0026	.0025
					RPM	12735	8490	6370	5100	4245	4010	3500	3110	2800	2340	1755
10	High alloyed steel, and tool steel	0.5D	1.5D (1.2D) [0.6D]	SFM(Vc)	415	415	415	415	415	460	460	460	460	460	460	
				IPT(fz)	.0002	.0003	.0005	.0006	.0011	.0015	.0019	.0021	.0023	.0026	.0025	
				RPM	12735	8490	6370	5100	4245	4010	3500	3110	2800	2340	1755	
M	12-13	Stainless steel	0.5D	1.5D (1.2D) [0.6D]	SFM(Vc)	440	590	445	440	440	440	440	440	440	440	440
					IPT(fz)	.0001	.0002	.0004	.0005	.0009	.0014	.0016	.0018	.0020	.0022	.0022
					RPM	13475	12000	6815	5390	4490	3850	3370	2990	2700	2250	1685
	14.1	Stainless steel	0.5D	1.5D (1.2D) [0.6D]	SFM(Vc)	315	315	315	315	315	315	315	315	315	315	315
					IPT(fz)	.0002	.0003	.0005	.0007	.0012	.0019	.0022	.0025	.0028	.0030	.0031
					RPM	9625	6385	4810	3850	3210	2750	2400	2140	1925	1600	1200
S	31-35	Heat Resistant Super Alloys	0.35D	1.0D [0.6D]	SFM(Vc)	85	85	85	85	85	85	85	85	85	85	80
					IPT(fz)	.0002	.0003	.0005	.0007	.0012	.0019	.0022	.0025	.0027	.0031	.0034
					RPM	2565	1685	1285	1025	855	735	640	570	510	425	315
	36-37	Titanium Alloys	0.5D	1.5D (1.2D) [0.6D]	SFM(Vc)	270	270	270	270	270	275	270	270	270	275	270
					IPT(fz)	.0002	.0004	.0006	.0008	.0014	.0022	.0025	.0029	.0032	.0035	.0036
					RPM	8320	5550	4160	3330	2770	2380	2080	1850	1660	1390	1040

\*( ) : Short length Type  
 \*[ ] : Stub length Type



\*1.2 x D Axial cutting depth should be applied for Short length series DIA over 5/16mm  
 \*0.6 x D Axial cutting depth should be applied for Stub length series.

HSS

HSS

**YG V7 MILL INOX END MILLS**

**YG V7 MILL INOX END MILLS**

RECOMMENDED CUTTING CONDITIONS

RECOMMENDED CUTTING CONDITIONS

**EMC75, EMD60, EMC76, EMD61, EMB12  
EMB37, EMB13, EMB38, EMB20 SERIES**

**EMB41, EMB42, EMB43, EMB44  
EMB14, EMB39, EMB15, EMB40 SERIES**

**4 FLUTE - SLOTTING**

**4 FLUTES - SIDE CUTTING**

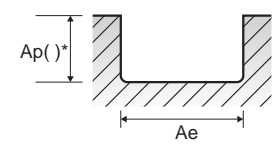
SFM(Vc) = ft./min.  
IPT(fz) = in./tooth  
RPM = rev./min.  
IPM(Feed) = in./min.

SFM(Vc) = ft./min.  
IPT(fz) = in./tooth  
RPM = rev./min.  
IPM(Feed) = in./min.

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø)										
						1/8	3/16	1/4	5/16	3/8	7/16	1/2	9/16	5/8	3/4	1
P	1-2	Non-alloy steel	1.0D	1.0D [0.6D]	SFM(Vc)	415	415	415	415	415	460	460	460	460	460	460
					IPT(fz)	.0002	.0003	.0005	.0006	.0011	.0015	.0019	.0021	.0023	.0026	.0025
					RPM	12735	8490	6370	5100	4245	4010	3500	3110	2800	2340	1755
					IPM(Feed)	10	11	12	13	18	25	26	26	26	24	17
					SFM(Vc)	415	415	415	415	415	460	460	460	460	460	460
					IPT(fz)	.0002	.0003	.0005	.0006	.0011	.0015	.0019	.0021	.0023	.0026	.0025
	6	Low alloy steel	1.0D	1.0D [0.6D]	SFM(Vc)	415	415	415	415	415	460	460	460	460	460	460
					IPT(fz)	.0002	.0003	.0005	.0006	.0011	.0015	.0019	.0021	.0023	.0026	.0025
					RPM	12735	8490	6370	5100	4245	4010	3500	3110	2800	2340	1755
					IPM(Feed)	10	11	12	13	18	25	26	26	26	24	17
					SFM(Vc)	415	415	415	415	415	460	460	460	460	460	460
					IPT(fz)	.0002	.0003	.0005	.0006	.0011	.0015	.0019	.0021	.0023	.0026	.0025
10	High alloyed steel, and tool steel	1.0D	1.0D [0.6D]	SFM(Vc)	415	415	415	415	415	460	460	460	460	460	460	
				IPT(fz)	.0002	.0003	.0005	.0006	.0011	.0015	.0019	.0021	.0023	.0026	.0025	
				RPM	12735	8490	6370	5100	4245	4010	3500	3110	2800	2340	1755	
				IPM(Feed)	10	11	12	13	18	25	26	26	26	24	17	
				SFM(Vc)	440	590	445	440	440	440	440	440	440	440	440	
				IPT(fz)	.0001	.0002	.0004	.0005	.0009	.0014	.0016	.0018	.0020	.0022	.0022	
M	12-13	Stainless steel	1.0D	1.0D [0.6D]	SFM(Vc)	440	590	445	440	440	440	440	440	440	440	440
					IPT(fz)	.0001	.0002	.0004	.0005	.0009	.0014	.0016	.0018	.0020	.0022	.0022
					RPM	13475	12000	6815	5390	4490	3850	3370	2990	2700	2250	1685
					IPM(Feed)	8	8	10	11	15	21	21	21	21	19	15
					SFM(Vc)	315	315	315	315	315	315	315	315	315	315	315
					IPT(fz)	.0002	.0003	.0005	.0007	.0012	.0019	.0022	.0025	.0028	.0030	.0031
S	14.1	Heat Resistant Super Alloys	1.0D	0.5D	SFM(Vc)	85	85	85	85	85	85	85	85	85	85	80
					IPT(fz)	.0002	.0003	.0005	.0007	.0012	.0019	.0022	.0025	.0027	.0031	.0034
					RPM	2565	1685	1285	1025	855	735	640	570	510	425	315
					IPM(Feed)	2	2	3	3	4	6	6	6	6	5	4
					SFM(Vc)	270	270	270	270	270	275	270	270	270	275	270
					IPT(fz)	.0002	.0004	.0006	.0008	.0014	.0022	.0025	.0029	.0032	.0035	.0036
S	31-35	Titanium Alloys	1.0D	1.0D [0.6D]	SFM(Vc)	8320	5550	4160	3330	2770	2380	2080	1850	1660	1390	1040
					IPT(fz)	.0002	.0004	.0006	.0008	.0014	.0022	.0025	.0029	.0032	.0035	.0036
					RPM	8320	5550	4160	3330	2770	2380	2080	1850	1660	1390	1040
					IPM(Feed)	8	8	10	11	15	21	21	21	21	19	15
					SFM(Vc)	270	270	270	270	270	275	270	270	270	275	270
					IPT(fz)	.0002	.0004	.0006	.0008	.0014	.0022	.0025	.0029	.0032	.0035	.0036

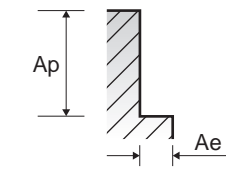
ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø)											
						3.0	4.0	5.0	6.0	8.0	10.0	12.0	14.0	16.0	18.0	20.0	25.0
P	1-2	Non-alloy steel	0.5D	1.5D (1.2D)	SFM(Vc)	415	415	415	415	415	460	460	460	460	460	460	460
					IPT(fz)	.0002	.0003	.0005	.0006	.0011	.0015	.0018	.0019	.0021	.0023	.0026	.0025
					RPM	13480	10110	8090	6740	5050	4460	3710	3180	2790	2480	2230	1780
					IPM(Feed)	11	13	15	17	22	27	27	24	23	23	23	18
					SFM(Vc)	415	415	415	415	415	460	460	460	460	460	460	460
					IPT(fz)	.0002	.0003	.0005	.0006	.0011	.0015	.0018	.0019	.0021	.0023	.0026	.0025
	6	Low alloy steel	0.5D	1.5D (1.2D)	SFM(Vc)	415	415	415	415	415	460	460	460	460	460	460	
					IPT(fz)	.0002	.0003	.0005	.0006	.0011	.0015	.0018	.0019	.0021	.0023	.0026	.0025
					RPM	13480	10110	8090	6740	5050	4460	3710	3180	2790	2480	2230	1780
					IPM(Feed)	11	13	15	17	22	27	27	24	23	23	23	18
					SFM(Vc)	415	415	415	415	415	460	460	460	460	460	460	460
					IPT(fz)	.0002	.0003	.0005	.0006	.0011	.0015	.0018	.0019	.0021	.0023	.0026	.0025
10	High alloyed steel, and tool steel	0.5D	1.5D (1.2D)	SFM(Vc)	415	415	415	415	415	460	460	460	460	460	460		
				IPT(fz)	.0002	.0003	.0005	.0006	.0011	.0015	.0018	.0019	.0021	.0023	.0026	.0025	
				RPM	13480	10110	8090	6740	5050	4460	3710	3180	2790	2480	2230	1780	
				IPM(Feed)	11	13	15	17	22	27	27	24	23	23	23	18	
				SFM(Vc)	440	590	445	440	440	440	440	440	440	440	440	440	
				IPT(fz)	.0001	.0002	.0004	.0005	.0009	.0013	.0016	.0017	.0018	.0020	.0022	.0022	
M	12-13	Stainless steel	0.5D	1.5D (1.2D)	SFM(Vc)	440	590	445	440	440	440	440	440	440	440	440	
					IPT(fz)	.0001	.0002	.0004	.0005	.0009	.0013	.0016	.0017	.0018	.0020	.0022	.0022
					RPM	14260	14260	8660	7130	5350	4280	3570	3060	2670	2380	2140	1710
					IPM(Feed)	8	10	12	14	18	23	22	20	19	19	19	15
					SFM(Vc)	315	315	315	315	315	315	315	315	315	315	315	315
					IPT(fz)	.0002	.0003	.0005	.0007	.0011	.0019	.0022	.0023	.0025	.0028	.0030	.0031
S	14.1	Heat Resistant Super Alloys	0.35D	1.0D	SFM(Vc)	85	85	85	85	85	85	85	85	85	85	80	
					IPT(fz)	.0002	.0003	.0005	.0007	.0012	.0019	.0022	.0024	.0025	.0027	.0030	.0034
					RPM	2720	2010	1630	1360	1020	820	680	580	510	450	410	320
					IPM(Feed)	2	2	3	4	5	6	6	6	5	5	5	4
					SFM(Vc)	315	315	315	315	270	315	315	315	315	315	315	315
					IPT(fz)	.0002	.0003	.0005	.0007	.0014	.0019	.0022	.0023	.0025	.0028	.0030	.0031
S	31-35	Titanium Alloys	0.5D	1.5D (1.2D)	SFM(Vc)	10190	7600	6110	5100	3280	3060	2550	2180	1910	1700	1530	1220
					IPT(fz)	.0002	.0003	.0005	.0007	.0014	.0019	.0022	.0023	.0025	.0028	.0030	.0031
					RPM	10190	7600	6110	5100	3280	3060	2550	2180	1910	1700	1530	1220
					IPM(Feed)	8	10	12	14	18	23	22	20	19	19	19	15
					SFM(Vc)	270	270	270	270	270	275	270	270	270	275	270	
					IPT(fz)	.0002	.0004	.0006	.0008	.0014	.0022	.0025	.0029	.0032	.0035	.0036	

\*( ) : Short length Type  
\*[ ] : Stub length Type



\*1.2 x D Axial cutting depth should be applied for Short length series DIA over 5/16mm  
\*0.6 x D Axial cutting depth should be applied for Stub length series.

\*( ) : Short length Type



\*1.2 x D Axial cutting depth should be applied for Short length series DIA over 5/16mm



HSS

HSS

**Y/G V7 MILL INOX END MILLS**

RECOMMENDED CUTTING CONDITIONS

**Y/G V7 MILL INOX END MILLS**

RECOMMENDED CUTTING CONDITIONS

**EMB41, EMB42, EMB43, EMB44  
EMB14, EMB39, EMB15, EMB40 SERIES**

**4 FLUTE - SLOTTING**

SFM(Vc) = ft./min.  
IPT(fz) = in./tooth  
RPM = rev./min.  
IPM(Feed) = in./min.

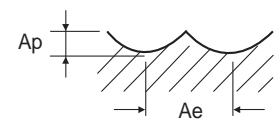
**EMB78, EMB79 SERIES 4 FLUTES - PLANE**

SFM(Vc) = ft./min.  
IPT(fz) = in./tooth  
RPM = rev./min.  
IPM(Feed) = in./min.

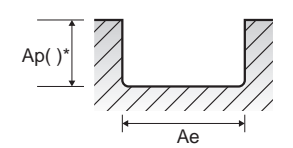
ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø)															
						3.0	4.0	5.0	6.0	8.0	10.0	12.0	14.0	16.0	18.0	20.0	25.0				
P	1-2	Non-alloy steel	1.0D	1.0D	SFM	415	415	415	415	415	460	460	460	460	460	460	460	460			
					IPT	.0002	.0003	.0005	.0006	.0011	.0015	.0018	.0019	.0021	.0023	.0026	.0025				
					RPM	13480	10110	8090	6740	5050	4460	3710	3180	2790	2480	2230	1780				
					IPM	11	13	15	17	22	27	27	24	23	23	23	18				
					SFM	415	415	415	415	415	460	460	460	460	460	460	460				
					IPT	.0002	.0003	.0005	.0006	.0011	.0015	.0018	.0019	.0021	.0023	.0026	.0025				
	RPM	13480	10110	8090	6740	5050	4460	3710	3180	2790	2480	2230	1780								
	IPM	11	13	15	17	22	27	27	24	23	23	23	18								
	6	Low alloy steel	1.0D	1.0D	SFM	415	415	415	415	415	460	460	460	460	460	460	460				
					IPT	.0002	.0003	.0005	.0006	.0011	.0015	.0018	.0019	.0021	.0023	.0026	.0025				
					RPM	13480	10110	8090	6740	5050	4460	3710	3180	2790	2480	2230	1780				
					IPM	11	13	15	17	22	27	27	24	23	23	23	18				
SFM					415	415	415	415	415	460	460	460	460	460	460	460					
IPT					.0002	.0003	.0005	.0006	.0011	.0015	.0018	.0019	.0021	.0023	.0026	.0025					
RPM	13480	10110	8090	6740	5050	4460	3710	3180	2790	2480	2230	1780									
IPM	11	13	15	17	22	27	27	24	23	23	23	18									
10	High alloyed steel, and tool steel	1.0D	1.0D	SFM	415	415	415	415	415	460	460	460	460	460	460	460					
				IPT	.0002	.0003	.0005	.0006	.0011	.0015	.0018	.0019	.0021	.0023	.0026	.0025					
				RPM	13480	10110	8090	6740	5050	4460	3710	3180	2790	2480	2230	1780					
				IPM	11	13	15	17	22	27	27	24	23	23	23	18					
				SFM	415	415	415	415	415	460	460	460	460	460	460	460					
				IPT	.0002	.0003	.0005	.0006	.0011	.0015	.0018	.0019	.0021	.0023	.0026	.0025					
RPM	13480	10110	8090	6740	5050	4460	3710	3180	2790	2480	2230	1780									
IPM	11	13	15	17	22	27	27	24	23	23	23	18									
M	12-13	Stainless steel	1.0D	1.0D	SFM	440	590	445	440	440	440	440	440	440	440	440	440				
					IPT	.0001	.0002	.0004	.0005	.0009	.0013	.0016	.0017	.0018	.0020	.0022	.0022				
					RPM	14260	14260	8660	7130	5350	4280	3570	3060	2670	2380	2140	1710				
					IPM	8	10	12	14	18	23	22	20	19	19	19	15				
					SFM	315	315	315	315	315	315	315	315	315	315	315	315				
					IPT	.0002	.0003	.0005	.0007	.0011	.0019	.0022	.0023	.0025	.0028	.0030	.0031				
RPM	10190	7600	6110	5100	3820	3060	2550	2180	1910	1700	1530	1220									
IPM	8	10	12	14	17	23	22	20	19	19	19	15									
S	31-35	Heat Resistant Super Alloys	1.0D	0.5D	SFM	85	85	85	85	85	85	85	85	85	85	85	80				
					IPT	.0002	.0003	.0005	.0007	.0012	.0019	.0022	.0024	.0025	.0027	.0030	.0034				
					RPM	2720	2010	1630	1360	1020	820	680	580	510	450	410	320				
					IPM	2	2	3	4	5	6	6	6	5	5	5	4				
					SFM	315	315	315	315	270	315	315	315	315	315	315	315				
					IPT	.0002	.0003	.0005	.0007	.0014	.0019	.0022	.0023	.0025	.0028	.0030	.0031				
RPM	10190	7600	6110	5100	3280	3060	2550	2180	1910	1700	1530	1220									
IPM	8	10	12	14	18	23	22	20	19	19	19	15									

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø)															
						1/8	3/16	1/4	5/16	3/8	7/16	1/2	9/16	5/8	3/4	1					
P	1-2	Non-alloy steel	0.5D	1.0D	SFM	445	445	445	445	445	445	445	445	445	440	445	445	440			
					IPT	.0010	.0012	.0015	.0023	.0024	.0026	.0028	.0028	.0029	.0035	.0039					
					RPM	13530	9020	6770	5410	4510	3870	3380	3010	2710	2260	1690					
					IPM	53	43	41	51	43	40	37	34	32	32	27					
					SFM	445	445	445	445	445	445	440	445	445	445	440					
					IPT	.0010	.0012	.0015	.0023	.0024	.0026	.0028	.0028	.0029	.0035	.0039					
	RPM	13530	9020	6770	5410	4510	3870	3380	3010	2710	2260	1690									
	IPM	53	43	41	51	43	40	37	34	32	32	27									
	6	Low alloy steel	0.5D	1.0D	SFM	445	445	445	445	445	445	445	440	445	445	445	440				
					IPT	.0010	.0012	.0015	.0023	.0024	.0026	.0028	.0028	.0029	.0035	.0039					
					RPM	13530	9020	6770	5410	4510	3870	3380	3010	2710	2260	1690					
					IPM	53	43	41	51	43	40	37	34	32	32	27					
SFM					445	445	445	445	445	445	440	445	445	445	440						
IPT					.0010	.0012	.0015	.0023	.0024	.0026	.0028	.0028	.0029	.0035	.0039						
RPM	13530	9020	6770	5410	4510	3870	3380	3010	2710	2260	1690										
IPM	53	43	41	51	43	40	37	34	32	32	27										
10	High alloyed steel, and tool steel	0.5D	1.0D	SFM	445	445	445	445	445	445	445	440	445	445	445	440					
				IPT	.0010	.0012	.0015	.0023	.0024	.0026	.0028	.0028	.0029	.0035	.0039						
				RPM	13530	9020	6770	5410	4510	3870	3380	3010	2710	2260	1690						
				IPM	53	43	41	51	43	40	37	34	32	32	27						
				SFM	445	445	445	445	445	445	440	445	445	445	440						
				IPT	.0010	.0012	.0015	.0023	.0024	.0026	.0028	.0028	.0029	.0035	.0039						
RPM	13530	9020	6770	5410	4510	3870	3380	3010	2710	2260	1690										
IPM	53	43	41	51	43	40	37	34	32	32	27										
M	12-13	Stainless steel	0.5D	1.0D	SFM	230	230	230	230	230	230	230	230	230	230	230					
					IPT	.0006	.0010	.0012	.0016	.0018	.0019	.0020	.0021	.0021	.0023	.0023					
					RPM	7020	4680	3510	2810	2340	2010	1750	1560	1400	1170	880					
					IPM	16	18	16	18	17	15	14	13	12	11	8					
					SFM	255	255	255	255	255	255	255	255	255	255	255					
					IPT	.0008	.0010	.0016	.0018	.0020	.0021	.0022	.0023	.0024	.0026	.0028					
RPM	7770	5180	3880	3110	2590	2220	1940	1730	1550	1290	970										
IPM	24	20	25	22	20	18	17	16	15	13	11										
S	31-35	Heat Resistant Super Alloys	0.2D	0.3D	SFM	100	100	100	100	100	100	100	100	100	100	100					
					IPT	.0004	.0004	.0006	.0010	.0011	.0013	.0015	.0017	.0018	.0021	.0020					
					RPM	3010	2010	1500	1200	1000	860	750	670	600	500	380					
					IPM	5	3	4	5	4	4	5	5	4	4	3					
					SFM	180	180	180	180	180	180	180	180	180	180	180					
					IPT	.0005	.0006	.0008	.0012	.0012	.0014	.0016	.0016	.0017	.0024	.0027					
RPM	5510	3680	2760	2210	1840	1580	1380	1230	1100	920	690										
IPM	10	9	9	10	9	9	9	8	8	9	7										

SFM = Surface Feet per Minute  
RPM = Revolutions Per Minute  
IPT = Inches Per Tooth  
IPM = Inches Per Minute  
Ap : Inch (Axial Depth of Cut)  
Ae : Inch (Radial Depth of Cut)



SFM = Surface Feet per Minute  
RPM = Revolutions Per Minute  
IPT = Inches Per Tooth  
IPM = Inches Per Minute  
Ap : Inch (Axial Depth of Cut)  
Ae : Inch (Radial Depth of Cut)



\*( ) : Short length Type

\*1.2 x D Axial cutting depth should be applied for Short length series DIA over 5/16mm

**YG V7 MILL INOX END MILLS**

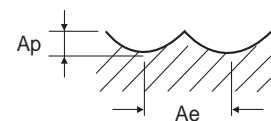
RECOMMENDED CUTTING CONDITIONS

**YG V7 MILL INOX END MILLS**

RECOMMENDED CUTTING CONDITIONS

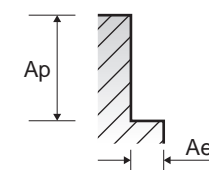
**EMB74, EMB75 SERIES 4 FLUTES - PLANE**

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø)											
						3.0	4.0	5.0	6.0	8.0	10.0	12.0	16.0	18.0	20.0	25.0	
P	1-2	Non-alloy steel	0.5D	1.0D	SFM (Vc)	445	445	445	460	445	440	445	440	440	440	440	440
					IPT (fz)	.0010	.0010	.0012	.0015	.0023	.0024	.0027	.0029	.0031	.0035	.0039	
					RPM	14320	10740	8590	7460	5370	4290	3580	2680	2380	2140	1710	
	6	Low alloy steel	0.5D	1.0D	SFM (Vc)	445	445	445	460	445	440	445	440	440	440	440	
					IPT (fz)	.0010	.0010	.0012	.0015	.0023	.0024	.0027	.0029	.0031	.0035	.0039	
					RPM	14320	10740	8590	7460	5370	4290	3580	2680	2380	2140	1710	
	10	High alloyed steel, and tool steel	0.5D	1.0D	SFM (Vc)	445	445	445	460	445	440	445	440	440	440	440	
					IPT (fz)	.0010	.0010	.0012	.0015	.0023	.0024	.0027	.0029	.0031	.0035	.0039	
					RPM	14320	10740	8590	7460	5370	4290	3580	2680	2380	2140	1710	
M	12-13	Stainless steel	0.5D	1.0D	SFM (Vc)	230	230	230	230	230	230	230	230	230	230	230	
					IPT (fz)	.0006	.0006	.0010	.0012	.0016	.0018	.0020	.0021	.0023	.0023	.0023	
					RPM	7420	5570	4450	3710	2780	2220	1850	1390	1230	1110	890	
	14.1	Stainless steel	0.5D	1.0D	SFM (Vc)	255	255	255	255	255	255	255	255	255	255	255	
					IPT (fz)	.0008	.0008	.0010	.0016	.0018	.0020	.0022	.0024	.0025	.0026	.0027	
					RPM	8220	6160	4930	4110	3080	2460	2050	1540	1370	1230	980	
	S	31-35	Heat Resistant Super Alloys	0.2D	0.3D	SFM (Vc)	100	100	100	100	100	100	95	100	95	100	
						IPT (fz)	.0004	.0004	.0004	.0006	.0010	.0010	.0015	.0018	.0020	.0021	.0021
						RPM	3180	2380	1910	1590	1190	950	790	590	530	470	380
36-37		Titanium Alloys	0.5D	1.0D	SFM (Vc)	180	180	180	180	180	180	180	180	180	180	180	
					IPT (fz)	.0005	.0005	.0006	.0008	.0012	.0012	.0016	.0017	.0019	.0024	.0027	
					RPM	5830	4370	3500	2910	2180	1750	1450	1090	970	870	700	
IPM (FEED)		11	8	8	9	10	8	9	7	7	8	7					



**EMB76, EMB77 SERIES 5 FLUTES - SIDE CUTTING**

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø)										
						1/4	5/16	3/8	7/16	1/2	9/16	5/8	3/4	1		
P	1-2	Non-alloy steel	0.25D	1.25D	SFM (Vc)	450	450	450	450	450	450	450	450	450	450	450
					IPT (fz)	.0013	.0015	.0020	.0022	.0025	.0027	.0030	.0035	.0040		
					RPM	6870	5490	4580	3920	3430	3050	2750	2290	1720		
	6	Low alloy steel	0.25D	1.25D	SFM (Vc)	450	450	450	450	450	450	450	450	450	450	
					IPT (fz)	.0013	.0015	.0020	.0022	.0025	.0027	.0030	.0035	.0040		
					RPM	6870	5490	4580	3920	3430	3050	2750	2290	1720		
	10	High alloyed steel, and tool steel	0.25D	1.25D	SFM (Vc)	450	450	450	450	450	450	450	450	450	450	
					IPT (fz)	.0013	.0015	.0020	.0022	.0025	.0027	.0030	.0035	.0040		
					RPM	6870	5490	4580	3920	3430	3050	2750	2290	1720		
M	12-13	Stainless steel	0.25D	1.25D	SFM (Vc)	350	350	350	350	350	350	350	350	350	350	
					IPT (fz)	.0012	.0012	.0015	.0016	.0017	.0025	.0027	.0030	.0035		
					RPM	5310	4250	3540	3040	2660	2360	2130	1770	1330		
	14.1	Stainless steel	0.25D	1.25D	SFM (Vc)	375	375	375	375	375	375	375	375	375	375	
					IPT (fz)	.0012	.0013	.0015	.0020	.0025	.0026	.0027	.0030	.0035		
					RPM	5710	4570	3810	3270	2860	2540	2290	1900	1430		
	S	31-35	Heat Resistant Super Alloys	0.25D	1.0D	SFM (Vc)	90	90	90	90	90	90	90	90	90	90
						IPT (fz)	.0007	.0008	.0010	.0012	.0014	.0018	.0019	.0024	.0030	
						RPM	1350	1080	900	770	680	600	540	450	340	
36-37		Titanium Alloys	0.25D	1.25D	SFM (Vc)	275	275	275	275	275	275	275	275	275	275	
					IPT (fz)	.0012	.0012	.0015	.0017	.0020	.0022	.0025	.0030	.0035		
					RPM	4200	3360	2800	2400	2100	1860	1680	1400	1050		
IPM (FEED)		25	21	21	21	21	21	21	21	21	18					





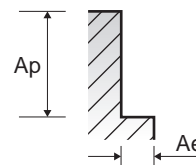
# V7 MILL INOX END MILLS

## RECOMMENDED CUTTING CONDITIONS

### EMB72, EMB73 SERIES

### 5 FLUTES - SIDE CUTTING

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø)						
						6.0	8.0	10.0	12.0	14.0	16.0	20.0
P	1-2	Non-alloy steel	0.25D	1.25D	SFM (Vc)	445	445	445	445	445	445	445
					IPT (fz)	.0013	.0015	.0020	.0025	.0027	.0030	.0035
					RPM	7160	5370	4300	3580	3070	2690	2150
	6	Low alloy steel	0.25D	1.25D	SFM (Vc)	450	450	450	450	450	450	450
					IPT (fz)	.0013	.0015	.0020	.0022	.0025	.0027	.0035
					RPM	6870	5490	4580	3920	3430	3050	2290
	10	High alloyed steel, and tool steel	0.25D	1.25D	SFM (Vc)	450	450	450	450	450	450	450
					IPT (fz)	.0013	.0015	.0020	.0022	.0025	.0027	.0035
					RPM	6870	5490	4580	3920	3430	3050	2290
M	12-13	Stainless steel	0.25D	1.25D	SFM (Vc)	345	345	345	475	345	345	345
					IPT (fz)	.0012	.0013	.0015	.0017	.0025	.0027	.0030
					RPM	5570	4180	3340	3850	2390	2090	1670
	14.1	Stainless steel	0.25D	1.25D	SFM (Vc)	375	380	375	375	380	380	375
					IPT (fz)	.0012	.0013	.0015	.0025	.0026	.0027	.0030
					RPM	6100	4580	3660	3050	2620	2290	1830
S	31-35	Heat Resistant Super Alloys	0.25D	1.0D	SFM (Vc)	80	80	80	80	80	80	80
					IPT (fz)	.0007	.0008	.0010	.0014	.0018	.0019	.0023
					RPM	1330	1000	800	660	570	500	400
	36-37	Titanium Alloys	0.25D	1.25D	SFM (Vc)	280	280	280	280	280	280	280
					IPT (fz)	.0012	.0012	.0015	.0020	.0022	.0025	.0030
					RPM	4510	3380	2710	2260	1930	1690	1350
					IPM (FEED)	27	21	20	22	22	21	20







Being the best through innovation

SOLID CARBIDE

# ALU-POWER HPC END MILLS

- For Aluminium, Aluminum Die Cast, Non-ferrous Alloys and Plastics

SELECTION GUIDE



SOLID CARBIDE ALU-POWER HPC END MILLS

3-Flute, High-Performance, For Aluminum, Aluminum Die Cast, Non-Ferrous Alloys And Plastics



Recommended cutting conditions : p.C600

⊙ : Excellent ○ : Good

Table with columns: ISO, VDI 3323, Material Description, Composition / Structure / Heat Treatment, HB, Hrc. Rows include P (Non-alloy steel, Low alloy steel, High alloyed steel), M (Stainless steel), K (Grey cast iron, Nodular cast iron, Malleable cast iron), N (Aluminum-wrought alloy, Aluminum-cast alloyed, Copper and Copper Alloys, Non Metallic Materials), S (Heat Resistant Super Alloys, Titanium Alloys), H (Hardened steel, Chilled Cast Iron, Hardened Cast Iron).

Table with columns: SERIES (JAG95, JAG97, E5G95, E5G97), FLUTE (3), HELIX ANGLE (37°), CUTTING EDGE SHAPE (SQUARE, CORNER RADIUS), SIZE MIN (1/8), SIZE MAX (1), PAGE (C590-C591, C592-C593), STANDARD LENGTH, Coating (DLC, Uncoated).



Table with columns: JAG96, JAG98, E5G96, E5G98, JAI38, E5I36, E5I38, JAI39, E5I37, E5I39. Includes details for FLUTE, HELIX ANGLE, CUTTING EDGE SHAPE, SIZE MIN, SIZE MAX, PAGE, STANDARD LENGTH, and Coating (DLC, Uncoated).





HSS



SQUARE CORNER RADIUS JAG95 SERIES JAG97 SERIES

CARBIDE, 3-FLUTE STANDARD LENGTH - DLC COATED

- Balanced cutting with less vibration
Ability to run at higher speeds with less heat in aluminum
More efficient chip evacuation
Ability to counteract extreme radial forces
DLC Coating provides edge strength and unsurpassed tool life

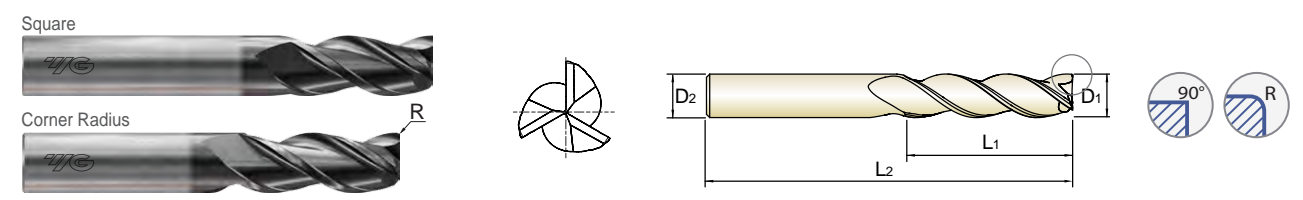


Table with columns: OD (D1), SD (D2), LOC (L1), OAL (L2), Square End EDP No., and Corner Radius (.010 to .250) EDP No.

Outside Diameter Tolerances (inch) and Shank Dimeter Tolerance table.

NEXT PAGE

ISO material compatibility chart with columns for P, M, K, S, H and rows for Material Description, VDI 3323, HRC, HB, and Recommended.



SQUARE CORNER RADIUS JAG95 SERIES JAG97 SERIES

CARBIDE, 3-FLUTE STANDARD LENGTH - DLC COATED

- Balanced cutting with less vibration
Ability to run at higher speeds with less heat in aluminum
More efficient chip evacuation
Ability to counteract extreme radial forces
DLC Coating provides edge strength and unsurpassed tool life

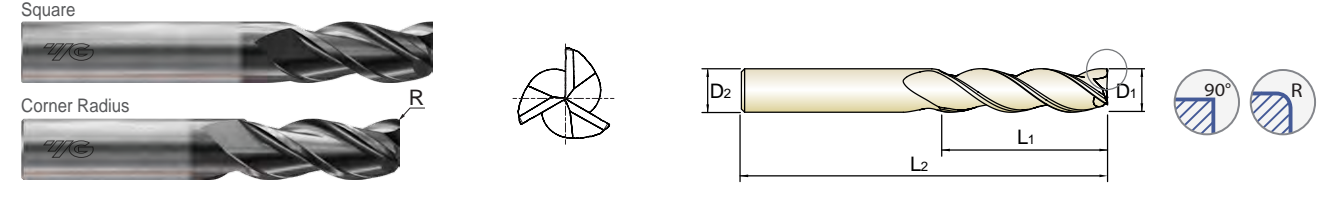


Table with columns: OD (D1), SD (D2), LOC (L1), OAL (L2), Square End EDP No., and Corner Radius (.010 to .250) EDP No.

Outside Diameter Tolerances (inch) and Shank Dimeter Tolerance table.

ISO material compatibility chart with columns for P, M, K, S, H and rows for Material Description, VDI 3323, HRC, HB, and Recommended.



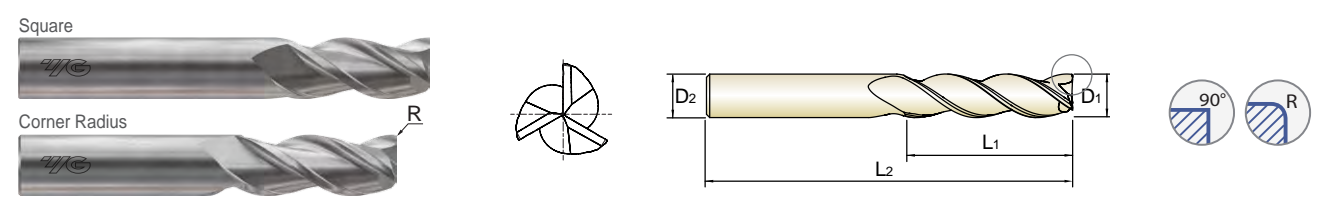
HSS

# Y/G ALU-POWER HPC END MILLS

SQUARE E5G95 SERIES  
CORNER RADIUS E5G97 SERIES

## CARBIDE, 3-FLUTE STANDARD LENGTH - UNCOATED

- Balanced cutting with less vibration
- Ability to run at higher speeds with less heat in aluminum
- More efficient chip evacuation
- Ability to counteract extreme radial forces



Unit : Inch

OD (D1)	SD (D2)	LOC (L1)	OAL (L2)	Square End EDP No.	Corner Radius							
					.010 EDP No.	.030 EDP No.	.060 EDP No.	.090 EDP No.	.120 EDP No.	.190 EDP No.	.250 EDP No.	
1/8	1/8	1/4	1-1/2	E5G95008	E5G97008	E5G97901						
		3/8	1-1/2	E5G95901	E5G97902	E5G97903						
3/16	3/16	5/16	2	E5G95012	E5G97012	E5G97904						
		9/16	2	E5G95902	E5G97905	E5G97906						
1/4	1/4	3/8	2	E5G95016	E5G97016	E5G97907	E5G97908					
		5/8	2-1/2	E5G95903	E5G97909	E5G97910	E5G97911					
		7/8	3	E5G95929	E5G97892	E5G97893	E5G97894					
		1-1/4	3-1/4	E5G95904	E5G97912	E5G97913	E5G97914					
5/16	5/16	7/16	2	E5G95020	E5G97020	E5G97915	E5G97916	E5G97917				
		5/8	2-1/2	E5G95905	E5G97918	E5G97919	E5G97920	E5G97921				
		13/16	3	E5G95930	E5G97895	E5G97896	E5G97897	E5G97898				
		1-1/4	3-1/2	E5G95906	E5G97922	E5G97923	E5G97924	E5G97925				
3/8	3/8	1/2	2	E5G95024	E5G97024	E5G97926	E5G97927	E5G97928	E5G97929			
		1	2-1/2	E5G95907	E5G97930	E5G97931	E5G97932	E5G97933	E5G97934			
		1-1/2	3-1/2	E5G95908	E5G97935	E5G97936	E5G97937	E5G97938	E5G97939			
		2	4	E5G95909	E5G97940	E5G97941	E5G97942	E5G97943	E5G97944			
7/16	7/16	9/16	2-1/2	E5G95028	E5G97028	E5G97945	E5G97946	E5G97947	E5G97948			
		1-1/4	2-3/4	E5G95910	E5G97949	E5G97950	E5G97951	E5G97952	E5G97953			
		2	4	E5G95911	E5G97954	E5G97955	E5G97956	E5G97957	E5G97958			

NEXT PAGE ▶

Outside Diameter Tolerances (inch)		Shank Diameter Tolerance
Diameter	Tolerance	
1/8 - 3/16	+0/-0.0032	h6
1/4 - 3/8	+0/-0.0035	
1/2 - 5/8	+0/-0.0043	
3/4 - 1	+0/-0.0051	

◎ : Excellent ○ : Good

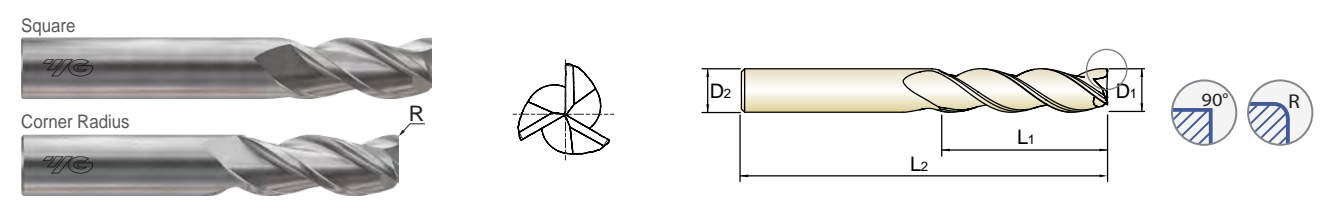
ISO	P										M				K			H		
	Non-alloy steel					Low alloy steel					High alloyed steel, and tool steel				Stainless steel		Grey cast iron		Nodular cast iron	Malleable cast iron
Material Description	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRC	13	25	28	32	35	38	40	42	45	48	50	52	54	56	58	60	62	64	66	68
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎

# Y/G ALU-POWER HPC END MILLS

SQUARE E5G95 SERIES  
CORNER RADIUS E5G97 SERIES

## CARBIDE, 3-FLUTE STANDARD LENGTH - UNCOATED

- Balanced cutting with less vibration
- Ability to run at higher speeds with less heat in aluminum
- More efficient chip evacuation
- Ability to counteract extreme radial forces



Unit : Inch

OD (D1)	SD (D2)	LOC (L1)	OAL (L2)	Square End EDP No.	Corner Radius							
					.010 EDP No.	.030 EDP No.	.060 EDP No.	.090 EDP No.	.120 EDP No.	.190 EDP No.	.250 EDP No.	
1/2	1/2	5/8	2-1/2	E5G95032	E5G97032	E5G97959	E5G97960	E5G97961	E5G97962	E5G97963		
		1	3	E5G95927	E5G97879	E5G97880	E5G97881	E5G97882	E5G97883	E5G97884		
		1-1/4	3	E5G95912	E5G97964	E5G97965	E5G97966	E5G97967	E5G97968	E5G97969		
		1-5/8	4	E5G95913	E5G97970	E5G97971	E5G97972	E5G97973	E5G97974	E5G97975		
		2	4	E5G95914	E5G97976	E5G97977	E5G97978	E5G97979	E5G97980	E5G97981		
		2-1/2	5	E5G95915	E5G97982	E5G97983	E5G97984	E5G97985	E5G97986	E5G97987		
		3	5	E5G95916	E5G97988	E5G97989	E5G97990	E5G97991	E5G97992	E5G97993		
5/8	5/8	3/4	3	E5G95040	E5G97040	E5G97994	E5G97995	E5G97996	E5G97997	E5G97998		
		1-5/8	3-1/2	E5G95917	E5G97999	E5G97801	E5G97802	E5G97803	E5G97804	E5G97805		
		2-1/2	5	E5G95918	E5G97806	E5G97807	E5G97808	E5G97809	E5G97810	E5G97811		
		3	5-1/4	E5G95919	E5G97812	E5G97813	E5G97814	E5G97815	E5G97816	E5G97817		
3/4	3/4	1	3	E5G95048	E5G97048	E5G97818	E5G97819	E5G97820	E5G97821	E5G97822	E5G97823	
		1-5/8	4	E5G95920	E5G97824	E5G97825	E5G97826	E5G97827	E5G97828	E5G97829	E5G97830	
		2-1/4	5	E5G95921	E5G97831	E5G97832	E5G97833	E5G97834	E5G97835	E5G97836	E5G97837	
		3-1/4	6	E5G95922	E5G97838	E5G97839	E5G97840	E5G97841	E5G97842	E5G97843	E5G97844	
1	1	4	6-1/4	E5G95923	E5G97845	E5G97846	E5G97847	E5G97848	E5G97849	E5G97850	E5G97851	
		1-1/4	3	E5G95064	E5G97064	E5G97852	E5G97853	E5G97854	E5G97855	E5G97856	E5G97857	
		1-1/4	4	E5G95928	E5G97885	E5G97886	E5G97887	E5G97888	E5G97889	E5G97890	E5G97891	
		2	5	E5G95924	E5G97858	E5G97859	E5G97860	E5G97861	E5G97862	E5G97863	E5G97864	
		3-1/4	6	E5G95925	E5G97865	E5G97866	E5G97867	E5G97868	E5G97869	E5G97870	E5G97871	
4	7	E5G95926	E5G97872	E5G97873	E5G97874	E5G97875	E5G97876	E5G97877	E5G97878			

Outside Diameter Tolerances (inch)		Shank Diameter Tolerance
Diameter	Tolerance	
1/8 - 3/16	+0/-0.0032	h6
1/4 - 3/8	+0/-0.0035	
1/2 - 5/8	+0/-0.0043	
3/4 - 1	+0/-0.0051	

◎ : Excellent ○ : Good

ISO	P										M				K			H		
	Non-alloy steel					Low alloy steel					High alloyed steel, and tool steel				Stainless steel		Grey cast iron		Nodular cast iron	Malleable cast iron
Material Description	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRC	13	25	28	32	35	38	40	42	45	48	50	52	54	56	58	60	62	64	66	68
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎

HSS



SQUARE CORNER RADIUS JAG96 SERIES JAG98 SERIES

CARBIDE, 3-FLUTE EXTENDED LENGTH - DLC COATED

- Balanced cutting with less vibration
Ability to run at higher speeds with less heat in aluminum
More efficient chip evacuation
Ability to counteract extreme radial forces
DLC Coating provides edge strength and unsurpassed tool life

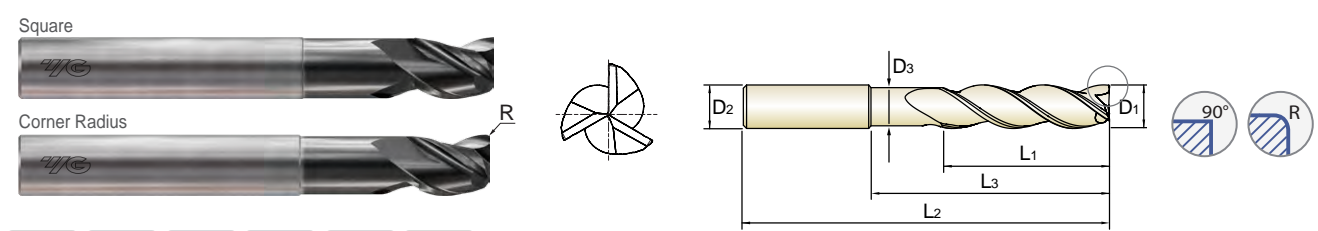


Table with columns: OD (D1), SD (D2), LOC (L1), LBS (L3), OAL (L2), Neck Dia. (D3), Square End EDP No., and Corner Radius (.010 to .250) EDP Nos. for JAG96 and JAG98 series.

Table with columns: Outside Diameter Tolerances (inch) and Shank Diameter Tolerance (h6).

ISO material compatibility chart for JAG96/98 series, showing suitability for various materials like Non-alloy steel, Low alloy steel, High alloyed steel, Stainless steel, etc.



SQUARE CORNER RADIUS E5G96 SERIES E5G98 SERIES

CARBIDE, 3-FLUTE EXTENDED LENGTH - UNCOATED

- Balanced cutting with less vibration
Ability to run at higher speeds with less heat in aluminum
More efficient chip evacuation
Ability to counteract extreme radial forces

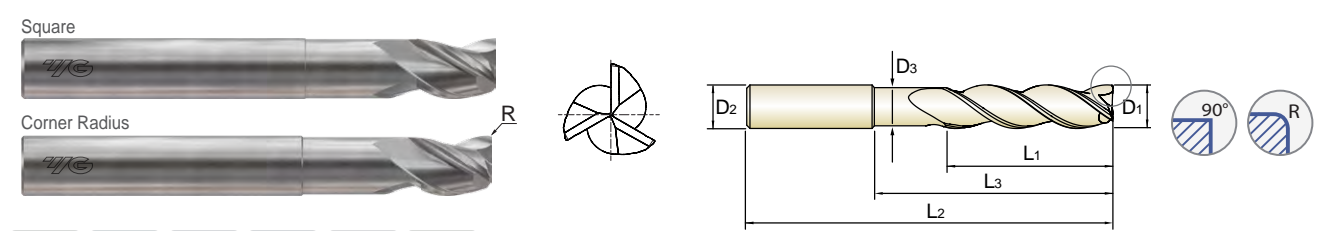


Table with columns: OD (D1), SD (D2), LOC (L1), LBS (L3), OAL (L2), Neck Dia. (D3), Square End EDP No., and Corner Radius (.010 to .250) EDP Nos. for E5G96 and E5G98 series.

Table with columns: Outside Diameter Tolerances (inch) and Shank Diameter Tolerance (h6).

ISO material compatibility chart for E5G96/98 series, showing suitability for various materials like Non-alloy steel, Low alloy steel, High alloyed steel, Stainless steel, etc.

HSS

CBN END MILLS

i-Xmill END MILLS

i-SMART MODULAR END MILLS

X5070 END MILLS

4G MILL END MILLS

X-POWER PRO END MILLS

TitaNox-POWER END MILLS

JET-POWER END MILLS

V7 PLUS A END MILLS

V7 MILL INOX

ALU-POWER HPC END MILLS

ALU-POWER END MILLS

D-POWER GRAPHITE END MILLS

STANDARD CARBIDE

ONLY ONE COATED PM60 END MILLS

SINE-POWER

TANK-POWER END MILLS

STANDARD COBALT & HSS

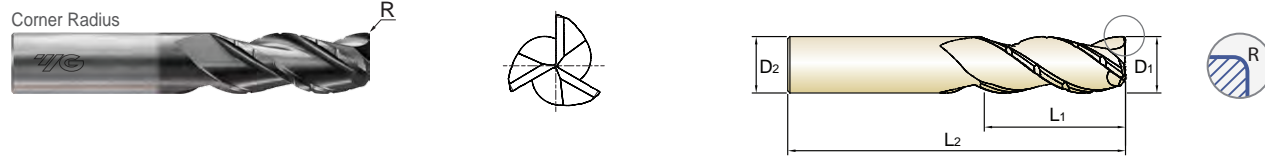
TECHNICAL DATA

# Y/G ALU-POWER HPC END MILLS

CORNER RADIUS JAI38 SERIES

## CARBIDE, 3-FLUTE STANDARD LENGTH - CHIP BREAKER - DLC COATED

- ▶ Balanced cutting with less vibration
- ▶ Ability to run at higher speeds with less heat in aluminum
- ▶ Chip Breaker Improves chip evacuation by shortening the chip length
- ▶ Ability to counteract extreme radial forces
- ▶ DLC Coating provides edge strength and unsurpassed tool life



Unit : Inch

OD (D1)	SD (D2)	LOC (L1)	OAL (L2)	Corner Radius			
				.010 EDP No.	.030 EDP No.	.060 EDP No.	.120 EDP No.
1/8	1/8	1/4	1-1/2	JAI38008			
		3/8	1-1/2	JAI38901			
		1/2	2-1/2	JAI38902			
3/16	3/16	5/16	2	JAI38012			
		9/16	2	JAI38903	JAI38904		
		3/8	2	JAI38016	JAI38905		
1/4	1/4	5/8	2-1/2	JAI38906	JAI38907		
		1-1/4	3-1/4	JAI38908	JAI38909	JAI38910	
		1/2	2	JAI38024	JAI38911		
3/8	3/8	1	2-1/2	JAI38912	JAI38913	JAI38914	
		1-1/2	3-1/2	JAI38915	JAI38916	JAI38917	
		2	4			JAI38918	
1/2	1/2	5/8	2-1/2	JAI38032	JAI38919	JAI38920	
		1-1/4	3	JAI38921	JAI38922	JAI38923	
		1-5/8	4	JAI38924	JAI38925	JAI38926	
		2	4	JAI38927	JAI38928	JAI38929	
		2-1/2	5		JAI38930	JAI38931	
		3	5		JAI38932		
5/8	5/8	3/4	3			JAI38040	
		1-5/8	3-1/2			JAI38933	
3/4	3/4	1	3	JAI38048	JAI38935	JAI38936	
		1-5/8	4	JAI38937	JAI38938	JAI38939	JAI38940
		2-1/4	5		JAI38941	JAI38942	JAI38943
1	1	1-1/4	3	JAI38064			
		2	5	JAI38944	JAI38945	JAI38946	
		3-1/4	6	JAI38947			

Outside Diameter Tolerances (inch)		Shank Diameter Tolerance	
Diameter	Tolerance		
1/8 - 3/16	+0/-0.0032	h6	◇ : Call for availability
1/4 - 3/8	+0/-0.0035		
1/2 - 5/8	+0/-0.0043		
3/4 - 1	+0/-0.0051		

◎ : Excellent ○ : Good

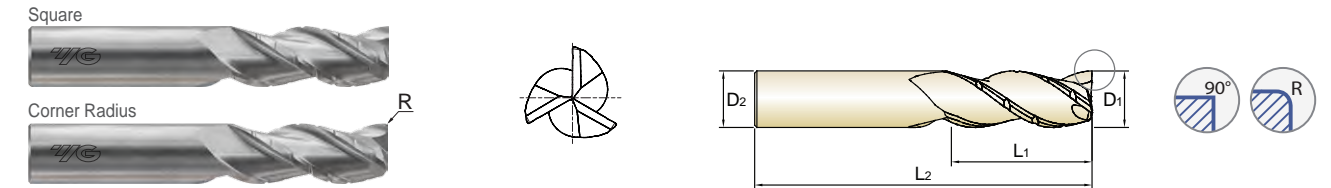
ISO	P														M						K					H		
	Non-alloy steel					Low alloy steel					High alloy steel, and tool steel				Stainless steel		Grey cast iron	Nodular cast iron		Malleable cast iron	Hardened steel			Chilled Cast Iron	Hardened Cast Iron			
Material Description	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20								
VDI 3323																												
HRc	13	25	28	32	30	10	29	32	38	15	35	15	23	10	10	26	3	25		21								
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230								
Recommended	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	

# Y/G ALU-POWER HPC END MILLS

SQUARE E5136 SERIES  
CORNER RADIUS E5138 SERIES

## CARBIDE, 3-FLUTE STANDARD LENGTH - CHIP BREAKER - UNCOATED

- ▶ Balanced cutting with less vibration
- ▶ Ability to run at higher speeds with less heat in aluminum
- ▶ Chip Breaker Improves chip evacuation by shortening the chip length
- ▶ Ability to counteract extreme radial forces



Unit : Inch

OD (D1)	SD (D2)	LOC (L1)	OAL (L2)	Square End EDP No.	Corner Radius			
					.010 EDP No.	.030 EDP No.	.060 EDP No.	.120 EDP No.
1/8	1/8	1/4	1-1/2		E5138008			
		3/8	1-1/2		E5138901			
		1/2	2-1/2		E5138902			
3/16	3/16	5/16	2		E5138012			
		9/16	2		E5138903	E5138904		
		3/8	2		E5138016	E5138905		
1/4	1/4	5/8	2-1/2		E5138906	E5138907		
		1-1/4	3-1/4		E5138908	E5138909	E5138910	
		1/2	2		E5138024	E5138911		
3/8	3/8	1	2-1/2		E5138912	E5138913	E5138914	
		1-1/2	3-1/2		E5138915	E5138916	E5138917	
		2	4				E5138918	
1/2	1/2	5/8	2-1/2		E5138032	E5138919	E5138920	
		1-1/4	3	E5136032	E5138921	E5138922	E5138923	
		1-5/8	4	E5136901	E5138924	E5138925	E5138926	
		2	4	E5136901	E5138927	E5138928	E5138929	
		2-1/2	5			E5138930	E5138931	
		3	5	E5136902		E5138932		
5/8	5/8	3/4	3	E5136040			E5138040	
		1-5/8	3-1/2				E5138933	
3/4	3/4	1	3	E5136048	E5138048	E5138935	E5138936	
		1-5/8	4	E5136903	E5138937	E5138938	E5138939	E5138940
		2-1/4	5			E5138941	E5138942	E5138943
1	1	1-1/4	3		E5138064			
		2	5		E5138944	E5138945	E5138946	
		3-1/4	6		E5138947			

Outside Diameter Tolerances (inch)		Shank Diameter Tolerance	
Diameter	Tolerance		
1/8 - 3/16	+0/-0.0032	h6	◇ : Call for availability
1/4 - 3/8	+0/-0.0035		
1/2 - 5/8	+0/-0.0043		
3/4 - 1	+0/-0.0051		

◎ : Excellent ○ : Good

ISO	P														M						K					H		
	Non-alloy steel					Low alloy steel					High alloy steel, and tool steel				Stainless steel		Grey cast iron	Nodular cast iron		Malleable cast iron	Hardened steel			Chilled Cast Iron	Hardened Cast Iron			
Material Description	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20								
VDI 3323																												
HRc	13	25	28	32	30	10	29	32	38	15	35	15	23	10	10	26	3	25		21								
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230								
Recommended	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	

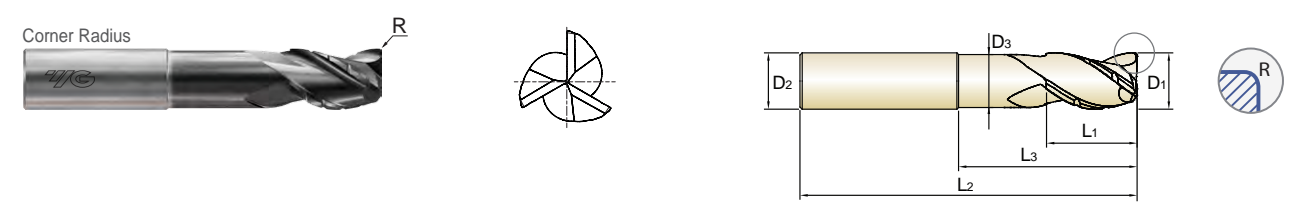


**Y/G ALU-POWER HPC END MILLS**

CORNER RADIUS **JAI39** SERIES

**CARBIDE, 3-FLUTE EXTENDED LENGTH - CHIP BREAKER - DLC COATED**

- ▶ Balanced cutting with less vibration
- ▶ Ability to run at higher speeds with less heat in aluminum
- ▶ Chip Breaker Improves chip evacuation by shortening the chip length
- ▶ Ability to counteract extreme radial forces
- ▶ DLC Coating provides edge strength and unsurpassed tool life



Unit : Inch

OD (D1)	SD (D2)	LOC (L1)	LBS (L3)	Neck Dia. (D3)	OAL (L2)	Corner Radius		
						.010 EDP No.	.030 EDP No.	.060 EDP No.
1/4	1/4	3/8	3/4	.220	2-1/2	<a href="#">JAI39016</a>		
3/8	3/8	1/2	1-1/8	.345	3		<a href="#">JAI39024</a>	
		1/2	2-1/8	.345	4		<a href="#">JAI39901</a>	
1/2	1/2	5/8	1-3/8	.470	3		<a href="#">JAI39032</a>	<a href="#">JAI39902</a>
		5/8	2-1/4	.470	4		<a href="#">JAI39903</a>	<a href="#">JAI39904</a>
		5/8	3-3/8	.470	5		<a href="#">JAI39905</a>	<a href="#">JAI39906</a>
		5/8	4-1/4	.470	6	<a href="#">JAI39907</a>	<a href="#">JAI39908</a>	<a href="#">JAI39909</a>
3/4	3/4	1	2	.710	4		<a href="#">JAI39048</a>	<a href="#">JAI39910</a>
		1	3-3/8	.710	6		<a href="#">JAI39911</a>	<a href="#">JAI39912</a>
		1	5	.710	7		<a href="#">JAI39913</a>	<a href="#">JAI39914</a>
1	1	1-1/4	4-3/8	.960	7	<a href="#">JAI39064</a>		

Outside Diameter Tolerances (inch)		Shank Diameter Tolerance
Diameter	Tolerance	
1/8 - 3/16	+0/-0.00032	h6
1/4 - 3/8	+0/-0.00035	
1/2 - 5/8	+0/-0.00043	
3/4 - 1	+0/-0.00051	

◎ : Excellent ○ : Good

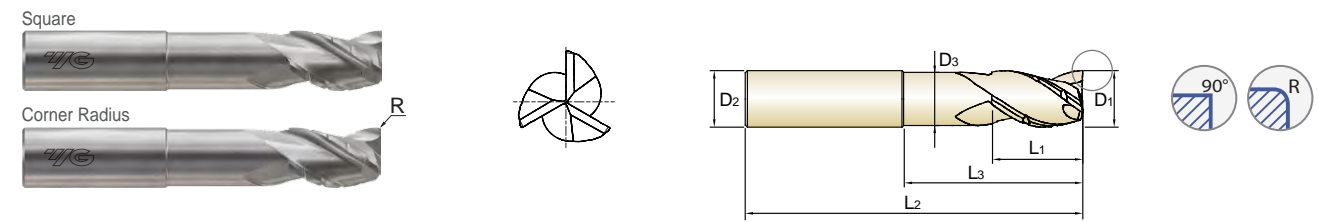
ISO	P										M				K					
	Non-alloy steel					Low alloy steel					High alloyed steel, and tool steel		Stainless steel		Grey cast iron		Nodular cast iron		Malleable cast iron	
Material Description	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc	13	25	28	32	38	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎

**Y/G ALU-POWER HPC END MILLS**

SQUARE **E5137** SERIES  
CORNER RADIUS **E5139** SERIES

**CARBIDE, 3-FLUTE EXTENDED LENGTH - CHIP BREAKER - UNCOATED**

- ▶ Balanced cutting with less vibration
- ▶ Ability to run at higher speeds with less heat in aluminum
- ▶ Chip Breaker Improves chip evacuation by shortening the chip length
- ▶ Ability to counteract extreme radial forces



Unit : Inch

OD (D1)	SD (D2)	LOC (L1)	LBS (L3)	Neck Dia. (D3)	OAL (L2)	Square End EDP No.	Corner Radius		
							.010 EDP No.	.030 EDP No.	.060 EDP No.
1/4	1/4	3/8	3/4	.220	2-1/2		<a href="#">E5139016</a>		
3/8	3/8	1/2	1-1/8	.345	3			<a href="#">E5139024</a>	
		1/2	2-1/8	.345	4			<a href="#">E5139901</a>	
1/2	1/2	5/8	1-3/8	.470	3	<a href="#">E5137032</a>		<a href="#">E5139032</a>	<a href="#">E5139902</a>
		5/8	2-1/4	.470	4	<a href="#">E5137901</a>		<a href="#">E5139903</a>	<a href="#">E5139904</a>
		5/8	3-3/8	.470	5			<a href="#">E5139905</a>	<a href="#">E5139906</a>
		5/8	4-1/4	.470	6		<a href="#">E5139907</a>	<a href="#">E5139908</a>	<a href="#">E5139909</a>
3/4	3/4	1	2	.710	4			<a href="#">E5139048</a>	<a href="#">E5139910</a>
		1	3-3/8	.710	6			<a href="#">E5139911</a>	<a href="#">E5139912</a>
		1	5	.710	7			<a href="#">E5139913</a>	<a href="#">E5139914</a>
1	1	1-1/4	4-3/8	.960	7		<a href="#">E5139064</a>		

Outside Diameter Tolerances (inch)		Shank Diameter Tolerance
Diameter	Tolerance	
1/8 - 3/16	+0/-0.00032	h6
1/4 - 3/8	+0/-0.00035	
1/2 - 5/8	+0/-0.00043	
3/4 - 1	+0/-0.00051	

◎ : Excellent ○ : Good

ISO	P										M				K					
	Non-alloy steel					Low alloy steel					High alloyed steel, and tool steel		Stainless steel		Grey cast iron		Nodular cast iron		Malleable cast iron	
Material Description	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc	13	25	28	32	38	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎

HSS

# Y/G ALU-POWER HPC END MILLS

RECOMMENDED CUTTING CONDITIONS

JAG96, JAG98, JAG95, JAG97 SERIES DLC Coated  
 E5G95, E5G97, E5G96, E5G98 SERIES Uncoated

SFM(Vc) = ft./min.  
 IPT(fz) = in./tooth  
 RPM = rev./min.  
 IPM(Feed) = in./min.



### 3 FLUTE - SLOTTING

ISO	VDI 3323	Material Description	Hardness (HB)	Ae	Ap	Parameter	Mill Diameter (Ø)						
							1/8	1/4	3/8	1/2	5/8	3/4	1
N	21-22	Aluminum-wrought alloy	60 / 100	1.0D	1.0D	SFM (Vc)	2000	2000	2000	2000	2000	2000	2000
						IPT (fz)	.0010	.0030	.0045	.0060	.0066	.0075	.0100
						RPM	61100	30500	20400	15300	12200	10200	7600
	23-25	Aluminum-cast, alloyed	75 / 90 / 130	1.0D	1.0D	SFM (Vc)	600	600	600	600	600	600	600
						IPT (fz)	.0010	.0030	.0045	.0060	.0066	.0075	.0100
						RPM	18340	9170	6110	4580	3670	3060	2290
	26-28	Copper and Copper Alloys (Bronze / Brass)	110 / 90 / 100	1.0D	1.0D	SFM (Vc)	880	880	880	880	880	880	880
						IPT (fz)	.0008	.0020	.0040	.0050	.0055	.0060	.0070
						RPM	26890	13450	8960	6720	5380	4480	3360
	29.1	Non Metallic Materials (Duroplastic)	-	1.0D	1.0D	SFM (Vc)	1670	1670	1670	1670	1670	1670	1670
						IPT (fz)	.0015	.0040	.0075	.0100	.0110	.0120	.0140
						RPM	51040	25520	17010	12760	10210	8510	6380

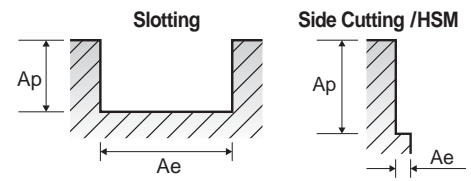
### 3 FLUTE - SIDE CUTTING

ISO	VDI 3323	Material Description	Hardness (HB)	Ae	Ap	Parameter	Mill Diameter (Ø)						
							1/8	1/4	3/8	1/2	5/8	3/4	1
N	21-22	Aluminum-wrought alloy	60 / 100	1.5D	0.5D	SFM (Vc)	3000	3000	3000	3000	3000	3000	3000
						IPT (fz)	.0010	.0030	.0045	.0060	.0066	.0075	.0100
						RPM	91700	45800	30600	23000	18300	15300	11500
	23-25	Aluminum-cast, alloyed	75 / 130	1.5D	0.5D	SFM (Vc)	800	800	800	800	800	800	800
						IPT (fz)	.0010	.0030	.0045	.0060	.0066	.0075	.0100
						RPM	24450	12220	8150	6110	4890	4080	3060
	26-28	Copper and Copper Alloys (Bronze / Brass)	110 / 90 / 100	1.5D	0.5D	SFM (Vc)	1150	1150	1150	1150	1150	1150	1150
						IPT (fz)	.0008	.0020	.0040	.0050	.0055	.0060	.0070
						RPM	35140	17570	11720	8790	7030	5860	4390
	29.1	Non Metallic Materials (Duroplastic)	-	1.5D	0.5D	SFM (Vc)	2070	2070	2070	2070	2070	2070	2070
						IPT (fz)	.0015	.0040	.0075	.0100	.0110	.0120	.0140
						RPM	63260	31630	21090	15820	12650	10540	7910

### 3 FLUTE - SIDE CUTTING HSM (Light)

ISO	VDI 3323	Material Description	Hardness (HB)	Ae	Ap	Parameter	Mill Diameter (Ø)						
							1/8	1/4	3/8	1/2	5/8	3/4	1
N	21-22	Aluminum-wrought alloy	60 / 100	2.0D	0.05D	SFM (Vc)	8000	8000	8000	8000	8000	8000	8000
						IPT (fz)	.0021	.0055	.0105	.0140	.0150	.0165	.0195
						RPM	244500	122200	81500	61100	48900	40700	30600
	23-25	Aluminum-cast, alloyed	75 / 130	2.0D	0.05D	SFM (Vc)	1200	1200	1200	1200	1200	1200	1200
						IPT (fz)	.0021	.0055	.0105	.0140	.0150	.0165	.0195
						RPM	36670	18340	12220	9170	7330	6110	4580
	26-28	Copper and Copper Alloys (Bronze / Brass)	110 / 90 / 100	2.0D	0.05D	SFM (Vc)	1850	1850	1850	1850	1850	1850	1850
						IPT (fz)	.0017	.0045	.0085	.0115	.0130	.0140	.0160
						RPM	56540	28270	18850	14130	11310	9420	7070
	29.1	Non Metallic Materials (Duroplastic)	-	2.0D	0.05D	SFM (Vc)	3350	3350	3350	3350	3350	3350	3350
						IPT (fz)	.0034	.0090	.0170	.0230	.0250	.0275	.0320
						RPM	102380	51190	34130	25590	20480	17060	12800

- NOTES:**
- ▶ All cutting data are target values
  - ▶ Maximum recommended depth shown
  - ▶ Finish cuts typically require reduced feed rates and/or higher spindle speed, with radial width of 2% x D or less
  - ▶ Reduce speed and feed recommendations for materials harder than listed
  - ▶ Reduce cut depth and feed by 50% for long-flute or long-reach tools
  - ▶ Above recommendations are based on ideal conditions. Adjust parameters accordingly for smaller taper machining centers or less rigid conditions
  - ▶ HSM = high-speed machining



# Y/G ALU-POWER HPC END MILLS

RECOMMENDED CUTTING CONDITIONS

JAI38, JAI39 SERIES DLC Coated  
 E5I36, E5I38, E5I37, E5I39 SERIES Uncoated

SFM(Vc) = ft./min.  
 IPT(fz) = in./tooth  
 RPM = rev./min.  
 IPM(Feed) = in./min.



### 3 FLUTE CHIP BREAKER - SLOTTING

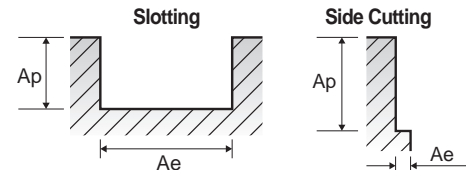
ISO	VDI 3323	Material Description	Hardness (HB)	Ae	Ap	Parameter	Outside Diameter (Ø)						
							1/8	1/4	3/8	1/2	5/8	3/4	1
N	21-22	Aluminum-wrought alloy	60 / 100	1.0D	1.0D	SFM (Vc)	2000	2000	2000	2000	2000	2000	2000
						IPT (fz)	.0010	.0030	.0045	.0060	.0066	.0075	.0100
						RPM	61100	30500	20400	15300	12200	10200	7600
	23-25	Aluminum-cast, alloyed	75 / 130	1.0D	1.0D	SFM (Vc)	600	600	600	600	600	600	600
						IPT (fz)	.0010	.0030	.0045	.0060	.0066	.0075	.0100
						RPM	18340	9170	6110	4580	3670	3060	2290
	26-28	Copper and Copper Alloys (Bronze / Brass)	110 / 90 / 100	1.0D	1.0D	SFM (Vc)	880	880	880	880	880	880	880
						IPT (fz)	.0008	.0020	.0040	.0050	.0055	.0060	.0070
						RPM	26890	13450	8960	6720	5380	4480	3360
	29.1	Non Metallic Materials (Duroplastic)	-	1.0D	1.0D	SFM (Vc)	1670	1670	1670	1670	1670	1670	1670
						IPT (fz)	.0015	.0040	.0075	.0100	.0110	.0120	.0140
						RPM	51040	25520	17010	12760	10210	8510	6380

### 3 FLUTE CHIP BREAKER - SIDE CUTTING

ISO	VDI 3323	Material Description	Hardness (HB)	Ae	Ap	Parameter	Outside Diameter (Ø)						
							1/8	1/4	3/8	1/2	5/8	3/4	1
N	21-22	Aluminum-wrought alloy	60 / 100	1.5D	0.5D	SFM (Vc)	3000	3000	3000	3000	3000	3000	3000
						IPT (fz)	.0010	.0030	.0045	.0060	.0066	.0075	.0100
						RPM	91700	45800	30600	23000	18300	15300	11500
	23-25	Aluminum-cast, alloyed	75 / 130	1.5D	0.5D	SFM (Vc)	800	800	800	800	800	800	800
						IPT (fz)	.0010	.0030	.0045	.0060	.0066	.0075	.0100
						RPM	24450	12220	8150	6110	4890	4080	3060
	26-28	Copper and Copper Alloys (Bronze / Brass)	110 / 90 / 100	1.5D	0.5D	SFM (Vc)	1150	1150	1150	1150	1150	1150	1150
						IPT (fz)	.0008	.0020	.0040	.0050	.0055	.0060	.0070
						RPM	35140	17570	11720	8790	7030	5860	4390
	29.1	Non Metallic Materials (Duroplastic)	-	1.5D	0.5D	SFM (Vc)	2070	2070	2070	2070	2070	2070	2070
						IPT (fz)	.0015	.0040	.0075	.0100	.0110	.0120	.0140
						RPM	63260	31630	21090	15820	12650	10540	7910

- NOTES:**
- ▶ All cutting data are target values
  - ▶ Maximum recommended depth shown
  - ▶ Finish cuts typically require reduced feed rates and/or higher spindle speed, with radial width of 2% x D or less
  - ▶ Reduce speed and feed recommendations for materials harder than listed
  - ▶ Reduce cut depth and feed by 50% for long-flute or long-reach tools
  - ▶ Above recommendations are based on ideal conditions. Adjust parameters accordingly for smaller taper machining centers or less rigid conditions
  - ▶ HSM = high-speed machining

**Tech Tip:** The tables above are based on common machining calculations. We realize that shops may not have RPM capability shown in the tables. To adapt the tables to machining conditions available, use the following calculation:  
**(Recommended Feed (IPM) / Recommended RPM) X Available RPM = IPM**  
 Example for 1/8" Side Milling in N21-22 WorkPiece Materials:  
**(275 IPM / 91700 RPM) X 15,000 = 45 IPM**





Global Cutting Tool Leader **YG-1**



MILLING





Being the best through innovation



SOLID CARBIDE

# ALU-POWER END MILLS

- For Silent Cutting of Aluminium Alloys, Mirror Surface

SELECTION GUIDE



SOLID CARBIDE & HSS ALU POWER END MILLS

for Silent Cutting of Aluminium Alloys, Mirror Surface



Please visit globalyg1.com/mat for material search

◎: Excellent ○: Good

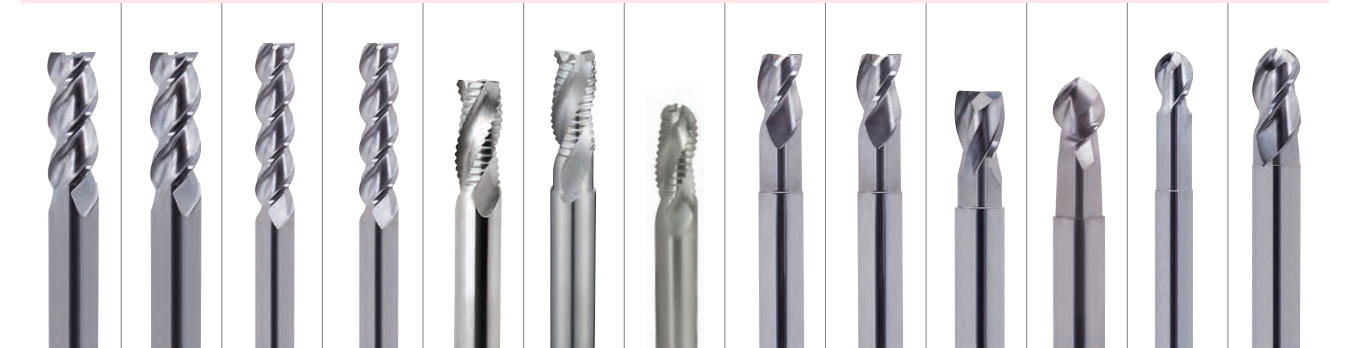
Recommended cutting conditions : p. C636

Table with 6 columns: ISO, VDI 3323, Material Description, Composition / Structure / Heat Treatment, HB, HRc. Rows include P (Non-alloy steel, Low alloy steel, High alloyed steel), M (Stainless steel), K (Grey cast iron, Nodular cast iron, Malleable cast iron), N (Aluminum-wrought alloy, Aluminum-cast alloyed, Copper and Copper Alloys, Non Metallic Materials), S (Heat Resistant Super Alloys, Titanium Alloys), and H (Hardened steel, Chilled Cast Iron, Hardened Cast Iron).

Table with 4 columns: SERIES (E5253, E5254, E5976, E5980), FLUTE (2 (Weldon), 2, 2, 3), HELIX ANGLE (42°, 42°, 37°, 45°), CUTTING EDGE SHAPE (SQUARE, SQUARE, SQUARE, SQUARE), SIZE MIN (D1/4, D1/16, D1/4, D1/8), SIZE MAX (D1, D1, D1, D1), PAGE (C608, C609, C610, C611), REGULAR LENGTH, EXTENDED NECK, STUB, TICN, Uncoated.



Table with 13 columns: E5981, E5983, E5982, E5984, E5E44, E5E98, E5E45, E5977, E5985, E5973, E5974, E5978, E5975. Includes specifications for REGULAR LENGTH, LONG LENGTH, NECK, EXTENDED NECK, and LONG REACH.



SELECTION GUIDE



SERIES	Metric		
	E5522 EG522	EG930	EG909
FLUTE	2	2	2
HELIX ANGLE	45°	25°	30°
CUTTING EDGE SHAPE	SQUARE	CORNER RADIUS	CORNER RADIUS
SIZE MIN	D3.0	D2.0	D4.0
SIZE MAX	D20.0	D20.0	D20.0
PAGE	C622	C623	C624

**SOLID CARBIDE & HSS**  
**ALU POWER**  
**END MILLS**

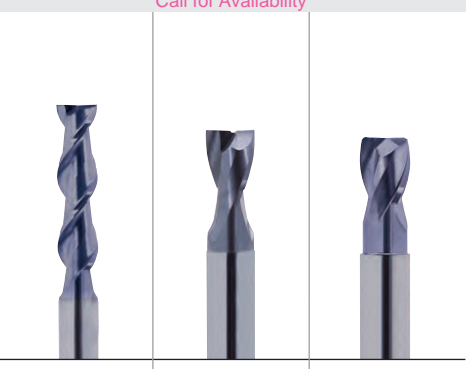
for Silent Cutting of Aluminium Alloys, Mirror Surface



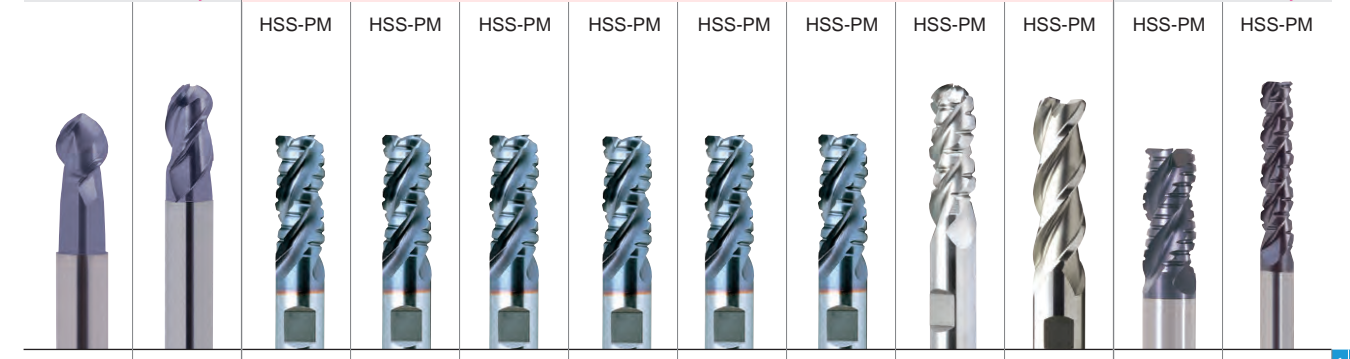
◎ : Excellent ○ : Good

Recommended cutting conditions : p. C636

ISO	VDI 3323	Material Description	Composition / Structure / Heat Treatment	HB	HRc	
P	1	Non-alloy steel	About 0.15% C Annealed	125		
	2		About 0.45% C Annealed	190	13	
	3		About 0.45% C Quenched & Tempered	250	25	
	4		About 0.75% C Annealed	270	28	
	5		About 0.75% C Quenched & Tempered	300	32	
	6	Low alloy steel	Annealed	180	10	
	7		Quenched & Tempered	275	29	
	8		Quenched & Tempered	300	32	
	9		Quenched & Tempered	350	38	
	10		High alloyed steel, and tool steel	Annealed	200	15
	11			Quenched & Tempered	325	35
M	12	Stainless steel	Ferritic / Martensitic Annealed	200	15	
	13		Martensitic Quenched & Tempered	240	23	
	14		Austenitic	180	10	
K	15	Grey cast iron	Pearlitic / ferritic	180	10	
	16		Pearlitic (Martensitic)	260	26	
	17	Nodular cast iron	Ferritic	160	3	
	18		Pearlitic	250	25	
	19		Ferritic	130		
20	Malleable cast iron	Pearlitic	230	21		
N	21	Aluminum-wrought alloy	Not Curable	60	◎	
	22		Curable Hardened	100	◎	
	23	Aluminum-cast, alloyed	≤ 12% Si, Not Curable	75	◎	
	24		≤ 12% Si, Curable Hardened	90	◎	
	25		> 12% Si, Not Curable	130	◎	
	26		Cutting Alloys, PB>1%	110	◎	
	27	Copper and Copper Alloys (Bronze / Brass)	CuZn, CuSnZn (Brass)	90		
	28		CuSn, lead-free copper and electrolytic copper	100		
	29		Non Metallic Materials	Duroplastic, Fiber Reinforced Plastic Rubber, Wood, etc.		
	30					
S	31	Heat Resistant Super Alloys	Fe Based Annealed	200	15	
	32		Cured	280	30	
	33		Annealed	250	25	
	34		Ni or Co Based Cured	350	38	
	35	Cast	320	34		
	36	Titanium Alloys	Pure Titanium	400 Rm		
37	Alpha + Beta Alloys Hardened		1050 Rm			
H	38	Hardened steel	Hardened	550	55	
	39		Hardened	630	60	
	40	Chilled Cast Iron	Cast	400	42	
	41	Hardened Cast Iron	Hardened	550	55	



Metric	HSS-PM Inch									HSS-PM Metric		
	EG910	EG908	EK191	EK191	EK226	EK226	EK192	EK192	EK196	EK193 EK132	EP922	EP924
2	3	3	3	3	3	3	3	3	3	3	3	3
50°	40°	42°	42°	42°	42°	42°	42°	42°	42°	42°	42°	42°
BALL NOSE	BALL NOSE	ROUGHING	CORNER RADIUS ROUGHING	ROUGHING	CORNER RADIUS ROUGHING	ROUGHING	CORNER RADIUS ROUGHING	BALL NOSE ROUGHING	CORNER RADIUS	ROUGHING	ROUGHING	
R3.0	R1.0	D1/2	D3/4	D3/4	D3/4	D1/2	D3/4	R1/4	D1/2	D12.0	D12.0	
R10.0	R8.0	D2	D1-1/4	D2	D1-1/4	D2	D1-1/4	R5/8	D1-1/2	D32.0	D32.0	
C625	C626	C627	C583	C628			C629 - C630		C631	C632	C634	C635
STUB CUT LENGTH NECK	LONG LENGTH NECK	REGULAR LENGTH for ALUMINUM	REGULAR LENGTH for ALUMINUM	MEDIUM LENGTH for ALUMINUM	MEDIUM LENGTH for ALUMINUM	LONG LENGTH for ALUMINUM	LONG LENGTH for ALUMINUM	REGULAR LENGTH for ALUMINUM	REGULAR & MEDIUM & LONG LENGTH	SHORT LENGTH for ALUMINUM	LONG LENGTH for ALUMINUM	
TICN	TICN	TICN	TICN	TICN	TICN	TICN	TICN	TICN	TICN	TiAlN	TiAlN	
Uncoated		Uncoated	Uncoated	Uncoated	Uncoated	Uncoated	Uncoated	Uncoated	Uncoated			
Call for Availability		U.S.A Stock									Call for Availability	





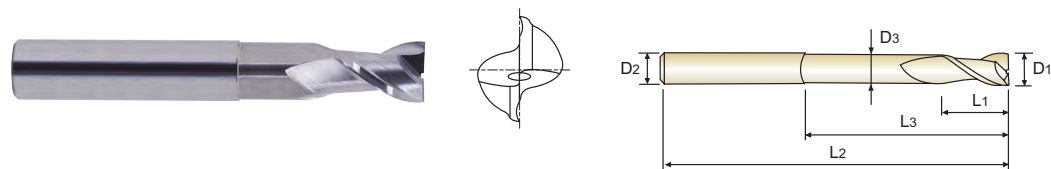




PLANE SHANK E5976 SERIES

**CARBIDE, 2 FLUTE 37° HELIX with EXTENDED NECK**

- ▶ High velocity milling of aluminum & other non-ferrous materials.
- ▶ Excellent plunging capabilities.
- ▶ Improved surface roughness-cylindrical margin which is controlled tightly.
- ▶ Maximum-metal removal rate.
- ▶ Superior chip evacuation.
- ▶ Mirror face-excellent surface finish.

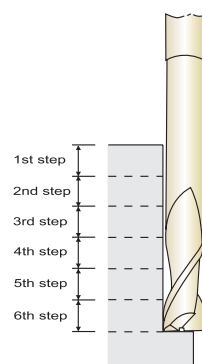


◆ U.S.A Stock

Unit : Inch

EDP No.	Mill Diameter	Shank Diameter	Length of Cut	Length Below Shank	Overall Length	Neck Diameter	
							UNCOATED
39573	39573TC	1/4	1/4	3/8	2-1/4	4	.220
39584	39584TC	3/8	3/8	1/2	2-1/4	4	.345
39593	39593TC	1/2	1/2	5/8	2-1/4	5	.470
39908	39908TC	1/2	1/2	5/8	3-1/4	6	.470
39901	39901TC	1/2	1/2	5/8	4	6	.470
39595	39595TC	5/8	5/8	3/4	2-1/4	5	.585
39902	39902TC	5/8	5/8	3/4	3-1/4	6	.585
39903	39903TC	5/8	5/8	3/4	4-1/4	7	.585
39598	39598TC	3/4	3/4	1	2-1/4	5	.710
39904	39904TC	3/4	3/4	1	3-1/4	6	.710
39905	39905TC	3/4	3/4	1	4-1/4	7	.710
39600	39600TC	1	1	1-1/8	2-1/4	5	.960
39906	39906TC	1	1	1-1/8	3-1/4	6	.960
39907	39907TC	1	1	1-1/8	4-1/4	7	.960

Mill Dia. Tolerance (inch)	Shank Dia. Tolerance
0~.0005	0~.0003



STEP MILLING

◎ : Excellent ○ : Good

ISO	P											M				K					
	Non-alloy steel					Low alloy steel						High alloyed steel, and tool steel		Stainless steel		Grey cast iron		Nodular cast iron	Malleable cast iron		
Material Description	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
HRc	13	25	28	32	30	10	29	32	38	15	35	15	23	10	10	26	3	25	21	21	
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230	
Recommend																					

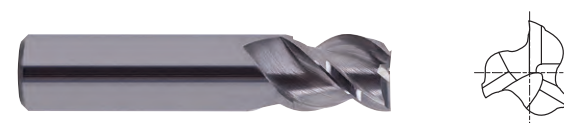
ISO	N					S					H											
	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)		Non Metallic Materials			Heat Resistant Super Alloys		Titanium Alloys	Hardened steel	Chilled Cast Iron	Hardened Cast Iron						
Material Description	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	
HRc	60	100	75	90	130	110	90	100			15	30	25	38	34	40	55	60	42	55	55	
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550	
Recommend	◎	◎	◎	◎	◎																	



PLAIN SHANK E5980 SERIES

**CARBIDE, 3 FLUTE 45° HELIX STUB LENGTH**

- ▶ Designed to machine aluminium at high speed condition.
- ▶ Improved surface roughness-cylindrical margin which is controlled tightly.
- ▶ Mirror face-excellent surface finish.



◆ U.S.A Stock

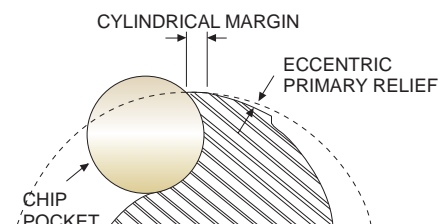
Unit : Inch

EDP No.	Mill Diameter	Shank Diameter	Length of Cut	Overall Length			
					UNCOATED	TiCN COATED	D1
25558	25558TC	1/8	1/8	1/4	1-1/2		
25565	25565TC	3/16	3/16	5/16	2		
25573	25573TC	1/4	1/4	3/8	2		
25579	25579TC	5/16	5/16	7/16	2		
25584	25584TC	3/8	3/8	1/2	2		
25588	25588TC	7/16	7/16	9/16	2-1/2		
25593	25593TC	1/2	1/2	5/8	2-1/2		
25595	25595TC	5/8	5/8	3/4	3		
25598	25598TC	3/4	3/4	1	3		
25600	25600TC	1	1	1-1/4	3		

Mill Dia. Tolerance (inch)	Shank Dia. Tolerance
0~.0005	0~.0003



- High performance in machining aluminum and non-ferrous materials
- Special designed geometry with high rigidity cutting edge
- Improved surface roughness - cylindrical margin which is controlled tightly.
- Excellent chip removal - higher rake angle, higher helix angle(45°), bigger chip pocket.



◎ : Excellent ○ : Good

ISO	P											M				K					
	Non-alloy steel					Low alloy steel						High alloyed steel, and tool steel		Stainless steel		Grey cast iron		Nodular cast iron	Malleable cast iron		
Material Description	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
HRc	13	25	28	32	30	10	29	32	38	15	35	15	23	10	10	26	3	25	21	21	
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230	
Recommend																					

ISO	N					S					H											
	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)		Non Metallic Materials			Heat Resistant Super Alloys		Titanium Alloys	Hardened steel	Chilled Cast Iron	Hardened Cast Iron						
Material Description	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	
HRc	60	100	75	90	130	110	90	100			15	30	25	38	34	40	55	60	42	55	55	
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550	
Recommend	◎	◎	◎	◎	◎																	



PLAIN SHANK E5981 SERIES  
PLAIN SHANK E5983 SERIES

### CARBIDE, 3 FLUTE 45° HELIX REGULAR LENGTH & CORNER RADIUS

- ▶ High velocity milling of aluminum & other non-ferrous materials.
- ▶ 3flute and 45° helix allow harmonic balance at high speed condition and smooth cutting.
- ▶ Improved surface roughness-cylindrical margin which is controlled tightly
- ▶ Maximum-metal removal rate.
- ▶ Superior chip evacuation.
- ▶ Mirror face-excellent surface finish.



CARBIDE 3 45° PLAIN p.C637

◆ U.S.A Stock

■ SQUARE Unit : Inch

EDP No.	Mill Diameter	Shank Diameter	Length of Cut	Overall Length
28558	1/8	1/8	3/8	1-1/2
28565	3/16	3/16	9/16	2
28573	1/4	1/4	5/8	2-1/2
28579	5/16	5/16	5/8	2-1/2
28584	3/8	3/8	1	2-1/2
28588	7/16	7/16	1-1/4	2-3/4
28593	1/2	1/2	1-1/4	3
28595	5/8	5/8	1-5/8	3-1/2
28598	3/4	3/4	1-5/8	4
28600	1	1	2	5

■ CORNER RADIUS Unit : Inch

EDP No.	Corner Radius R	Mill Diameter	Shank Diameter	Length of Cut	Overall Length
EA50321	R.060	1/2	1/2	1-1/4	3
EA50401	R.060	5/8	5/8	1-5/8	3-1/2
EA50481	R.060	3/4	3/4	1-5/8	4
EA50641	R.065	1	1	2	5
EA20321	R.120	1/2	1/2	1-1/4	3
EA20401	R.120	5/8	5/8	1-5/8	3-1/2
EA20481	R.120	3/4	3/4	1-5/8	4
EA20641	R.120	1	1	2	5

Mill Dia. Tolerance (inch)	Shank Dia. Tolerance
0~-.0005	0~-.0003

◎ : Excellent ○ : Good

ISO	P											M				K				
	Non-alloy steel					Low alloy steel						High alloyed steel, and tool steel		Stainless steel		Grey cast iron		Nodular cast iron	Malleable cast iron	
Material Description	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc	13	25	28	32	30	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend																				

ISO	N					S					H										
	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys			Titanium Alloys	Hardened steel	Chilled Cast Iron	Hardened Cast Iron				
Material Description	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend	◎	◎	◎	◎	◎																



PLAIN SHANK E5982 SERIES  
PLAIN SHANK E5984 SERIES

### CARBIDE, 3 FLUTE 45° HELIX LONG LENGTH & CORNER RADIUS

- ▶ High velocity milling of aluminum & other non-ferrous materials.
- ▶ 3flute and 45° helix allow harmonic balance at high speed condition and smooth cutting.
- ▶ Improved surface roughness-cylindrical margin which is controlled tightly
- ▶ Maximum-metal removal rate.
- ▶ Superior chip evacuation.
- ▶ Mirror face-excellent surface finish.



CARBIDE 3 45° PLAIN p.C637

◆ U.S.A Stock

■ SQUARE Unit : Inch

EDP No.	Mill Diameter	Shank Diameter	Length of Cut	Overall Length
36573	1/4	1/4	1-1/4	3-1/4
36579	5/16	5/16	1-1/4	3-1/2
36584	3/8	3/8	1-1/2	3-1/2
36588	7/16	7/16	2	4
36593	1/2	1/2	2	4
36595	5/8	5/8	2-1/2	5
36598	3/4	3/4	3-1/4	6
36600	1	1	3-1/4	6

■ CORNER RADIUS Unit : Inch

EDP No.	Corner Radius R	Mill Diameter	Shank Diameter	Length of Cut	Overall Length
EA60321	R.060	1/2	1/2	2	4
EA60401	R.060	5/8	5/8	2-1/2	5
EA60481	R.060	3/4	3/4	3-1/4	6
EA60641	R.060	1	1	3-1/4	6
EA30321	R.120	1/2	1/2	2	4
EA30401	R.120	5/8	5/8	2-1/2	5
EA30481	R.120	3/4	3/4	3-1/4	6
EA30641	R.120	1	1	3-1/4	6

Mill Dia. Tolerance (inch)	Shank Dia. Tolerance
0~-.0005	0~-.0003

◎ : Excellent ○ : Good

ISO	P											M				K				
	Non-alloy steel					Low alloy steel						High alloyed steel, and tool steel		Stainless steel		Grey cast iron		Nodular cast iron	Malleable cast iron	
Material Description	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc	13	25	28	32	30	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend																				

ISO	N					S					H										
	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys			Titanium Alloys	Hardened steel	Chilled Cast Iron	Hardened Cast Iron				
Material Description	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend	◎	◎	◎	◎	◎																





PLAIN SHANK E5E44 SERIES  
PLAIN SHANK E5E98 SERIES

**CARBIDE, 3 FLUTE ROUGHING / ROUGHING with NECK**

- ▶ Excellent cutting qualities on aluminum, copper
- ▶ Increased tool life and superior chip evacuation
- ▶ Reduces chipping of corner edges



\* WITH NECK

CARBIDE 3 30° PLAIN p.C643

◆ U.S.A Stock

**ROUGHING** Unit : Inch

EDP No.	Mill Diameter	Shank Diameter	Length of Cut	Overall Length
<a href="#">44016</a>	1/4	1/4	3/4	2-1/2
<a href="#">44024</a>	3/8	3/8	7/8	2-1/2
<a href="#">44032</a>	1/2	1/2	1	3
<a href="#">44040</a>	5/8	5/8	1-1/4	3-1/2
<a href="#">44048</a>	3/4	3/4	1-5/8	4
<a href="#">44064</a>	1	1	1-3/4	4

**ROUGHING WITH NECK** Unit : Inch

EDP No.	Mill Diameter	Shank Diameter	Length of Cut	Length Below Shank	Overall Length	Neck Diameter
<a href="#">98016</a>	1/4	1/4	3/4	1	2-1/2	.210
<a href="#">98024</a>	3/8	3/8	7/8	1-1/4	3	.335
<a href="#">98032</a>	1/2	1/2	1	1-3/8	3-1/4	.440
<a href="#">98040</a>	5/8	5/8	1-1/4	1-3/4	3-3/4	.565
<a href="#">98048</a>	3/4	3/4	1-5/8	2-1/4	4-1/2	.690
<a href="#">98064</a>	1	1	1-3/4	2-1/2	5	.940

Mill Dia. Tolerance (inch)	Shank Dia. Tolerance
0~- .0005	0~- .0003

◎ : Excellent ○ : Good

ISO Material Description	P										M				K					
	Non-alloy steel					Low alloy steel					High alloyed steel, and tool steel				Stainless steel		Grey cast iron	Nodular cast iron	Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc	13	25	28	32	30	10	29	32	38	15	35	15	23	10	10	26	3	25	21	
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend																				

ISO Material Description	N					S					H										
	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys			Titanium Alloys	Hardened steel	Chilled Cast Iron	Hardened Cast Iron				
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc						15	30	25	38	34	15	30	25	38	34	55	60	42	55		
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend	◎	◎	◎	◎	◎																



PLAIN SHANK E5E45 SERIES

**CARBIDE, 3 FLUTE ROUGHING BALL NOSE**

- ▶ Excellent cutting qualities on aluminum, copper
- ▶ Increased tool life and superior chip evacuation
- ▶ Reduces chipping of corner edges



CARBIDE 3 30° PLAIN p.C643

◆ U.S.A Stock

Unit : Inch

SAB CODE	Mill Diameter	Shank Diameter	Length of Cut	Overall Length	No. of Flute
<a href="#">45016</a>	1/4	1/4	3/4	2-1/2	3
<a href="#">45024</a>	3/8	3/8	7/8	2-1/2	3
<a href="#">45032</a>	1/2	1/2	1	3	3
<a href="#">45040</a>	5/8	5/8	1-1/4	3-1/2	3
<a href="#">45048</a>	3/4	3/4	1-5/8	4	3
<a href="#">45064</a>	1	1	1-3/4	4	3

Mill Dia. Tolerance (inch)	Shank Dia. Tolerance
0~- .0005	0~- .0003

◎ : Excellent ○ : Good

ISO Material Description	P										M				K					
	Non-alloy steel					Low alloy steel					High alloyed steel, and tool steel				Stainless steel		Grey cast iron	Nodular cast iron	Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc	13	25	28	32	30	10	29	32	38	15	35	15	23	10	10	26	3	25	21	
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend																				

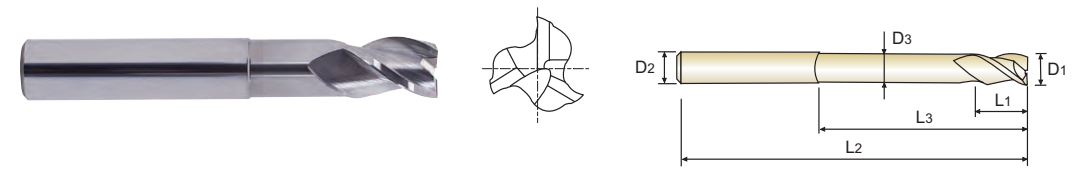
ISO Material Description	N					S					H										
	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys			Titanium Alloys	Hardened steel	Chilled Cast Iron	Hardened Cast Iron				
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc						15	30	25	38	34	15	30	25	38	34	55	60	42	55		
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend	◎	◎	◎	◎	◎																

# YG ALU-POWER END MILLS

PLAIN SHANK E5977 SERIES

## CARBIDE, 3 FLUTE 37° HELIX with EXTENDED NECK

- ▶ High velocity milling of aluminum & other non-ferrous materials.
- ▶ 3flute and 37° helix allow harmonic balance at high speed condition and smooth cutting.
- ▶ Improved surface roughness-cylindrical margin which is controlled tightly.
- ▶ Maximum-metal removal rate.
- ▶ Superior chip evacuation.
- ▶ Mirror face-excellent surface finish.



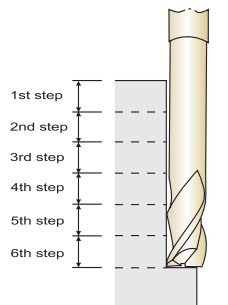
p.C638

◆ U.S.A Stock

Unit : Inch

EDP No.		Mill Diameter	Shank Diameter	Length of Cut	Length Below Shank	Overall Length	Neck Diameter
UNCOATED	TICN COATED	D1	D2	L1	L3	L2	D3
40573	40573TC	1/4	1/4	3/8	2-1/4	4	.220
40584	40584TC	3/8	3/8	1/2	2-1/4	4	.345
40593	40593TC	1/2	1/2	5/8	2-1/4	5	.470
40901	40901TC	1/2	1/2	5/8	3-1/4	6	.470
40902	40902TC	1/2	1/2	5/8	4	6	.470
40595	40595TC	5/8	5/8	3/4	2-1/4	5	.585
40903	40903TC	5/8	5/8	3/4	3-1/4	6	.585
40904	40904TC	5/8	5/8	3/4	4-1/4	7	.585
40598	40598TC	3/4	3/4	1	2-1/4	5	.710
40905	40905TC	3/4	3/4	1	3-1/4	6	.710
40906	40906TC	3/4	3/4	1	4-1/4	7	.710
40600	40600TC	1	1	1-1/8	2-1/4	5	.960
40907	40907TC	1	1	1-1/8	3-1/4	6	.960
40908	40908TC	1	1	1-1/8	4-1/4	7	.960

Mill Dia. Tolerance (inch)	Shank Dia. Tolerance
0~-.0005	0~-.0003



STEP MILLING

◎: Excellent ○: Good

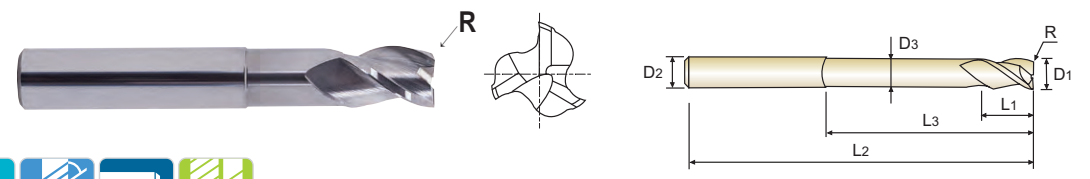
ISO Material Description	P										M				K					
	Non-alloy steel					Low alloy steel					High alloyed steel, and tool steel				Stainless steel		Grey cast iron		Nodular cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc	13	25	28	32	30	10	29	32	38	15	35	15	23	10	10	26	3	25	21	21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend	◎	◎	◎	◎	◎															

# YG ALU-POWER END MILLS

PLAIN SHANK E5985 SERIES

## CARBIDE, 3 FLUTE 37° HELIX with EXTENDED NECK CORNER RADIUS

- ▶ High velocity milling of aluminum & other non-ferrous materials.
- ▶ 3flute and 37° helix allow harmonic balance at high speed condition and smooth cutting.
- ▶ Improved surface roughness-cylindrical margin which is controlled tightly.
- ▶ Maximum-metal removal rate.
- ▶ Superior chip evacuation.
- ▶ Mirror face-excellent surface finish.



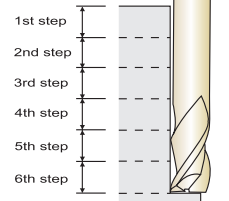
p.C638

◆ U.S.A Stock

Unit : Inch

EDP No.		Corner Radius	Mill Diameter	Shank Diameter	Length of Cut	Length Below Shank	Overall Length	Neck Diameter
UNCOATED	TICN COATED	R	D1	D2	L1	L3	L2	D3
EA40321	EA40321C	R.060	1/2	1/2	5/8	3-1/4	6	.470
EA40322	EA40322C	R.060	1/2	1/2	5/8	4	6	.470
EA40401	EA40401C	R.060	5/8	5/8	3/4	2-1/4	5	.585
EA40402	EA40402C	R.060	5/8	5/8	3/4	3-1/4	6	.585
EA40403	EA40403C	R.060	5/8	5/8	3/4	4-1/4	7	.585
EA40481	EA40481C	R.060	3/4	3/4	1	2-1/4	5	.710
EA40482	EA40482C	R.060	3/4	3/4	1	3-1/4	6	.710
EA40483	EA40483C	R.060	3/4	3/4	1	4-1/4	7	.710
EA40641	EA40641C	R.060	1	1	1-1/8	2-1/4	5	.960
EA40642	EA40642C	R.060	1	1	1-1/8	3-1/4	6	.960
EA40643	EA40643C	R.060	1	1	1-1/8	4-1/4	7	.960
EA10321	EA10321C	R.120	1/2	1/2	5/8	3-1/4	6	.470
EA10322	EA10322C	R.120	1/2	1/2	5/8	4	6	.470
EA10401	EA10401C	R.120	5/8	5/8	3/4	2-1/4	5	.585
EA10402	EA10402C	R.120	5/8	5/8	3/4	3-1/4	6	.585
EA10403	EA10403C	R.120	5/8	5/8	3/4	4-1/4	7	.585
EA10481	EA10481C	R.120	3/4	3/4	1	2-1/4	5	.710
EA10482	EA10482C	R.120	3/4	3/4	1	3-1/4	6	.710
EA10483	EA10483C	R.120	3/4	3/4	1	4-1/4	7	.710
EA10641	EA10641C	R.120	1	1	1-1/8	2-1/4	5	.960
EA10642	EA10642C	R.120	1	1	1-1/8	3-1/4	6	.960
EA10643	EA10643C	R.120	1	1	1-1/8	4-1/4	7	.960

Mill Dia. Tolerance (inch)	Shank Dia. Tolerance
0~-.0005	0~-.0003



STEP MILLING

◎: Excellent ○: Good

ISO Material Description	P										M				K					
	Non-alloy steel					Low alloy steel					High alloyed steel, and tool steel				Stainless steel		Grey cast iron		Nodular cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc	13	25	28	32	30	10	29	32	38	15	35	15	23	10	10	26	3	25	21	21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend	◎	◎	◎	◎	◎															

HSS

HSS



PLAIN SHANK E5973 SERIES

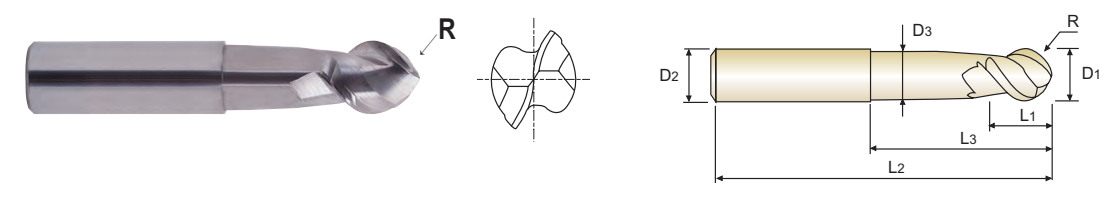
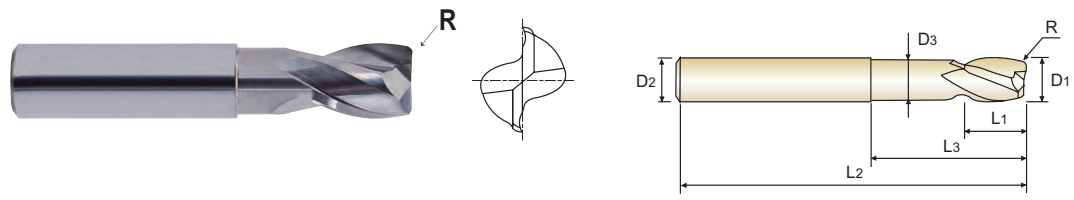
PLAIN SHANK E5974 SERIES

**CARBIDE, 2 FLUTE CORNER RADIUS with NECK**

**CARBIDE, 2 FLUTE 50° HELIX STUB CUT LENGTH BALL NOSE with NECK**

- ▶ Excellent cutting qualities on stainless steel, aluminum, copper.
- ▶ Increased tool life and higher cutting accuracy.
- ▶ Mirror face-excellent surface finish.

- ▶ Excellent cutting qualities on stainless steel, aluminum, copper.
- ▶ Increased tool life and higher cutting accuracy.
- ▶ Mirror face-excellent surface finish.



CARBIDE 2 30° ±.001 PLAIN p.C639

CARBIDE 2 50° ±.0005 PLAIN p.C640

◆ U.S.A Stock

◆ U.S.A Stock

Unit : Inch

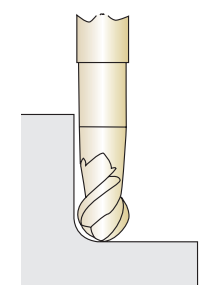
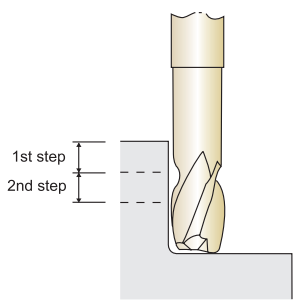
EDP No.		Corner Radius	Mill Diameter	Shank Diameter		Length of Cut	Length Below Shank	Overall Length	Neck Diameter
UNCOATED	TiCN COATED	R	D1	D2	L1	L3	L2	D3	
<a href="#">24562</a>	<a href="#">24562TC</a>	R.012	5/32	1/4	3/16	3/8	2	.140	
<a href="#">24573</a>	<a href="#">24573TC</a>	R.020	1/4	1/4	5/16	3/4	2-3/8	.226	
<a href="#">24579</a>	<a href="#">24579TC</a>	R.024	5/16	5/16	3/8	1-1/8	2-3/4	.282	
<a href="#">24584</a>	<a href="#">24584TC</a>	R.031	3/8	3/8	1/2	1-1/2	3-1/8	.336	
<a href="#">24593</a>	<a href="#">24593TC</a>	R.040	1/2	1/2	9/16	1-1/2	3-1/2	.460	
<a href="#">24595</a>	<a href="#">24595TC</a>	R.051	5/8	5/8	3/4	1-3/4	4	.566	
<a href="#">24598</a>	<a href="#">24598TC</a>	R.063	3/4	3/4	1	1-3/4	4	.670	

Unit : Inch

EDP No.		Radius of Ball Nose	Mill Diameter	Shank Diameter		Length of Cut	Length Below Shank	Overall Length	Neck Diameter
UNCOATED	TiCN COATED	R (±.0005)	D1	D2	L1	L3	L2	D3	
<a href="#">37573</a>	<a href="#">37573TC</a>	R 1/8	1/4	1/4	7/32	1	2-1/4	.226	
<a href="#">37579</a>	<a href="#">37579TC</a>	R 5/32	5/16	5/16	9/32	1-1/8	2-1/2	.280	
<a href="#">37584</a>	<a href="#">37584TC</a>	R 3/16	3/8	3/8	11/32	1-3/8	3	.335	
<a href="#">37593</a>	<a href="#">37593TC</a>	R 1/4	1/2	1/2	13/32	1-1/2	3	.460	
<a href="#">37595</a>	<a href="#">37595TC</a>	R 5/16	5/8	5/8	9/16	2	3-1/2	.566	
<a href="#">37598</a>	<a href="#">37598TC</a>	R 3/8	3/4	3/4	11/16	2	4	.671	

Mill Dia. Tolerance (inch)	Shank Dia. Tolerance
0~-0.0012	0~-0.0003

Mill Dia. Tolerance (inch)	Shank Dia. Tolerance
0~-0.0010	0~-0.0003



STEP MILLING

◎ : Excellent ○ : Good

ISO Material Description	P										M				K					
	Non-alloy steel					Low alloy steel					High alloyed steel, and tool steel				Stainless steel		Grey cast iron		Nodular cast iron	Malleable cast iron
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc	13	25	28	32	30	10	29	32	38	15	35	15	23	10	10	26	3	25	21	
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend																				

ISO Material Description	N					S					H										
	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys			Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron			
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend	◎	◎	◎	◎	◎																

◎ : Excellent ○ : Good

ISO Material Description	P										M				K					
	Non-alloy steel					Low alloy steel					High alloyed steel, and tool steel				Stainless steel		Grey cast iron		Nodular cast iron	Malleable cast iron
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc	13	25	28	32	30	10	29	32	38	15	35	15	23	10	10	26	3	25	21	
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend																				

ISO Material Description	N					S					H										
	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys			Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron			
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend	◎	◎	◎	◎	◎																

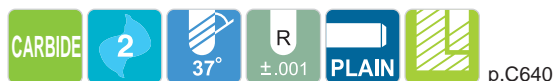
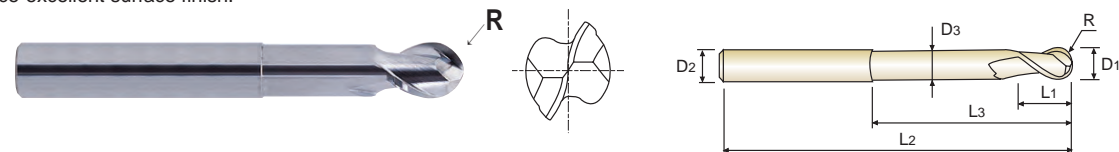




PLAIN SHANK E5978 SERIES

CARBIDE, 2 FLUTE 37° HELIX LONG REACH BALL NOSE

- ▶ High velocity milling of aluminum & other non-ferrous materials.
- ▶ Extended neck design which is suitable for step milling.
- ▶ Improved surface roughness-cylindrical margin which is controlled tightly
- ▶ Maximum-metal removal rate.
- ▶ Superior chip evacuation.
- ▶ Mirror face-excellent surface finish.

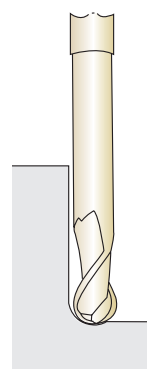


◆ U.S.A Stock

Unit : Inch

EDP No.		Radius of Ball Nose	Mill Diameter	Shank Diameter	Length of Cut	Length Below Shank	Overall Length	Neck Diameter
UNCOATED	TiCN COATED	R (±.001)	D1	D2	L1	L3	L2	D3
89573	89573TC	R 1/8	1/4	1/4	3/8	2-1/4	4	.220
89584	89584TC	R 3/16	3/8	3/8	1/2	2-1/4	4	.345
89593	89593TC	R 1/4	1/2	1/2	5/8	2-1/4	5	.470
89901	89901TC	R 1/4	1/2	1/2	5/8	3-1/4	6	.470
89902	89902TC	R 1/4	1/2	1/2	5/8	4	6	.470
89595	89595TC	R 5/16	5/8	5/8	3/4	2-1/4	5	.585
89903	89903TC	R 5/16	5/8	5/8	3/4	3-1/4	6	.585
89904	89904TC	R 5/16	5/8	5/8	3/4	4-1/4	7	.585
89598	89598TC	R 3/8	3/4	3/4	1	2-1/4	5	.710
89905	89905TC	R 3/8	3/4	3/4	1	3-1/4	6	.710
89906	89906TC	R 3/8	3/4	3/4	1	4-1/4	7	.710
89600	89600TC	R 1/2	1	1	1-1/8	2-1/4	5	.960
89907	89907TC	R 1/2	1	1	1-1/8	3-1/4	6	.960
89908	89908TC	R 1/2	1	1	1-1/8	4-1/4	7	.960

Mill Dia. Tolerance (inch)	Shank Dia. Tolerance
0~- .0012	0~- .0003



◎ : Excellent ○ : Good

ISO	P											M				K				
Material Description	Non-alloy steel				Low alloy steel				High alloyed steel, and tool steel			Stainless steel				Grey cast iron		Nodular cast iron	Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend																				

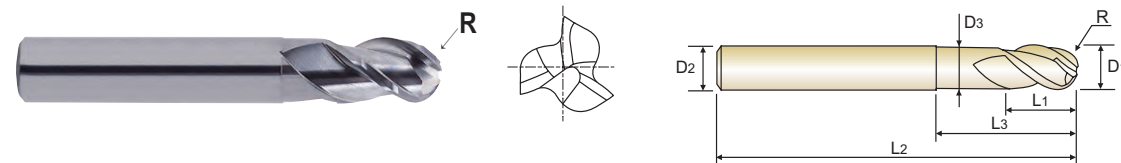
ISO	N					S					H										
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed		Copper and Copper Alloys (Bronze / Brass)		Non Metallic Materials		Heat Resistant Super Alloys			Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron					
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend	◎	◎	◎	◎	◎																



PLAIN SHANK E5975 SERIES

CARBIDE, 3 FLUTE 40° HELIX LONG LENGTH BALL NOSE with NECK

- ▶ Excellent cutting qualities on stainless steel, aluminum, copper.
- ▶ Increased tool life and higher cutting accuracy.
- ▶ Mirror face-excellent surface finish.

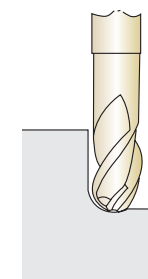


◆ U.S.A Stock

Unit : Inch

EDP No.		Radius of Ball Nose	Mill Diameter	Shank Diameter	Length of Cut	Length Below Shank	Overall Length	Neck Diameter
UNCOATED	TiCN COATED	R (±.0005)	D1	D2	L1	L3	L2	D3
38602	38602TC	R 3/64	3/32	1/4	1/8	3/16	2-3/8	.090
38601	38601TC	R 1/16	1/8	1/4	3/16	1/4	2-3/8	.117
38566	38566TC	R 3/32	3/16	1/4	1/4	3/8	2-1/2	.172
38573	38573TC	R 1/8	1/4	1/4	3/8	1/2	3	.235
38579	38579TC	R 5/32	5/16	5/16	1/2	1	3	.289
38584	38584TC	R 3/16	3/8	3/8	5/8	1-1/4	3-1/8	.351
38593	38593TC	R 1/4	1/2	1/2	3/4	1-3/8	3-1/2	.476
38595	38595TC	R 5/16	5/8	5/8	1	1-1/2	4	.601

Mill Dia. Tolerance (inch)	Shank Dia. Tolerance
0~- .0012	0~- .0003



◎ : Excellent ○ : Good

ISO	P											M				K				
Material Description	Non-alloy steel				Low alloy steel				High alloyed steel, and tool steel			Stainless steel				Grey cast iron		Nodular cast iron	Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend																				

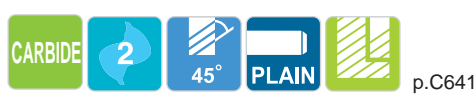
ISO	N					S					H										
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed		Copper and Copper Alloys (Bronze / Brass)		Non Metallic Materials		Heat Resistant Super Alloys			Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron					
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend	◎	◎	◎	◎	◎																



PLAIN SHANK E5522 SERIES  
PLAIN SHANK EG522 SERIES

**CARBIDE, 2 FLUTE 45° HELIX LONG LENGTH - TiCN COATED**

- ▶ Suitable for high speed machining in aluminum and other non-ferrous materials, excellent surface finishes, superior chip removal.
- ▶ Mirror face-excellent surface finish.

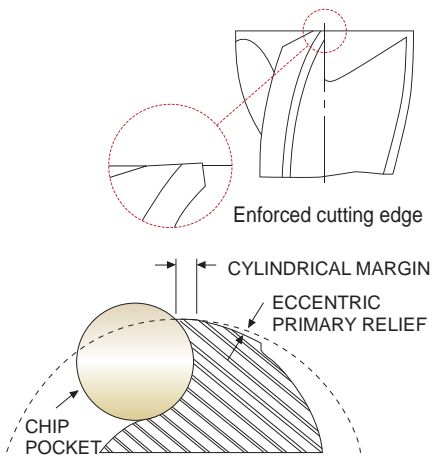


◇ Call for Availability

Unit : Inch

EDP No.	Mill Diameter		Shank Diameter	Length of Cut	Overall Length	
	UNCOATED	TiCN COATED				
<b>E5522030</b>	<b>EG522030</b>	3.0	.1181	6	8	57
<b>E5522040</b>	<b>EG522040</b>	4.0	.1575	6	11	57
<b>E5522050</b>	<b>EG522050</b>	5.0	.1969	6	13	57
<b>E5522060</b>	<b>EG522060</b>	6.0	.2362	6	13	57
<b>E5522080</b>	<b>EG522080</b>	8.0	.3150	8	19	63
<b>E5522100</b>	<b>EG522100</b>	10.0	.3937	10	22	72
<b>E5522120</b>	<b>EG522120</b>	12.0	.4724	12	26	83
<b>E5522140</b>	<b>EG522140</b>	14.0	.5512	14	26	83
<b>E5522160</b>	<b>EG522160</b>	16.0	.6299	16	32	92
<b>E5522180</b>	<b>EG522180</b>	18.0	.7087	18	32	92
<b>E5522200</b>	<b>EG522200</b>	20.0	.7874	20	38	104

Mill Dia. Tolerance (mm)	Shank Dia. Tolerance
0~-0.03	h6



- High performance in machining aluminum and non-ferrous materials
- Special designed geometry with high rigidity cutting edge
- Improved surface roughness - cylindrical margin which is controlled tightly.
- Excellent chip removal - higher rake angle, higher helix angle(45°), bigger chip pocket.

◎ : Excellent ○ : Good

ISO	P											M				K				
	Non-alloy steel					Low alloy steel						High alloyed steel, and tool steel		Stainless steel		Grey cast iron		Nodular cast iron	Malleable cast iron	
Material Description	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc	13	25	28	32	30	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend																				

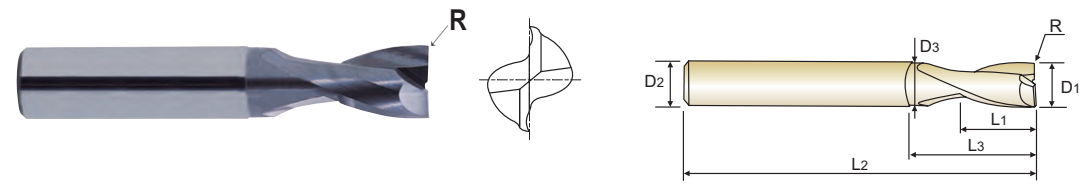
ISO	N					S					H										
	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)		Non Metallic Materials			Heat Resistant Super Alloys		Titanium Alloys	Hardened steel	Chilled Cast Iron	Hardened Cast Iron					
Material Description	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc						15	30	25	38	34	15	30	25	38	34	55	60	42	55		
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend	◎	◎	◎	◎	◎																



PLAIN SHANK EG930 SERIES

**CARBIDE, 2 FLUTE 25° HELIX STUB CUT LENGTH CORNER RADIUS TiCN COATED**

- ▶ Designed for the machining aluminum and its alloys, non-ferrous materials.
- ▶ Increased tool life and higher cutting accuracy.
- ▶ Maximum-stock removal, chip ejection, stability.
- ▶ Corner Radius for avoiding the chipping.
- ▶ Mirror face-excellent surface finish.

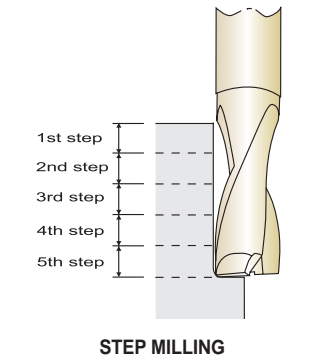


◇ Call for Availability

Unit : mm

EDP No.	Corner Radius R (±0.025)	Mill Diameter		Shank Diameter D2	Length of Cut L1	Length Below Shank L3	Overall Length L2	Neck Diameter D3
		Metric	Inch					
<b>EG930020</b>	R0.2	2.0	.0787	3	3	6	40	1.9
<b>EG930030</b>	R0.2	3.0	.1181	3	4	8	40	2.9
<b>EG930040</b>	R0.2	4.0	.1575	4	5	12	50	3.8
<b>EG930050</b>	R0.2	5.0	.1969	5	8	14	50	4.8
<b>EG930060</b>	R0.2	6.0	.2362	6	8	18	65	5.7
<b>EG930080</b>	R0.2	8.0	.3150	8	10	22	70	7.7
<b>EG930100</b>	R0.2	10.0	.3937	10	14	28	80	9.7
<b>EG930120</b>	R0.2	12.0	.4724	12	16	35	90	11.5
<b>EG930160</b>	R0.2	16.0	.6299	16	20	40	90	15.5
<b>EG930200</b>	R0.2	20.0	.7874	20	25	50	100	19.5

Mill Dia. Tolerance (mm)	Shank Dia. Tolerance
0~-0.03	h6



◎ : Excellent ○ : Good

ISO	P											M				K				
	Non-alloy steel					Low alloy steel						High alloyed steel, and tool steel		Stainless steel		Grey cast iron		Nodular cast iron	Malleable cast iron	
Material Description	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc	13	25	28	32	30	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend																				

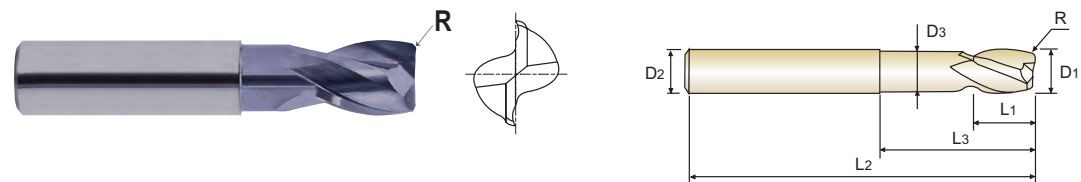
ISO	N					S					H										
	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)		Non Metallic Materials			Heat Resistant Super Alloys		Titanium Alloys	Hardened steel	Chilled Cast Iron	Hardened Cast Iron					
Material Description	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc						15	30	25	38	34	15	30	25	38	34	55	60	42	55		
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend	◎	◎	◎	◎	◎																

# YG ALU-POWER END MILLS

PLAIN SHANK EG909 SERIES

## CARBIDE, 2 FLUTE STUB CUT LENGTH CORNER RADIUS with NECK TiCN COATED

- ▶ Excellent cutting qualities on stainless steel, Aluminum, copper.
- ▶ Increased tool life and higher cutting accuracy.
- ▶ Mirror face-excellent surface finish.

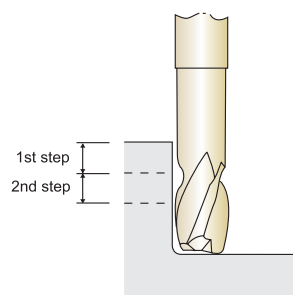


◇ Call for Availability

Unit : mm

EDP No.	Corner Radius R (±0.025)	Mill Diameter		Shank Diameter D2	Length of Cut L1	Length Below Shank L3	Overall Length L2	Neck Diameter D3
		Metric D1	Inch					
<a href="#">EG909040</a>	R0.3	4.0	.1575	6	5	10	50	3.6
<a href="#">EG909060</a>	R0.5	6.0	.2362	6	8	20	60	5.4
<a href="#">EG909080</a>	R0.6	8.0	.3150	8	10	30	70	7.2
<a href="#">EG909100</a>	R0.8	10.0	.3937	10	12	36	80	9.0
<a href="#">EG909120</a>	R1.0	12.0	.4724	12	14	40	90	11.0
<a href="#">EG909160</a>	R1.3	16.0	.6299	16	18	45	100	14.5
<a href="#">EG909200</a>	R1.6	20.0	.7874	20	24	45	100	18.0

Mill Dia. Tolerance (mm)	Shank Dia. Tolerance
0~-0.03	h6



STEP MILLING

◎ : Excellent ○ : Good

ISO Material Description	P											M				K					
	Non-alloy steel				Low alloy steel				High alloyed steel, and tool steel			Stainless steel				Grey cast iron		Nodular cast iron	Malleable cast iron		
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
HRc	13	25	28	32	30	10	29	32	38	15	35	15	23	10	10	26	3	25		21	
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230	
Recommend																					

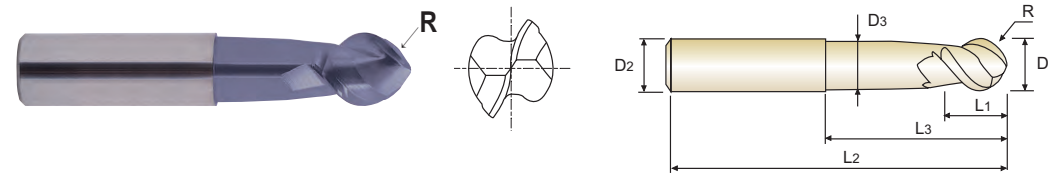
ISO Material Description	N					S					H										
	Aluminum-wrought alloy		Aluminum-cast, alloyed		Copper and Copper Alloys (Bronze / Brass)	Non Metallic Materials			Heat Resistant Super Alloys			Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron					
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc						15	30	25	38	34	15	30	25	38	34	55	60	42	55		
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend	◎	◎	◎	◎	◎																

# YG ALU-POWER END MILLS

PLAIN SHANK EG910 SERIES

## CARBIDE, 2 FLUTE 50° HELIX STUB CUT LENGTH BALL NOSE with NECK TiCN COATED

- ▶ Excellent cutting qualities on stainless steel, Aluminum, copper.
- ▶ Increased tool life and higher cutting accuracy.
- ▶ Mirror face-excellent surface finish.

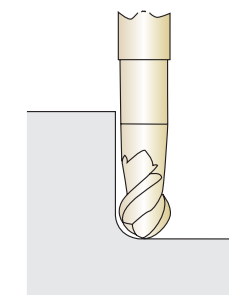


◇ Call for Availability

Unit : mm

EDP No.	Radius of Ball Nose R (±0.01)	Mill Diameter		Shank Diameter D2	Length of Cut L1	Length Below Shank L3	Overall Length L2	Neck Diameter D3
		Metric D1	Inch					
<a href="#">EG910060</a>	R 3.0	6.0	.2362	6	5.5	25	55	5.4
<a href="#">EG910080</a>	R 4.0	8.0	.3150	8	7	30	65	7.2
<a href="#">EG910100</a>	R 5.0	10.0	.3937	10	8.5	35	75	9.0
<a href="#">EG910120</a>	R 6.0	12.0	.4724	12	10.5	40	75	11.0
<a href="#">EG910160</a>	R 8.0	16.0	.6299	16	14	50	90	14.5
<a href="#">EG910200</a>	R 10.0	20.0	.7874	20	17	50	100	18.0

Mill Dia. Tolerance (mm)	Shank Dia. Tolerance
±0.02	h6



STEP MILLING

◎ : Excellent ○ : Good

ISO Material Description	P											M				K					
	Non-alloy steel				Low alloy steel				High alloyed steel, and tool steel			Stainless steel				Grey cast iron		Nodular cast iron	Malleable cast iron		
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
HRc	13	25	28	32	30	10	29	32	38	15	35	15	23	10	10	26	3	25		21	
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230	
Recommend																					

ISO Material Description	N					S					H										
	Aluminum-wrought alloy		Aluminum-cast, alloyed		Copper and Copper Alloys (Bronze / Brass)	Non Metallic Materials			Heat Resistant Super Alloys			Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron					
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc						15	30	25	38	34	15	30	25	38	34	55	60	42	55		
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend	◎	◎	◎	◎	◎																

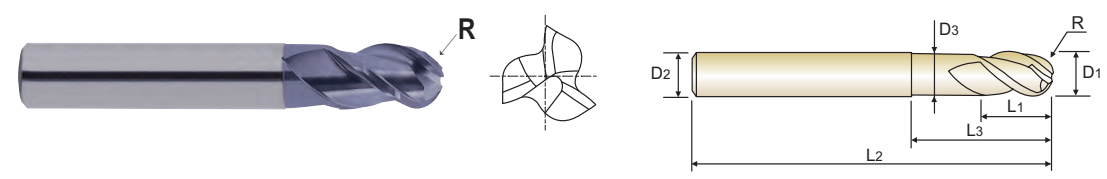




PLAIN SHANK EG908 SERIES

**CARBIDE, 3 FLUTE 40° HELIX LONG LENGTH BALL NOSE with NECK TiCN COATED**

- ▶ Excellent cutting performance on stainless steels, Aluminum & copper.
- ▶ Increased tool life and higher cutting accuracy.
- ▶ Mirror face-excellent surface finish.



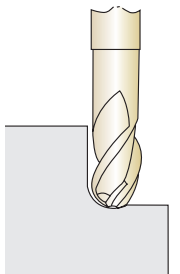
CARBIDE 3 40° ±0.01 PLAIN p.C642

◇ Call for Availability

EDP No.	Radius of Ball Nose R (±0.01)	Mill Diameter		Shank Diameter D2	Length of Cut L1	Length Below Shank L3	Overall Length L2	Neck Diameter D3
		Metric	Inch					
		D1						
EG908020	R1.0	2.0	.0787	6	3	5	60	1.9
EG908025	R1.25	2.5	.0984	6	4	6	60	2.4
EG908030	R1.5	3.0	.1181	6	4.5	6.5	60	2.8
EG908035	R1.75	3.5	.1378	6	5	7	65	3.2
EG908040	R2.0	4.0	.1575	6	6	8	65	3.7
EG908050	R2.5	5.0	.1969	6	7.5	10	65	4.6
EG908060	R3.0	6.0	.2362	6	9	12	75	5.6
EG908080	R4.0	8.0	.3150	8	12	25	75	7.4
EG908100	R5.0	10.0	.3937	10	15	30	80	9.4
EG908120	R6.0	12.0	.4724	12	18	36	90	11.4
EG908160	R8.0	16.0	.6299	16	24	40	100	15.4

Unit : mm

Mill Dia. Tolerance (mm)	Shank Dia. Tolerance
0~-0.03	h6



◎ : Excellent ○ : Good

ISO	P											M				K					
	Non-alloy steel					Low alloy steel						High alloyed steel, and tool steel				Stainless steel		Grey cast iron		Nodular cast iron	Malleable cast iron
Material Description	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
HRc	13	25	28	32	30	10	29	32	38	15	35	15	23	10	10	26	3	25	21	21	
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230	
Recommend																					

ISO	N					S					H											
	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys			Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron				
Material Description	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	
HRc	60	100	75	90	130	110	90	100			15	30	25	38	34			55	60	42	55	
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550	
Recommend	◎	◎	◎	◎	◎																	



FLAT SHANK EK191 SERIES

**HSS-PM, 3 FLUTE 42° HELIX REGULAR LENGTH ROUGHING for ALUMINUM**

- ▶ High performance metal removal in aluminum alloys.
- ▶ Corner radius against chipping



HSS-PM ALU 3 42° FLAT p.C644

◆ U.S.A Stock

■ SQUARE Unit : Inch

EDP No.	UNCOATED	TiCN COATED	Mill Diameter	Shank Diameter	Length of Cut	Overall Length
66519	66519 PC	5/8	5/8	1-5/8	3-3/4	
66524	66524 PC	3/4	3/4	1-5/8	3-7/8	
66540	66540 PC	1	1	2	4-1/2	
66541	66541 PC	1-1/4	1-1/4	2	4-1/2	
66542	66542 PC	1-1/2	1-1/4	2	4-1/2	
*66543	*66543 PC	2	2	2	5-3/4	

\*Combination Shank

HSS-PM ALU 3 42° ±.001 FLAT p.C600

◆ U.S.A Stock

■ with CORNER RADIUS Unit : Inch

EDP No.	UNCOATED	TiCN COATED	Corner Radius R	Mill Diameter	Shank Diameter	Length of Cut	Overall Length
66904	66904 PC	R.090	3/4	3/4	1-5/8	3-7/8	
66905	66905 PC	R.120	3/4	3/4	1-5/8	3-7/8	
66906	66906 PC	R.060	1	1	2	4-1/2	
66907	66907 PC	R.090	1	1	2	4-1/2	
66908	66908 PC	R.120	1	1	2	4-1/2	
66909	66909 PC	R.060	1-1/4	1-1/4	2	4-1/2	
66910	66910 PC	R.090	1-1/4	1-1/4	2	4-1/2	
66911	66911 PC	R.120	1-1/4	1-1/4	2	4-1/2	

■ The TiN coated, or TiAlN coated is available on your request.

Mill Dia. Tolerance (inch)	
up to 1	0~+.0030
over 1	0~+.0060

◎ : Excellent ○ : Good

ISO	P											M				K					
	Non-alloy steel					Low alloy steel						High alloyed steel, and tool steel				Stainless steel		Grey cast iron		Nodular cast iron	Malleable cast iron
Material Description	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
HRc	13	25	28	32	30	10	29	32	38	15	35	15	23	10	10	26	3	25	21	21	
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230	
Recommend																					

ISO	N					S					H											
	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys			Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron				
Material Description	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	
HRc	60	100	75	90	130	110	90	100			15	30	25	38	34			55	60	42	55	
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550	
Recommend	◎	◎	◎	◎	◎																	



FLAT SHANK EK226 SERIES

**HSS-PM, 3 FLUTE 42° HELIX & MEDIUM LENGTH ROUGHING for ALUMINUM**

- ▶ High performance metal removal in aluminum alloys.
- ▶ Corner radius against chipping



◆ U.S.A Stock

■ SQUARE Unit : Inch

EDP No.		Mill Diameter	Shank Diameter	Length of Cut	Overall Length
UNCOATED	TiCN COATED				
<a href="#">80524</a>	<a href="#">80524 PC</a>	3/4	3/4	2-1/2	4-5/8
<a href="#">80540</a>	<a href="#">80540 PC</a>	1	1	3	5-1/2
<a href="#">80541</a>	<a href="#">80541 PC</a>	1-1/4	1-1/4	3	5-1/2
<a href="#">80542</a>	<a href="#">80542 PC</a>	1-1/2	1-1/4	3	5-1/2
* <a href="#">80543</a>	* <a href="#">80543 PC</a>	2	2	3	6-3/4

\*Combination Shank



◆ U.S.A Stock

■ with CORNER RADIUS Unit : Inch

EDP No.		Corner Radius	Mill Diameter	Shank Diameter	Length of Cut	Overall Length
UNCOATED	TiCN COATED	R				
<a href="#">80901</a>	<a href="#">80901 PC</a>	R.060	3/4	3/4	2-1/4	4-5/8
<a href="#">80902</a>	<a href="#">80902 PC</a>	R.090	3/4	3/4	2-1/4	4-5/8
<a href="#">80903</a>	<a href="#">80903 PC</a>	R.120	3/4	3/4	2-1/4	4-5/8
<a href="#">80904</a>	<a href="#">80904 PC</a>	R.060	1	1	3	5-1/2
<a href="#">80905</a>	<a href="#">80905 PC</a>	R.090	1	1	3	5-1/2
<a href="#">80906</a>	<a href="#">80906 PC</a>	R.120	1	1	3	5-1/2
<a href="#">80907</a>	<a href="#">80907 PC</a>	R.060	1-1/4	1-1/4	3	5-1/2
<a href="#">80908</a>	<a href="#">80908 PC</a>	R.090	1-1/4	1-1/4	3	5-1/2
<a href="#">80909</a>	<a href="#">80909 PC</a>	R.120	1-1/4	1-1/4	3	5-1/2

■ The TiN coated, or TiAlN coated is available on your request.

Mill Dia. Tolerance (inch)	
up to 1	0~+.0030
over 1	0~+.0060

◎ : Excellent ○ : Good

ISO	P											M				K				
	Non-alloy steel					Low alloy steel						High alloyed steel, and tool steel				Stainless steel		Grey cast iron		Nodular cast iron
Material Description	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc	13	25	28	32	30	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend																				

ISO	N					S					H										
	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys			Titanium Alloys	Hardened steel	Chilled Cast Iron	Hardened Cast Iron				
Material Description	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend	◎	◎	◎	◎	◎																



FLAT SHANK EK192 SERIES

**HSS-PM, 3 FLUTE 42° HELIX LONG LENGTH ROUGHING for ALUMINUM**

- ▶ High performance metal removal in aluminum alloys.



◆ U.S.A Stock

■ SQUARE Unit : Inch

EDP No.		Mill Diameter	Shank Diameter	Length of Cut	Overall Length
UNCOATED	TiCN COATED				
<a href="#">67515</a>	<a href="#">67515 PC</a>	1/2	1/2	2	4
<a href="#">67519</a>	<a href="#">67519 PC</a>	5/8	5/8	2-1/2	4-5/8
<a href="#">67524</a>	<a href="#">67524 PC</a>	3/4	3/4	3	5-1/4
<a href="#">67540</a>	<a href="#">67540 PC</a>	1	1	4	6-1/2
<a href="#">67541</a>	<a href="#">67541 PC</a>	1-1/4	1-1/4	4	6-1/2
<a href="#">67542</a>	<a href="#">67542 PC</a>	1-1/2	1-1/4	4	6-1/2
* <a href="#">67543</a>	* <a href="#">67543 PC</a>	2	2	4	7-3/4
<a href="#">67544</a>	<a href="#">67544 PC</a>	1-1/4	1-1/4	6	8-1/2
<a href="#">67545</a>	<a href="#">67545 PC</a>	1-1/2	1-1/4	6	8-1/2
* <a href="#">67546</a>	* <a href="#">67546 PC</a>	2	2	6	9-3/4

\*Combination Shank

■ with NECK Unit : Inch

EDP No.		Mill Diameter	Shank Diameter	Length of Cut	Length Below Shank	Overall Length	Neck Diameter
UNCOATED	TiCN COATED						
<a href="#">EK10482</a>	<a href="#">EK10482C</a>	3/4	3/4	1-1/2	3	5-1/4	.705
<a href="#">EK10483</a>	<a href="#">EK10483C</a>	3/4	3/4	1-1/2	4	6-1/4	.705
<a href="#">EK10642</a>	<a href="#">EK10642C</a>	1	1	1-1/2	3	5-1/2	.950
<a href="#">EK10643</a>	<a href="#">EK10643C</a>	1	1	2	4	6-1/2	.950
<a href="#">EK10644</a>	<a href="#">EK10644C</a>	1	1	2	6	8-1/2	.950
<a href="#">EK11601</a>	<a href="#">EK11601C</a>	1-1/4	1-1/4	2	4	6-1/2	1.200
<a href="#">EK11602</a>	<a href="#">EK11602C</a>	1-1/4	1-1/4	2	6	8-1/2	1.200

■ The TiN coated, or TiAlN coated is available on your request.

Mill Dia. Tolerance (inch)	
up to 1	0~+.0030
over 1	0~+.0060

◎ : Excellent ○ : Good

ISO	P											M				K				
	Non-alloy steel					Low alloy steel						High alloyed steel, and tool steel				Stainless steel		Grey cast iron		Nodular cast iron
Material Description	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc	13	25	28	32	30	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend																				

ISO	N					S					H										
	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys			Titanium Alloys	Hardened steel	Chilled Cast Iron	Hardened Cast Iron				
Material Description	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend	◎	◎	◎	◎	◎																

**HSS-PM, 3 FLUTE 42° HELIX LONG LENGTH ROUGHING with CORNER RADIUS for ALUMINUM**

- ▶ High performance metal in aluminum alloys.
- ▶ Corner radius against chipping



◆ U.S.A Stock

Unit : Inch

EDP No.	Corner Radius		Mill Diameter	Shank Diameter	Length of Cut	Overall Length
	UNCOATED	TiCN COATED				
<b>67904</b>	<b>67904 PC</b>	R.060	3/4	3/4	3	5-1/4
<b>67905</b>	<b>67905 PC</b>	R.090	3/4	3/4	3	5-1/4
<b>67906</b>	<b>67906 PC</b>	R.120	3/4	3/4	3	5-1/4
<b>67907</b>	<b>67907 PC</b>	R.060	1	1	4	6-1/2
<b>67908</b>	<b>67908 PC</b>	R.090	1	1	4	6-1/2
<b>67909</b>	<b>67909 PC</b>	R.120	1	1	4	6-1/2
<b>67910</b>	<b>67910 PC</b>	R.060	1-1/4	1-1/4	4	6-1/2
<b>67911</b>	<b>67911 PC</b>	R.090	1-1/4	1-1/4	4	6-1/2
<b>67912</b>	<b>67912 PC</b>	R.120	1-1/4	1-1/4	4	6-1/2
<b>67913</b>	<b>67913 PC</b>	R.060	1-1/4	1-1/4	6	8-1/2
<b>67914</b>	<b>67914 PC</b>	R.090	1-1/4	1-1/4	6	8-1/2
<b>67915</b>	<b>67915 PC</b>	R.120	1-1/4	1-1/4	6	8-1/2

■ The TiN coated, or TiAlN coated is available on your request.

Mill Dia. Tolerance (inch)	
up to 1	0~+.0030
over 1	0~+.0060

◎ : Excellent ○ : Good

ISO	P											M				K				
	Non-alloy steel				Low alloy steel				High alloyed steel, and tool steel	Stainless steel			Grey cast iron		Nodular cast iron	Malleable cast iron				
Material Description	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc	13	25	28	32	30	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend																				

ISO	N					S					H										
	Aluminum-wrought alloy		Aluminum-cast, alloyed		Copper and Copper Alloys (Bronze / Brass)	Non Metallic Materials		Heat Resistant Super Alloys			Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron						
Material Description	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc						15	30	25	38	34	15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend	◎	◎	◎	◎	◎																

**HSS-PM, 3 FLUTE 42° HELIX ROUGHING BALL NOSE REGULAR LENGTH for ALUMINUM**

- ▶ High performance metal removal in aluminum alloys.



◆ U.S.A Stock

Unit : Inch

EDP No.	Radius of Ball Nose		Mill Diameter	Shank Diameter	Length of Cut	Overall Length
	UNCOATED	TiCN COATED				
<b>EP12032</b>	<b>EP12032C</b>	R1/4	1/2	1/2	1-1/4	3-1/4
<b>EP12040</b>	<b>EP12040C</b>	R5/16	5/8	5/8	1-5/8	3-3/4
<b>EP12048</b>	<b>EP12048C</b>	R3/8	3/4	3/4	1-5/8	3-7/8
<b>EP12064</b>	<b>EP12064C</b>	R1/2	1	1	2	4-1/2
<b>EP12110</b>	<b>EP12110C</b>	R5/8	1-1/4	1-1/4	2	4-1/2

■ The TiN coated, or TiAlN coated is available on your request.

Mill Dia. Tolerance (inch)	
up to 1	0~+.0030
over 1	0~+.0060

◎ : Excellent ○ : Good

ISO	P											M				K				
	Non-alloy steel				Low alloy steel				High alloyed steel, and tool steel	Stainless steel			Grey cast iron		Nodular cast iron	Malleable cast iron				
Material Description	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc	13	25	28	32	30	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend																				

ISO	N					S					H										
	Aluminum-wrought alloy		Aluminum-cast, alloyed		Copper and Copper Alloys (Bronze / Brass)	Non Metallic Materials		Heat Resistant Super Alloys			Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron						
Material Description	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc						15	30	25	38	34	15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend	◎	◎	◎	◎	◎																





FLAT SHANK EK193 SERIES

FLAT SHANK EK132 SERIES

### HSS-PM, 3 FLUTE FINISHING REGULAR LENGTH & MEDIUM LENGTH & LONG LENGTH

► High performance metal removal in aluminum alloys.



p.C645

◆ U.S.A Stock

■ SQUARE

Unit : Inch

EDP No.		Mill Diameter	Shank Diameter	Length of Cut	Overall Length
UNCOATED	TICN COATED				
EP10323	EP10323C	1/2	1/2	1-1/4	3-1/4
EP10324	EP10324C	1/2	1/2	2	4
EP10403	EP10403C	5/8	5/8	1-5/8	3-3/4
EP10404	EP10404C	5/8	5/8	2-1/2	4-5/8
EP10484	EP10484C	3/4	3/4	1-5/8	3-7/8
EP10485	EP10485C	3/4	3/4	2-1/4	4-5/8
EP10486	EP10486C	3/4	3/4	3	5-1/4
EP10644	EP10644C	1	1	2	4-1/2
EP10645	EP10645C	1	1	3	5-1/2
EP10646	EP10646C	1	1	4	6-1/2
EP11165	EP11165C	1-1/4	1-1/4	2	4-1/2
EP11166	EP11166C	1-1/4	1-1/4	3	5-1/2
EP11167	EP11167C	1-1/4	1-1/4	4	6-1/2
EP11324	EP11324C	1-1/2	1-1/4	2	4-1/2
EP11325	EP11325C	1-1/2	1-1/4	3	5-1/2
EP11326	EP11326C	1-1/2	1-1/4	4	6-1/2

■ SQUARE with NECK

Unit : Inch

EDP No.		Mill Diameter	Shank Diameter	Length of Cut	Length Below Shank	Overall Length	Neck Diameter
UNCOATED	TICN COATED						
EK13210	EK13210C	3/4	3/4	1-1/2	3	5-1/4	.705
EK13211	EK13211C	3/4	3/4	1-1/2	4	6-1/4	.705
EK13212	EK13212C	1	1	1-1/2	3	5-1/2	.950
EK13213	EK13213C	1	1	2	4	6-1/2	.950
EK13214	EK13214C	1	1	2	6	8-1/2	.950
EK13215	EK13215C	1-1/4	1-1/4	2	4	6-1/2	1.200
EK13216	EK13216C	1-1/4	1-1/4	2	6	8-1/2	1.200

■ The TiN coated, or TiAlN coated is available on your request.

Mill Dia. Tolerance (inch)	
0~+.0010	* * 0~+.0015

\* \* The shank of end mills is the same diameter as the cutting portion.

◎ : Excellent ○ : Good

ISO Material Description	P										M				K					
	Non-alloy steel					Low alloy steel					High alloyed steel, and tool steel				Stainless steel		Grey cast iron	Nodular cast iron	Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend																				

ISO Material Description	N					S					H										
	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys			Titanium Alloys	Hardened steel	Chilled Cast Iron	Hardened Cast Iron				
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend	◎	◎	◎	◎	◎																



FLAT SHANK EK193 SERIES

### HSS-PM, 3 FLUTE FINISHING CORNER RADIUS REGULAR LENGTH & MEDIUM LENGTH & LONG LENGTH

► High performance metal removal in aluminum alloys.  
► Corner radius against chipping



p.C645

◆ U.S.A Stock

EDP No.		Corner Radius R	Mill Diameter	Shank Diameter	Length of Cut	Overall Length
UNCOATED	TICN COATED					
EP10321	EP10321C	R.120	1/2	1/2	1-1/4	3-1/4
EP10322	EP10322C	R.120	1/2	1/2	2	4
EP10401	EP10401C	R.120	5/8	5/8	1-5/8	3-3/4
EP10402	EP10402C	R.120	5/8	5/8	2-1/2	4-5/8
EP10481	EP10481C	R.120	3/4	3/4	1-5/8	3-7/8
EP10482	EP10482C	R.120	3/4	3/4	2-1/4	4-5/8
EP10483	EP10483C	R.120	3/4	3/4	3	5-1/4
EP10641	EP10641C	R.120	1	1	2	4-1/2
EP10642	EP10642C	R.120	1	1	3	5-1/2
EP10643	EP10643C	R.120	1	1	4	6-1/2
EP11162	EP11162C	R.120	1-1/4	1-1/4	2	4-1/2
EP11163	EP11163C	R.120	1-1/4	1-1/4	3	5-1/2
EP11164	EP11164C	R.120	1-1/4	1-1/4	4	6-1/2
EP11321	EP11321C	R.120	1-1/2	1-1/4	2	4-1/2
EP11322	EP11322C	R.120	1-1/2	1-1/4	3	5-1/2
EP11323	EP11323C	R.120	1-1/2	1-1/4	4	6-1/2

■ The TiN coated, or TiAlN coated is available on your request.

Mill Dia. Tolerance (inch)	
0~+.0010	* * 0~+.0015

\* \* The shank of end mills is the same diameter as the cutting portion.

◎ : Excellent ○ : Good

ISO Material Description	P										M				K					
	Non-alloy steel					Low alloy steel					High alloyed steel, and tool steel				Stainless steel		Grey cast iron	Nodular cast iron	Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend																				

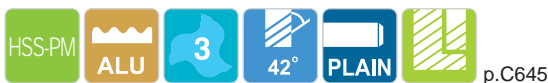
ISO Material Description	N					S					H										
	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys			Titanium Alloys	Hardened steel	Chilled Cast Iron	Hardened Cast Iron				
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend	◎	◎	◎	◎	◎																



PLAIN SHANK EP922 SERIES

### HSS-PM, 3 FLUTE 42° HELIX SHORT LENGTH ROUGHING for ALUMINUM

- ▶ Maximum stock removal rates at High Speed Condition.
- ▶ Reduces vibrations and improves surface roughness.



◇ Call for Availability

Unit : mm

EDP No.	Mill Diameter		Shank Diameter	Length of Cut	Overall Length
	Metric	Inch			
	js12		h6		
EP922120	12.0	.4724	12	26	83
EP922140	14.0	.5512	12	26	83
EP922160	16.0	.6299	16	32	92
EP922180	18.0	.7087	16	32	92
EP922200	20.0	.7874	20	38	104
EP922220	22.0	.8661	20	38	104
EP922250	25.0	.9843	25	45	121
EP922280	28.0	1.1024	25	45	121
EP922320	32.0	1.2598	32	53	133

#### Tolerances according to DIN 7160 & 7161

Tolerance range in μm						
Nominal-Diameter in mm						
	from 1 to 3	over 3 to 6	over 6 to 10	over 10 to 18	over 18 to 30	over 30 to 50
js12	± 50	± 60	± 75	± 90	± 105	± 125
h6	$\begin{matrix} 0 \\ -6 \end{matrix}$	$\begin{matrix} 0 \\ -8 \end{matrix}$	$\begin{matrix} 0 \\ -9 \end{matrix}$	$\begin{matrix} 0 \\ -11 \end{matrix}$	$\begin{matrix} 0 \\ -13 \end{matrix}$	$\begin{matrix} 0 \\ -16 \end{matrix}$

◎ : Excellent ○ : Good

ISO	P											M				K					
	Non-alloy steel					Low alloy steel						High alloyed steel, and tool steel		Stainless steel		Grey cast iron		Nodular cast iron	Malleable cast iron		
Material Description	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
HRc	13	25	28	32	30	10	29	32	38	15	35	15	23	10	10	26	3	25	21		
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230	
Recommend																					

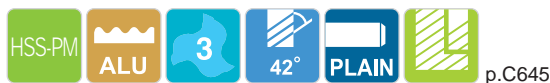
ISO	N					S					H											
	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys			Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron				
Material Description	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	
HRc						15	30	25	38	34	15	30	25	38	34	55	60	42	55			
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550	
Recommend	◎	◎	◎	◎	◎																	



PLAIN SHANK EP924 SERIES

### HSS-PM, 3 FLUTE 42° HELIX LONG LENGTH ROUGHING for ALUMINUM

- ▶ Maximum stock removal rates at High Speed Condition.
- ▶ Reduces vibrations and improves surface roughness.



◇ Call for Availability

Unit : mm

EDP No.	Mill Diameter		Shank Diameter	Length of Cut	Overall Length
	Metric	Inch			
	js12		h6		
EP924120	12.0	.4724	12	53	110
EP924140	14.0	.5512	12	53	110
EP924160	16.0	.6299	16	63	123
EP924180	18.0	.7087	16	63	123
EP924200	20.0	.7874	20	75	141
EP924220	22.0	.8661	20	75	141
EP924250	25.0	.9843	25	90	166
EP924280	28.0	1.1024	25	90	166
EP924320	32.0	1.2598	32	106	186

#### Tolerances according to DIN 7160 & 7161

Tolerance range in μm						
Nominal-Diameter in mm						
	from 1 to 3	over 3 to 6	over 6 to 10	over 10 to 18	over 18 to 30	over 30 to 50
js12	± 50	± 60	± 75	± 90	± 105	± 125
h6	$\begin{matrix} 0 \\ -6 \end{matrix}$	$\begin{matrix} 0 \\ -8 \end{matrix}$	$\begin{matrix} 0 \\ -9 \end{matrix}$	$\begin{matrix} 0 \\ -11 \end{matrix}$	$\begin{matrix} 0 \\ -13 \end{matrix}$	$\begin{matrix} 0 \\ -16 \end{matrix}$

◎ : Excellent ○ : Good

ISO	P											M				K					
	Non-alloy steel					Low alloy steel						High alloyed steel, and tool steel		Stainless steel		Grey cast iron		Nodular cast iron	Malleable cast iron		
Material Description	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
HRc	13	25	28	32	30	10	29	32	38	15	35	15	23	10	10	26	3	25	21		
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230	
Recommend																					

ISO	N					S					H											
	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys			Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron				
Material Description	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	
HRc						15	30	25	38	34	15	30	25	38	34	55	60	42	55			
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550	
Recommend	◎	◎	◎	◎	◎																	

**E5253, E5254 SERIES**

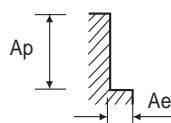
**2 FLUTE - SIDE CUTTING**

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø)												
						1/8	5/32	3/16	1/4	5/16	3/8	1/2	9/16	5/8	11/16	13/16		
N	21-25	Aluminum-wrought alloy Aluminum-cast, alloyed	D1/8 ~ 3/8 : 0.25D D1/2 ~ 13/16 : 0.5D	1.0D	SFM (Vc)	325	410	490	655	655	785	1045	885	980	720	850		
					IPT (fz)	.0018	.0022	.0026	.0030	.0044	.0052	.0064	.0073	.0079	.0089	.0094		
					RPM	10000	10000	10000	10000	8000	8000	8000	6000	6000	4000	4000		
					IPM (FEED)	35	43	51	59	71	83	102	87	95	71	75		

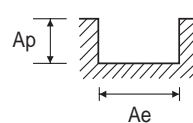
SFM(Vc) = ft./min.  
IPT(fz) = in./tooth  
RPM = rev./min.  
IPM(Feed) = in./min.

**2 FLUTE - SLOTTING**

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø)												
						1/8	5/32	3/16	1/4	5/16	3/8	1/2	9/16	5/8	11/16	13/16		
N	21-25	Aluminum-wrought alloy Aluminum-cast, alloyed	1.0D	0.5D	SFM (Vc)	325	410	490	655	655	785	1045	885	980	720	850		
					IPT (fz)	.0014	.0018	.0020	.0024	.0034	.0042	.0052	.0059	.0063	.0069	.0079		
					RPM	10000	10000	10000	10000	8000	8000	8000	6000	6000	4000	4000		
					IPM (FEED)	28	35	39	47	55	67	83	71	75	55	63		



※ The Feed, in long & extra long types, should be reduced by around 50%.



※ The Feed, in long & extra long types, should be reduced by around 50%.

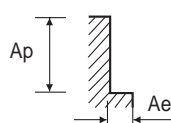
**EG253, EG254 SERIES** TiCN Coated

**2 FLUTE - SIDE CUTTING**

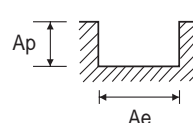
ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø)												
						1/8	5/32	3/16	1/4	5/16	3/8	1/2	9/16	5/8	11/16	13/16		
N	21-25	Aluminum-wrought alloy Aluminum-cast, alloyed	D1/8 ~ 3/8 : 0.25D D1/2 ~ 13/16 : 0.5D	1.0D	SFM (Vc)	395	490	590	785	785	940	1255	1060	1180	865	1020		
					IPT (fz)	.0024	.0028	.0033	.0040	.0057	.0067	.0084	.0092	.0102	.0114	.0123		
					RPM	12000	12000	12000	12000	9600	9600	9600	7200	7200	4800	4800		
					IPM (FEED)	57	66	80	95	109	128	161	132	147	109	118		

**2 FLUTE - SLOTTING**

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø)												
						1/8	5/32	3/16	1/4	5/16	3/8	1/2	9/16	5/8	11/16	13/16		
N	21-25	Aluminum-wrought alloy Aluminum-cast, alloyed	1.0D	0.5D	SFM (Vc)	510	640	765	1020	980	1180	1570	1415	1570	1080	1275		
					IPT (fz)	.0014	.0018	.0020	.0023	.0035	.0043	.0053	.0057	.0061	.0071	.0079		
					RPM	15600	15600	15600	15600	12000	12000	12000	9600	9600	6000	6000		
					IPM (FEED)	43	57	61	71	85	104	128	109	118	85	95		



※ The Feed, in long & extra long types, should be reduced by around 50%.



※ The Feed, in long & extra long types, should be reduced by around 50%.

**E5980, E5981, E5982, E5983, E5984 SERIES**

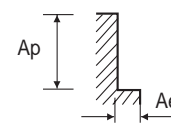
**3 FLUTE - SIDE CUTTING**

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø)												
						1/8	5/32	3/16	1/4	5/16	3/8	1/2	9/16	5/8	11/16	13/16		
N	21-25	Aluminum-wrought alloy Aluminum-cast, alloyed	D1/8 ~ 3/8 : 0.25D D1/2 ~ 13/16 : 0.5D	1.0D	SFM (Vc)	325	410	490	655	655	785	1045	885	980	720	850		
					IPT (fz)	.0014	.0017	.0020	.0024	.0035	.0041	.0051	.0058	.0063	.0071	.0075		
					RPM	10000	10000	10000	10000	8000	8000	8000	6000	6000	4000	4000		
					IPM (FEED)	43	52	61	71	85	99	123	104	113	85	90		

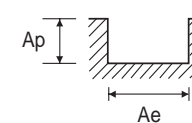
SFM(Vc) = ft./min.  
IPT(fz) = in./tooth  
RPM = rev./min.  
IPM(Feed) = in./min.

**3 FLUTE - SLOTTING**

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø)												
						1/8	5/32	3/16	1/4	5/16	3/8	1/2	9/16	5/8	11/16	13/16		
N	21-25	Aluminum-wrought alloy Aluminum-cast, alloyed	1.0D	0.5D	SFM (Vc)	325	410	490	655	655	785	1045	885	980	720	850		
					IPT (fz)	.0011	.0014	.0016	.0019	.0028	.0033	.0041	.0047	.0050	.0055	.0063		
					RPM	10000	10000	10000	10000	8000	8000	8000	6000	6000	4000	4000		
					IPM (FEED)	33	43	47	57	66	80	99	85	90	66	76		



※ The Feed, in long & extra long types, should be reduced by around 50%.



※ The Feed, in long & extra long types, should be reduced by around 50%.

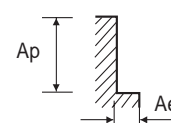
**EG980, EG981, EG982, EG983, EG984 SERIES** TiCN Coated

**3 FLUTE - SIDE CUTTING**

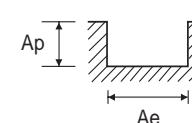
ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø)												
						1/8	5/32	3/16	1/4	5/16	3/8	1/2	9/16	5/8	11/16	13/16		
N	21-25	Aluminum-wrought alloy Aluminum-cast, alloyed	D1/8 ~ 3/8 : 0.25D D1/2 ~ 13/16 : 0.5D	1.0D	SFM (Vc)	395	490	590	785	785	940	1255	1060	1180	865	1020		
					IPT (fz)	.0015	.0019	.0022	.0026	.0039	.0045	.0056	.0063	.0068	.0077	.0081		
					RPM	12000	12000	12000	12000	9600	9600	9600	7200	7200	4800	4800		
					IPM (FEED)	55	68	80	92	111	129	160	135	147	111	117		

**3 FLUTE - SLOTTING**

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø)												
						1/8	5/32	3/16	1/4	5/16	3/8	1/2	9/16	5/8	11/16	13/16		
N	21-25	Aluminum-wrought alloy Aluminum-cast, alloyed	1.0D	0.5D	SFM (Vc)	510	640	765	1020	980	1180	1570	1415	1570	1080	1275		
					IPT (fz)	.0009	.0012	.0013	.0016	.0024	.0029	.0036	.0039	.0041	.0048	.0054		
					RPM	15600	15600	15600	15600	12000	12000	12000	9600	9600	6000	6000		
					IPM (FEED)	43	55	61	74	86	104	129	111	117	86	98		



※ The Feed, in long & extra long types, should be reduced by around 50%.



※ The Feed, in long & extra long types, should be reduced by around 50%.



**E5977, E5985** SERIES

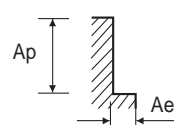
**3 FLUTE - SIDE CUTTING**

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø)					
						1/4	3/8	1/2	5/8	3/4	1
N	21-25	Aluminum-wrought alloy Aluminum-cast, alloyed	D1/8 ~ 3/8 : 0.25D D1/2 ~ 13/16 : 0.5D	1.0D	SFM (Vc)	525	630	840	785	630	680
					IPT (fz)	.0024	.0041	.0051	.0063	.0091	.0101
					RPM	8000	6400	6400	4800	3200	2600
					IPM (FEED)	57	79	98	91	87	79

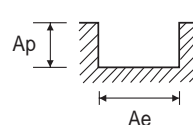
SFM(Vc) = ft./min.  
IPT(fz) = in./tooth  
RPM = rev./min.  
IPM(Feed) = in./min.

**3 FLUTE - SLOTTING**

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø)					
						1/4	3/8	1/2	5/8	3/4	1
N	21-25	Aluminum-wrought alloy Aluminum-cast, alloyed	1.0D	0.5D	SFM (Vc)	525	630	840	785	630	680
					IPT (fz)	.0019	.0033	.0041	.0050	.0074	.0082
					RPM	8000	6400	6400	4800	3200	2600
					IPM (FEED)	45	64	79	72	71	64



※ The Feed, in long & extra long types, should be reduced by around 50%.



※ The Feed, in long & extra long types, should be reduced by around 50%.

**EG977, EG985** SERIES TiCN Coated

**3 FLUTE - SIDE CUTTING**

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø)					
						1/4	3/8	1/2	5/8	3/4	1
N	21-25	Aluminum-wrought alloy Aluminum-cast, alloyed	D1/8 ~ 3/8 : 0.25D D1/2 ~ 13/16 : 0.5D	1.0D	SFM (Vc)	685	815	1085	1015	825	890
					IPT (fz)	.0023	.0041	.0051	.0063	.0090	.0100
					RPM	10500	8300	8300	6200	4200	3400
					IPM (FEED)	74	103	128	118	114	102

**3 FLUTE - SLOTTING**

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø)					
						1/4	3/8	1/2	5/8	3/4	1
N	21-25	Aluminum-wrought alloy Aluminum-cast, alloyed	1.0D	0.5D	SFM (Vc)	685	815	1085	1015	825	890
					IPT (fz)	.0028	.0051	.0062	.0075	.0110	.0122
					RPM	10500	8300	8300	6200	4200	3400
					IPM (FEED)	59	84	103	93	92	83

**E5973** SERIES

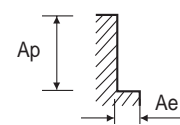
**2 FLUTE - SIDE CUTTING**

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø)						
						5/32	1/4	5/16	3/8	1/2	5/8	3/4
N	21-25	Aluminum-wrought alloy Aluminum-cast, alloyed	D5/32 ~ 3/8 : 0.25D D1/2 ~ 3/4 : 0.5D	1.0D	SFM (Vc)	410	655	655	785	1045	980	785
					IPT (fz)	.0021	.0031	.0044	.0051	.0064	.0078	.0095
					RPM	10000	10000	8000	8000	6000	4000	4000
					IPM (FEED)	42	61	70	82	103	94	76
N	26-28	Copper and Copper Alloys (Bronze / Brass)	D5/32 ~ 3/8 : 0.25D D1/2 ~ 3/4 : 0.5D	1.0D	SFM (Vc)	125	195	190	225	300	295	225
					IPT (fz)	.0018	.0025	.0039	.0046	.0057	.0067	.0083
					RPM	3000	3000	2300	2300	2300	1800	1150
					IPM (FEED)	11	15	18	21	26	24	19

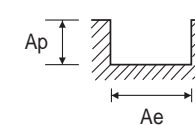
SFM(Vc) = ft./min.  
IPT(fz) = in./tooth  
RPM = rev./min.  
IPM(Feed) = in./min.

**2 FLUTE - SLOTTING**

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø)						
						5/32	1/4	5/16	3/8	1/2	5/8	3/4
N	21-25	Aluminum-wrought alloy Aluminum-cast, alloyed	1.0D	0.5D	SFM (Vc)	410	655	655	785	1045	980	785
					IPT (fz)	.0018	.0023	.0034	.0042	.0051	.0063	.0076
					RPM	10000	10000	8000	8000	8000	6000	4000
					IPM (FEED)	36	45	55	67	82	76	61
N	26-28	Copper and Copper Alloys (Bronze / Brass)	1.0D	0.5D	SFM (Vc)	125	195	190	225	300	295	225
					IPT (fz)	.0015	.0020	.0030	.0037	.0046	.0053	.0065
					RPM	3000	3000	2300	2300	2300	1800	1150
					IPM (FEED)	9	12	14	17	21	19	15



※ The Feed, in long & extra long types, should be reduced by around 50%.



※ The Feed, in long & extra long types, should be reduced by around 50%.

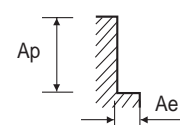
**E5976** SERIES

**2 FLUTE - SIDE CUTTING**

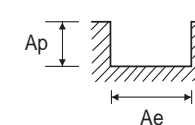
ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø)					
						1/4	3/8	1/2	5/8	3/4	1
N	21-25	Aluminum-wrought alloy Aluminum-cast, alloyed	D1/4 ~ 3/8 : 0.25D D1/2 ~ 1 : 0.5D	1.0D	SFM (Vc)	525	630	840	785	630	680
					IPT (fz)	.0029	.0052	.0064	.0079	.0114	.0127
					RPM	8000	6400	6400	4800	3200	2600
					IPM (FEED)	47	66	82	76	73	66

**2 FLUTE - SLOTTING**

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø)					
						1/4	3/8	1/2	5/8	3/4	1
N	21-25	Aluminum-wrought alloy Aluminum-cast, alloyed	0.5D	1.0D	SFM (Vc)	525	630	840	785	630	680
					IPT (fz)	.0024	.0042	.0052	.0063	.0092	.0102
					RPM	8000	6400	6400	4800	3200	2600
					IPM (FEED)	38	54	66	60	59	53



※ The Feed, in long & extra long types, should be reduced by around 50%.



※ The Feed, in long & extra long types, should be reduced by around 50%.

HSS

**Y/G ALU-POWER END MILLS**

RECOMMENDED CUTTING CONDITIONS

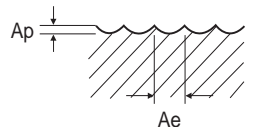
**Y/G ALU-POWER END MILLS**

RECOMMENDED CUTTING CONDITIONS

**E5978 SERIES 2 FLUTE - PLANE**

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø)					
						1/4	5/16	3/8	1/2	5/8	3/4
N	21-25	Aluminum-wrought alloy Aluminum-cast, alloyed	0.5D	0.2D	SFM (Vc)	735	705	845	1125	1115	845
					IPT (fz)	.0025	.0037	.0043	.0055	.0063	.0080
					RPM	11200	8600	8600	8600	6800	4300
					IPM (FEED)	55	63	74	95	85	69

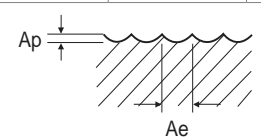
SFM(Vc) = ft./min.  
IPT(fz) = in./tooth  
RPM = rev./min.  
IPM(Feed) = in./min.



※ The Feed, in long & extra long types, should be reduced by around 50%.

**E5978 SERIES TiCN Coated 2 FLUTE - PLANE**

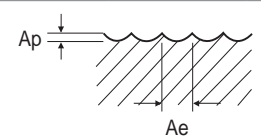
ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø)					
						1/4	5/16	3/8	1/2	5/8	3/4
N	21-25	Aluminum-wrought alloy Aluminum-cast, alloyed	0.5D	0.2D	SFM (Vc)	950	915	1100	1465	1440	1100
					IPT (fz)	.0025	.0037	.0043	.0055	.0063	.0093
					RPM	14500	11200	11200	11200	8800	5600
					IPM (FEED)	72	82	96	123	111	104



※ The Feed, in long & extra long types, should be reduced by around 50%.

**E5974 SERIES 2 FLUTE - PLANE**

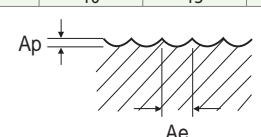
ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø)					
						1/4	5/16	3/8	1/2	5/8	3/4
N	21-25	Aluminum-wrought alloy Aluminum-cast, alloyed	0.5D	0.2D	SFM (Vc)	915	885	1060	1415	1390	1060
					IPT (fz)	.0019	.0028	.0033	.0042	.0048	.0062
					RPM	14000	10800	10800	10800	8500	5400
					IPM (FEED)	53	61	71	91	82	67
N	26-28	Copper and Copper Alloys (Bronze / Brass)	0.5D	0.2D	SFM (Vc)	275	260	315	420	410	315
					IPT (fz)	.0015	.0023	.0028	.0036	.0040	.0053
					RPM	4200	3200	3200	3200	2500	1600
					IPM (FEED)	13	15	18	23	20	17



※ The Feed, in long & extra long types, should be reduced by around 50%.

**E5975 SERIES 3 FLUTE - PLANE**

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø)							
						3/32	1/8	3/16	1/4	5/16	3/8	1/2	5/8
N	21-25	Aluminum-wrought alloy Aluminum-cast, alloyed	0.5D	0.2D	SFM (Vc)	510	450	675	905	885	1060	1415	1390
					IPT (fz)	.0005	.0007	.0010	.0013	.0019	.0022	.0028	.0032
					RPM	20700	13800	13800	13800	10800	10800	10800	8500
					IPM (FEED)	29	29	41	53	61	71	91	82
N	26-28	Copper and Copper Alloys (Bronze / Brass)	0.5D	0.2D	SFM (Vc)	150	135	205	275	260	315	420	410
					IPT (fz)	.0004	.0006	.0008	.0010	.0016	.0019	.0024	.0027
					RPM	6200	4200	4200	4200	3200	3200	3200	2500
					IPM (FEED)	7	7	10	13	15	18	23	20



※ The Feed, in long & extra long types, should be reduced by around 50%.

**E5522 SERIES 2Flute / Side Cutting / METRIC**

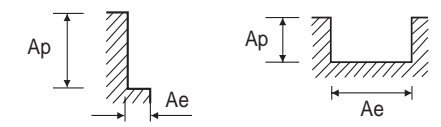
**2 FLUTE - SIDE CUTTING**

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø)											
						3.0	4.0	5.0	6.0	8.0	10.0	12.0	14.0	16.0	18.0	20.0	
N	21-25	Aluminum-wrought alloy Aluminum-cast, alloyed	D3 ~ 10 : 0.25D D12 ~ 20 : 0.5D	1.0D	SFM (Vc)	310	410	515	620	660	825	990	865	990	740	825	
					IPT (fz)	.0018	.0022	.0026	.0030	.0044	.0052	.0064	.0073	.0079	.0089	.0094	
					RPM	10000	10000	10000	10000	8000	8000	8000	6000	6000	4000	4000	
					IPM (FEED)	35	43	51	59	71	83	102	87	95	71	75	

SFM(Vc) = ft./min.  
IPT(fz) = in./tooth  
RPM = rev./min.  
IPM(Feed) = in./min.

**2 FLUTE - SLOTTING**

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø)											
						3.0	4.0	5.0	6.0	8.0	10.0	12.0	14.0	16.0	18.0	20.0	
N	21-25	Aluminum-wrought alloy Aluminum-cast, alloyed	1.0D	0.5D	SFM (Vc)	310	410	515	620	660	825	990	865	990	740	825	
					IPT (fz)	.0014	.0018	.0020	.0024	.0034	.0042	.0052	.0059	.0063	.0069	.0079	
					RPM	10000	10000	10000	10000	8000	8000	8000	6000	6000	4000	4000	
					IPM (FEED)	28	35	39	47	55	67	83	71	75	55	63	



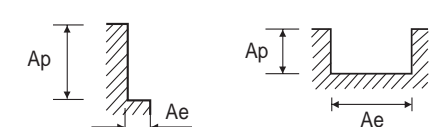
**EG522, EG930 SERIES TiCN Coated**

**2 FLUTE - SIDE CUTTING**

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø)											
						3.0	4.0	5.0	6.0	8.0	10.0	12.0	14.0	16.0	18.0	20.0	
N	21-25	Aluminum-wrought alloy Aluminum-cast, alloyed	D3 ~ 10 : 0.25D D12 ~ 20 : 0.5D	1.0D	SFM (Vc)	400	535	670	805	825	1030	1235	1155	1320	930	1030	
					IPT (fz)	.0018	.0021	.0026	.0030	.0046	.0053	.0067	.0069	.0076	.0091	.0098	
					RPM	13000	13000	13000	13000	10000	10000	10000	8000	8000	5000	5000	
					IPM (FEED)	47	55	67	79	91	106	134	110	122	91	98	

**2 FLUTE - SLOTTING**

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø)											
						3.0	4.0	5.0	6.0	8.0	10.0	12.0	14.0	16.0	18.0	20.0	
N	21-25	Aluminum-wrought alloy Aluminum-cast, alloyed	1.0D	0.5D	SFM (Vc)	400	535	670	805	825	1030	1235	1155	1320	930	1030	
					IPT (fz)	.0013	.0018	.0020	.0023	.0036	.0044	.0053	.0057	.0061	.0071	.0079	
					RPM	13000	13000	13000	13000	10000	10000	10000	8000	8000	5000	5000	
					IPM (FEED)	35	47	51	59	71	87	106	91	98	71	79	



HSS



RECOMMENDED CUTTING CONDITIONS

**EG909 SERIES** TiCN Coated

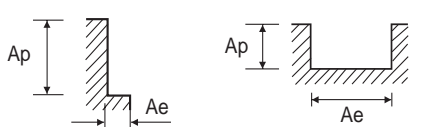
**2 FLUTE - SIDE CUTTING**

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø)						
						4.0	6.0	8.0	10.0	12.0	16.0	20.0
N	21-25	Aluminum-wrought alloy Aluminum-cast, alloyed	~ D10 : 0.25D D12 ~ 20 : 0.5D	1.0D	SFM (Vc)	535	805	825	1030	1235	1320	1030
					IPT (fz)	.0021	.0030	.0046	.0053	.0067	.0076	.0098
					RPM	13000	13000	10000	10000	10000	8000	5000
					IPM (FEED)	55	79	91	106	134	122	98
					SFM (Vc)	160	240	245	310	370	395	310
					IPT (fz)	.001	.002	.003	.004	.005	.006	.008
					RPM	3900	3900	3000	3000	3000	2400	1500
					IPM (FEED)	14	20	23	27	34	31	25

SFM(Vc) = ft./min.  
IPT(fz) = in./tooth  
RPM = rev./min.  
IPM(Feed) = in./min.

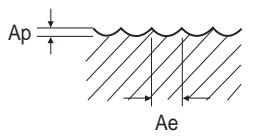
**2 FLUTE - SLOTTING**

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø)						
						4.0	6.0	8.0	10.0	12.0	16.0	20.0
N	21-25	Aluminum-wrought alloy Aluminum-cast, alloyed	1.0D	0.5D	SFM (Vc)	535	805	825	1030	1235	1320	1030
					IPT (fz)	.0018	.0023	.0036	.0044	.0053	.0061	.0079
					RPM	13000	13000	10000	10000	10000	8000	5000
					IPM (FEED)	47	59	71	87	106	98	79
					SFM (Vc)	160	240	245	310	370	395	310
					IPT (fz)	.001	.001	.003	.003	.004	.005	.006
					RPM	3900	3900	3000	3000	3000	2400	1500
					IPM (FEED)	12	15	18	22	27	25	20



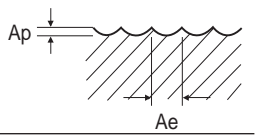
**EG910 SERIES** TiCN Coated **2 FLUTE - PLANE**

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø)					
						6.0	8.0	10.0	12.0	16.0	20.0
N	21-25	Aluminum-wrought alloy Aluminum-cast, alloyed	0.5D	0.2D	SFM (Vc)	1115	1155	1445	1730	1815	1445
					IPT (fz)	.0019	.0028	.0033	.0042	.0048	.0062
					RPM	18000	14000	14000	11000	7000	
					IPM (FEED)	69	79	93	118	106	87
					SFM (Vc)	340	345	435	520	545	435
					IPT (fz)	.001	.002	.002	.003	.003	.005
					RPM	5500	4200	4200	4200	3300	2100
					IPM (FEED)	17	20	23	30	26	22



**EG908 SERIES** TiCN Coated **3 FLUTE - PLANE**

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø)										
						2.0	2.5	3.0	4.0	5.0	6.0	8.0	10.0	12.0	16.0	
N	21-25	Aluminum-wrought alloy Aluminum-cast, alloyed	0.5D	0.2D	SFM (Vc)	555	565	555	740	930	1115	1155	1445	1730	1815	
					IPT (fz)	.0005	.0006	.0007	.0009	.0010	.0013	.0019	.0022	.0028	.0032	
					RPM	27000	22000	18000	18000	18000	14000	14000	14000	14000	11000	
					IPM (FEED)	37	37	37	49	53	69	79	93	118	106	
					SFM (Vc)	165	165	170	225	285	340	345	435	520	545	
					IPT (fz)	.0004	.0005	.0006	.0007	.0007	.001	.001	.001	.002	.002	
					RPM	8000	6500	5500	5500	5500	4200	4200	4200	4200	3300	
					IPM (FEED)	10	10	10	12	13	17	20	23	30	26	



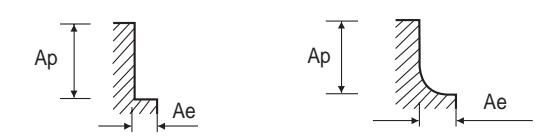
RECOMMENDED CUTTING CONDITIONS

**E5E44, E5E98, E5E45 SERIES**

**3 FLUTE - SIDE CUTTING**

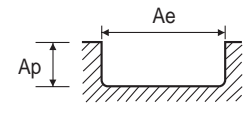
ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø)					
						1/4	3/8	1/2	5/8	3/4	1
N	21-25	Aluminum-wrought alloy Aluminum-cast, alloyed	0.5D	1.5D	SFM (Vc)	655	660	670	655	650	655
					IPT (fz)	.0010	.0011	.0015	.0020	.0026	.0032
					RPM	10000	6700	5100	4000	3300	2500
					IPM (FEED)	30	23	23	24	26	24

SFM(Vc) = ft./min.  
IPT(fz) = in./tooth  
RPM = rev./min.  
IPM(Feed) = in./min.



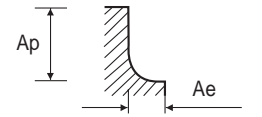
**3 FLUTE - SLOTTING**

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø)					
						1/4	3/8	1/2	5/8	3/4	1
N	21-25	Aluminum-wrought alloy Aluminum-cast, alloyed	1.0D	1.5D	SFM (Vc)	460	460	470	460	450	470
					IPT (fz)	.0010	.0011	.0015	.0020	.0028	.0031
					RPM	7000	4700	3600	2800	2300	1800
					IPM (FEED)	21	16	16	17	19	17



**EK196 SERIES** **3 FLUTE - SIDE CUTTING**

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø)				
						1/4	5/16	3/8	1/2	5/8
N	21-25	Aluminum-wrought alloy Aluminum-cast, alloyed	0.5D	1.5D	SFM (Vc)	295	255	245	260	260
					IPT (fz)	.0006	.0010	.0019	.0027	.0038
					RPM	4500	3100	2500	2000	1600
					IPM (FEED)	8	9	14	16	18







RECOMMENDED CUTTING CONDITIONS

EK191, EK226, EK192 SERIES

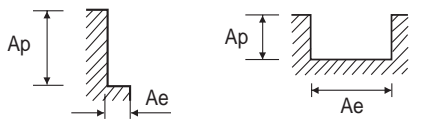
3 FLUTE - SIDE CUTTING

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø)					
						1/2	3/4	1	1 1/4	2	
N	21-22	Aluminum-wrought alloy	0.5D	1.5D	SFM (Vc)	250~500	250~500	250~500	250~500	250~500	
					IPT (fz)	.0050	.0070	.0100	.0120	.0150	
					RPM	1910~3820	1270~2550	960~1910	760~1530	480~960	
N	23-22	Aluminum-cast, alloyed	0.5D	1.5D	SFM (Vc)	250~750	250~750	250~750	250~750	250~750	
					IPT (fz)	.0050	.0070	.0100	.0120	.0150	
					RPM	1910~5730	1270~3820	960~2870	760~2290	480~1430	
						IPM (FEED)	29~57	27~54	29~57	27~55	22~43
						IPM (FEED)	29~86	27~80	29~86	27~82	22~64

SFM(Vc) = ft./min.  
IPT(fz) = in./tooth  
RPM = rev./min.  
IPM(Feed) = in./min.

3 FLUTE - SLOTTING

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø)					
						1/2	3/4	1	1 1/4	2	
N	21-22	Aluminum-wrought alloy	1.0D	0.5D	SFM (Vc)	250~500	250~500	250~500	250~500	250~500	
					IPT (fz)	.0050	.0070	.0100	.0120	.0150	
					RPM	1910~3820	1270~2550	960~1910	760~1530	480~960	
N	23-22	Aluminum-cast, alloyed	1.0D	0.5D	SFM (Vc)	250~750	250~750	250~750	250~750	250~750	
					IPT (fz)	.0050	.0070	.0100	.0120	.0150	
					RPM	1910~5730	1270~3820	960~2870	760~2290	480~1430	
						IPM (FEED)	29~57	27~54	29~57	27~55	22~43
						IPM (FEED)	29~86	27~80	29~86	27~82	22~64



EK191, EK226, EK192 SERIES

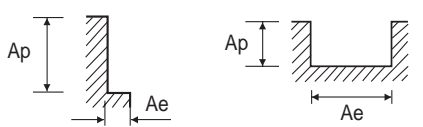
TiCN Coated

3 FLUTE - SIDE CUTTING

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø)					
						1/2	3/4	1	1 1/4	2	
N	21-22	Aluminum-wrought alloy	0.5D	1.5D	SFM (Vc)	400~2500	400~2500	400~2500	400~2500	400~2500	
					IPT (fz)	.0050	.0070	.0100	.0120	.0150	
					RPM	3060~19100	2040~12730	1530~9550	1220~7640	760~4780	
N	23-22	Aluminum-cast, alloyed	0.5D	1.5D	SFM (Vc)	500~3250	500~3250	500~3250	500~3250	500~3250	
					IPT (fz)	.0050	.0070	.0100	.0120	.0150	
					RPM	3820~24830	2550~16550	1910~12420	1530~9930	960~6210	
						IPM (FEED)	46~287	43~267	46~287	44~275	34~215
						IPM (FEED)	57~372	54~348	57~372	55~357	43~279

3 FLUTE - SLOTTING

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø)					
						1/2	3/4	1	1 1/4	2	
N	21-22	Aluminum-wrought alloy	1.0D	0.5D	SFM (Vc)	400~2500	400~2500	400~2500	400~2500	400~2500	
					IPT (fz)	.0050	.0070	.0100	.0120	.0150	
					RPM	3060~19100	2040~12730	1530~9550	1220~7640	760~4780	
N	23-22	Aluminum-cast, alloyed	1.0D	0.5D	SFM (Vc)	500~3250	500~3250	500~3250	500~3250	500~3250	
					IPT (fz)	.0050	.0070	.0100	.0120	.0150	
					RPM	3820~24830	2550~16550	1910~12420	1530~9930	960~6210	
						IPM (FEED)	46~287	43~267	46~287	44~275	34~215
						IPM (FEED)	57~372	54~348	57~372	55~357	43~279



RECOMMENDED CUTTING CONDITIONS

EK193, EK132 SERIES

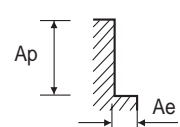
3 FLUTE - SIDE CUTTING

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø)					
						1/2	5/8	3/4	1	1 1/4	1 1/2
N	21-25	Aluminum-wrought alloy Aluminum-cast, alloyed	0.5D	1.5D	SFM (Vc)	590	575	450	525	525	530
					IPT (fz)	.0028	.0025	.0039	.0045	.0054	.0062
					RPM	4500	3500	2300	2000	1600	1350
					IPM (FEED)	38	26	27	27	26	25

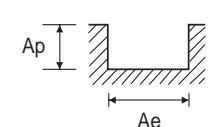
SFM(Vc) = ft./min.  
IPT(fz) = in./tooth  
RPM = rev./min.  
IPM(Feed) = in./min.

3 FLUTE - SLOTTING

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø)					
						1/2	5/8	3/4	1	1 1/4	1 1/2
N	21-25	Aluminum-wrought alloy Aluminum-cast, alloyed	1.0D	0.5D	SFM (Vc)	535	520	410	475	475	485
					IPT (fz)	.0031	.0041	.0065	.0073	.0087	.0103
					RPM	4095	3185	2093	1820	1456	1229
					IPM (FEED)	38	39	41	40	38	38



\* The Feed, in long & extra long types, should be reduced by around 50%.



\* The Feed, in long & extra long types, should be reduced by around 50%.

EP922, EP924 SERIES

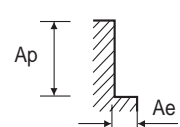
TiAlN Coated

3 FLUTE - SIDE CUTTING

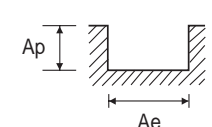
ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø)				
						12.0	16.0	20.0	25.0	32.0
N	21-25	Aluminum-wrought alloy Aluminum-cast, alloyed	0.5D	1.5D	SFM (Vc)	345	365	350	360	365
					IPT (fz)	.0019	.0027	.0041	.0043	.0064
					RPM	2800	2200	1700	1400	1100
					IPM (FEED)	16	18	21	18	21

3 FLUTE - SLOTTING

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø)				
						12.0	16.0	20.0	25.0	32.0
N	21-25	Aluminum-wrought alloy Aluminum-cast, alloyed	1.0D	0.5D	SFM (Vc)	345	365	350	360	365
					IPT (fz)	.0026	.0038	.0055	.0060	.0085
					RPM	2800	2200	1700	1400	1100
					IPM (FEED)	22	25	28	25	28



\* The Feed, in long & extra long types, should be reduced by around 50%.



\* The Feed, in long & extra long types, should be reduced by around 50%.



Global Cutting Tool Leader **YG-1**



MILLING



Being the best through innovation



SOLID CARBIDE

D-POWER GRAPHITE  
END MILLS

- For Graphites



SELECTION GUIDE



SERIES  
FLUTE  
HELIX ANGLE  
CUTTING EDGE SHAPE  
SIZE MIN  
SIZE MAX  
PAGE

	Inch		
	EI107	EI099	EI106
FLUTE	2, 4	2	4
HELIX ANGLE	30°	30°	30°
CUTTING EDGE SHAPE	SQUARE	BALL NOSE	BALL NOSE
SIZE MIN	D1/64	R.0391	R.0391
SIZE MAX	D1/2	R1/4	R1/4
PAGE	C650	C651	

**SOLID CARBIDE**  
**D-POWER GRAPHITE END MILLS**  
Aluminium Alloys and Silent Cutting

Please visit [globalyg1.com/mat](http://globalyg1.com/mat) for material search  
© : Excellent ○ : Good  
Recommended cutting conditions : p. C660

ISO	VDI 3323	Material Description	Composition / Structure / Heat Treatment	HB	HRc	
<b>P</b>	1	Non-alloy steel	About 0.15% C Annealed	125		
	2		About 0.45% C Annealed	190	13	
	3		About 0.45% C Quenched & Tempered	250	25	
	4		About 0.75% C Annealed	270	28	
	5		About 0.75% C Quenched & Tempered	300	32	
	6	Low alloy steel	Annealed	180	10	
	7		Quenched & Tempered	275	29	
	8		Quenched & Tempered	300	32	
	9		Quenched & Tempered	350	38	
	10		High alloyed steel, and tool steel	Annealed	200	15
	11			Quenched & Tempered	325	35
<b>M</b>	12	Stainless steel	Ferritic / Martensitic Annealed	200	15	
	13		Martensitic Quenched & Tempered	240	23	
	14	Austenitic	180	10		
<b>K</b>	15	Grey cast iron	Pearlitic / ferritic	180	10	
	16		Pearlitic (Martensitic)	260	26	
	17	Nodular cast iron	Ferritic	160	3	
	18		Pearlitic	250	25	
	19		Ferritic	130		
	20	Malleable cast iron	Pearlitic	230	21	
<b>N</b>	21	Aluminum-wrought alloy	Not Curable	60		
	22		Curable Hardened	100		
	23	Aluminum-cast, alloyed	≤ 12% Si, Not Curable	75		
	24		≤ 12% Si, Curable Hardened	90		
	25		> 12% Si, Not Curable	130		
	26		Copper and Cutting Alloys, PB>1%	110		
	27		Copper Alloys CuZn, CuSnZn (Brass)	90		
	28		(Bronze / Brass) CuSn, lead-free copper and electrolytic copper	100		
	29		Non Metallic Materials	Duroplastic, Fiber Reinforced Plastic		
	30			Rubber, Wood, etc.		
<b>S</b>	31	Heat Resistant Super Alloys	Fe Based Annealed	200	15	
	32		Cured	280	30	
	33		Annealed	250	25	
	34		Ni or Co Based Cured	350	38	
	35		Cast	320	34	
	36	Titanium Alloys	Pure Titanium	400 Rm		
	37		Alpha + Beta Alloys Hardened	1050 Rm		
<b>H</b>	38	Hardened steel	Hardened	550	55	
	39		Hardened	630	60	
	40	Chilled Cast Iron	Cast	400	42	
	41	Hardened Cast Iron	Hardened	550	55	

	Inch		
	REGULAR LENGTH	REGULAR LENGTH	REGULAR LENGTH
	Diamond	Diamond	Diamond
	U.S.A Stock		

	Inch					Metric			
	EI971	EI972	EIB07	EIB05	EIB06	EI880	EI881	EI451	EI450
	2	2	4	4	4	2	3	2	2
	30°	30°	30°	30°	30°	30°	30°	30°	30°
	BALL NOSE	BALL NOSE	BALL NOSE	CORNER RADIUS	CORNER RADIUS	BALL NOSE	BALL NOSE	BALL NOSE	BALL NOSE
	R.0391	R.0391	R.0156	D1/16	D1/32	R1.0	R1.0	R1.0	R1.0
	R1/4	R5/32	R.0625	D1/2	D3/8	R6.0	R6.0	R6.0	R4.0
	C652	C653	C654	C655	C656	C657		C658	C659
	LONG LENGTH	LONG REACH	REGULAR LENGTH NECK	REGULAR LENGTH	REGULAR LENGTH NECK	SHORT LENGTH	SHORT LENGTH	LONG LENGTH	LONG REACH
	Diamond	Diamond	Diamond	Diamond	Diamond	Diamond	Diamond	Diamond	Diamond
	U.S.A Stock					Call for Availability			

**YG** D-POWER GRAPHITE END MILLS

PLAIN SHANK **EI107** SERIES

**CARBIDE, 4(2) FLUTE REGULAR LENGTH**

- ▶ Higher hardness of film and excellent wear-resistance increase the tool life dramatically.
- ▶ Ultra fine film of YG-1's diamond coated carbide end mills ensure the smooth and excellent surface on work materials.
- ▶ High performance on graphite, wrought aluminum, bakelite, plastics, wood, brass, etc.
- ▶ YG-1's diamond coated carbide end mills may have good result for the machining of non-ferrous metals and non-metallic materials.



for GRAPHITE  
◆ U.S.A Stock

Unit : Inch

EDP No.	Mill Diameter	Shank Diameter	Length of Cut	Overall Length
★ 99686	1/64	1/8	3/65	1-1/2
99629	1/8	1/8	1/2	1-1/2
99630	3/16	3/16	5/8	2
99631	1/4	1/4	3/4	2-1/2
99632	5/16	5/16	13/16	2-1/2
99633	3/8	3/8	7/8	2-1/2
99635	1/2	1/2	1	3

★ 2Flute

Mill Dia. Tolerance (inch)	Shank Dia. Tolerance
0~-0.0012	0~-0.0003

◎ : Excellent ○ : Good

ISO	P										M				K						
	Non-alloy steel					Low alloy steel					High alloyed steel, and tool steel				Stainless steel		Grey cast iron		Nodular cast iron		Malleable cast iron
Material Description	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
HRc	13	25	28	32	30	10	29	32	38	15	35	15	23	10	10	26	3	25	21		
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230	
Recommended																					

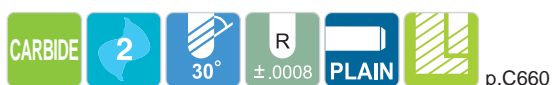
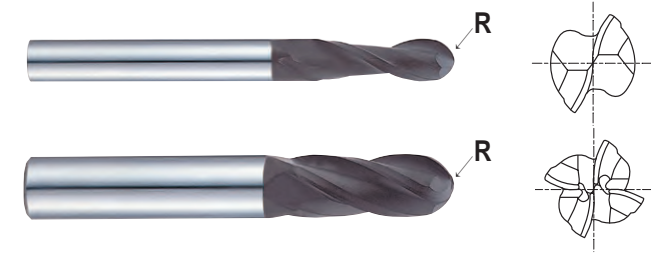
ISO	N					S					H											
	Aluminum-wrought alloy		Aluminum-cast, alloyed		Copper and Copper Alloys (Bronze / Brass)	Heat Resistant Super Alloys			Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron									
Material Description	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	39-1	40	41
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	39-1	40	41
HRc											15	30	25	38	34	55	60	50	42	55	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400Rm	1050Rm	550	630		400	550
Recommended	○	○	○	○	○			◎														

**YG** D-POWER GRAPHITE END MILLS

PLAIN SHANK **EI099** SERIES  
PLAIN SHANK **EI106** SERIES

**CARBIDE, 2&4 FLUTE REGULAR LENGTH BALL NOSE**

- ▶ Higher hardness of film and excellent wear-resistance increase the tool life dramatically.
- ▶ Ultra fine film of YG-1's diamond coated carbide ball end mills ensure the smooth and excellent surface on work materials.
- ▶ High performance on graphite, wrought aluminum, bakelite, plastics, wood, brass, etc.
- ▶ YG-1's diamond coated carbide ball end mills may have good result for the machining of non-ferrous metals and non-metallic materials.



for GRAPHITE  
◆ U.S.A Stock

Unit : Inch

EI099(2 FLUTE), EI106(4 FLUTE) Series

EDP No.	Radius of Ball Nose R (±.0008)	Mill Diameter	Shank Diameter	Length of Cut	Overall Length
99572	R .0391	5/64	1/8	1/4	1-1/2
99573	R 3/64	3/32	1/8	3/8	1-1/2
99574	R 1/16	1/8	1/8	1/2	1-1/2
99575	R 3/32	3/16	3/16	5/8	2
99576	R 1/8	1/4	1/4	3/4	2-1/2
99577	R 5/32	5/16	5/16	13/16	2-1/2
99578	R 3/16	3/8	3/8	7/8	2-1/2
99583	R 1/4	1/2	1/2	1	3

Mill Dia. Tolerance (inch)	Shank Dia. Tolerance
0~-0.0012	0~-0.0003

◎ : Excellent ○ : Good

ISO	P										M				K						
	Non-alloy steel					Low alloy steel					High alloyed steel, and tool steel				Stainless steel		Grey cast iron		Nodular cast iron		Malleable cast iron
Material Description	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
HRc	13	25	28	32	30	10	29	32	38	15	35	15	23	10	10	26	3	25	21		
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230	
Recommended																					

ISO	N					S					H											
	Aluminum-wrought alloy		Aluminum-cast, alloyed		Copper and Copper Alloys (Bronze / Brass)	Heat Resistant Super Alloys			Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron									
Material Description	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	39-1	40	41
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	39-1	40	41
HRc											15	30	25	38	34	55	60	50	42	55	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400Rm	1050Rm	550	630		400	550
Recommended	○	○	○	○	○			◎														

HSS

HSS

**YG D-POWER GRAPHITE END MILLS**

**YG D-POWER GRAPHITE END MILLS**

PLAIN SHANK **E1971** SERIES

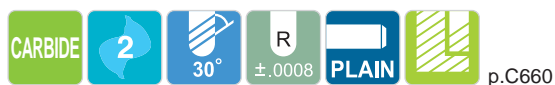
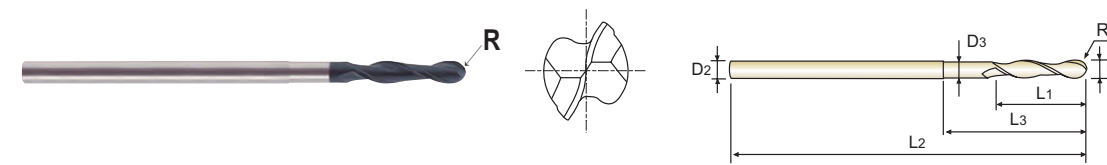
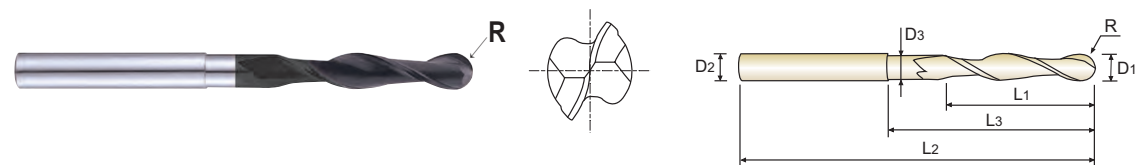
PLAIN SHANK **E1972** SERIES

**CARBIDE, 2 FLUTE LONG LENGTH BALL NOSE**

**CARBIDE, 2 FLUTE LONG REACH BALL NOSE**

- ▶ Higher hardness of film and excellent wear-resistance increase the tool life dramatically.
- ▶ Ultra fine film of YG-1's diamond coated carbide ball end mills ensure the smooth and excellent surface on work materials.
- ▶ High performance on graphite, wrought aluminum, bakelite, plastics, wood, brass, etc.
- ▶ YG-1's diamond coated carbide ball end mills may have good result for the machining of non-ferrous metals and non-metallic materials.

- ▶ Higher hardness of film and excellent wear-resistance increase the tool life dramatically.
- ▶ Ultra fine film of YG-1's diamond coated carbide ball end mills ensure the smooth and excellent surface on work materials.
- ▶ High performance on graphite, wrought aluminum, bakelite, plastics, wood, brass, etc.
- ▶ YG-1's diamond coated carbide ball end mills may have good result for the machining of non-ferrous metals and non-metallic materials.



for GRAPHITE  
◆ U.S.A Stock



for GRAPHITE  
◆ U.S.A Stock

Unit : Inch

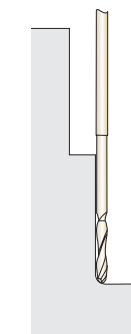
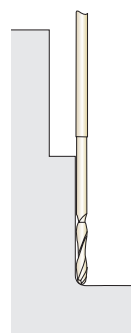
EDP No.	Radius of Ball Nose	Mill Diameter	Shank Diameter	Length of Cut	Length Below Shank	Overall Length	Neck Diameter
	R (±.0008)	D1	D2	L1	L3	L2	D3
<b>99671</b>	R.0391	5/64	1/8	3/8	3/4	3-1/4	.076
<b>99672</b>	R 1/16	1/8	1/8	5/8	1	3-1/4	.120
<b>99973</b>	R 3/32	3/16	3/16	1-1/8	2	4	.182
<b>99673</b>	R 3/32	3/16	1/4	1-1/8	2	4	.185
<b>99674</b>	R 1/8	1/4	1/4	1-1/8	2	4	.230
<b>99675</b>	R 5/32	5/16	5/16	1-1/2	2-3/8	4-1/2	.293
<b>99676</b>	R 3/16	3/8	3/8	2	2-3/4	4-3/4	.355
<b>99677</b>	R1/4	1/2	1/2	2-1/8	3	5-1/8	.480

Unit : Inch

EDP No.	Radius of Ball Nose	Mill Diameter	Shank Diameter	Length of Cut	Length Below Shank	Overall Length	Neck Diameter
	R (±.0008)	D1	D2	L1	L3	L2	D3
<b>99678</b>	R.0391	5/64	1/8	3/8	3/4	4	.076
<b>99679</b>	R1/16	1/8	1/8	5/8	1	4	.120
<b>99980</b>	R3/32	3/16	3/16	1-1/8	2	4-3/4	.182
<b>99680</b>	R3/32	3/16	1/4	1-1/8	2	4-3/4	.186
<b>99681</b>	R1/8	1/4	1/4	1-1/8	2	6	.230
<b>99682</b>	R5/32	5/16	5/16	1-1/2	2-3/8	6	.293

Mill Dia. Tolerance (inch)	Shank Dia. Tolerance
0~- .0012	0~- .0003

Mill Dia. Tolerance (inch)	Shank Dia. Tolerance
0~- .0012	0~- .0003



◎ : Excellent ○ : Good

ISO	P										M				K													
	Non-alloy steel					Low alloy steel					High alloyed steel, and tool steel				Stainless steel		Grey cast iron		Nodular cast iron		Malleable cast iron							
Material Description	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20								
VDI 3323																												
HRC		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25										
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230								
Recommended																												

ISO	N						S						H															
	Aluminum-wrought alloy		Aluminum-cast, alloyed		Copper and Copper Alloys (Bronze / Brass)		Non Metallic Materials		Heat Resistant Super Alloys				Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron											
Material Description	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	39-1	40	41						
VDI 3323																												
HRC											15	30	25	38	34			55	60	50		40	41					
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400Rm	1050Rm	550	630			400	550					
Recommended	○	○	○	○	○																							

◎ : Excellent ○ : Good

ISO	P										M				K													
	Non-alloy steel					Low alloy steel					High alloyed steel, and tool steel				Stainless steel		Grey cast iron		Nodular cast iron		Malleable cast iron							
Material Description	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20								
VDI 3323																												
HRC		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25										
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230								
Recommended																												

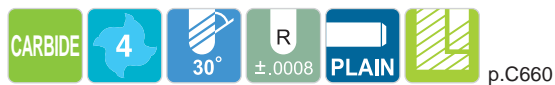
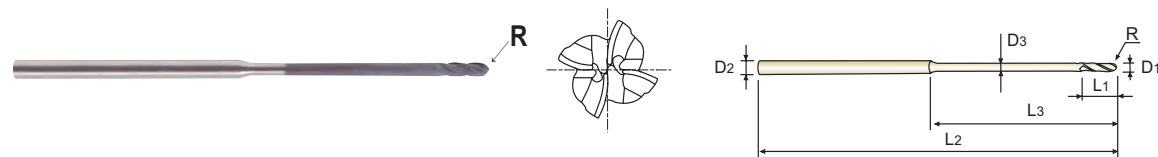
  

ISO	N						S						H															
	Aluminum-wrought alloy		Aluminum-cast, alloyed		Copper and Copper Alloys (Bronze / Brass)		Non Metallic Materials		Heat Resistant Super Alloys				Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron											
Material Description	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	39-1	40	41						
VDI 3323																												
HRC											15	30	25	38	34			55	60	50		40	41					
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400Rm	1050Rm	550	630			400	550					
Recommended	○	○	○	○	○																							



## CARBIDE, 4 FLUTE REGULAR LENGTH BALL NOSE with NECK

- Higher hardness of film and excellent wear-resistance increase the tool life dramatically.
- Ultra fine film of YG-1's diamond coated carbide ball end mills ensure the smooth and excellent surface on work materials.
- High performance on graphite, wrought aluminum, bakelite, plastics, wood, brass, etc.
- YG-1's diamond coated carbide ball end mills may have good result for the machining of non-ferrous metals and non-metallic materials.



for GRAPHITE  
◆ U.S.A Stock

Unit : Inch

EDP No.	Radius of Ball Nose	Mill Diameter	Shank Diameter	Length of Cut	Length Below Shank	Overall Length	Neck Diameter
	R (±.0008)	D1	D2	L1	L3	L2	D3
EIB07002	R.0156	1/32	1/8	3/32	3/8	3	.028
EIB07901	R.0156	1/32	1/8	3/32	1/2	3	.028
EIB07003	R.0234	3/64	1/8	9/64	9/16	3	.043
EIB07902	R.0234	3/64	1/8	9/64	3/4	3	.043
EIB07004	R.0312	1/16	1/8	3/16	3/4	3	.057
EIB07903	R.0312	1/16	1/8	3/16	1	3	.057
EIB07006	R.0469	3/32	1/8	9/32	1	3	.086
EIB07904	R.0469	3/32	1/8	9/32	1-1/2	3	.086
EIB07008	R.0625	1/8	1/8	3/8	1-1/2	3	.115
EIB07905	R.0625	1/8	1/8	3/8	2	3	.115

Mill Dia. Tolerance (inch)	Shank Dia. Tolerance
0~-.0012	0~-.0003

◎ : Excellent ○ : Good

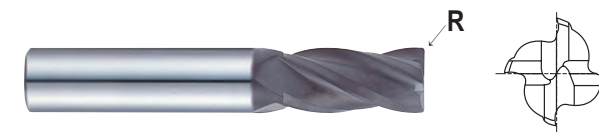
ISO	P										M				K						
	Non-alloy steel					Low alloy steel					High alloyed steel, and tool steel				Stainless steel		Grey cast iron		Nodular cast iron		Malleable cast iron
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21	
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230	
Recommended																					

ISO	N					S					H											
	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)		Non Metallic Materials			Heat Resistant Super Alloys			Titanium Alloys		Hardened steel		Chilled Cast Iron		Hardened Cast Iron		
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	39-1	40	41
HRc											15	30	25	38	34			55	60	50	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400Rm	1050Rm	550	630		400	550
Recommended	○	○	○	○	○				◎													

## CARBIDE, 4 FLUTE REGULAR LENGTH CORNER RADIUS

- Higher hardness of film and excellent wear-resistance increase the tool life dramatically.
- Ultra fine film of YG-1's diamond coated carbide ball end mills ensure the smooth and excellent surface on work materials.
- High performance on graphite, wrought aluminum, bakelite, plastics, wood, brass, etc.
- YG-1's diamond coated carbide ball end mills may have good result for the machining of non-ferrous metals and non-metallic materials.



for GRAPHITE  
◆ U.S.A Stock

Unit : Inch

EDP No.	Corner Radius	Mill Diameter	Shank Diameter	Length of Cut	Length Below Shank	Overall Length	Neck Diameter
	R (±.001)	D1	D2	L1	L3	L2	D3
EIB05004	R.010	1/16	1/8	3/16	-	1-1/2	-
EIB05901	R.015	1/16	1/8	3/16	-	1-1/2	-
EIB05006	R.010	3/32	1/8	3/8	-	1-1/2	-
EIB05008	R.015	1/8	1/8	1/2	-	1-1/2	-
EIB05902	R.020	1/8	1/8	1/2	-	1-1/2	-
EIB05012	R.020	3/16	3/16	5/8	-	2	-
EIB05911	R.020	3/16	3/16	3/16	1-1/2	4	.169
EIB05903	R.030	3/16	3/16	5/8	-	2	-
EIB05016	R.020	1/4	1/4	3/4	-	2-1/2	-
EIB05913	R.020	1/4	1/4	1/4	2	4	.230
EIB05912	R.020	1/4	1/4	1/4	2	6	.230
EIB05904	R.030	1/4	1/4	3/4	-	2-1/2	-
EIB05024	R.020	3/8	3/8	7/8	-	2-1/2	-
EIB05908	R.020	3/8	3/8	3/8	2	4	.355
EIB05907	R.020	3/8	3/8	3/8	-	4	-
EIB05905	R.030	3/8	3/8	7/8	-	2-1/2	-
EIB05032	R.030	1/2	1/2	1	-	3	-
EIB05906	R.060	1/2	1/2	1	-	3	-
EIB05909	R.030	1/2	1/2	1-1/2	-	4	-
EIB05910	R.030	1/2	1/2	3	-	6	-

Mill Dia. Tolerance (inch)	Shank Dia. Tolerance
0~-.0012	0~-.0003

◎ : Excellent ○ : Good

ISO	P										M				K						
	Non-alloy steel					Low alloy steel					High alloyed steel, and tool steel				Stainless steel		Grey cast iron		Nodular cast iron		Malleable cast iron
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21	
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230	
Recommended																					

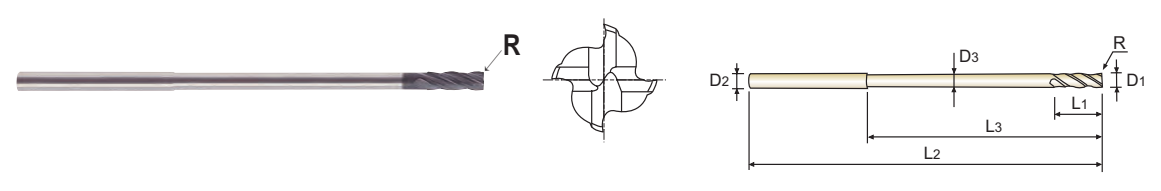
ISO	N					S					H											
	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)		Non Metallic Materials			Heat Resistant Super Alloys			Titanium Alloys		Hardened steel		Chilled Cast Iron		Hardened Cast Iron		
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	39-1	40	41
HRc											15	30	25	38	34			55	60	50	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400Rm	1050Rm	550	630		400	550
Recommended	○	○	○	○	○				◎													

**YIG D-POWER GRAPHITE END MILLS**

PLAIN SHANK **EIB06 SERIES**

**CARBIDE, 4 FLUTE REGULAR LENGTH CORNER RADIUS with NECK**

- ▶ Higher hardness of film and excellent wear-resistance increase the tool life dramatically.
- ▶ Ultra fine film of YG-1's diamond coated carbide ball end mills ensure the smooth and excellent surface on work materials.
- ▶ High performance on graphite, wrought aluminum, bakelite, plastics, wood, brass, etc.
- ▶ YG-1's diamond coated carbide ball end mills may have good result for the machining of non-ferrous metals and non-metallic materials.



CARBIDE 4 30° ±.001 PLAIN p.C661

for GRAPHITE  
◆ U.S.A Stock

Unit : Inch

EDP No.	Corner Radius	Mill Diameter	Shank Diameter	Length of Cut	Length Below Shank	Overall Length	Neck Diameter
	R (±.001)	D1	D2	L1	L3	L2	D3
EIB06002	R.005	1/32	1/8	3/32	3/8	3	.028
EIB06901	R.005	1/32	1/8	3/32	1/2	3	.028
EIB06003	R.010	3/64	1/8	9/64	9/16	3	.043
EIB06902	R.010	3/64	1/8	9/64	3/4	3	.043
EIB06004	R.010	1/16	1/8	3/16	3/4	3	.057
EIB06903	R.010	1/16	1/8	3/16	1	3	.057
EIB06006	R.010	3/32	1/8	9/32	1	3	.086
EIB06904	R.010	3/32	1/8	9/32	1-1/2	3	.086
EIB06008	R.010	1/8	1/8	3/8	1-1/2	3	.115
EIB06905	R.010	1/8	1/8	3/8	2	3	.115
EIB06906	R.015	1/8	1/8	3/16	.800	2-1/2	.115
EIB06907	R.020	3/8	3/8	3/8	3	6	.355

Mill Dia. Tolerance (inch)	Shank Dia. Tolerance
0~.0012	0~.0003

◎ : Excellent ○ : Good

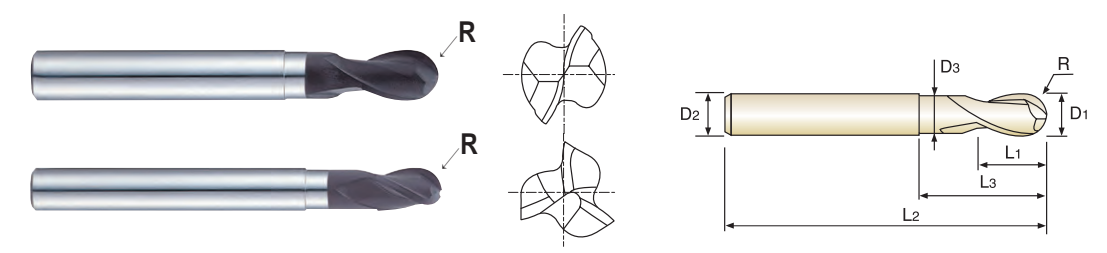
ISO	P										M					K																																																																																					
	Non-alloy steel					Low alloy steel					High alloyed steel, and tool steel					Stainless steel					Grey cast iron					Nodular cast iron					Malleable cast iron																																																																						
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	39-1	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100
HRc	13	25	28	32	35	38	40	42	44	46	48	50	52	54	56	58	60	62	64	66	68	70	72	74	76	78	80	82	84	86	88	90	92	94	96	98	100	102	104	106	108	110	112	114	116	118	120	122	124	126	128	130	132	134	136	138	140	142	144	146	148	150	152	154	156	158	160	162	164	166	168	170	172	174	176	178	180	182	184	186	188	190	192	194	196	198	200														
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230																																																																																	

**YIG D-POWER GRAPHITE END MILLS**

PLAIN SHANK **E1880 SERIES**  
PLAIN SHANK **E1881 SERIES**

**CARBIDE, 2&3 FLUTE SHORT LENGTH BALL NOSE**

- ▶ Higher hardness of film and excellent wear-resistance increase the tool life dramatically.
- ▶ Ultra fine film of YG-1's diamond coated carbide ball end mills ensure the smooth and excellent surface on work materials.
- ▶ High performance on graphite, wrought aluminum, bakelite, plastics, wood, brass, etc.
- ▶ YG-1's diamond coated carbide ball end mills may have good result for the machining of non-ferrous metals and non-metallic materials.



CARBIDE 2&3 30° ±.001 PLAIN p.C661

for GRAPHITE  
◇ Call for Availability

Unit : mm

EDP No.	Radius of Ball Nose R (±0.01)	Mill Diameter		Shank Diameter D2	Length of Cut L1	Length Below Shank L3	Overall Length L2	Neck Diameter D3	
		Metric D1	Inch						
E1880020	E1881020	R1.0	2.0	.0787	6	3	5	60	1.9
E1880025	E1881025	R1.25	2.5	.0984	6	4	6	60	2.4
E1880030	E1881030	R1.5	3.0	.1181	6	4.5	6.5	60	2.8
E1880035	E1881035	R1.75	3.5	.1378	6	5	7	65	3.2
E1880040	E1881040	R2.0	4.0	.1575	6	6	8	65	3.7
E1880050	E1881050	R2.5	5.0	.1969	6	7.5	10	65	4.6
E1880060	E1881060	R3.0	6.0	.2362	6	9	12	75	5.6
E1880080	E1881080	R4.0	8.0	.3150	8	12	25	75	7.4
E1880100	E1881100	R5.0	10.0	.3937	10	15	30	80	9.4
E1880120	E1881120	R6.0	12.0	.4724	12	18	36	90	11.4

Mill Dia. Tolerance (mm)	Shank Dia. Tolerance
0~0.03	h6

◎ : Excellent ○ : Good

ISO	P										M					K																																																																																					
	Non-alloy steel					Low alloy steel					High alloyed steel, and tool steel					Stainless steel					Grey cast iron					Nodular cast iron					Malleable cast iron																																																																						
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	39-1	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100
HRc	13	25	28	32	35	38	40	42	44	46	48	50	52	54	56	58	60	62	64	66	68	70	72	74	76	78	80	82	84	86	88	90	92	94	96	98	100	102	104	106	108	110	112	114	116	118	120	122	124	126	128	130	132	134	136	138	140	142	144	146	148	150	152	154	156	158	160	162	164	166	168	170	172	174	176	178	180	182	184	186	188	190	192	194	196	198	200														
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230																																																																																	

HSS

HSS

**YG D-POWER GRAPHITE END MILLS**

**YG D-POWER GRAPHITE END MILLS**

PLAIN SHANK **EI451** SERIES

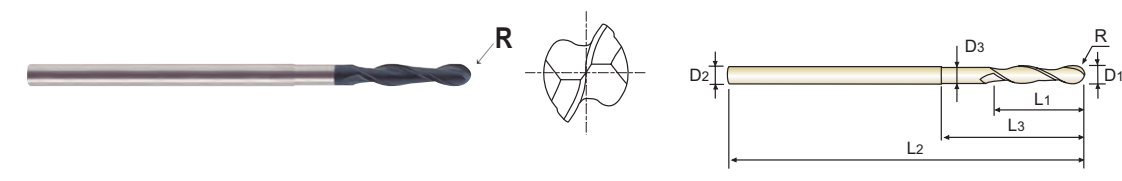
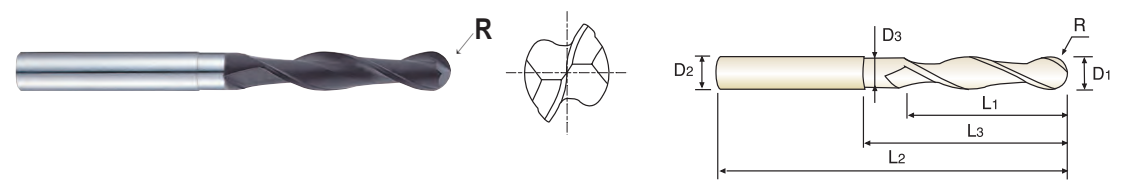
PLAIN SHANK **EI450** SERIES

**CARBIDE, 2 FLUTE LONG LENGTH BALL NOSE**

**CARBIDE, 2 FLUTE LONG REACH BALL NOSE**

- ▶ Higher hardness of film and excellent wear-resistance increase the tool life dramatically.
- ▶ Ultra fine film of YG-1's diamond coated carbide ball end mills ensure the smooth and excellent surface on work materials.
- ▶ High performance on graphite, wrought aluminum, bakelite, plastics, wood, brass, etc.
- ▶ YG-1's diamond coated carbide ball end mills may have good result for the machining of non-ferrous metals and non-metallic materials.

- ▶ Higher hardness of film and excellent wear-resistance increase the tool life dramatically.
- ▶ Ultra fine film of YG-1's diamond coated carbide ball end mills ensure the smooth and excellent surface on work materials.
- ▶ High performance on graphite, wrought aluminum, bakelite, plastics, wood, brass, etc.
- ▶ YG-1's diamond coated carbide ball end mills may have good result for the machining of non-ferrous metals and non-metallic materials.



CARBIDE 2 30° ±0.01 PLAIN p.C661

for GRAPHITE  
◇ Call for Availability

CARBIDE 2 30° ±0.01 PLAIN p.C661

for GRAPHITE  
◇ Call for Availability

Unit : mm

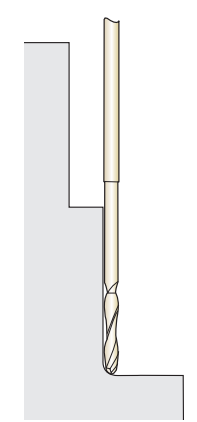
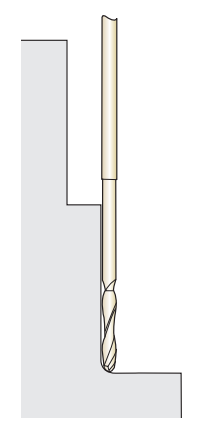
EDP No.	Radius of Ball Nose R (±0.01)	Mill Diameter		Shank Diameter D2	Length of Cut L1	Length Below Shank L3	Overall Length L2	Neck Diameter D3
		Metric D1	Inch					
99558	R1.0	2.0	.0787	4	10	20	80	1.95
99559	R1.5	3.0	.1181	4	15	25	80	2.9
99560	R2.0	4.0	.1575	4	20	30	80	3.9
99561	R2.5	5.0	.1969	6	30	50	100	4.9
99562	R3.0	6.0	.2362	6	30	50	100	5.5
99563	R4.0	8.0	.3150	8	40	60	110	7.5
99564	R5.0	10.0	.3937	10	50	70	120	9.5
99565	R6.0	12.0	.4724	12	55	75	130	11.5

Unit : mm

EDP No.	Radius of Ball Nose R (±0.01)	Mill Diameter		Shank Diameter D2	Length of Cut L1	Length Below Shank L3	Overall Length L2	Neck Diameter D3
		Metric D1	Inch					
99566	R1.0	2.0	.0787	4	10	20	100	1.95
99567	R1.5	3.0	.1181	4	15	25	100	2.9
99568	R2.0	4.0	.1575	4	20	30	100	3.9
99569	R2.5	5.0	.1969	6	30	50	120	4.9
99570	R3.0	6.0	.2362	6	30	50	150	5.5
99571	R4.0	8.0	.3150	8	40	60	150	7.5

Mill Dia. Tolerance (mm)	Shank Dia. Tolerance
0~-0.03	h6

Mill Dia. Tolerance (mm)	Shank Dia. Tolerance
0~-0.03	h6



◎ : Excellent ○ : Good

ISO	P										M				K						
	Non-alloy steel					Low alloy steel					High alloyed steel, and tool steel				Stainless steel		Grey cast iron		Nodular cast iron		Malleable cast iron
Material Description	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
VDI 3323																					
HRc	13	25	28	32	30	10	29	32	38	15	35	15	23	10	10	26	3	25		21	
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230	
Recommended																					

ISO	N					S					H												
	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)		Non Metallic Materials			Heat Resistant Super Alloys			Titanium Alloys		Hardened steel		Chilled Cast Iron		Hardened Cast Iron			
Material Description	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	39-1	40	41	
VDI 3323																							
HRc											15	30	25	38	34	34	37	55	60	50	42	55	
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400Rm	1050Rm	550	630		400	550	
Recommended	○	○	○	○	○				◎														

◎ : Excellent ○ : Good

ISO	P										M				K						
	Non-alloy steel					Low alloy steel					High alloyed steel, and tool steel				Stainless steel		Grey cast iron		Nodular cast iron		Malleable cast iron
Material Description	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
VDI 3323																					
HRc	13	25	28	32	30	10	29	32	38	15	35	15	23	10	10	26	3	25		21	
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230	
Recommended																					

ISO	N					S					H												
	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)		Non Metallic Materials			Heat Resistant Super Alloys			Titanium Alloys		Hardened steel		Chilled Cast Iron		Hardened Cast Iron			
Material Description	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	39-1	40	41	
VDI 3323																							
HRc											15	30	25	38	34	34	37	55	60	50	42	55	
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400Rm	1050Rm	550	630		400	550	
Recommended	○	○	○	○	○				◎														



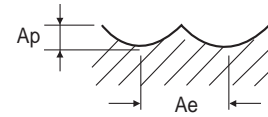
# YIG D-POWER GRAPHITE END MILLS

RECOMMENDED CUTTING CONDITIONS

## EI106 SERIES 4 FLUTE BALL NOSE - SURFACING

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø)									
						5/64	3/32	1/8	9/64	5/32	3/16	1/4	5/16	3/8	1/2
N	29.2	Non Metallic Materials	0.2D	0.2D	SFM (Vc)	325	395	525	590	655	760	980	1065	1130	1375
					IPT (fz)	.0010	.0014	.0018	.0021	.0026	.0032	.0039	.0045	.0070	.0059
					RPM	15890	16090	16040	16030	16010	15480	14970	13020	11510	10510
					IPM (FEED)	63	88	114	138	165	201	232	236	324	248

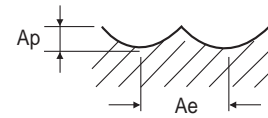
SFM = Surface Feet per Minute  
 RPM = Revolutions Per Minute  
 IPT = Inches Per Tooth  
 IPM = Inches Per Minute



## EI099, EI971, EI972 SERIES 2 FLUTE BALL NOSE - SURFACING

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø)									
						5/64	3/32	1/8	9/64	5/32	3/16	1/4	5/16	3/8	1/2
N	29.2	Non Metallic Materials	0.2D	0.2D	SFM (Vc)	325	395	525	590	655	760	980	1065	1130	1375
					IPT (fz)	.0010	.0014	.0018	.0018	.0026	.0032	.0039	.0045	.0052	.0059
					RPM	15890	16090	16040	16030	16010	15480	14970	13020	11510	10510
					IPM (FEED)	32	44	57	59	83	100	116	118	120	124

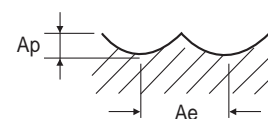
SFM = Surface Feet per Minute  
 RPM = Revolutions Per Minute  
 IPT = Inches Per Tooth  
 IPM = Inches Per Minute



## EIB07 SERIES 4 FLUTE BALL NOSE - SURFACING

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø)													
						1/32	3/64	1/16	5/64	3/32	1/8	9/64	5/32	3/16	1/4	5/16	3/8	1/2	
N	29.2	Non Metallic Materials	0.2D	0.2D	SFM (Vc)	165	245	325	325	395	525	590	655	760	980	1065	1130	1375	
					IPT (fz)	.0005	.0005	.0007	.0009	.0012	.0016	.0019	.0023	.0029	.0035	.0041	.0047	.0053	
					RPM	20170	19970	19860	15890	16090	16040	16030	16010	15480	14970	13020	11510	10510	
					IPM (FEED)	38	43	52	57	79	102	125	147	182	211	212	217	225	

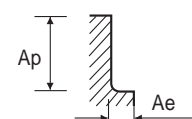
SFM = Surface Feet per Minute  
 RPM = Revolutions Per Minute  
 IPT = Inches Per Tooth  
 IPM = Inches Per Minute



## EIB05 SERIES 4 FLUTE CORNER RADIUS - SIDE CUTTING

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø)								
						1/16	5/64	1/8	5/32	3/16	1/4	5/16	3/8	1/2
N	29.2	Non Metallic Materials	0.3D	0.3D	SFM (Vc)	655	820	1310	1635	1965	2620	2620	2550	2750
					IPT (fz)	.0008	.0010	.0014	.0020	.0024	.0028	.0034	.0043	.0051
					RPM	40030	40090	40030	39970	40030	40030	32030	25980	21010
					IPM (FEED)	126	158	221	315	378	441	441	451	431

SFM = Surface Feet per Minute  
 RPM = Revolutions Per Minute  
 IPT = Inches Per Tooth  
 IPM = Inches Per Minute



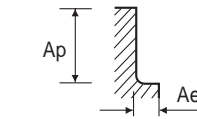
# YIG D-POWER GRAPHITE END MILLS

RECOMMENDED CUTTING CONDITIONS

## EIB06 SERIES 4 FLUTE CORNER RADIUS - SIDE CUTTING

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø)											
						1/32	3/64	1/16	5/64	1/8	5/32	3/16	1/4	5/16	3/8	1/2	
N	29.2	Non Metallic Materials	0.3D	0.3D	SFM (Vc)	325	490	655	820	1310	1635	1965	2620	2620	230	2750	
					IPT (fz)	.0003	.0004	.0006	.0007	.0010	.0014	.0017	.0019	.0024	.0030	.0036	
					RPM	39730	39930	40030	40090	40030	39970	40030	40030	32030	26070	21010	
					IPM (FEED)	44	66	88	110	154	221	265	309	309	316	301	

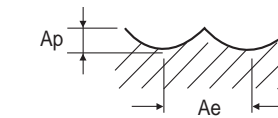
SFM = Surface Feet per Minute  
 RPM = Revolutions Per Minute  
 IPT = Inches Per Tooth  
 IPM = Inches Per Minute



## EI880, EI451, EI450 SERIES 2 FLUTE BALL NOSE - SURFACING

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø)									
						2	2.5	3	3.5	4	5	6	8	10	12
N	29.2	Non Metallic Materials	0.2D	0.2D	SFM (Vc)	330	410	495	575	660	800	930	1070	1185	1300
					IPT (fz)	.0010	.0014	.0018	.0022	.0026	.0032	.0039	.0046	.0052	.0059
					RPM	16010	15910	16010	15940	16010	15520	15040	12980	11500	10510
					IPM (FEED)	32	44	57	69	83	100	116	118	120	124

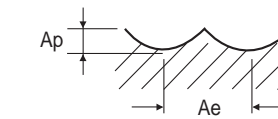
SFM = Surface Feet per Minute  
 RPM = Revolutions Per Minute  
 IPT = Inches Per Tooth  
 IPM = Inches Per Minute



## EI881 SERIES 3 FLUTE BALL NOSE - SURFACING

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø)									
						2	2.5	3	3.5	4	5	6	8	10	12
N	29.2	Non Metallic Materials	0.2D	0.2D	SFM (Vc)	330	410	495	575	660	800	930	1070	1185	1300
					IPT (fz)	.0010	.0014	.0018	.0022	.0025	.0032	.0039	.0046	.0053	.0059
					RPM	16010	15910	16010	15940	16010	15520	15040	12980	11500	10510
					IPM (FEED)	47	67	85	104	122	150	175	177	181	187

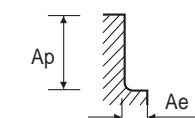
SFM = Surface Feet per Minute  
 RPM = Revolutions Per Minute  
 IPT = Inches Per Tooth  
 IPM = Inches Per Minute



## EI107 SERIES 4 FLUTE - SIDE CUTTING

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø)						
						1/64	1/8	3/16	1/4	5/16	3/8	1/2
N	29.2	Non Metallic Materials	0.3D	0.3D	SFM (Vc)	165	1310	1965	2620	2620	2550	2620
					IPT (fz)	.0002	.0004	.0008	.0012	.0015	.0020	.0024
					RPM	40340	40030	40030	40030	32030	25980	20020
					IPM (FEED)	32	63	126	189	197	205	189

SFM = Surface Feet per Minute  
 RPM = Revolutions Per Minute  
 IPT = Inches Per Tooth  
 IPM = Inches Per Minute





Global Cutting Tool Leader **YG-1**



MILLING



Being the best through innovation



SOLID CARBIDE

# STANDARD CARBIDE END MILLS

- General Purpose



SELECTION GUIDE



CARBIDE

STANDARD CARBIDE END MILLS

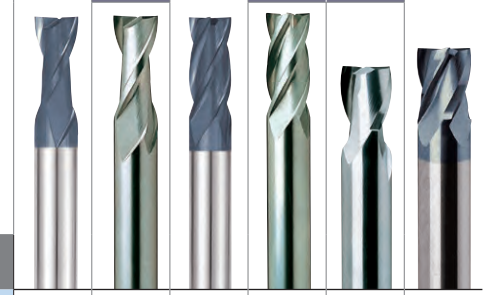
- General Purpose



Recommended cutting conditions : p. C708

Table with columns: SERIES, FLUTE, HELIX ANGLE, CUTTING EDGE SHAPE, SIZE MIN, SIZE MAX, PAGE. Rows: UGMF90, E5020, UGMF89, E5021, E5244, UGMGF57.

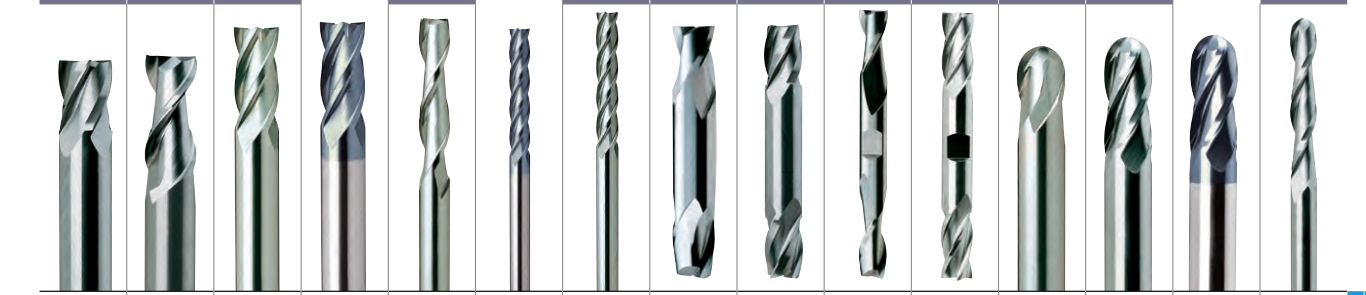
Table with columns: REGULAR LENGTH, Y-Coating, Uncoated, Y-Coating, Uncoated, Y-Coating. Rows: Y-Coating, Uncoated, Y-Coating, Uncoated, Y-Coating.



Main selection table with columns: ISO, VDI 3323, Material Description, Composition / Structure / Heat Treatment, HB, HRc. Rows 1-41.

Table with columns: E5245, E5011, E5012, UGMGF58, E5026, UGMGF59, E5065, E5022, E5023, E5025, E5024, E5249, E5250, UGMF91, E5014. Rows: 4, 2, 4, 4, 2, 4, 4, 2, 4, 2, 4, 2, 4, 4, 2.

Table with columns: REGULAR LENGTH, Y-Coating, Uncoated, Y-Coating, Uncoated, Y-Coating. Rows: Y-Coating, Uncoated, Y-Coating, Uncoated, Y-Coating.



Main selection table with columns: ISO, VDI 3323, Material Description, Composition / Structure / Heat Treatment, HB, HRc. Rows 1-41.

SELECTION GUIDE



CARBIDE

STANDARD CARBIDE END MILLS

- General Purpose

Please visit global.yg1.com/mat for material search

⊙: Excellent ○: Good

Recommended cutting conditions : p. C708

Table with columns: ISO, VDI 3323, Material Description, Composition / Structure / Heat Treatment, HB, HRC. Rows include P (Non-alloy steel, Low alloy steel, High alloyed steel), M (Stainless steel), K (Grey cast iron, Nodular cast iron, Malleable cast iron), N (Aluminum-wrought alloy, Aluminum-cast alloyed, Copper and Copper Alloys), S (Heat Resistant Super Alloys, Titanium Alloys), H (Hardened steel, Chilled Cast Iron, Hardened Cast Iron).

Table with columns: SERIES (E5060, E5018, E5062, E5251 E5252, E5216, E5069), FLUTE (4, 2, 4, 2&4, 4, 5), HELIX ANGLE (30°, 30°, 30°, 30°, 30°, 45°), CUTTING EDGE SHAPE (BALL NOSE, BALL NOSE, BALL NOSE, BALL NOSE, CORNER RADIUS, CORNER RADIUS), SIZE MIN (R1/16, R1/16, R1/16, R7/64, D1/8, D1/4), SIZE MAX (R1/2, R1/2, R1/2, R1/4, D1, D1), PAGE (C687, C688, C689, C690, C691, C693). Includes images of end mills and coating options (Uncoated, TiN, TiCN, TYN, TICON, TYLON F, TYLON E).

Table with columns: Inch (E5243, E5059, E5246, E5066, E5067, E5068, E5073, E5058, E5056 E5057, E5077, E5078, EH527, EH540, EH882) and Metric (E5243, E5059, E5246, E5066, E5067, E5068, E5073, E5058, E5056 E5057, E5077, E5078, EH527, EH540, EH882). Includes images of end mills and coating options (Uncoated, TiN, TiCN, TYN, TICON, TYLON F, TYLON E).



PLAIN SHANK UGMF90 SERIES

### CARBIDE, 2 FLUTE REGULAR LENGTH

- ▶ These are designed for slotting, drilling, pocketing and general operation.
- ▶ Suitable for cutting hardened & high alloy steels, steel casting, chill casting, malleable cast iron, CrNi-steels, brass, copper, aluminum with a high percentage of silicon and abrasive plastics.



Unit : Inch

EDP No. Y-COATED	Mill Diameter	Shank Diameter	Length of Cut	Overall Length
<a href="#">UGMF90008</a>	1/8	1/8	1/2	1-1/2
<a href="#">UGMF90012</a>	3/16	3/16	5/8	2
<a href="#">UGMF90016</a>	1/4	1/4	3/4	2-1/2
<a href="#">UGMF90024</a>	3/8	3/8	1	2-1/2
<a href="#">UGMF90032</a>	1/2	1/2	1	3
<a href="#">UGMF90040</a>	5/8	5/8	1-1/4	3-1/2
<a href="#">UGMF90048</a>	3/4	3/4	1-1/2	4
<a href="#">UGMF90064</a>	1	1	1-1/2	4

Mill Dia. Tolerance (inch)	Shank Dia. Tolerance
0~-0.0012	0~-0.0005

◎ : Excellent ○ : Good

ISO Material Description	P										M				K						
	Non-alloy steel					Low alloy steel					High alloyed steel, and tool steel				Stainless steel		Grey cast iron		Nodular cast iron		Malleable cast iron
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
HRc	13	25	28	32	32	10	29	32	38	15	35	15	23	10	10	26	3	25	21	21	
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230	
Recommend	◎	◎	◎	◎	○	◎	◎	○	◎	◎	○	○	○	○	○	○	○	○	○	○	

ISO Material Description	N					S					H										
	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)		Non Metallic Materials			Heat Resistant Super Alloys			Titanium Alloys		Hardened steel		Chilled Cast Iron		Hardened Cast Iron	
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34	36	39	55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend	○	○	○	○	○	○	○	○													



PLAIN SHANK E5020 SERIES

### CARBIDE, 2 FLUTE REGULAR LENGTH

- ▶ These are designed for slotting, drilling, pocketing and general operation.
- ▶ Suitable for cutting hardened & high alloy steels, steel casting, chill casting, malleable cast iron, CrNi-steels, brass, copper, aluminum with a high percentage of silicon and abrasive plastics.



Unit : Inch

EDP No.					Mill Diameter	Shank Diameter	Length of Cut	Overall Length
UNCOATED	TIN COATED	TiCN COATED	YG:TYLON F	YG:TYLON E				
<a href="#">01552</a>	<a href="#">01552TN</a>	<a href="#">01552TC</a>	<a href="#">01552TE</a>	<a href="#">01552TE</a>	1/32	1/8	5/64	1-1/2
<a href="#">01553</a>	<a href="#">01553TN</a>	<a href="#">01553TC</a>	<a href="#">01553TE</a>	<a href="#">01553TE</a>	3/64	1/8	7/64	1-1/2
<a href="#">01554</a>	<a href="#">01554TN</a>	<a href="#">01554TC</a>	<a href="#">01554TE</a>	<a href="#">01554TE</a>	1/16	1/8	3/16	1-1/2
<a href="#">01555</a>	<a href="#">01555TN</a>	<a href="#">01555TC</a>	<a href="#">01555TE</a>	<a href="#">01555TE</a>	5/64	1/8	3/16	1-1/2
<a href="#">01556</a>	<a href="#">01556TN</a>	<a href="#">01556TC</a>	<a href="#">01556TE</a>	<a href="#">01556TE</a>	3/32	1/8	3/8	1-1/2
<a href="#">01557</a>	<a href="#">01557TN</a>	<a href="#">01557TC</a>	<a href="#">01557TE</a>	<a href="#">01557TE</a>	7/64	1/8	3/8	1-1/2
<a href="#">01558</a>	<a href="#">01558TN</a>	<a href="#">01558TC</a>	<a href="#">01558TE</a>	<a href="#">01558TE</a>	1/8	1/8	1/2	1-1/2
<a href="#">01560</a>	<a href="#">01560TN</a>	<a href="#">01560TC</a>	<a href="#">01560TE</a>	<a href="#">01560TE</a>	9/64	3/16	1/2	2
<a href="#">01562</a>	<a href="#">01562TN</a>	<a href="#">01562TC</a>	<a href="#">01562TE</a>	<a href="#">01562TE</a>	5/32	3/16	9/16	2
<a href="#">01564</a>	<a href="#">01564TN</a>	<a href="#">01564TC</a>	<a href="#">01564TE</a>	<a href="#">01564TE</a>	11/64	3/16	5/8	2
<a href="#">01565</a>	<a href="#">01565TN</a>	<a href="#">01565TC</a>	<a href="#">01565TE</a>	<a href="#">01565TE</a>	3/16	3/16	5/8	2
<a href="#">01569</a>	<a href="#">01569TN</a>	<a href="#">01569TC</a>	<a href="#">01569TE</a>	<a href="#">01569TE</a>	13/64	1/4	5/8	2-1/2
<a href="#">01570</a>	<a href="#">01570TN</a>	<a href="#">01570TC</a>	<a href="#">01570TE</a>	<a href="#">01570TE</a>	7/32	1/4	5/8	2-1/2
<a href="#">01572</a>	<a href="#">01572TN</a>	<a href="#">01572TC</a>	<a href="#">01572TE</a>	<a href="#">01572TE</a>	15/64	1/4	3/4	2-1/2
<a href="#">01573</a>	<a href="#">01573TN</a>	<a href="#">01573TC</a>	<a href="#">01573TE</a>	<a href="#">01573TE</a>	1/4	1/4	3/4	2-1/2
<a href="#">01579</a>	<a href="#">01579TN</a>	<a href="#">01579TC</a>	<a href="#">01579TE</a>	<a href="#">01579TE</a>	5/16	5/16	13/16	2-1/2
<a href="#">01584</a>	<a href="#">01584TN</a>	<a href="#">01584TC</a>	<a href="#">01584TE</a>	<a href="#">01584TE</a>	3/8	3/8	1	2-1/2
<a href="#">01588</a>	<a href="#">01588TN</a>	<a href="#">01588TC</a>	<a href="#">01588TE</a>	<a href="#">01588TE</a>	7/16	7/16	1	2-3/4
<a href="#">01593</a>	<a href="#">01593TN</a>	<a href="#">01593TC</a>	<a href="#">01593TE</a>	<a href="#">01593TE</a>	1/2	1/2	1	3
<a href="#">01595</a>	<a href="#">01595TN</a>	<a href="#">01595TC</a>	<a href="#">01595TE</a>	<a href="#">01595TE</a>	5/8	5/8	1-1/4	3-1/2
<a href="#">01598</a>	<a href="#">01598TN</a>	<a href="#">01598TC</a>	<a href="#">01598TE</a>	<a href="#">01598TE</a>	3/4	3/4	1-1/2	4
<a href="#">01600</a>	<a href="#">01600TN</a>	<a href="#">01600TC</a>	<a href="#">01600TE</a>	<a href="#">01600TE</a>	1	1	1-1/2	4

Mill Dia. Tolerance (inch)	Shank Dia. Tolerance
0~-0.0012	0~-0.0005

◎ : Excellent ○ : Good

ISO Material Description	P										M				K						
	Non-alloy steel					Low alloy steel					High alloyed steel, and tool steel				Stainless steel		Grey cast iron		Nodular cast iron		Malleable cast iron
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
HRc	13	25	28	32	32	10	29	32	38	15	35	15	23	10	10	26	3	25	21	21	
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230	
Recommend	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	○	○	○	○	○	○	○	○	

ISO Material Description	N					S					H										
	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)		Non Metallic Materials			Heat Resistant Super Alloys			Titanium Alloys		Hardened steel		Chilled Cast Iron		Hardened Cast Iron	
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34	36	39	55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend	○	○	○	○	○	○	○	○													





PLAIN SHANK UGMF89 SERIES

CARBIDE, 4 FLUTE REGULAR LENGTH

- ▶ These are designed for slotting, drilling, pocketing and general operation.
- ▶ Suitable for cutting hardened & high alloy steels, steel casting, chill casting, malleable cast iron, CrNi-steels, brass, copper, aluminum with a high percentage of silicon and abrasive plastics.



EDP No.	Mill Diameter	Shank Diameter	Length of Cut	Overall Length
UGMF89004	1/16	1/8	3/16	1-1/2
UGMF89005	5/64	1/8	3/16	1-1/2
UGMF89006	3/32	1/8	3/8	1-1/2
UGMF89007	7/64	1/8	3/8	1-1/2
UGMF89008	1/8	1/8	1/2	1-1/2
UGMF89009	9/64	3/16	1/2	2
UGMF89010	5/32	3/16	9/16	2
UGMF89011	11/64	3/16	5/8	2
UGMF89012	3/16	3/16	5/8	2
UGMF89013	13/64	1/4	5/8	2-1/2
UGMF89014	7/32	1/4	5/8	2-1/2
UGMF89015	15/64	1/4	3/4	2-1/2
UGMF89016	1/4	1/4	3/4	2-1/2
UGMF89018	9/32	5/16	3/4	2-1/2
UGMF89020	5/16	5/16	13/16	2-1/2
UGMF89024	3/8	3/8	1	2-1/2
UGMF89028	7/16	7/16	1	2-3/4
UGMF89032	1/2	1/2	1	3
UGMF89036	9/16	9/16	1-1/4	3-1/2
UGMF89040	5/8	5/8	1-1/4	3-1/2
UGMF89048	3/4	3/4	1-1/2	4
UGMF89056	7/8	7/8	1-1/2	4
UGMF89064	1	1	1-1/2	4

Mill Dia. Tolerance (inch)	Shank Dia. Tolerance
0--.0012	0--.0005

◎ : Excellent ○ : Good

ISO	P										M				K					
	Non-alloy steel					Low alloy steel					High alloyed steel, and tool steel		Stainless steel		Grey cast iron		Nodular cast iron		Malleable cast iron	
Material Description	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc	13	25	28	32	30	10	29	32	38	15	35	15	23	10	10	26	3	25	21	21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎

ISO	N					S					H										
	Aluminum-wrought alloy		Aluminum-cast, alloyed		Copper and Copper Alloys (Bronze / Brass)	Non Metallic Materials		Heat Resistant Super Alloys			Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron						
Material Description	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc	60	100	75	90	130	110	90	100			15	30	25	38	34	55	60	42	55	55	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend	◎	◎	◎	◎	◎	◎	◎	◎			◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎



PLAIN SHANK E5021 SERIES

CARBIDE, 4 FLUTE REGULAR LENGTH

- ▶ Possible for high-speed cutting, suitable for high efficiency machining for hardened & high alloy steels, steel casting, chill casting, malleable cast iron, CrNi-steels, brass, copper, aluminum with a high percentage of silicon and abrasive plastics.



EDP No.	Mill Diameter	Shank Diameter	Length of Cut	Overall Length
07554	1/16	1/8	3/16	1-1/2
07555	5/64	1/8	3/16	1-1/2
07556	3/32	1/8	3/8	1-1/2
07557	7/64	1/8	3/8	1-1/2
07558	1/8	1/8	1/2	1-1/2
07560	9/64	3/16	1/2	2
07561	5/32	3/16	9/16	2
07564	11/64	3/16	5/8	2
07565	3/16	3/16	5/8	2
07569	13/64	1/4	5/8	2-1/2
07570	7/32	1/4	5/8	2-1/2
07572	15/64	1/4	3/4	2-1/2
07573	1/4	1/4	3/4	2-1/2
07576	9/32	5/16	3/4	2-1/2
07579	5/16	5/16	13/16	2-1/2
07584	3/8	3/8	1	2-1/2
07588	7/16	7/16	1	2-3/4
07593	1/2	1/2	1	3
07595	5/8	5/8	1-1/4	3-1/2
07598	3/4	3/4	1-1/2	4
07600	1	1	1-1/2	4

Mill Dia. Tolerance (inch)	Shank Dia. Tolerance
0--.0012	0--.0005

◎ : Excellent ○ : Good

ISO	P										M				K					
	Non-alloy steel					Low alloy steel					High alloyed steel, and tool steel		Stainless steel		Grey cast iron		Nodular cast iron		Malleable cast iron	
Material Description	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc	13	25	28	32	30	10	29	32	38	15	35	15	23	10	10	26	3	25	21	21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎

ISO	N					S					H										
	Aluminum-wrought alloy		Aluminum-cast, alloyed		Copper and Copper Alloys (Bronze / Brass)	Non Metallic Materials		Heat Resistant Super Alloys			Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron						
Material Description	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc	60	100	75	90	130	110	90	100			15	30	25	38	34	55	60	42	55	55	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend	◎	◎	◎	◎	◎	◎	◎	◎			◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎



PLAIN SHANK E5244 SERIES

CARBIDE, 2 FLUTE STUB LENGTH

► Suitable for cutting hardened & high alloy steels, steel casting, chill casting, malleable cast iron, CrNi-steels, brass, copper, aluminum with a high percentage of silicon and abrasive plastics.



CARBIDE 2 30° PLAIN p.C712, C713

Unit : Inch

EDP No.	UNCOATED				Mill Diameter	Shank Diameter	Length of Cut	Overall Length
	TIN COATED	TiCN COATED	YG:TYLON F	YG:TYLON E				
30554	30554TN	30554TC	30554TF	30554TE	1/16	1/8	1/8	1-1/2
30556	30556TN	30556TC	30556TF	30556TE	3/32	1/8	3/16	1-1/2
30558	30558TN	30558TC	30558TF	30558TE	1/8	1/8	1/4	1-1/2
30561	30561TN	30561TC	30561TF	30561TE	5/32	3/16	5/16	2
30565	30565TN	30565TC	30565TF	30565TE	3/16	3/16	3/8	2
30570	30570TN	30570TC	30570TF	30570TE	7/32	1/4	7/16	2
30573	30573TN	30573TC	30573TF	30573TE	1/4	1/4	1/2	2
30579	30579TN	30579TC	30579TF	30579TE	5/16	5/16	1/2	2
30584	30584TN	30584TC	30584TF	30584TE	3/8	3/8	5/8	2
30588	30588TN	30588TC	30588TF	30588TE	7/16	7/16	5/8	2-1/2
30593	30593TN	30593TC	30593TF	30593TE	1/2	1/2	5/8	2-1/2
30595	30595TN	30595TC	30595TF	30595TE	5/8	5/8	3/4	3
30598	30598TN	30598TC	30598TF	30598TE	3/4	3/4	1	3

Mill Dia. Tolerance (inch)	Shank Dia. Tolerance
0~-.0012	0~-.0005

◎ : Excellent ○ : Good

ISO	P										M				K							
Material Description	Non-alloy steel					Low alloy steel					High alloyed steel, and tool steel				Stainless steel		Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20		
HRc	13	25	28	32	300	10	29	32	38	15	35	15	23	10	10	26	3	25	130	21		
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230		
Recommend	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎		



PLAIN SHANK UGMGF57 SERIES

CARBIDE, 4 FLUTE STUB LENGTH

► Suitable for cutting hardened & high alloy steels, steel casting, chill casting, malleable cast iron, CrNi-steels, brass, copper, aluminum with a high percentage of silicon and abrasive plastics.



CARBIDE 4 30° PLAIN p.C709

Unit : Inch

EDP No.	Mill Diameter	Shank Diameter	Length of Cut	Overall Length
UGMGF57004	1/16	1/8	1/8	1-1/2
UGMGF57006	3/32	1/8	3/16	1-1/2
UGMGF57008	1/8	1/8	1/4	1-1/2
UGMGF57010	5/32	3/16	5/16	2
UGMGF57012	3/16	3/16	3/8	2
UGMGF57014	7/32	1/4	7/16	2
UGMGF57016	1/4	1/4	1/2	2
UGMGF57020	5/16	5/16	1/2	2
UGMGF57024	3/8	3/8	5/8	2
UGMGF57028	7/16	7/16	5/8	2-1/2
UGMGF57032	1/2	1/2	5/8	2-1/2
UGMGF57040	5/8	5/8	3/4	3
UGMGF57048	3/4	3/4	1	3

Mill Dia. Tolerance (inch)	Shank Dia. Tolerance
0~-.0012	0~-.0005

◎ : Excellent ○ : Good

ISO	P										M				K							
Material Description	Non-alloy steel					Low alloy steel					High alloyed steel, and tool steel				Stainless steel		Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20		
HRc	13	25	28	32	300	10	29	32	38	15	35	15	23	10	10	26	3	25	130	21		
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230		
Recommend	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎		



PLAIN SHANK E5245 SERIES

CARBIDE, 4 FLUTE STUB LENGTH

► Suitable for cutting hardened & high alloy steels, steel casting, chill casting, malleable cast iron, CrNi-steels, brass, copper, aluminum with a high percentage of silicon and abrasive plastics.



Unit : Inch

UNCOATED	EDP No.				Mill Diameter	Shank Diameter	Length of Cut	Overall Length
	TiN COATED	TiCN COATED	YG:TYLON F	YG:TYLON E				
31554	31554TN	31554TC	31554TF	31554TE	1/16	1/8	1/8	1-1/2
31556	31556TN	31556TC	31556TF	31556TE	3/32	1/8	3/16	1-1/2
31558	31558TN	31558TC	31558TF	31558TE	1/8	1/8	1/4	1-1/2
31561	31561TN	31561TC	31561TF	31561TE	5/32	3/16	5/16	2
31565	31565TN	31565TC	31565TF	31565TE	3/16	3/16	3/8	2
31570	31570TN	31570TC	31570TF	31570TE	7/32	1/4	7/16	2
31573	31573TN	31573TC	31573TF	31573TE	1/4	1/4	1/2	2
31579	31579TN	31579TC	31579TF	31579TE	5/16	5/16	1/2	2
31584	31584TN	31584TC	31584TF	31584TE	3/8	3/8	5/8	2
31588	31588TN	31588TC	31588TF	31588TE	7/16	7/16	5/8	2-1/2
31593	31593TN	31593TC	31593TF	31593TE	1/2	1/2	5/8	2-1/2
31595	31595TN	31595TC	31595TF	31595TE	5/8	5/8	3/4	3
31598	31598TN	31598TC	31598TF	31598TE	3/4	3/4	1	3

Mill Dia. Tolerance (inch)	Shank Dia. Tolerance
0~-0.0012	0~-0.0005

◎ : Excellent ○ : Good

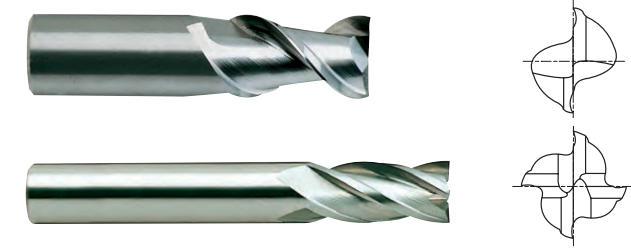
ISO	P										M				K							
	Non-alloy steel					Low alloy steel					High alloyed steel, and tool steel				Stainless steel		Grey cast iron		Nodular cast iron		Malleable cast iron	
Material Description	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
HRc	13	25	28	32	30	10	29	32	38	15	35	15	23	10	10	26	3	25	130	21	21	21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230	130	230
Recommend	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎



PLAIN SHANK E5011 SERIES  
PLAIN SHANK E5012 SERIES

CARBIDE, 2&4 FLUTE LONG LENGTH

► Suitable for cutting hardened & high alloy steels, steel casting, chill casting, malleable cast iron, CrNi-steels, brass, copper, aluminum with a high percentage of silicon and abrasive plastics.



Unit : Inch

E5011(2 FLUTE) Series					Mill Diameter	Shank Diameter	Length of Cut	Overall Length
UNCOATED	TiN COATED	TiCN COATED	YG:TYLON F	YG:TYLON E				
02558	02558TN	02558TC	02558TF	02558TE	1/8	1/8	3/4	2-1/4
02565	02565TN	02565TC	02565TF	02565TE	3/16	3/16	3/4	2-1/2
02573	02573TN	02573TC	02573TF	02573TE	1/4	1/4	1-1/8	3
02579	02579TN	02579TC	02579TF	02579TE	5/16	5/16	1-1/8	3
02584	02584TN	02584TC	02584TF	02584TE	3/8	3/8	1-1/8	3
02588	02588TN	02588TC	02588TF	02588TE	7/16	7/16	2	4
02593	02593TN	02593TC	02593TF	02593TE	1/2	1/2	2	4
02595	02595TN	02595TC	02595TF	02595TE	5/8	5/8	2-1/4	5
02598	02598TN	02598TC	02598TF	02598TE	3/4	3/4	2-1/4	5
02600	02600TN	02600TC	02600TF	02600TE	1	1	2-1/4	5

Unit : Inch

E5012(4 FLUTE) Series					Mill Diameter	Shank Diameter	Length of Cut	Overall Length
UNCOATED	TiN COATED	TiCN COATED	YG:TYLON F	YG:TYLON E				
08558	08558TN	08558TC	08558TF	08558TE	1/8	1/8	3/4	2-1/4
08565	08565TN	08565TC	08565TF	08565TE	3/16	3/16	3/4	2-1/2
08573	08573TN	08573TC	08573TF	08573TE	1/4	1/4	1-1/8	3
08579	08579TN	08579TC	08579TF	08579TE	5/16	5/16	1-1/8	3
08584	08584TN	08584TC	08584TF	08584TE	3/8	3/8	1-1/8	3
08588	08588TN	08588TC	08588TF	08588TE	7/16	7/16	2	4
08593	08593TN	08593TC	08593TF	08593TE	1/2	1/2	2	4
08595	08595TN	08595TC	08595TF	08595TE	5/8	5/8	2-1/4	5
08598	08598TN	08598TC	08598TF	08598TE	3/4	3/4	2-1/4	5
08600	08600TN	08600TC	08600TF	08600TE	1	1	2-1/4	5

Mill Dia. Tolerance (inch)	Shank Dia. Tolerance
0~-0.0012	0~-0.0005

◎ : Excellent ○ : Good

ISO	P										M				K							
	Non-alloy steel					Low alloy steel					High alloyed steel, and tool steel				Stainless steel		Grey cast iron		Nodular cast iron		Malleable cast iron	
Material Description	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
HRc	13	25	28	32	30	10	29	32	38	15	35	15	23	10	10	26	3	25	130	21	21	21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230	130	230
Recommend	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎





PLAIN SHANK UGMGF58 SERIES

### CARBIDE, 4 FLUTE LONG LENGTH

► Suitable for cutting hardened & high alloy steels, steel casting, chill casting, malleable cast iron, CrNi-steels, brass, copper, aluminum with a high percentage of silicon and abrasive plastics.



CARBIDE 4 30° PLAIN p.C709

Unit : Inch

EDP No. Y-COATED	Mill Diameter	Shank Diameter	Length of Cut	Overall Length
<a href="#">UGMGF58008</a>	1/8	1/8	3/4	2-1/4
<a href="#">UGMGF58012</a>	3/16	3/16	3/4	2-1/2
<a href="#">UGMGF58016</a>	1/4	1/4	1-1/8	3
<a href="#">UGMGF58020</a>	5/16	5/16	1-1/8	3
<a href="#">UGMGF58024</a>	3/8	3/8	1-1/8	3
<a href="#">UGMGF58028</a>	7/16	7/16	2	4
<a href="#">UGMGF58032</a>	1/2	1/2	2	4
<a href="#">UGMGF58040</a>	5/8	5/8	2-1/4	5
<a href="#">UGMGF58048</a>	3/4	3/4	2-1/4	5
<a href="#">UGMGF58064</a>	1	1	2-1/4	5

Mill Dia. Tolerance (inch)	Shank Dia. Tolerance
0--.0012	0--.0005

◎ : Excellent ○ : Good

ISO	P										M				K						
	Non-alloy steel					Low alloy steel					High alloyed steel, and tool steel				Stainless steel		Grey cast iron		Nodular cast iron		Malleable cast iron
Material Description	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
HRc	13	25	28	32	30	10	29	32	38	15	35	15	23	10	10	26	3	25	130	21	
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230	
Recommend	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	

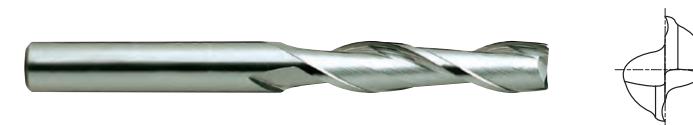
ISO	N					S					H										
	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys			Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron			
Material Description	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc	60	100	75	90	130	110	90	100			15	30	25	38	34	40	55	60	42	55	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend	◎	◎	◎	◎	◎	◎	◎	◎			◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎



PLAIN SHANK E5026 SERIES

### CARBIDE, 2 FLUTE EXTRA LONG LENGTH

► Suitable for cutting hardened & high alloy steels, steel casting, chill casting, malleable cast iron, CrNi-steels, brass, copper, aluminum with a high percentage of silicon and abrasive plastics.



CARBIDE 2 30° PLAIN p.C712, C713

Unit : Inch

EDP No.					Mill Diameter	Shank Diameter	Length of Cut	Overall Length
UNCOATED	TIN COATED	TiCN COATED	YG:TYLON F	YG:TYLON E				
<a href="#">54558</a>	<a href="#">54558TN</a>	<a href="#">54558TC</a>	<a href="#">54558TF</a>	<a href="#">54558TE</a>	1/8	1/8	1	3
<a href="#">54565</a>	<a href="#">54565TN</a>	<a href="#">54565TC</a>	<a href="#">54565TF</a>	<a href="#">54565TE</a>	3/16	3/16	1-1/8	3
<a href="#">54904</a>	<a href="#">54904TN</a>	<a href="#">54904TC</a>	<a href="#">54904TF</a>	<a href="#">54904TE</a>	3/16	3/16	1	4
<a href="#">54573</a>	<a href="#">54573TN</a>	<a href="#">54573TC</a>	<a href="#">54573TF</a>	<a href="#">54573TE</a>	1/4	1/4	1-1/2	4
<a href="#">54901</a>	<a href="#">54901TN</a>	<a href="#">54901TC</a>	<a href="#">54901TF</a>	<a href="#">54901TE</a>	1/4	1/4	1-1/2	6
<a href="#">54579</a>	<a href="#">54579TN</a>	<a href="#">54579TC</a>	<a href="#">54579TF</a>	<a href="#">54579TE</a>	5/16	5/16	1-5/8	4
<a href="#">54584</a>	<a href="#">54584TN</a>	<a href="#">54584TC</a>	<a href="#">54584TF</a>	<a href="#">54584TE</a>	3/8	3/8	1-3/4	4
<a href="#">54902</a>	<a href="#">54902TN</a>	<a href="#">54902TC</a>	<a href="#">54902TF</a>	<a href="#">54902TE</a>	3/8	3/8	1-1/2	6
<a href="#">54588</a>	<a href="#">54588TN</a>	<a href="#">54588TC</a>	<a href="#">54588TF</a>	<a href="#">54588TE</a>	7/16	7/16	3	6
<a href="#">54903</a>	<a href="#">54903TN</a>	<a href="#">54903TC</a>	<a href="#">54903TF</a>	<a href="#">54903TE</a>	1/2	1/2	1-1/2	6
<a href="#">54593</a>	<a href="#">54593TN</a>	<a href="#">54593TC</a>	<a href="#">54593TF</a>	<a href="#">54593TE</a>	1/2	1/2	3	6
<a href="#">54595</a>	<a href="#">54595TN</a>	<a href="#">54595TC</a>	<a href="#">54595TF</a>	<a href="#">54595TE</a>	5/8	5/8	3	6
<a href="#">54598</a>	<a href="#">54598TN</a>	<a href="#">54598TC</a>	<a href="#">54598TF</a>	<a href="#">54598TE</a>	3/4	3/4	3	6
<a href="#">54600</a>	<a href="#">54600TN</a>	<a href="#">54600TC</a>	<a href="#">54600TF</a>	<a href="#">54600TE</a>	1	1	3	6

Mill Dia. Tolerance (inch)	Shank Dia. Tolerance
0--.0012	0--.0005

◎ : Excellent ○ : Good

ISO	P										M				K						
	Non-alloy steel					Low alloy steel					High alloyed steel, and tool steel				Stainless steel		Grey cast iron		Nodular cast iron		Malleable cast iron
Material Description	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
HRc	13	25	28	32	30	10	29	32	38	15	35	15	23	10	10	26	3	25	130	21	
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230	
Recommend	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	

ISO	N					S					H										
	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys			Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron			
Material Description	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc	60	100	75	90	130	110	90	100			15	30	25	38	34	40	55	60	42	55	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend	◎	◎	◎	◎	◎	◎	◎	◎			◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎

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PLAIN SHANK UGMGF59 SERIES



PLAIN SHANK E5065 SERIES

CARBIDE, 4 FLUTE EXTRA LONG LENGTH

CARBIDE, 4 FLUTE EXTRA LONG LENGTH

Suitable for cutting hardened & high alloy steels, steel casting, chill casting, malleable cast iron, CrNi-steels, brass, copper, aluminum with a high percentage of silicon and abrasive plastics.

Suitable for cutting hardened & high alloy steels, steel casting, chill casting, malleable cast iron, CrNi-steels, brass, copper, aluminum with a high percentage of silicon and abrasive plastics.



Icons for CARBIDE, 4 flutes, 30 degree angle, PLAIN shank, and p.C709

Icons for CARBIDE, 4 flutes, 30 degree angle, PLAIN shank, and p.C714, C715

Table with 5 columns: EDP No. (Y-COATED), Mill Diameter, Shank Diameter, Length of Cut, Overall Length. Lists various UGMGF59 series part numbers and their dimensions.

Table with 9 columns: EDP No. (UNCOATED, TIN COATED, TiCN COATED, YG:TYLON F, YG:TYLON E), Mill Diameter, Shank Diameter, Length of Cut, Overall Length. Lists various E5065 series part numbers and their dimensions.

Table with 2 columns: Mill Dia. Tolerance (inch), Shank Dia. Tolerance. Values: 0~-.0012, 0~-.0005

Table with 2 columns: Mill Dia. Tolerance (inch), Shank Dia. Tolerance. Values: 0~-.0012, 0~-.0005

ISO material compatibility chart for UGMGF59 series. Columns include ISO, Material Description, P (Non-alloy steel, Low alloy steel, High alloyed steel, and tool steel), M (Stainless steel, Grey cast iron, Nodular cast iron, Malleable cast iron), S (Aluminum-wrought alloy, Aluminum-cast, alloyed, Copper and Copper Alloys, Non Metallic Materials, Heat Resistant Super Alloys, Titanium Alloys), H (Hardened steel, Chilled Cast Iron, Hardened Cast Iron).

ISO material compatibility chart for E5065 series. Columns include ISO, Material Description, P (Non-alloy steel, Low alloy steel, High alloyed steel, and tool steel), M (Stainless steel, Grey cast iron, Nodular cast iron, Malleable cast iron), S (Aluminum-wrought alloy, Aluminum-cast, alloyed, Copper and Copper Alloys, Non Metallic Materials, Heat Resistant Super Alloys, Titanium Alloys), H (Hardened steel, Chilled Cast Iron, Hardened Cast Iron).

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PLAIN SHANK E5022 SERIES

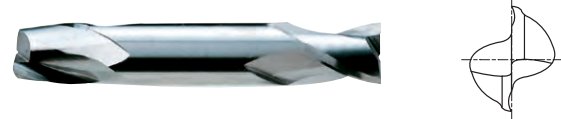
PLAIN SHANK E5023 SERIES

CARBIDE, 2 FLUTE STUB LENGTH DOUBLE

CARBIDE, 4 FLUTE STUB LENGTH DOUBLE

- Same construction features as 2&4 flute single end mill in a more economical version.
Suitable for cutting hardened & high alloy steels, steel casting, chill casting, malleable cast iron, CrNi-steels, brass, copper, aluminum with a high percentage of silicon and abrasive plastics.

- Same construction features as 2&4 flute single end mill in a more economical version.
Suitable for cutting hardened & high alloy steels, steel casting, chill casting, malleable cast iron, CrNi-steels, brass, copper, aluminum with a high percentage of silicon and abrasive plastics.



p.C712, C713

p.C714, C715

Unit : Inch

Unit : Inch

Table with 9 columns: UNCOATED, TIN COATED, TiCN COATED, YG:TYLON F, YG:TYLON E, Mill Diameter, Shank Diameter, Length of Cut, Overall Length. Rows include various part numbers like 32552, 32553, 32554, etc.

Table with 9 columns: UNCOATED, TIN COATED, TiCN COATED, YG:TYLON F, YG:TYLON E, Mill Diameter, Shank Diameter, Length of Cut, Overall Length. Rows include various part numbers like 33554, 33555, 33556, etc.

Table for Mill Dia. Tolerance (inch) with values 0~-0.012 and \*\*0~-0.0020

Table for Mill Dia. Tolerance (inch) with values 0~-0.012 and \*\*0~-0.0020

\*\* The shank of end mills is the same diameter as the cutting portion.

\*\* The shank of end mills is the same diameter as the cutting portion.

◎ : Excellent ○ : Good

◎ : Excellent ○ : Good

ISO material compatibility chart for 2-flute end mill. Columns include Non-alloy steel, Low alloy steel, High alloyed steel, Stainless steel, Grey cast iron, Nodular cast iron, Malleable cast iron, Aluminum-wrought alloy, Aluminum-cast, alloyed, Copper and Copper Alloys, Non Metallic Materials, Heat Resistant Super Alloys, Titanium Alloys, Hardened steel, Chilled Cast Iron, Hardened Cast Iron.

ISO material compatibility chart for 4-flute end mill. Columns include Non-alloy steel, Low alloy steel, High alloyed steel, Stainless steel, Grey cast iron, Nodular cast iron, Malleable cast iron, Aluminum-wrought alloy, Aluminum-cast, alloyed, Copper and Copper Alloys, Non Metallic Materials, Heat Resistant Super Alloys, Titanium Alloys, Hardened steel, Chilled Cast Iron, Hardened Cast Iron.





FLAT SHANK E5025 SERIES

CARBIDE, 2 FLUTE REGULAR LENGTH DOUBLE

- ▶ Same construction features as single end mill in a more economical version.
- ▶ Suitable for cutting hardened & high alloy steels, steel casting, chill casting, malleable cast iron, CrNi-steels, brass, copper, aluminum with a high percentage of silicon and abrasive plastics.



p.C712, C713

Unit : Inch

	EDP No.					Mill Diameter	Shank Diameter	Length of Cut	Overall Length
	UNCOATED	TIN COATED	TiCN COATED	YG:TYLON F	YG:TYLON E				
	<a href="#">11559</a>	<a href="#">11559TN</a>	<a href="#">11559TC</a>	<a href="#">11559TE</a>	<a href="#">11559TE</a>	1/8	3/8	3/8	3-1/16
	<a href="#">11563</a>	<a href="#">11563TN</a>	<a href="#">11563TC</a>	<a href="#">11563TE</a>	<a href="#">11563TE</a>	5/32	3/8	7/16	3-1/8
	<a href="#">11567</a>	<a href="#">11567TN</a>	<a href="#">11567TC</a>	<a href="#">11567TE</a>	<a href="#">11567TE</a>	3/16	3/8	1/2	3-1/4
	<a href="#">11571</a>	<a href="#">11571TN</a>	<a href="#">11571TC</a>	<a href="#">11571TE</a>	<a href="#">11571TE</a>	7/32	3/8	9/16	3-3/8
	<a href="#">11574</a>	<a href="#">11574TN</a>	<a href="#">11574TC</a>	<a href="#">11574TE</a>	<a href="#">11574TE</a>	1/4	3/8	5/8	3-3/8
	<a href="#">11577</a>	<a href="#">11577TN</a>	<a href="#">11577TC</a>	<a href="#">11577TE</a>	<a href="#">11577TE</a>	9/32	3/8	11/16	3-3/8
	<a href="#">11580</a>	<a href="#">11580TN</a>	<a href="#">11580TC</a>	<a href="#">11580TE</a>	<a href="#">11580TE</a>	5/16	3/8	3/4	3-1/2
	<a href="#">11582</a>	<a href="#">11582TN</a>	<a href="#">11582TC</a>	<a href="#">11582TE</a>	<a href="#">11582TE</a>	11/32	3/8	3/4	3-1/2
	<a href="#">11584</a>	<a href="#">11584TN</a>	<a href="#">11584TC</a>	<a href="#">11584TE</a>	<a href="#">11584TE</a>	3/8	3/8	3/4	3-1/2
	<a href="#">11589</a>	<a href="#">11589TN</a>	<a href="#">11589TC</a>	<a href="#">11589TE</a>	<a href="#">11589TE</a>	7/16	1/2	7/8	4
	<a href="#">11593</a>	<a href="#">11593TN</a>	<a href="#">11593TC</a>	<a href="#">11593TE</a>	<a href="#">11593TE</a>	1/2	1/2	1	4

Mill Dia. Tolerance (inch)	
0~-.0012	** 0~-.0020

\*\* The shank of end mills is the same diameter as the cutting portion.

◎ : Excellent ○ : Good

ISO	P										M				K					
	Non-alloy steel					Low alloy steel					High alloyed steel, and tool steel		Stainless steel		Grey cast iron		Nodular cast iron		Malleable cast iron	
Material Description	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc	13	25	28	32	30	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	○	○	○	○	○	○	○	○	○

ISO	N					S					H										
	Aluminum-wrought alloy		Aluminum-cast, alloyed		Copper and Copper Alloys (Bronze / Brass)	Non Metallic Materials		Heat Resistant Super Alloys			Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron						
Material Description	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc						15	30	25	38	34	15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend	○	○	○	○	○	○	○	○			○	○	○	○	○	○	○	○	○	○	○



FLAT SHANK E5024 SERIES

CARBIDE, 4 FLUTE REGULAR LENGTH DOUBLE

- ▶ Same construction features as single end mill in a more economical version.
- ▶ Suitable for cutting hardened & high alloy steels, steel casting, chill casting, malleable cast iron, CrNi-steels, brass, copper, aluminum with a high percentage of silicon and abrasive plastics.



p.C714, C715

Unit : Inch

	EDP No.					Mill Diameter	Shank Diameter	Length of Cut	Overall Length
	UNCOATED	TIN COATED	TiCN COATED	YG:TYLON F	YG:TYLON E				
	<a href="#">13559</a>	<a href="#">13559TN</a>	<a href="#">13559TC</a>	<a href="#">13559TE</a>	<a href="#">13559TE</a>	1/8	3/8	3/8	3-1/16
	<a href="#">13563</a>	<a href="#">13563TN</a>	<a href="#">13563TC</a>	<a href="#">13563TE</a>	<a href="#">13563TE</a>	5/32	3/8	7/16	3-1/8
	<a href="#">13567</a>	<a href="#">13567TN</a>	<a href="#">13567TC</a>	<a href="#">13567TE</a>	<a href="#">13567TE</a>	3/16	3/8	1/2	3-1/4
	<a href="#">13571</a>	<a href="#">13571TN</a>	<a href="#">13571TC</a>	<a href="#">13571TE</a>	<a href="#">13571TE</a>	7/32	3/8	9/16	3-3/8
	<a href="#">13574</a>	<a href="#">13574TN</a>	<a href="#">13574TC</a>	<a href="#">13574TE</a>	<a href="#">13574TE</a>	1/4	3/8	5/8	3-3/8
	<a href="#">13577</a>	<a href="#">13577TN</a>	<a href="#">13577TC</a>	<a href="#">13577TE</a>	<a href="#">13577TE</a>	9/32	3/8	11/16	3-3/8
	<a href="#">13580</a>	<a href="#">13580TN</a>	<a href="#">13580TC</a>	<a href="#">13580TE</a>	<a href="#">13580TE</a>	5/16	3/8	3/4	3-1/2
	<a href="#">13582</a>	<a href="#">13582TN</a>	<a href="#">13582TC</a>	<a href="#">13582TE</a>	<a href="#">13582TE</a>	11/32	3/8	3/4	3-1/2
	<a href="#">13584</a>	<a href="#">13584TN</a>	<a href="#">13584TC</a>	<a href="#">13584TE</a>	<a href="#">13584TE</a>	3/8	3/8	3/4	3-1/2
	<a href="#">13589</a>	<a href="#">13589TN</a>	<a href="#">13589TC</a>	<a href="#">13589TE</a>	<a href="#">13589TE</a>	7/16	1/2	7/8	4
	<a href="#">13593</a>	<a href="#">13593TN</a>	<a href="#">13593TC</a>	<a href="#">13593TE</a>	<a href="#">13593TE</a>	1/2	1/2	1	4

Mill Dia. Tolerance (inch)	
0~-.0012	** 0~-.0020

\*\* The shank of end mills is the same diameter as the cutting portion.

◎ : Excellent ○ : Good

ISO	P										M				K					
	Non-alloy steel					Low alloy steel					High alloyed steel, and tool steel		Stainless steel		Grey cast iron		Nodular cast iron		Malleable cast iron	
Material Description	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc	13	25	28	32	30	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	○	○	○	○	○	○	○	○	○

ISO	N					S					H										
	Aluminum-wrought alloy		Aluminum-cast, alloyed		Copper and Copper Alloys (Bronze / Brass)	Non Metallic Materials		Heat Resistant Super Alloys			Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron						
Material Description	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc						15	30	25	38	34	15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend	○	○	○	○	○	○	○	○			○	○	○	○	○	○	○	○	○	○	○

HSS

HSS



PLAIN SHANK E5249 SERIES

PLAIN SHANK E5250 SERIES

**CARBIDE, 2 FLUTE REGULAR LENGTH BALL NOSE**

**CARBIDE, 4 FLUTE REGULAR LENGTH BALL NOSE**

► Suitable for cutting hardened & high alloy steels, steel casting, chill casting, malleable cast iron, CrNi-steels, brass, copper, aluminum with a high percentage of silicon and abrasive plastics.

► Suitable for cutting hardened & high alloy steels, steel casting, chill casting, malleable cast iron, CrNi-steels, brass, copper, aluminum with a high percentage of silicon and abrasive plastics.



CARBIDE 2 30° ±.0008 PLAIN p.C716, C717

CARBIDE 4 30° ±.0008 PLAIN p.C718, C719

Unit : Inch

Unit : Inch

EDP No.					Radius of Ball Nose R (±.0008)	Mill Diameter	Shank Diameter	Length of Cut	Overall Length
UNCOATED	TIN COATED	TiCN COATED	YG:TYLON F	YG:TYLON E					
<a href="#">41558</a>	<a href="#">41558TN</a>	<a href="#">41558TC</a>	<a href="#">41558TF</a>	<a href="#">41558TE</a>	R1/16	1/8	1/8	1/2	1-1/2
<a href="#">41561</a>	<a href="#">41561TN</a>	<a href="#">41561TC</a>	<a href="#">41561TF</a>	<a href="#">41561TE</a>	R5/64	5/32	3/16	9/16	2
<a href="#">41565</a>	<a href="#">41565TN</a>	<a href="#">41565TC</a>	<a href="#">41565TF</a>	<a href="#">41565TE</a>	R3/32	3/16	3/16	5/8	2
<a href="#">41570</a>	<a href="#">41570TN</a>	<a href="#">41570TC</a>	<a href="#">41570TF</a>	<a href="#">41570TE</a>	R7/64	7/32	1/4	5/8	2-1/2
<a href="#">41573</a>	<a href="#">41573TN</a>	<a href="#">41573TC</a>	<a href="#">41573TF</a>	<a href="#">41573TE</a>	R1/8	1/4	1/4	3/4	2-1/2
<a href="#">41579</a>	<a href="#">41579TN</a>	<a href="#">41579TC</a>	<a href="#">41579TF</a>	<a href="#">41579TE</a>	R5/32	5/16	5/16	13/16	2-1/2
<a href="#">41584</a>	<a href="#">41584TN</a>	<a href="#">41584TC</a>	<a href="#">41584TF</a>	<a href="#">41584TE</a>	R3/16	3/8	3/8	1	2-1/2
<a href="#">41588</a>	<a href="#">41588TN</a>	<a href="#">41588TC</a>	<a href="#">41588TF</a>	<a href="#">41588TE</a>	R7/32	7/16	7/16	1	2-3/4
<a href="#">41593</a>	<a href="#">41593TN</a>	<a href="#">41593TC</a>	<a href="#">41593TF</a>	<a href="#">41593TE</a>	R1/4	1/2	1/2	1	3
<a href="#">41595</a>	<a href="#">41595TN</a>	<a href="#">41595TC</a>	<a href="#">41595TF</a>	<a href="#">41595TE</a>	R5/16	5/8	5/8	1-1/4	3-1/2
<a href="#">41598</a>	<a href="#">41598TN</a>	<a href="#">41598TC</a>	<a href="#">41598TF</a>	<a href="#">41598TE</a>	R3/8	3/4	3/4	1-1/2	4
<a href="#">41600</a>	<a href="#">41600TN</a>	<a href="#">41600TC</a>	<a href="#">41600TF</a>	<a href="#">41600TE</a>	R1/2	1	1	1-1/2	4

EDP No.					Radius of Ball Nose R (±.0008)	Mill Diameter	Shank Diameter	Length of Cut	Overall Length
UNCOATED	TIN COATED	TiCN COATED	YG:TYLON F	YG:TYLON E					
<a href="#">43558</a>	<a href="#">43558TN</a>	<a href="#">43558TC</a>	<a href="#">43558TF</a>	<a href="#">43558TE</a>	R1/16	1/8	1/8	1/2	1-1/2
<a href="#">43561</a>	<a href="#">43561TN</a>	<a href="#">43561TC</a>	<a href="#">43561TF</a>	<a href="#">43561TE</a>	R5/64	5/32	3/16	9/16	2
<a href="#">43565</a>	<a href="#">43565TN</a>	<a href="#">43565TC</a>	<a href="#">43565TF</a>	<a href="#">43565TE</a>	R3/32	3/16	3/16	5/8	2
<a href="#">43570</a>	<a href="#">43570TN</a>	<a href="#">43570TC</a>	<a href="#">43570TF</a>	<a href="#">43570TE</a>	R7/64	7/32	1/4	5/8	2-1/2
<a href="#">43573</a>	<a href="#">43573TN</a>	<a href="#">43573TC</a>	<a href="#">43573TF</a>	<a href="#">43573TE</a>	R1/8	1/4	1/4	3/4	2-1/2
<a href="#">43579</a>	<a href="#">43579TN</a>	<a href="#">43579TC</a>	<a href="#">43579TF</a>	<a href="#">43579TE</a>	R5/32	5/16	5/16	13/16	2-1/2
<a href="#">43584</a>	<a href="#">43584TN</a>	<a href="#">43584TC</a>	<a href="#">43584TF</a>	<a href="#">43584TE</a>	R3/16	3/8	3/8	1	2-1/2
<a href="#">43588</a>	<a href="#">43588TN</a>	<a href="#">43588TC</a>	<a href="#">43588TF</a>	<a href="#">43588TE</a>	R7/32	7/16	7/16	1	2-3/4
<a href="#">43593</a>	<a href="#">43593TN</a>	<a href="#">43593TC</a>	<a href="#">43593TF</a>	<a href="#">43593TE</a>	R1/4	1/2	1/2	1	3
<a href="#">43595</a>	<a href="#">43595TN</a>	<a href="#">43595TC</a>	<a href="#">43595TF</a>	<a href="#">43595TE</a>	R5/16	5/8	5/8	1-1/4	3-1/2
<a href="#">43598</a>	<a href="#">43598TN</a>	<a href="#">43598TC</a>	<a href="#">43598TF</a>	<a href="#">43598TE</a>	R3/8	3/4	3/4	1-1/2	4
<a href="#">43600</a>	<a href="#">43600TN</a>	<a href="#">43600TC</a>	<a href="#">43600TF</a>	<a href="#">43600TE</a>	R1/2	1	1	1-1/2	4

Mill Dia. Tolerance (inch)	Shank Dia. Tolerance
0~.0012	0~.0005

Mill Dia. Tolerance (inch)	Shank Dia. Tolerance
0~.0012	0~.0005

◎ : Excellent ○ : Good

ISO	P											M				K				
	Non-alloy steel					Low alloy steel						High alloyed steel, and tool steel				Stainless steel		Grey cast iron	Nodular cast iron	Malleable cast iron
Material Description	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc	13	25	28	32	30	10	29	32	38	15	35	15	23	10	10	26	3	25	13	21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎

ISO	N					S					H										
	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys			Titanium Alloys	Hardened steel	Chilled Cast Iron	Hardened Cast Iron				
Material Description	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc	60	100	75	90	130	110	90	100			15	30	25	38	34	55	60	42	55		
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎

◎ : Excellent ○ : Good

ISO	P											M				K				
	Non-alloy steel					Low alloy steel						High alloyed steel, and tool steel				Stainless steel		Grey cast iron	Nodular cast iron	Malleable cast iron
Material Description	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc	13	25	28	32	30	10	29	32	38	15	35	15	23	10	10	26	3	25	13	21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎

ISO	N					S					H										
	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys			Titanium Alloys	Hardened steel	Chilled Cast Iron	Hardened Cast Iron				
Material Description	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc	60	100	75	90	130	110	90	100			15	30	25	38	34	55	60	42	55		
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎



PLAIN SHANK UGMF91 SERIES

### CARBIDE, 4 FLUTE REGULAR LENGTH

- ▶ These are designed for slotting, drilling, pocketing and general operation.
- ▶ Suitable for cutting hardened & high alloy steels, steel casting, chill casting, malleable cast iron, CrNi-steels, brass, copper, aluminum with a high percentage of silicon and abrasive plastics.



CARBIDE 4 30° PLAIN ±.0008 p.C711

EDP No.	Radius of Ball Nose	Mill Diameter	Shank Diameter	Length of Cut	Overall Length
Y-COATED					
UGMF91008	1/16	1/8	1/8	1/2	1-1/2
UGMF91010	5/64	5/32	3/16	9/16	2
UGMF91012	3/32	3/16	3/16	5/8	2
UGMF91016	1/8	1/4	1/4	3/4	2-1/2
UGMF91020	5/32	5/16	5/16	13/16	2-1/2
UGMF91024	3/16	3/8	3/8	1	2-1/2
UGMF91028	7/32	7/16	7/16	1	2-3/4
UGMF91032	1/4	1/2	1/2	1	3
UGMF91040	5/16	5/8	5/8	1-1/4	3-1/2
UGMF91048	3/8	3/4	3/4	1-1/2	4
UGMF91064	1/2	1	1	1-1/2	4

Mill Dia. Tolerance (inch)	Shank Dia. Tolerance
0--.0012	0--.0005

◎ : Excellent ○ : Good

ISO Material Description	P											M				K				
	Non-alloy steel				Low alloy steel				High alloyed steel, and tool steel			Stainless steel		Grey cast iron		Nodular cast iron		Malleable cast iron		
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc	13	25	28	32	30	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎

ISO Material Description	N					S					H										
	Aluminum-wrought alloy		Aluminum-cast, alloyed		Copper and Copper Alloys (Bronze / Brass)	Heat Resistant Super Alloys			Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron								
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc						15	30	25	38	34	15	30	25	38	34	55	60	42		55	
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○



PLAIN SHANK E5014 SERIES  
PLAIN SHANK E5060 SERIES

### CARBIDE, 2&4 FLUTE LONG LENGTH BALL NOSE

- ▶ Suitable for cutting hardened & high alloy steels, steel casting, chill casting, malleable cast iron, CrNi-steels, brass, copper, aluminum with a high percentage of silicon and abrasive plastics.



CARBIDE 2&4 30° R ±.0008 PLAIN p.C716, C717 p.C718, C719

E5014(2 FLUTE) Series Unit : Inch

UNCOATED	TiN COATED	TiCN COATED	YG:TYLON F	YG:TYLON E	Radius of Ball Nose R (±.0008)	Mill Diameter	Shank Diameter	Length of Cut	Overall Length
50558	50558TN	50558TC	50558TE	50558TE	R1/16	1/8	1/8	3/4	2-1/4
50565	50565TN	50565TC	50565TE	50565TE	R3/32	3/16	3/16	3/4	2-1/2
50573	50573TN	50573TC	50573TE	50573TE	R1/8	1/4	1/4	1-1/8	3
50579	50579TN	50579TC	50579TE	50579TE	R5/32	5/16	5/16	1-1/8	3
50584	50584TN	50584TC	50584TE	50584TE	R3/16	3/8	3/8	1-1/8	3
50588	50588TN	50588TC	50588TE	50588TE	R7/32	7/16	7/16	2	4
50593	50593TN	50593TC	50593TE	50593TE	R1/4	1/2	1/2	2	4
50595	50595TN	50595TC	50595TE	50595TE	R5/16	5/8	5/8	2-1/4	5
50598	50598TN	50598TC	50598TE	50598TE	R3/8	3/4	3/4	2-1/4	5
50600	50600TN	50600TC	50600TE	50600TE	R1/2	1	1	2-1/4	5

E5060(4 FLUTE) Series Unit : Inch

UNCOATED	TiN COATED	TiCN COATED	YG:TYLON F	YG:TYLON E	Radius of Ball Nose R (±.0008)	Mill Diameter	Shank Diameter	Length of Cut	Overall Length
51558	51558TN	51558TC	51558TE	51558TE	R1/16	1/8	1/8	3/4	2-1/4
51565	51565TN	51565TC	51565TE	51565TE	R3/32	3/16	3/16	3/4	2-1/2
51573	51573TN	51573TC	51573TE	51573TE	R1/8	1/4	1/4	1-1/8	3
51579	51579TN	51579TC	51579TE	51579TE	R5/32	5/16	5/16	1-1/8	3
51584	51584TN	51584TC	51584TE	51584TE	R3/16	3/8	3/8	1-1/8	3
51588	51588TN	51588TC	51588TE	51588TE	R7/32	7/16	7/16	2	4
51593	51593TN	51593TC	51593TE	51593TE	R1/4	1/2	1/2	2	4
51595	51595TN	51595TC	51595TE	51595TE	R5/16	5/8	5/8	2-1/4	5
51598	51598TN	51598TC	51598TE	51598TE	R3/8	3/4	3/4	2-1/4	5
51600	51600TN	51600TC	51600TE	51600TE	R1/2	1	1	2-1/4	5

Mill Dia. Tolerance (inch)	Shank Dia. Tolerance
0--.0012	0--.0005

◎ : Excellent ○ : Good

ISO Material Description	P											M				K				
	Non-alloy steel				Low alloy steel				High alloyed steel, and tool steel			Stainless steel		Grey cast iron		Nodular cast iron		Malleable cast iron		
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc	13	25	28	32	30	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	○	○	○	○	○	○

ISO Material Description	N					S					H										
	Aluminum-wrought alloy		Aluminum-cast, alloyed		Copper and Copper Alloys (Bronze / Brass)	Heat Resistant Super Alloys			Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron								
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc						15	30	25	38	34	15	30	25	38	34	55	60	42		55	
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○





PLAIN SHANK E5018 SERIES

CARBIDE, 2 FLUTE EXTRA LONG LENGTH BALL NOSE

► Suitable for cutting hardened & high alloy steels, steel casting, chill casting, malleable cast iron, CrNi-steels, brass, copper, aluminum with a high percentage of silicon and abrasive plastics.



p.C716, C717

Unit : Inch

EDP No.					Radius of Ball Nose R (±.0008)	Mill Diameter	Shank Diameter	Length of Cut	Overall Length
UNCOATED	TiN COATED	TiCN COATED	YG:TYLON F	YG:TYLON E					
52558	52558TN	52558TC	52558TE	52558TE	R1/16	1/8	1/8	1	3
52565	52565TN	52565TC	52565TE	52565TE	R3/32	3/16	3/16	1-1/8	3
52904	52904TN	52904TC	52904TE	52904TE	R3/32	3/16	3/16	1	4
52573	52573TN	52573TC	52573TE	52573TE	R1/8	1/4	1/4	1-1/2	4
52901	52901TN	52901TC	52901TE	52901TE	R1/8	1/4	1/4	1-1/2	6
52579	52579TN	52579TC	52579TE	52579TE	R5/32	5/16	5/16	1-5/8	4
52584	52584TN	52584TC	52584TE	52584TE	R3/16	3/8	3/8	1-3/4	4
52902	52902TN	52902TC	52902TE	52902TE	R3/16	3/8	3/8	1-1/2	6
52588	52588TN	52588TC	52588TE	52588TE	R7/32	7/16	7/16	3	6
52903	52903TN	52903TC	52903TE	52903TE	R1/4	1/2	1/2	1-1/2	6
52593	52593TN	52593TC	52593TE	52593TE	R1/4	1/2	1/2	3	6
52595	52595TN	52595TC	52595TE	52595TE	R5/16	5/8	5/8	3	6
52598	52598TN	52598TC	52598TE	52598TE	R3/8	3/4	3/4	3	6
52600	52600TN	52600TC	52600TE	52600TE	R1/2	1	1	3	6

Mill Dia. Tolerance (inch)	Shank Dia. Tolerance
0--.0012	0--.0005

◎ : Excellent ○ : Good

ISO	P										M				K					
	Non-alloy steel					Low alloy steel					High alloyed steel, and tool steel				Stainless steel		Grey cast iron	Nodular cast iron	Malleable cast iron	
Material Description	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc	13	25	28	32	30	10	29	32	38	15	35	15	23	10	10	26	3	25	21	21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	○	○	○	○	○	○

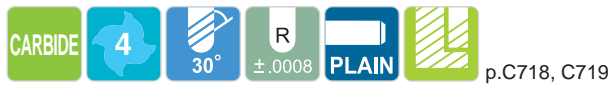
ISO	N					S					H										
	Aluminum-wrought alloy		Aluminum-cast, alloyed		Copper and Copper Alloys (Bronze / Brass)	Non Metallic Materials		Heat Resistant Super Alloys			Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron						
Material Description	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc	60	100	75	90	130	110	90	100			15	30	25	38	34	55	60	42	42	55	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○



PLAIN SHANK E5062 SERIES

CARBIDE, 4 FLUTE EXTRA LONG LENGTH BALL NOSE

► Suitable for cutting hardened & high alloy steels, steel casting, chill casting, malleable cast iron, CrNi-steels, brass, copper, aluminum with a high percentage of silicon and abrasive plastics.



p.C718, C719

Unit : Inch

EDP No.					Radius of Ball Nose R (±.0008)	Mill Diameter	Shank Diameter	Length of Cut	Overall Length
UNCOATED	TiN COATED	TiCN COATED	YG:TYLON F	YG:TYLON E					
53558	53558TN	53558TC	53558TE	53558TE	R1/16	1/8	1/8	1	3
53565	53565TN	53565TC	53565TE	53565TE	R3/32	3/16	3/16	1-1/8	3
53573	53573TN	53573TC	53573TE	53573TE	R1/8	1/4	1/4	1-1/2	4
53901	53901TN	53901TC	53901TE	53901TE	R1/8	1/4	1/4	1-1/2	6
53579	53579TN	53579TC	53579TE	53579TE	R5/32	5/16	5/16	1-5/8	4
53584	53584TN	53584TC	53584TE	53584TE	R3/16	3/8	3/8	1-3/4	4
53902	53902TN	53902TC	53902TE	53902TE	R3/16	3/8	3/8	1-1/2	6
53588	53588TN	53588TC	53588TE	53588TE	R7/32	7/16	7/16	3	6
53903	53903TN	53903TC	53903TE	53903TE	R1/4	1/2	1/2	1-1/2	6
53593	53593TN	53593TC	53593TE	53593TE	R1/4	1/2	1/2	3	6
53595	53595TN	53595TC	53595TE	53595TE	R5/16	5/8	5/8	3	6
53904	53904TN	53904TC	53904TE	53904TE	R5/16	5/8	5/8	1-1/2	6
53598	53598TN	53598TC	53598TE	53598TE	R3/8	3/4	3/4	3	6
53905	53905TN	53905TC	53905TE	53905TE	R3/8	3/4	3/4	1-1/2	6
53600	53600TN	53600TC	53600TE	53600TE	R1/2	1	1	3	6
53906	53906TN	53906TC	53906TE	53906TE	R1/2	1	1	1-1/2	6

Mill Dia. Tolerance (inch)	Shank Dia. Tolerance
0--.0012	0--.0005

◎ : Excellent ○ : Good

ISO	P										M				K					
	Non-alloy steel					Low alloy steel					High alloyed steel, and tool steel				Stainless steel		Grey cast iron	Nodular cast iron	Malleable cast iron	
Material Description	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc	13	25	28	32	30	10	29	32	38	15	35	15	23	10	10	26	3	25	21	21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	○	○	○	○	○	○

ISO	N					S					H										
	Aluminum-wrought alloy		Aluminum-cast, alloyed		Copper and Copper Alloys (Bronze / Brass)	Non Metallic Materials		Heat Resistant Super Alloys			Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron						
Material Description	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc	60	100	75	90	130	110	90	100			15	30	25	38	34	55	60	42	42	55	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○

HSS

CBN END MILLS

i-Xmill END MILLS

i-SMART MODULAR END MILLS

X5070 END MILLS

4G MILL END MILLS

X-POWER PRO END MILLS

TitaNox-POWER END MILLS

JET-POWER END MILLS

V7 PLUS A END MILLS

V7 MILL INOX

ALU-POWER HPC END MILLS

ALU-POWER END MILLS

D-POWER GRAPHITE END MILLS

STANDARD CARBIDE

ONLY ONE COATED PM60 END MILLS

SINE-POWER

TANK-POWER END MILLS

STANDARD COBALT & HSS

TECHNICAL DATA

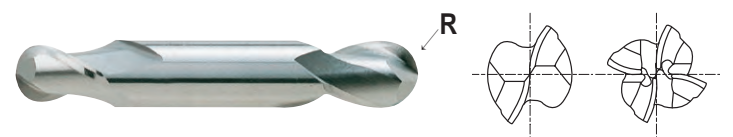


PLAIN SHANK E5251 SERIES

PLAIN SHANK E5252 SERIES

CARBIDE, 2&4 FLUTE STUB LENGTH DOUBLE BALL NOSE

- Same construction features as single end mill in a more economical version. Suitable for cutting hardened & high alloy steels, steel casting, chill casting, malleable cast iron, CrNi-steels, brass, copper, aluminum with a high percentage of silicon and abrasive plastics.



Icons for CARBIDE, 2&4 flutes, 30 degree angle, tolerance ±.0008, PLAIN shank, and material grades p.C716, C717, p.C718, C719.

Table for E5251 Series 2 FLUTE. Columns include EDP No., Radius of Ball Nose, Mill Diameter, Shank Diameter, Length of Cut, and Overall Length. Rows list various part numbers and their specifications.

Table for E5252 Series 4 FLUTE. Columns include EDP No., Radius of Ball Nose, Mill Diameter, Shank Diameter, Length of Cut, and Overall Length. Rows list various part numbers and their specifications.

Table showing Mill Dia. Tolerance (inch) for different diameter ranges: 0--.0012 and \*\* 0--.0020.

\*\* The shank of end mills is the same diameter as the cutting portion.

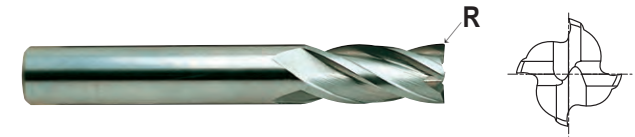
Material compatibility chart for E5251/E5252 series. Shows ISO material groups (P, M, K, S, H) and their suitability for different end mill types (Excellent/Good).



PLAIN SHANK E5216 SERIES

CARBIDE, 4 FLUTE REGULAR LENGTH CORNER RADIUS

- Suitable for cutting hardened & high alloy steels, steel casting, chill casting, malleable cast iron, CrNi-steels, brass, copper, aluminum with a high percentage of silicon and abrasive plastics.



Icons for CARBIDE, 4 flutes, 30 degree angle, tolerance ±.001, PLAIN shank, and material grades p.C714, C715.

Table for E5216 Series 4 FLUTE. Columns include EDP No., Corner Radius, Mill Diameter, Shank Diameter, Length of Cut, and Overall Length. Rows list various part numbers and their specifications.

▶ NEXT PAGE

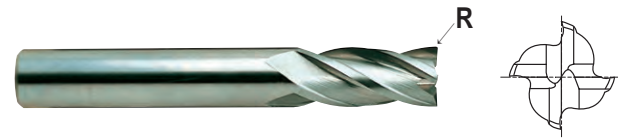
Material compatibility chart for E5216 series. Shows ISO material groups (P, M, K, S, H) and their suitability for different end mill types (Excellent/Good).



PLAIN SHANK E5216 SERIES

### CARBIDE, 4 FLUTE REGULAR LENGTH CORNER RADIUS

► Suitable for cutting hardened & high alloy steels, steel casting, chill casting, malleable cast iron, CrNi-steels, brass, copper, aluminum with a high percentage of silicon and abrasive plastics.



CARBIDE 4 30° ±.001 PLAIN p.C714, C715

Unit : Inch

EDP No.		Corner Radius	Mill Diameter	Shank Diameter	Length of Cut	Overall Length
UNCOATED	YG:TYLON F	R				
07593-125R	07593TE-125R	R.125	1/2	1/2	1	3
07595-015R	07595TE-015R	R.015	5/8	5/8	1-1/4	3-1/2
07595-030R	07595TE-030R	R.030	5/8	5/8	1-1/4	3-1/2
07595-045R	07595TE-045R	R.045	5/8	5/8	1-1/4	3-1/2
07595-060R	07595TE-060R	R.060	5/8	5/8	1-1/4	3-1/2
07595-090R	07595TE-090R	R.090	5/8	5/8	1-1/4	3-1/2
07595-125R	07595TE-125R	R.125	5/8	5/8	1-1/4	3-1/2
07598-015R	07598TE-015R	R.015	3/4	3/4	1-1/2	4
07598-030R	07598TE-030R	R.030	3/4	3/4	1-1/2	4
07598-045R	07598TE-045R	R.045	3/4	3/4	1-1/2	4
07598-060R	07598TE-060R	R.060	3/4	3/4	1-1/2	4
07598-090R	07598TE-090R	R.090	3/4	3/4	1-1/2	4
07598-125R	07598TE-125R	R.125	3/4	3/4	1-1/2	4
07600-015R	07600TE-015R	R.015	1	1	1-1/2	4
07600-030R	07600TE-030R	R.030	1	1	1-1/2	4
07600-045R	07600TE-045R	R.045	1	1	1-1/2	4
07600-060R	07600TE-060R	R.060	1	1	1-1/2	4
07600-090R	07600TE-090R	R.090	1	1	1-1/2	4
07600-125R	07600TE-125R	R.125	1	1	1-1/2	4

Mill Dia. Tolerance (inch)	Shank Dia. Tolerance
0~~.0012	0~~.0005

◎ : Excellent ○ : Good

ISO	P										M				K							
Material Description	Non-alloy steel					Low alloy steel					High alloyed steel, and tool steel				Stainless steel		Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20		
HRc	13	25	28	32	30	29	32	38	35	15	35	15	23	10	10	26	3	25				
HB	125	190	250	270	300	180	275	300	200	200	325	200	240	180	180	260	160	250	130	230		
Recommend	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎

ISO	N					S					H										
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys			Titanium Alloys		Hardened steel		Chilled Cast Iron		Hardened Cast Iron	
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend	◎	◎	◎	◎	◎	◎	◎	◎										◎	◎	◎	◎



PLAIN SHANK E5069 SERIES

### CARBIDE, 5 FLUTE 45° HELIX REGULAR LENGTH CORNER RADIUS

Designed to machine stainless steels, Inconols and other alloys. 5 Flute and 45° medium helix allow harmonic balance and smooth cutting.



CARBIDE 5 45° ±.001 PLAIN p.C708

Unit : Inch

EDP No.	Corner Radius	Mill Diameter	Shank Diameter	Length of Cut	Overall Length
	R				
86573TE-030R	R.030	1/4	1/4	3/4	2-1/2
86584TE-030R	R.030	3/8	3/8	1	2-1/2
86584TE-060R	R.060	3/8	3/8	1	2-1/2
86593TE-030R	R.030	1/2	1/2	1-1/4	3
86593TE-060R	R.060	1/2	1/2	1-1/4	3
86593TE-090R	R.090	1/2	1/2	1-1/4	3
86595TE-030R	R.030	5/8	5/8	1-5/8	3-1/2
86595TE-060R	R.060	5/8	5/8	1-5/8	3-1/2
86595TE-090R	R.090	5/8	5/8	1-5/8	3-1/2
86595TE-125R	R.125	5/8	5/8	1-5/8	3-1/2
86598TE-030R	R.030	3/4	3/4	1-5/8	4
86598TE-060R	R.060	3/4	3/4	1-5/8	4
86598TE-090R	R.090	3/4	3/4	1-5/8	4
86598TE-125R	R.125	3/4	3/4	1-5/8	4
86598TE-156R	R.156	3/4	3/4	1-5/8	4
86598TE-187R	R.187	3/4	3/4	1-5/8	4
86600TE-030R	R.030	1	1	2	4
86600TE-060R	R.060	1	1	2	4
86600TE-090R	R.090	1	1	2	4
86600TE-125R	R.125	1	1	2	4
86600TE-156R	R.156	1	1	2	4
86600TE-187R	R.187	1	1	2	4

Any non stocked radius available in 1 week for uncoated tools

Mill Dia. Tolerance (inch)	Shank Dia. Tolerance
0~~.0012	0~~.0005

◎ : Excellent ○ : Good

ISO	P										M				K							
Material Description	Non-alloy steel					Low alloy steel					High alloyed steel, and tool steel				Stainless steel		Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20		
HRc	13	25	28	32	30	29	32	38	35	15	35	15	23	10	10	26	3	25				
HB	125	190	250	270	300	180	275	300	200	200	325	200	240	180	180	260	160	250	130	230		
Recommend	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎

ISO	N					S					H										
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys			Titanium Alloys		Hardened steel		Chilled Cast Iron		Hardened Cast Iron	
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend	◎	◎	◎	◎	◎	◎	◎	◎										◎	◎	◎	◎





PLAIN SHANK  
FLAT SHANK **E5243** SERIES

**CARBIDE, 3 FLUTE 45° HELIX REGULAR LENGTH**

- ▶ Designed to machine stainless steel, inconel, titanium and other hard to machine materials.
- ▶ It's 3 flute design gives high stability and allows good chip removal in plunging & slotting operations.
- ▶ The normal rake angle and 45° medium helix allows an extremely wide range of application.
- ▶ YG:TYLON super TiAlN coating are recommended for maximum performance.



EDP No.					Mill Diameter	Shank Diameter	Length of Cut	Overall Length
UNCOATED	TIN COATED	TiCN COATED	YG:TYLON F	YG:TYLON E				
<b>34558</b>	<b>34558TN</b>	<b>34558TC</b>	<b>34558TE</b>	<b>34558TE</b>	1/8	1/8	3/8	1-1/2
<b>34565</b>	<b>34565TN</b>	<b>34565TC</b>	<b>34565TE</b>	<b>34565TE</b>	3/16	3/16	9/16	2
<b>34573</b>	<b>34573TN</b>	<b>34573TC</b>	<b>34573TE</b>	<b>34573TE</b>	1/4	1/4	3/4	2-1/2
<b>34579</b>	<b>34579TN</b>	<b>34579TC</b>	<b>34579TE</b>	<b>34579TE</b>	5/16	5/16	13/16	2-1/2
<b>34584</b>	<b>34584TN</b>	<b>34584TC</b>	<b>34584TE</b>	<b>34584TE</b>	3/8	3/8	7/8	2-1/2
<b>34593</b>	<b>34593TN</b>	<b>34593TC</b>	<b>34593TE</b>	<b>34593TE</b>	1/2	1/2	1	3
<b>34594</b>	<b>34594TN</b>	<b>34594TC</b>	<b>34594TE</b>	<b>34594TE</b>	9/16	9/16	1-1/4	3-1/2
<b>34595</b>	<b>34595TN</b>	<b>34595TC</b>	<b>34595TE</b>	<b>34595TE</b>	5/8	5/8	1-1/4	3-1/2
<b>34598</b>	<b>34598TN</b>	<b>34598TC</b>	<b>34598TE</b>	<b>34598TE</b>	3/4	3/4	1-1/2	4
<b>34600</b>	<b>34600TN</b>	<b>34600TC</b>	<b>34600TE</b>	<b>34600TE</b>	1	1	1-1/2	4

Mill Dia. Tolerance (inch)	Shank Dia. Tolerance
0~-0.0012	0~-0.0005

◎ : Excellent ○ : Good

ISO Material Description	P										M				K						
	Non-alloy steel					Low alloy steel					High alloyed steel, and tool steel				Stainless steel		Grey cast iron		Nodular cast iron		Malleable cast iron
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
HRc	13	25	28	32	30	10	29	32	38	15	35	15	23	10	10	26	3	25	130	21	
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230	
Recommend	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	○	○	○	○	○	○	

ISO Material Description	N					S					H										
	Aluminum-wrought alloy		Aluminum-cast, alloyed		Copper and Copper Alloys (Bronze / Brass)	Non Metallic Materials		Heat Resistant Super Alloys			Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron						
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc	21	22	23	24	25	26	27	28	29	30	15	30	25	38	34	55	60	42	42	55	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○



PLAIN SHANK **E5059** SERIES

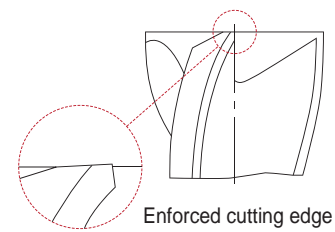
**CARBIDE, 3 FLUTE 50° HELIX STUB & REGULAR & LONG LENGTH**

- ▶ Designed to machine stainless steel, inconel, titanium and other hard to machine materials.
- ▶ It's 3 flute design gives high stability and allows good chip removal in plunging & slotting operations.
- ▶ The high rake angle and 50° helix allows an extremely wide range of application.
- ▶ YG:TYLON super TiAlN coating are recommended for maximum performance.



EDP No.					Mill Diameter	Shank Diameter	Length of Cut	Overall Length
UNCOATED	TIN COATED	TiCN COATED	YG:TYLON F	YG:TYLON E				
<b>83573</b>	<b>83573TN</b>	<b>83573TC</b>	<b>83573TE</b>	<b>83573TE</b>	1/4	1/4	1/2	2
<b>83901</b>	<b>83901TN</b>	<b>83901TC</b>	<b>83901TE</b>	<b>83901TE</b>	1/4	1/4	3/4	2-1/2
<b>83902</b>	<b>83902TN</b>	<b>83902TC</b>	<b>83902TE</b>	<b>83902TE</b>	1/4	1/4	1-1/4	3
<b>83584</b>	<b>83584TN</b>	<b>83584TC</b>	<b>83584TE</b>	<b>83584TE</b>	3/8	3/8	1/2	2
<b>83903</b>	<b>83903TN</b>	<b>83903TC</b>	<b>83903TE</b>	<b>83903TE</b>	3/8	3/8	1	2-1/2
<b>83904</b>	<b>83904TN</b>	<b>83904TC</b>	<b>83904TE</b>	<b>83904TE</b>	3/8	3/8	1-1/2	3-1/2
<b>83593</b>	<b>83593TN</b>	<b>83593TC</b>	<b>83593TE</b>	<b>83593TE</b>	1/2	1/2	5/8	2-1/2
<b>83905</b>	<b>83905TN</b>	<b>83905TC</b>	<b>83905TE</b>	<b>83905TE</b>	1/2	1/2	1	3
<b>83906</b>	<b>83906TN</b>	<b>83906TC</b>	<b>83906TE</b>	<b>83906TE</b>	1/2	1/2	2	4
<b>83595</b>	<b>83595TN</b>	<b>83595TC</b>	<b>83595TE</b>	<b>83595TE</b>	5/8	5/8	7/8	3
<b>83907</b>	<b>83907TN</b>	<b>83907TC</b>	<b>83907TE</b>	<b>83907TE</b>	5/8	5/8	2-1/2	6
<b>83598</b>	<b>83598TN</b>	<b>83598TC</b>	<b>83598TE</b>	<b>83598TE</b>	3/4	3/4	1	3-1/2
<b>83908</b>	<b>83908TN</b>	<b>83908TC</b>	<b>83908TE</b>	<b>83908TE</b>	3/4	3/4	3	6

Mill Dia. Tolerance (inch)	Shank Dia. Tolerance
0~-0.0012	0~-0.0005



◎ : Excellent ○ : Good

ISO Material Description	P										M				K						
	Non-alloy steel					Low alloy steel					High alloyed steel, and tool steel				Stainless steel		Grey cast iron		Nodular cast iron		Malleable cast iron
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
HRc	13	25	28	32	30	10	29	32	38	15	35	15	23	10	10	26	3	25	130	21	
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230	
Recommend	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	○	○	○	○	○	○	

ISO Material Description	N					S					H										
	Aluminum-wrought alloy		Aluminum-cast, alloyed		Copper and Copper Alloys (Bronze / Brass)	Non Metallic Materials		Heat Resistant Super Alloys			Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron						
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc	21	22	23	24	25	26	27	28	29	30	15	30	25	38	34	55	60	42	42	55	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○



PLAIN SHANK  
FLAT SHANK **E5246** SERIES

**CARBIDE, 3 FLUTE 60° HELIX REGULAR LENGTH**

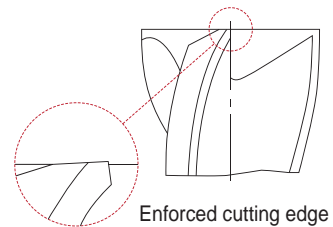
- ▶ Excellent shearing and chip ejection due to 60° Helix.
- ▶ 20% ~ 30% increase in chip load recommended over 30° helix tools.



Unit : Inch

EDP No.					Mill Diameter	Shank Diameter	Length of Cut	Overall Length
UNCOATED	TIN COATED	TiCN COATED	YG:TYLON F	YG:TYLON E				
<b>20558</b>	<b>20558TN</b>	<b>20558TC</b>	<b>20558TE</b>	<b>20558TE</b>	1/8	1/8	3/8	1-1/2
<b>20565</b>	<b>20565TN</b>	<b>20565TC</b>	<b>20565TE</b>	<b>20565TE</b>	3/16	3/16	9/16	2
<b>20573</b>	<b>20573TN</b>	<b>20573TC</b>	<b>20573TE</b>	<b>20573TE</b>	1/4	1/4	3/4	2-1/2
<b>20579</b>	<b>20579TN</b>	<b>20579TC</b>	<b>20579TE</b>	<b>20579TE</b>	5/16	5/16	13/16	2-1/2
<b>20584</b>	<b>20584TN</b>	<b>20584TC</b>	<b>20584TE</b>	<b>20584TE</b>	3/8	3/8	7/8	2-1/2
<b>20593</b>	<b>20593TN</b>	<b>20593TC</b>	<b>20593TE</b>	<b>20593TE</b>	1/2	1/2	1	3
<b>20594</b>	<b>20594TN</b>	<b>20594TC</b>	<b>20594TE</b>	<b>20594TE</b>	9/16	9/16	1-1/4	3-1/2
<b>20595</b>	<b>20595TN</b>	<b>20595TC</b>	<b>20595TE</b>	<b>20595TE</b>	5/8	5/8	1-1/4	3-1/2
<b>20598</b>	<b>20598TN</b>	<b>20598TC</b>	<b>20598TE</b>	<b>20598TE</b>	3/4	3/4	1-1/2	4
<b>20600</b>	<b>20600TN</b>	<b>20600TC</b>	<b>20600TE</b>	<b>20600TE</b>	1	1	1-1/2	4

Mill Dia. Tolerance (inch)	Shank Dia. Tolerance
0~-0.012	0~-0.005



◎ : Excellent ○ : Good

ISO	P										M				K						
	Non-alloy steel					Low alloy steel					High alloyed steel, and tool steel				Stainless steel		Grey cast iron		Nodular cast iron		Malleable cast iron
Material Description	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
HRc	13	25	28	32	30	10	29	32	38	15	35	15	23	10	10	26	3	25	13	21	
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230	
Recommend	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	○	○	○	○	○	○	

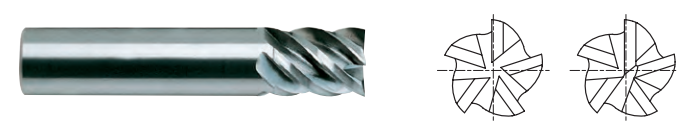
ISO	N					S					H									
	Aluminum-wrought alloy		Aluminum-cast, alloyed		Copper and Copper Alloys (Bronze / Brass)	Non Metallic Materials			Heat Resistant Super Alloys			Titanium Alloys	Hardened steel	Chilled Cast Iron	Hardened Cast Iron					
Material Description	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40
HRc	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	55	60	42
Recommend	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎



PLAIN SHANK **E5066** SERIES

**CARBIDE, 5 FLUTE 45° HELIX STUB LENGTH**

- ▶ Designed to machine stainless steels, inconels and other alloys.
- ▶ The new design of stub length allows cutting at maximum speeds and feeds with minimum deflection
- ▶ 5 Flute and 45° medium helix allow harmonic balance and smooth cutting.



up to Ø3/16 over Ø3/16



Unit : Inch

EDP No.					Mill Diameter	Shank Diameter	Length of Cut	Overall Length
UNCOATED	TIN COATED	TiCN COATED	YG:TYLON F	YG:TYLON E				
<b>85558</b>	<b>85558TN</b>	<b>85558TC</b>	<b>85558TE</b>	<b>85558TE</b>	1/8	1/8	1/4	1-1/2
<b>85561</b>	<b>85561TN</b>	<b>85561TC</b>	<b>85561TE</b>	<b>85561TE</b>	5/32	3/16	5/16	2
<b>85565</b>	<b>85565TN</b>	<b>85565TC</b>	<b>85565TE</b>	<b>85565TE</b>	3/16	3/16	5/16	2
<b>85570</b>	<b>85570TN</b>	<b>85570TC</b>	<b>85570TE</b>	<b>85570TE</b>	7/32	1/4	3/8	2
<b>85573</b>	<b>85573TN</b>	<b>85573TC</b>	<b>85573TE</b>	<b>85573TE</b>	1/4	1/4	3/8	2
<b>85579</b>	<b>85579TN</b>	<b>85579TC</b>	<b>85579TE</b>	<b>85579TE</b>	5/16	5/16	7/16	2
<b>85584</b>	<b>85584TN</b>	<b>85584TC</b>	<b>85584TE</b>	<b>85584TE</b>	3/8	3/8	1/2	2
<b>85588</b>	<b>85588TN</b>	<b>85588TC</b>	<b>85588TE</b>	<b>85588TE</b>	7/16	7/16	9/16	2-1/2
<b>85593</b>	<b>85593TN</b>	<b>85593TC</b>	<b>85593TE</b>	<b>85593TE</b>	1/2	1/2	5/8	2-1/2
<b>85595</b>	<b>85595TN</b>	<b>85595TC</b>	<b>85595TE</b>	<b>85595TE</b>	5/8	5/8	3/4	3
<b>85598</b>	<b>85598TN</b>	<b>85598TC</b>	<b>85598TE</b>	<b>85598TE</b>	3/4	3/4	1	3
<b>85600</b>	<b>85600TN</b>	<b>85600TC</b>	<b>85600TE</b>	<b>85600TE</b>	1	1	1-1/4	3

Mill Dia. Tolerance (inch)	Shank Dia. Tolerance
0~-0.012	0~-0.003

◎ : Excellent ○ : Good

ISO	P										M				K						
	Non-alloy steel					Low alloy steel					High alloyed steel, and tool steel				Stainless steel		Grey cast iron		Nodular cast iron		Malleable cast iron
Material Description	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
HRc	13	25	28	32	30	10	29	32	38	15	35	15	23	10	10	26	3	25	13	21	
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230	
Recommend	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	○	○	○	○	○	○	

ISO	N					S					H									
	Aluminum-wrought alloy		Aluminum-cast, alloyed		Copper and Copper Alloys (Bronze / Brass)	Non Metallic Materials			Heat Resistant Super Alloys			Titanium Alloys	Hardened steel	Chilled Cast Iron	Hardened Cast Iron					
Material Description	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40
HRc	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	55	60	42
Recommend	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎



PLAIN SHANK E5067 SERIES

CARBIDE, 5 FLUTE 45° HELIX REGULAR LENGTH

- ▶ Designed to machine stainless steels, inconels and other alloys.
- ▶ The new design of stub length allows cutting at maximum speeds and feeds with minimum deflection
- ▶ 5 Flute and 45° medium helix allow harmonic balance and smooth cutting.



Unit : Inch

UNCOATED	TIN COATED	TiCN COATED	EDP No.		Mill Diameter	Shank Diameter	Length of Cut	Overall Length
			YG:TYLON F	YG:TYLON E				
86558	86558TN	86558TC	86558TF	86558TE	1/8	1/8	1/2	1-1/2
86561	86561TN	86561TC	86561TF	86561TE	5/32	3/16	9/16	2
86565	86565TN	86565TC	86565TF	86565TE	3/16	3/16	9/16	2
86570	86570TN	86570TC	86570TF	86570TE	7/32	1/4	3/4	2-1/2
86573	86573TN	86573TC	86573TF	86573TE	1/4	1/4	3/4	2-1/2
86579	86579TN	86579TC	86579TF	86579TE	5/16	5/16	13/16	2-1/2
86584	86584TN	86584TC	86584TF	86584TE	3/8	3/8	1	2-1/2
86588	86588TN	86588TC	86588TF	86588TE	7/16	7/16	1	2-3/4
86593	86593TN	86593TC	86593TF	86593TE	1/2	1/2	1-1/4	3
86595	86595TN	86595TC	86595TF	86595TE	5/8	5/8	1-5/8	3-1/2
86598	86598TN	86598TC	86598TF	86598TE	3/4	3/4	1-5/8	4
86599	86599TN	86599TC	86599TF	86599TE	7/8	7/8	2	4
86600	86600TN	86600TC	86600TF	86600TE	1	1	2	4

Mill Dia. Tolerance (inch)	Shank Dia. Tolerance
0~-0.0012	0~-0.0003

◎ : Excellent ○ : Good

ISO Material Description	P										M				K						
	Non-alloy steel					Low alloy steel					High alloyed steel, and tool steel				Stainless steel		Grey cast iron		Nodular cast iron		Malleable cast iron
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
HRc	13	25	28	32	300	10	29	32	38	15	35	15	23	10	10	26	3	25	130	21	
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230	
Recommend	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	○	○	○	○	○	○	

ISO Material Description	N					S				H											
	Aluminum-wrought alloy		Aluminum-cast, alloyed		Copper and Copper Alloys (Bronze / Brass)	Non Metallic Materials		Heat Resistant Super Alloys		Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron							
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○



PLAIN SHANK E5068 SERIES

CARBIDE, 5 FLUTE 45° HELIX MEDIUM & LONG LENGTH

- ▶ Designed to machine stainless steel, inconels and other alloys.
- ▶ The new design of stub length allows cutting at maximum speeds and feeds with minimum deflection
- ▶ 5 Flute and 45° medium helix allow harmonic balance and smooth cutting.



Unit : Inch

UNCOATED	TIN COATED	TiCN COATED	EDP No.		Mill Diameter	Shank Diameter	Length of Cut	Overall Length
			YG:TYLON F	YG:TYLON E				
58573	58573TN	58573TC	58573TF	58573TE	1/4	1/4	1-1/4	4
58579	58579TN	58579TC	58579TF	58579TE	5/16	5/16	1-1/4	4
58584	58584TN	58584TC	58584TF	58584TE	3/8	3/8	1-1/2	4
58588	58588TN	58588TC	58588TF	58588TE	7/16	7/16	2	4
58593	58593TN	58593TC	58593TF	58593TE	1/2	1/2	2	4
58595	58595TN	58595TC	58595TF	58595TE	5/8	5/8	2-1/2	5
58598	58598TN	58598TC	58598TF	58598TE	3/4	3/4	3-1/4	6
58901	58901TN	58901TC	58901TF	58901TE	3/4	3/4	2-1/4	5
58600	58600TN	58600TC	58600TF	58600TE	1	1	3-1/4	6
58902	58902TN	58902TC	58902TF	58902TE	1	1	2-5/8	6

Mill Dia. Tolerance (inch)	Shank Dia. Tolerance
0~-0.0012	0~-0.0003

◎ : Excellent ○ : Good

ISO Material Description	P										M				K						
	Non-alloy steel					Low alloy steel					High alloyed steel, and tool steel				Stainless steel		Grey cast iron		Nodular cast iron		Malleable cast iron
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
HRc	13	25	28	32	300	10	29	32	38	15	35	15	23	10	10	26	3	25	130	21	
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230	
Recommend	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	○	○	○	○	○	○	

ISO Material Description	N					S				H											
	Aluminum-wrought alloy		Aluminum-cast, alloyed		Copper and Copper Alloys (Bronze / Brass)	Non Metallic Materials		Heat Resistant Super Alloys		Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron							
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○





PLAIN SHANK E5073 SERIES

CARBIDE, 5 FLUTE 45° HELIX EXTRA LONG LENGTH

- ▶ Designed to machine stainless steel, inconels and other alloys.
- ▶ The new design of stub length allows cutting at maximum speeds and feeds with minimum deflection
- ▶ 5 Flute and 45° medium helix allow harmonic balance and smooth cutting.



Unit : Inch

EDP No.					Mill Diameter	Shank Diameter	Length of Cut	Overall Length
UNCOATED	TIN COATED	TiCN COATED	YG:TYLON F	YG:TYLON E				
<a href="#">59579</a>	<a href="#">59579TN</a>	<a href="#">59579TC</a>	<a href="#">59579TE</a>	<a href="#">59579TE</a>	5/16	5/16	2-1/8	4
<a href="#">59584</a>	<a href="#">59584TN</a>	<a href="#">59584TC</a>	<a href="#">59584TE</a>	<a href="#">59584TE</a>	3/8	3/8	2-1/2	6
<a href="#">59593</a>	<a href="#">59593TN</a>	<a href="#">59593TC</a>	<a href="#">59593TE</a>	<a href="#">59593TE</a>	1/2	1/2	3-1/8	6
<a href="#">59595</a>	<a href="#">59595TN</a>	<a href="#">59595TC</a>	<a href="#">59595TE</a>	<a href="#">59595TE</a>	5/8	5/8	4	6
<a href="#">59598</a>	<a href="#">59598TN</a>	<a href="#">59598TC</a>	<a href="#">59598TE</a>	<a href="#">59598TE</a>	3/4	3/4	4	6
<a href="#">59600</a>	<a href="#">59600TN</a>	<a href="#">59600TC</a>	<a href="#">59600TE</a>	<a href="#">59600TE</a>	1	1	4-1/8	7

Mill Dia. Tolerance (inch)	Shank Dia. Tolerance
0~-0.0012	0~-0.0003

◎ : Excellent ○ : Good

ISO Material Description	P										M				K						
	Non-alloy steel					Low alloy steel					High alloyed steel, and tool steel				Stainless steel		Grey cast iron		Nodular cast iron		Malleable cast iron
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
HRc	13	25	28	32	30	10	29	32	38	15	35	15	23	10	10	26	3	25	130	230	
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230	
Recommend	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	○	○	○	○	○	○	

ISO Material Description	N					S					H										
	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)		Non Metallic Materials			Heat Resistant Super Alloys			Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron			
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc	15	30	25	38	34	15	30	25	38	34	55	60	42	55	550	630	400	400	550	550	
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend						○	○	○			○	○	○	○	○	○	○	○	○	○	○



PLAIN SHANK E5058 SERIES

CARBIDE, 6 FLUTE 40° HELIX REGULAR LENGTH

- ▶ For finishing in most materials.
- ▶ 20 ~ 40% increase in inches per minute over 4 flute tools.
- ▶ YG:TYLON SUPER TiAlN coating recommended for maximum performance.



Unit : Inch

EDP No.					Mill Diameter	Shank Diameter	Length of Cut	Overall Length
UNCOATED	TIN COATED	TiCN COATED	YG:TYLON F	YG:TYLON E				
<a href="#">84565</a>	<a href="#">84565TN</a>	<a href="#">84565TC</a>	<a href="#">84565TE</a>	<a href="#">84565TE</a>	3/16	3/16	5/8	2
<a href="#">84573</a>	<a href="#">84573TN</a>	<a href="#">84573TC</a>	<a href="#">84573TE</a>	<a href="#">84573TE</a>	1/4	1/4	3/4	2-1/2
<a href="#">84579</a>	<a href="#">84579TN</a>	<a href="#">84579TC</a>	<a href="#">84579TE</a>	<a href="#">84579TE</a>	5/16	5/16	7/8	2-1/2
<a href="#">84584</a>	<a href="#">84584TN</a>	<a href="#">84584TC</a>	<a href="#">84584TE</a>	<a href="#">84584TE</a>	3/8	3/8	7/8	2-1/2
<a href="#">84588</a>	<a href="#">84588TN</a>	<a href="#">84588TC</a>	<a href="#">84588TE</a>	<a href="#">84588TE</a>	7/16	7/16	1	2-1/2
<a href="#">84593</a>	<a href="#">84593TN</a>	<a href="#">84593TC</a>	<a href="#">84593TE</a>	<a href="#">84593TE</a>	1/2	1/2	1	3
<a href="#">84595</a>	<a href="#">84595TN</a>	<a href="#">84595TC</a>	<a href="#">84595TE</a>	<a href="#">84595TE</a>	5/8	5/8	1-1/4	3-1/2
<a href="#">84598</a>	<a href="#">84598TN</a>	<a href="#">84598TC</a>	<a href="#">84598TE</a>	<a href="#">84598TE</a>	3/4	3/4	1-1/2	4

MATERIAL HARDNESS		
Recommended Coating	Under 45 Rc F	Over 45 Rc E

Mill Dia. Tolerance (inch)	Shank Dia. Tolerance
0~-0.0012	0~-0.0005

◎ : Excellent ○ : Good

ISO Material Description	P										M				K						
	Non-alloy steel					Low alloy steel					High alloyed steel, and tool steel				Stainless steel		Grey cast iron		Nodular cast iron		Malleable cast iron
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
HRc	13	25	28	32	30	10	29	32	38	15	35	15	23	10	10	26	3	25	130	230	
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230	
Recommend	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	○	○	○	○	○	○	

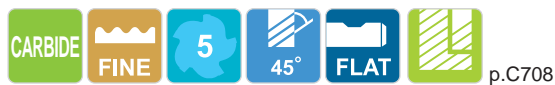
ISO Material Description	N					S					H										
	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)		Non Metallic Materials			Heat Resistant Super Alloys			Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron			
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc	15	30	25	38	34	15	30	25	38	34	55	60	42	55	550	630	400	400	550	550	
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend						○	○	○			○	○	○	○	○	○	○	○	○	○	○



FLAT SHANK E5056 SERIES  
FLAT SHANK E5057 SERIES

**CARBIDE, 5 FLUTE 45° HELIX STUB & REGULAR LENGTH FINE PITCH ROUGHING CORNER RADIUS**

- ▶ 5 flute design gives minimum harmonic vibration.
- ▶ Stub tools for minimum deflection and maximum rigidity.
- ▶ Ideal for profile milling.
- ▶ Not recommended for slotting.



**E5056 Series ■ STUB LENGTH** Unit : Inch

EDP No.					Radius of Ball Nose	Mill Diameter	Shank Diameter	Length of Cut	Overall Length
UNCOATED	TiN COATED	TiCN COATED	YG:TYLON F	YG:TYLON E	R (±.0008)				
<a href="#">47570</a>	<a href="#">47570TN</a>	<a href="#">47570TC</a>	<a href="#">47570TF</a>	<a href="#">81584TE</a>	R7/64	7/32	1/4	1/2	2-1/2
<a href="#">47573</a>	<a href="#">47573TN</a>	<a href="#">47573TC</a>	<a href="#">47573TF</a>	<a href="#">81593TE</a>	R1/8	1/4	1/4	1/2	2-1/2
<a href="#">47584</a>	<a href="#">47584TN</a>	<a href="#">47584TC</a>	<a href="#">47584TF</a>	<a href="#">81595TE</a>	R3/16	3/8	3/8	9/16	2-1/2
<a href="#">47588</a>	<a href="#">47588TN</a>	<a href="#">47588TC</a>	<a href="#">47588TF</a>	<a href="#">81598TE</a>	R7/32	7/16	7/16	9/16	2-3/4
<a href="#">47593</a>	<a href="#">47593TN</a>	<a href="#">47593TC</a>	<a href="#">47593TF</a>	<a href="#">81600TE</a>	R1/4	1/2	1/2	5/8	3

**E5057 Series ■ REGULAR LENGTH** Unit : Inch

EDP No.					Radius of Ball Nose	Mill Diameter	Shank Diameter	Length of Cut	Overall Length
UNCOATED	TiN COATED	TiCN COATED	YG:TYLON F	YG:TYLON E	R (±.0008)				
<a href="#">48570</a>	<a href="#">48570TN</a>	<a href="#">48570TC</a>	<a href="#">48570TF</a>	<a href="#">82584TE</a>	R7/64	7/32	1/4	1/2	2-1/2
<a href="#">48573</a>	<a href="#">48573TN</a>	<a href="#">48573TC</a>	<a href="#">48573TF</a>	<a href="#">82593TE</a>	R1/8	1/4	1/4	1/2	2-1/2
<a href="#">48584</a>	<a href="#">48584TN</a>	<a href="#">48584TC</a>	<a href="#">48584TF</a>	<a href="#">82595TE</a>	R3/16	3/8	3/8	9/16	2-1/2
<a href="#">48588</a>	<a href="#">48588TN</a>	<a href="#">48588TC</a>	<a href="#">48588TF</a>	<a href="#">82598TE</a>	R7/32	7/16	7/16	9/16	2-3/4
<a href="#">48593</a>	<a href="#">48593TN</a>	<a href="#">48593TC</a>	<a href="#">48593TF</a>	<a href="#">82600TE</a>	R1/4	1/2	1/2	5/8	3

Mill Dia. Tolerance (inch)	Shank Dia. Tolerance
0~-0.003	0~-0.005

◎ : Excellent ○ : Good

ISO	P											M				K				
	Non-alloy steel					Low alloy steel						High alloyed steel, and tool steel	Stainless steel		Grey cast iron	Nodular cast iron	Malleable cast iron			
Material Description	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc	13	25	28	32	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎

ISO	N						S				H										
	Aluminum-wrought alloy		Aluminum-cast, alloyed		Copper and Copper Alloys (Bronze / Brass)		Non Metallic Materials		Heat Resistant Super Alloys		Titanium Alloys	Hardened steel	Chilled Cast Iron	Hardened Cast Iron							
Material Description	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc						15	30	25	38	34	15	30	25	38	34	55	60	42	55		55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○



PLAIN SHANK E5077 SERIES

**CARBIDE, 3 FLUTE TAPER**

- ▶ Designed for milling die cavity.
- ▶ Many different center line angles are available on your job requirement.



**E5077 Series ■ TAPER LENGTH** Unit : Inch

EDP No.					Mill Diameter	Shank Diameter	Length of Cut	Overall Length
UNCOATED	TiN COATED	TiCN COATED	YG:TYLON F	YG:TYLON E				
<a href="#">87552</a>	<a href="#">87552TN</a>	<a href="#">87552TC</a>	<a href="#">87552TF</a>	<a href="#">87552TE</a>	1/8	1/4	1-1/2	1°
<a href="#">87553</a>	<a href="#">87553TN</a>	<a href="#">87553TC</a>	<a href="#">87553TF</a>	<a href="#">87553TE</a>	1/8	1/4	1-1/2	1.5°
<a href="#">87554</a>	<a href="#">87554TN</a>	<a href="#">87554TC</a>	<a href="#">87554TF</a>	<a href="#">87554TE</a>	1/8	1/4	1-1/4	2°
<a href="#">87556</a>	<a href="#">87556TN</a>	<a href="#">87556TC</a>	<a href="#">87556TF</a>	<a href="#">87556TE</a>	1/8	1/4	1	3°
<a href="#">87560</a>	<a href="#">87560TN</a>	<a href="#">87560TC</a>	<a href="#">87560TF</a>	<a href="#">87560TE</a>	1/8	1/4	3/4	5°
<a href="#">87564</a>	<a href="#">87564TN</a>	<a href="#">87564TC</a>	<a href="#">87564TF</a>	<a href="#">87564TE</a>	1/8	1/4	1/2	7°
<a href="#">87570</a>	<a href="#">87570TN</a>	<a href="#">87570TC</a>	<a href="#">87570TF</a>	<a href="#">87570TE</a>	3/32	1/4	1/2	10°
<a href="#">87572</a>	<a href="#">87572TN</a>	<a href="#">87572TC</a>	<a href="#">87572TF</a>	<a href="#">87572TE</a>	3/16	3/8	1-3/4	1°
<a href="#">87573</a>	<a href="#">87573TN</a>	<a href="#">87573TC</a>	<a href="#">87573TF</a>	<a href="#">87573TE</a>	3/16	3/8	1-3/4	1.5°
<a href="#">87574</a>	<a href="#">87574TN</a>	<a href="#">87574TC</a>	<a href="#">87574TF</a>	<a href="#">87574TE</a>	3/16	3/8	1-3/4	2°
<a href="#">87576</a>	<a href="#">87576TN</a>	<a href="#">87576TC</a>	<a href="#">87576TF</a>	<a href="#">87576TE</a>	5/32	3/8	1-3/4	3°
<a href="#">87580</a>	<a href="#">87580TN</a>	<a href="#">87580TC</a>	<a href="#">87580TF</a>	<a href="#">87580TE</a>	1/8	3/8	1-1/2	5°
<a href="#">87584</a>	<a href="#">87584TN</a>	<a href="#">87584TC</a>	<a href="#">87584TF</a>	<a href="#">87584TE</a>	1/8	3/8	1	7°
<a href="#">87590</a>	<a href="#">87590TN</a>	<a href="#">87590TC</a>	<a href="#">87590TF</a>	<a href="#">87590TE</a>	1/8	3/8	3/4	10°
<a href="#">87592</a>	<a href="#">87592TN</a>	<a href="#">87592TC</a>	<a href="#">87592TF</a>	<a href="#">87592TE</a>	1/4	1/2	2	1°
<a href="#">87594</a>	<a href="#">87594TN</a>	<a href="#">87594TC</a>	<a href="#">87594TF</a>	<a href="#">87594TE</a>	1/4	1/2	2	2°
<a href="#">87596</a>	<a href="#">87596TN</a>	<a href="#">87596TC</a>	<a href="#">87596TF</a>	<a href="#">87596TE</a>	1/4	1/2	2	3°
<a href="#">87600</a>	<a href="#">87600TN</a>	<a href="#">87600TC</a>	<a href="#">87600TF</a>	<a href="#">87600TE</a>	1/4	1/2	1-1/4	5°
<a href="#">87902</a>	<a href="#">87902TN</a>	<a href="#">87902TC</a>	<a href="#">87902TF</a>	<a href="#">87902TE</a>	3/16	1/2	1-1/4	7°
<a href="#">87903</a>	<a href="#">87903TN</a>	<a href="#">87903TC</a>	<a href="#">87903TF</a>	<a href="#">87903TE</a>	1/8	1/2	1	10°

Cutting Small Dia. Tolerance (mm)	Shank Dia. Tolerance	Center Line Angle Tolerance
Ø1/16 ~ Ø1/4	0~-0.0020	±5'
Ø17/64 ~ Ø1	0~-0.0030	

◎ : Excellent ○ : Good

ISO	P											M				K				
	Non-alloy steel					Low alloy steel						High alloyed steel, and tool steel	Stainless steel		Grey cast iron	Nodular cast iron	Malleable cast iron			
Material Description	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc	13	25	28	32	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎

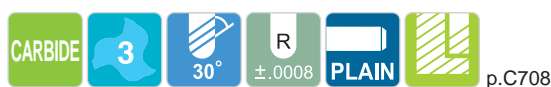
ISO	N						S				H										
	Aluminum-wrought alloy		Aluminum-cast, alloyed		Copper and Copper Alloys (Bronze / Brass)		Non Metallic Materials		Heat Resistant Super Alloys		Titanium Alloys	Hardened steel	Chilled Cast Iron	Hardened Cast Iron							
Material Description	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc						15	30	25	38	34	15	30	25	38	34	55	60	42	55		55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○



PLAIN SHANK E5078 SERIES

CARBIDE, 3 FLUTE TAPER BALL NOSE

- Designed for milling die cavity.
- Many different center line angles are available on your job requirement.



EDP No.					TIP Radius	Cutting Small Diameter	Shank Diameter	Length of Cut	Overall Length	Center Ling Angle
UNCOATED	TiN COATED	TiCN COATED	YG:TYLON F	YG:TYLON E	R (±.0008)					
88552	88552TN	88552TC	88552TE	88552TE	.062	1/8	1/4	1-1/2	3	1°
88553	88553TN	88553TC	88553TE	88553TE	.062	1/8	1/4	1-1/2	3	1.5°
88554	88554TN	88554TC	88554TE	88554TE	.062	1/8	1/4	1-1/4	3	2°
88556	88556TN	88556TC	88556TE	88556TE	.062	1/8	1/4	1	3	3°
88560	88560TN	88560TC	88560TE	88560TE	.062	1/8	1/4	3/4	3	5°
88564	88564TN	88564TC	88564TE	88564TE	.062	1/8	1/4	1/2	3	7°
88570	88570TN	88570TC	88570TE	88570TE	.047	3/32	1/4	1/2	3	10°
88572	88572TN	88572TC	88572TE	88572TE	.093	3/16	3/8	1-3/4	3-1/2	1°
88573	88573TN	88573TC	88573TE	88573TE	.093	3/16	3/8	1-3/4	3-1/2	1.5°
88574	88574TN	88574TC	88574TE	88574TE	.093	3/16	3/8	1-3/4	3-1/2	2°
88576	88576TN	88576TC	88576TE	88576TE	.078	5/32	3/8	1-3/4	3-1/2	3°
88580	88580TN	88580TC	88580TE	88580TE	.062	1/8	3/8	1-1/2	3-1/2	5°
88584	88584TN	88584TC	88584TE	88584TE	.062	1/8	3/8	1	3-1/2	7°
88590	88590TN	88590TC	88590TE	88590TE	.062	1/8	3/8	3/4	3-1/2	10°
88592	88592TN	88592TC	88592TE	88592TE	.125	1/4	1/2	2	4	1°
88594	88594TN	88594TC	88594TE	88594TE	.125	1/4	1/2	2	4	2°
88596	88596TN	88596TC	88596TE	88596TE	.125	1/4	1/2	2	4	3°
88600	88600TN	88600TC	88600TE	88600TE	.125	1/4	1/2	1-1/4	4	5°
88902	88902TN	88902TC	88902TE	88902TE	.093	3/16	1/2	1-1/4	4	7°
88903	88903TN	88903TC	88903TE	88903TE	.062	1/8	1/2	1	4	10°

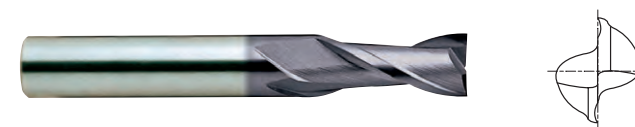
Cutting Small Dia. Tolerance (mm)	Shank Dia. Tolerance	Center Line Angle Tolerance
Ø1/16 ~ Ø1/4	0~- .0020	±5'
Ø17/64 ~ Ø1	0~- .0030	

ISO	P										M				K			H		
Material Description	Non-alloy steel					Low alloy steel					High alloyed steel, and tool steel				Stainless steel		Grey cast iron		Nodular cast iron	Malleable cast iron
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc	13	25	28	32	30	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	○	○	○	○	○	○	○	○	○



PLAIN SHANK EH527 SERIES

CARBIDE, 2 FLUTE LONG LENGTH - TiAlN 'F' Coated



EDP No.	Mill Diameter		Shank Diameter	Length of Cut	Overall Length
	Metric	Inch			
EH527035	3.5	.1378	3.5	7	50
EH527040	4.0	.1575	4	8	50
EH527045	4.5	.1772	4.5	8	50
EH527050	5.0	.1969	5	10	50
EH527055	5.5	.2165	5.5	10	57
EH527060	6.0	.2362	6	10	57
EH527065	6.5	.2559	6.5	13	60
EH527070	7.0	.2756	7	13	60
EH527075	7.5	.2953	7.5	16	63
EH527080	8.0	.3150	8	16	63
EH527085	8.5	.3346	8.5	16	67
EH527090	9.0	.3543	9	16	67
EH527095	9.5	.3740	9.5	19	72
EH527100	10.0	.3937	10	19	72
EH527110	11.0	.4330	11	22	83
EH527120	12.0	.4724	12	22	83
EH527130	13.0	.5118	13	22	83
EH527140	14.0	.5512	14	22	83
EH527150	15.0	.5905	15	26	92
EH527160	16.0	.6299	16	26	92
EH527180	18.0	.7087	18	26	92
EH527200	20.0	.7874	20	32	104

Tolerances according to DIN 7160 & 7161

Tolerance range in µm					
Nominal-Diameter in mm					
	from 1 to 3	over 3 to 6	over 6 to 10	over 10 to 18	over 18 to 30
h10	0 - 40	0 - 48	0 - 58	0 - 70	0 - 84
h6	0 - 6	0 - 8	0 - 9	0 - 11	0 - 13

ISO	P										M				K			H		
Material Description	Non-alloy steel					Low alloy steel					High alloyed steel, and tool steel				Stainless steel		Grey cast iron		Nodular cast iron	Malleable cast iron
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc	13	25	28	32	30	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	○	○	○	○	○	○	○	○	○





PLAIN SHANK EH540 SERIES

CARBIDE, 4 FLUTE LONG LENGTH - TiAlN 'F' Coated



Unit : mm

EDP No.	Mill Diameter		Shank Diameter	Length of Cut	Overall Length
	Metric	Inch			
	h10		h6		
EH540035	3.5	.1378	3.5	10	50
EH540040	4.0	.1575	4	11	50
EH540045	4.5	.1772	4.5	11	50
EH540050	5.0	.1969	5	13	50
EH540055	5.5	.2165	5.5	13	57
EH540060	6.0	.2362	6	13	57
EH540065	6.5	.2559	6.5	16	60
EH540070	7.0	.2756	7	16	60
EH540075	7.5	.2953	7.5	19	63
EH540080	8.0	.3150	8	19	63
EH540085	8.5	.3346	8.5	19	67
EH540090	9.0	.3543	9	19	67
EH540095	9.5	.3740	9.5	22	72
EH540100	10.0	.3937	10	22	72
EH540110	11.0	.4330	11	26	83
EH540120	12.0	.4724	12	26	83
EH540130	13.0	.5118	13	26	83
EH540140	14.0	.5512	14	26	83
EH540150	15.0	.5905	15	32	92
EH540160	16.0	.6299	16	32	92
EH540180	18.0	.7087	18	32	92
EH540200	20.0	.7874	20	38	104

Tolerances according to DIN 7160 & 7161

Tolerance range in $\mu\text{m}$					
Nominal-Diameter in mm					
	from 1 to 3	over 3 to 6	over 6 to 10	over 10 to 18	over 18 to 30
h10	0 - 40	0 - 48	0 - 58	0 - 70	0 - 84
h6	0 - 6	0 - 8	0 - 9	0 - 11	0 - 13

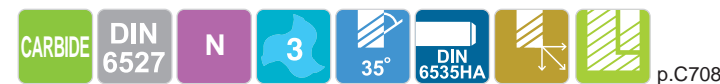
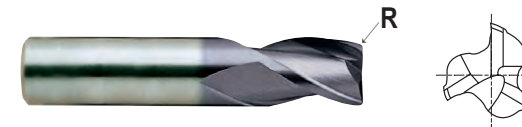
⊙ : Excellent ○ : Good

ISO	P										M				K					
Material Description	Non-alloy steel					Low alloy steel					High alloyed steel, and tool steel	Stainless steel		Grey cast iron	Nodular cast iron	Malleable cast iron				
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc	13	25	28	32	30	29	32	38	35	15	35	15	23	10	10	26	3	25	21	
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	○	○	○	○	○	○	○	○	○



PLAIN SHANK EH882 SERIES

CARBIDE, 3 FLUTE 35° HELIX CORNER RADIUS - TiAlN 'F' Coated



Unit : mm

EDP No.	Corner Radius	Mill Diameter		Shank Diameter	Length of Cut	Overall Length
		Metric	Inch			
	R	h10		h6		
EH882030	0.20~0.25	3.0	.1181	3	4	38
EH882040	0.20~0.25	4.0	.1575	6	5	54
EH882050	0.20~0.25	5.0	.1969	6	6	54
EH882060	0.40~0.50	6.0	.2362	6	7	54
EH882080	0.40~0.50	8.0	.3150	8	9	58
EH882100	0.40~0.50	10.0	.3937	10	11	66
EH882120	0.75~0.85	12.0	.4724	12	12	73
EH882160	0.75~0.85	16.0	.6299	16	16	82
EH882200	0.75~0.85	20.0	.7874	20	20	92

TiN & TiCN-COATING are available on your request.

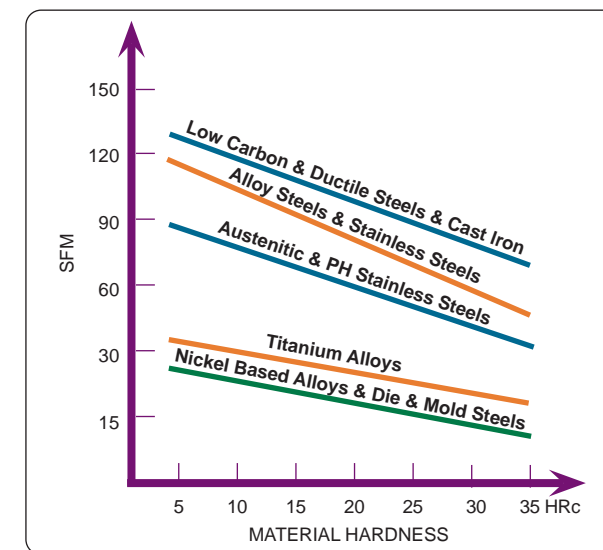
Tolerances according to DIN 7160 & 7161

Tolerance range in $\mu\text{m}$					
Nominal-Diameter in mm					
	from 1 to 3	over 3 to 6	over 6 to 10	over 10 to 18	over 18 to 30
h10	0 - 40	0 - 48	0 - 58	0 - 70	0 - 84
h6	0 - 6	0 - 8	0 - 9	0 - 11	0 - 13

TiAlN FEED CHART

Unit : inch

Mill Diameter	Feed / Tooth	Mill Diameter	Feed / Tooth
3	.0035 ~ .0070	10	.0018 ~ .0040
5	.0050 ~ .0025	12	.0025 ~ .0050
6	.0012 ~ .0030	16	.0030 ~ .0060
8	.0018 ~ .0035	20	.0035 ~ .0070



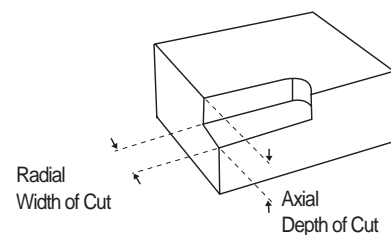
⊙ : Excellent ○ : Good

ISO	P										M				K					
Material Description	Non-alloy steel					Low alloy steel					High alloyed steel, and tool steel	Stainless steel		Grey cast iron	Nodular cast iron	Malleable cast iron				
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc	13	25	28	32	30	29	32	38	35	15	35	15	23	10	10	26	3	25	21	
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	○	○	○	○	○	○	○	○	○

**SPEED & FEED RECOMMENDATIONS**

Material	Speed	Chip Load per Tooth by End Mill Diameter			Recommended Coating
		Up to 1/4"	Up to 1/2"	Up to 1"	
Carbon + Alloy Steel <45Rc	100-700	.0002-.002	.001-.003	.003-.007	TF
Carbon + Alloy Steel >45Rc	50-400	.0002-.001	.0005-.0015	.001-.003	TE
Stainless Steels Non-Hardenable 200-300 Series	150-500	.0002-.001	.001-.002	.002-.006	TF
Stainless Steels Hardenable 400 Series Martensitic and PH Series	100-450	.0002-.0005	.0005-.001	.001-.005	TF
Cast+Ductile Iron	100-800	.0002-.0015	.002-.003	.003-.008	TF or TE
Nickel+Cobalt Based Alloys	20-200	.0003-.0008	.0008-.001	.001-.002	TE
Titanium	30-200	.0002-.0008	.0008-.002	.002-.004	TE
Aluminum	600-2000	.0002-.002	.002-.004	.004-.008	TiCN
Copper	300-1000	.0005-.002	.002-.003	.003-.006	CrN
Brass+ Bronze Alloys	600-1000	.0005-.002	.002-.003	.003-.006	TiCN
Graphite	600-1000	.0005-.005	.001-.008	.002-.010	D
Plastic	600-1200	.0006-.003	.003-.006	.006-.012	TF

TF = YG:TYLON F  
 TE = YG:TYLON E  
 D = DIAMOND  
 CrN = CHROME NITRIDE



**SPEED & FEED DETERMINANTS**

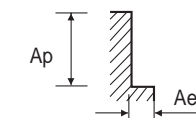
1. MATERIAL HARDNESS
2. MACHINE RIGIDITY
3. TYPE OF COATING
4. TOOL GEOMETRY
5. FINISH REQUIREMENTS
6. DEPTH & WIDTH OF CUT

**UGMF89, UGMGF57, UGMGF58, UGMGF59 SERIES**

**4 FLUTE - SIDE CUTTING**

SFM(Vc) = ft./min.  
 IPT(fz) = in./tooth  
 RPM = rev./min.  
 IPM(FEED) = in./min.

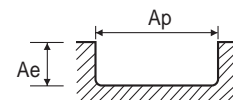
ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø)															
						1/16	5/64	3/32	7/64	1/8	9/64	5/32	11/64	3/16	13/64	7/32	15/64				
P	1-2	Non-alloy steel	0.1D	1.5D	SFM(Vc)	185	205	225	215	200	195	190	185	175	185	190	195				
					IPT(fz)	.0003	.0004	.0004	.0005	.0007	.0008	.0009	.0010	.0012	.0012	.0013	.0013				
					RPM	11200	10080	9070	7560	6050	5320	4590	4100	3600	3460	3310	3170				
	3-4		SFM(Vc)	160	180	190	190	175	170	160	160	155	160	165	165						
			IPT(fz)	.0003	.0004	.0004	.0005	.0007	.0008	.0010	.0011	.0012	.0013	.0013	.0014						
			RPM	9640	8680	7810	6550	5290	4600	3910	3530	3150	2990	2840	2680						
	5		SFM(Vc)	130	150	160	155	140	140	135	130	125	130	135	135						
			IPT(fz)	.0003	.0003	.0004	.0005	.0006	.0007	.0008	.0009	.0011	.0011	.0012	.0012						
			RPM	8090	7280	6550	5420	4280	3780	3280	2900	2520	2430	2330	2240						
	6		SFM(Vc)	185	205	225	215	200	195	190	185	175	185	175	185	190	195				
			IPT(fz)	.0003	.0004	.0004	.0005	.0007	.0008	.0009	.0010	.0012	.0012	.0013	.0013	.0013					
RPM		11200	10080	9070	7560	6050	5320	4590	4100	3600	3460	3310	3170								
7	SFM(Vc)	160	180	190	190	175	170	160	160	155	160	165	165								
	IPT(fz)	.0003	.0004	.0004	.0005	.0007	.0008	.0010	.0011	.0012	.0013	.0013	.0014								
	RPM	9640	8680	7810	6550	5290	4600	3910	3530	3150	2990	2840	2680								
8-9	SFM(Vc)	130	150	160	155	140	140	135	130	125	130	135	135								
	IPT(fz)	.0003	.0003	.0004	.0005	.0006	.0007	.0008	.0009	.0011	.0011	.0012	.0012								
	RPM	8090	7280	6550	5420	4280	3780	3280	2900	2520	2430	2330	2240								
10	SFM(Vc)	185	205	225	215	200	195	190	185	175	185	175	185	190	195						
	IPT(fz)	.0003	.0004	.0004	.0005	.0007	.0008	.0009	.0010	.0012	.0012	.0013	.0013	.0013							
	RPM	11200	10080	9070	7560	6050	5320	4590	4100	3600	3460	3310	3170								
11.1	SFM(Vc)	130	150	160	155	140	140	135	130	125	130	135	135								
	IPT(fz)	.0003	.0003	.0004	.0005	.0006	.0007	.0008	.0009	.0011	.0011	.0012	.0012								
	RPM	8090	7280	6550	5420	4280	3780	3280	2900	2520	2430	2330	2240								
12-13	SFM(Vc)	255	285	310	305	285	280	270	265	260	270	275	280								
	IPT(fz)	.0002	.0002	.0003	.0003	.0004	.0004	.0005	.0005	.0006	.0006	.0007	.0007								
	RPM	15560	14000	12600	10650	8690	7620	6550	5920	5290	5040	4790	4540								
14.1-14.2	SFM(Vc)	255	285	310	305	285	280	270	265	260	270	275	280								
	IPT(fz)	.0002	.0002	.0003	.0003	.0004	.0004	.0005	.0005	.0006	.0006	.0007	.0007								
	RPM	15560	14000	12600	10650	8690	7620	6550	5920	5290	5040	4790	4540								
K 15-20	SFM(Vc)	215	245	265	255	225	225	215	215	205	210	215	220								
	IPT(fz)	.0005	.0006	.0007	.0008	.0010	.0012	.0014	.0015	.0017	.0019	.0021	.0023								
	RPM	13220	11900	10710	8820	6930	6110	5290	4730	4160	3970	3780	3590								
N 21-25	SFM(Vc)	510	575	620	615	575	555	515	520	515	535	550	560								
	IPT(fz)	.0005	.0005	.0006	.0007	.0009	.0010	.0012	.0013	.0014	.0015	.0016	.0017								
	RPM	31110	28000	25200	21420	17640	15120	12600	11530	10460	10020	9580	9140								
26-28	SFM(Vc)	380	430	465	450	410	415	410	405	385	400	410	420								
	IPT(fz)	.0005	.0006	.0006	.0007	.0009	.0010	.0012	.0013	.0015	.0016	.0017	.0018								
	RPM	23330	21000	18900	15750	12600	11340	10080	8950	7810	7500	7180	6870								



**UGMF90 SERIES 2 FLUTE - SLOTTING**

SFM(Vc) = ft./min.  
IPT(fz) = in./tooth  
RPM = rev./min.  
IPM(Feed) = in./min.

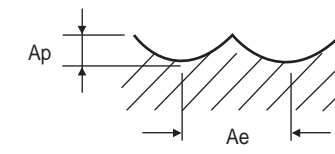
ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø)							
						1/8	3/16	1/4	3/8	1/2	5/8	3/4	1
P	1-2	Non-alloy steel	1.0D	1.0D	SFM(Vc)	200	175	200	175	200	185	190	195
					IPT(fz)	.0005	.0008	.0010	.0017	.0020	.0027	.0031	.0033
					RPM	6050	3600	3020	1760	1510	1130	980	750
	3-4		1.0D	1.0D	SFM(Vc)	175	155	165	150	165	165	165	165
					IPT(fz)	.0005	.0008	.0010	.0017	.0020	.0025	.0030	.0032
					RPM	5290	3150	2520	1510	1260	1010	830	630
	5		1.0D	1.0D	SFM(Vc)	140	125	140	125	140	135	135	140
					IPT(fz)	.0005	.0008	.0009	.0016	.0019	.0030	.0036	.0038
					RPM	4280	2520	2140	1260	1080	820	690	530
	6		1.0D	1.0D	SFM(Vc)	200	175	200	175	200	185	190	195
					IPT(fz)	.0005	.0008	.0010	.0017	.0020	.0027	.0031	.0033
					RPM	6050	3600	3020	1760	1510	1130	980	750
7	1.0D	1.0D	SFM(Vc)	175	155	165	150	165	165	165	165		
			IPT(fz)	.0005	.0008	.0010	.0017	.0020	.0025	.0030	.0032		
			RPM	5290	3150	2520	1510	1260	1010	830	630		
8-9	1.0D	1.0D	SFM(Vc)	140	125	140	125	140	135	135	140		
			IPT(fz)	.0005	.0008	.0009	.0016	.0019	.0030	.0036	.0038		
			RPM	4280	2520	2140	1260	1080	820	690	530		
10	1.0D	1.0D	SFM(Vc)	200	175	200	175	200	185	190	195		
			IPT(fz)	.0005	.0008	.0010	.0017	.0020	.0027	.0031	.0033		
			RPM	6050	3600	3020	1760	1510	1130	980	750		
11.1	1.0D	1.0D	SFM(Vc)	140	125	140	125	140	135	135	140		
			IPT(fz)	.0005	.0008	.0009	.0016	.0019	.0030	.0036	.0038		
			RPM	4280	2520	2140	1260	1080	820	690	530		
M	12-13	Stainless steel	1.0D	1.0D	SFM(Vc)	285	260	280	245	280	270	265	265
					IPT(fz)	.0002	.0004	.0005	.0008	.0009	.0015	.0019	.0020
					RPM	8690	5290	4280	2520	2140	1640	1350	1020
14.1-14.2	1.0D	1.0D	SFM(Vc)	285	260	280	245	280	270	265	265		
			IPT(fz)	.0002	.0004	.0005	.0008	.0009	.0015	.0019	.0020		
			RPM	8690	5290	4280	2520	2140	1640	1350	1020		
K	15-20	Grey cast iron Nodular cast iron Malleable cast iron	1.0D	1.0D	SFM(Vc)	225	205	225	210	215	205	215	225
					IPT(fz)	.0007	.0012	.0016	.0030	.0040	.0056	.0068	.0071
					RPM	6930	4160	3400	2140	1640	1260	1100	850
N	21-25	Aluminum-wrought alloy Aluminum-cast, alloyed	1.0D	1.0D	SFM(Vc)	575	515	570	520	560	535	530	535
					IPT(fz)	.0006	.0010	.0013	.0021	.0026	.0034	.0041	.0044
					RPM	17640	10460	8690	5290	4280	3280	2710	2040
26-28	1.0D	Copper and Copper Alloys (Bronze / Brass)	1.0D	1.0D	SFM(Vc)	410	385	430	385	430	410	410	415
					IPT(fz)	.0006	.0010	.0013	.0022	.0026	.0034	.0040	.0044
					RPM	12600	7810	6550	3910	3280	2520	2100	1590



**UGMF91 SERIES 4 FLUTE BALL NOSE - PLANE**

SFM(Vc) = ft./min.  
IPT(fz) = in./tooth  
RPM = rev./min.  
IPM(Feed) = in./min.

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø)							
						1/8	3/16	1/4	3/8	1/2	5/8	3/4	1
P	1-4	Non-alloy steel	0.7D	0.3D	SFM(Vc)	185	165	180	160	180	175	190	200
					IPT(fz)	.0004	.0007	.0009	.0014	.0014	.0019	.0020	.0023
					RPM	5670	3400	2770	1640	1390	1070	980	770
	5		0.7D	0.3D	SFM(Vc)	155	135	155	135	155	145	155	165
					IPT(fz)	.0002	.0004	.0004	.0007	.0008	.0011	.0013	.0016
					RPM	4790	2770	2380	1390	1200	880	800	630
	6-7		0.7D	0.3D	SFM(Vc)	185	165	180	160	180	175	190	200
					IPT(fz)	.0004	.0007	.0009	.0014	.0014	.0019	.0020	.0023
					RPM	5670	3400	2770	1640	1390	1070	980	770
	8-9		0.7D	0.3D	SFM(Vc)	155	135	155	135	155	145	155	165
					IPT(fz)	.0002	.0004	.0004	.0007	.0008	.0011	.0013	.0016
					RPM	4790	2770	2380	1390	1200	880	800	630
10	0.7D	0.3D	SFM(Vc)	185	165	180	160	180	175	190	200		
			IPT(fz)	.0004	.0007	.0009	.0014	.0014	.0019	.0020	.0023		
			RPM	5670	3400	2770	1640	1390	1070	980	770		
11.1	0.7D	0.3D	SFM(Vc)	155	135	155	135	155	145	155	165		
			IPT(fz)	.0002	.0004	.0004	.0007	.0008	.0011	.0013	.0016		
			RPM	4790	2770	2380	1390	1200	880	800	630		
K	15-20	Grey cast iron Nodular cast iron Malleable cast iron	0.7D	0.3D	SFM(Vc)	265	235	255	235	265	245	260	265
					IPT(fz)	.0005	.0011	.0015	.0033	.0038	.0053	.0061	.0064
					RPM	8060	4790	3910	2380	2020	1510	1320	1020
N	21-25	Aluminum-wrought alloy Aluminum-cast, alloyed	0.7D	0.3D	SFM(Vc)	765	680	775	695	775	720	790	825
					IPT(fz)	.0003	.0006	.0007	.0013	.0018	.0021	.0023	.0024
					RPM	23440	13860	11840	7060	5920	4410	4030	3160







RECOMMENDED CUTTING CONDITIONS

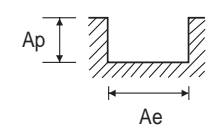
E5020, E5244, E5011  
E5026, E5022, E5025 SERIES

2 FLUTE - **SLOTING**

SFM(Vc) = ft./min.  
IPT(fz) = in./tooth  
RPM = rev./min.  
IPM(Feed) = in./min.

Table with columns: ISO, VDI 3323, Material Description, Ae, Ap, Parameter, Diameter (Ø) [3/32, 1/8, 5/32, 3/16, 1/4, 5/16, 3/8, 1/2, 9/16, 5/8, 13/16]. Rows include P (Non-alloy steel, Low alloy steel, High alloyed steel, and tool steel), M (Stainless steel), K (Grey cast iron, Nodular cast iron, Malleable cast iron), and N (Aluminum-wrought alloy, Aluminum-cast, alloyed, Copper and Copper Alloys).

RPM = rev./min.  
Feed = inch/min.  
SFM = ft/min  
Fz = inch/tooth



※ The Feed, in long & extra long types, should be reduced by around 50%.



RECOMMENDED CUTTING CONDITIONS

E5020, E5244, E5011  
E5026, E5022, E5025 SERIES

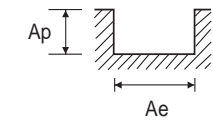
TiAlN Coated

2 FLUTE - **SLOTING**

SFM(Vc) = ft./min.  
IPT(fz) = in./tooth  
RPM = rev./min.  
IPM(Feed) = in./min.

Table with columns: ISO, VDI 3323, Material Description, Ae, Ap, Parameter, Diameter (Ø) [3/32, 1/8, 5/32, 3/16, 1/4, 5/16, 3/8, 1/2, 9/16, 5/8, 13/16]. Rows include P (Non-alloy steel, Low alloy steel, High alloyed steel, and tool steel), M (Stainless steel), K (Grey cast iron, Nodular cast iron, Malleable cast iron), and N (Aluminum-wrought alloy, Aluminum-cast, alloyed, Copper and Copper Alloys).

RPM = rev./min.  
Feed = inch/min.  
SFM = ft/min  
Fz = inch/tooth



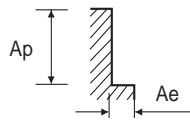
※ The Feed, in long & extra long types, should be reduced by around 50%.

**E5021, E5245, E5012, E5065  
E5023, E5024, E5216 SERIES**

**4 FLUTE - SIDE CUTTING**

SFM(Vc) = ft./min.  
IPT(fz) = in./tooth  
RPM = rev./min.  
IPM(Feed) = in./min.

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø)												
						3/32	1/8	5/32	3/16	1/4	5/16	3/8	1/2	9/16	5/8	13/16		
P	1-2	Non-alloy steel	0.1D	1.5D	SFM(Vc)	135	120	115	110	120	115	110	120	120	115	115		
					IPT(fz)	.0005	.0007	.0010	.0013	.0015	.0020	.0025	.0031	.0034	.0043	.0055		
					RPM	5500	3700	2800	2200	1800	1400	1100	900	800	700	550		
	3-4		0.1D	1.5D	SFM(Vc)	120	105	100	95	105	100	95	105	105	100	100		
					IPT(fz)	.0004	.0008	.0010	.0013	.0016	.0021	.0026	.0031	.0036	.0042	.0052		
					RPM	4800	3200	2400	1900	1600	1200	950	800	700	600	480		
	5		0.1D	1.5D	SFM(Vc)	100	85	80	80	85	80	80	85	85	80	85		
					IPT(fz)	.0004	.0007	.0009	.0011	.0013	.0018	.0022	.0027	.0031	.0045	.0056		
					RPM	4000	2600	2000	1600	1300	1000	800	660	570	500	400		
	6		0.1D	1.5D	SFM(Vc)	135	120	115	110	120	115	110	120	120	115	115		
					IPT(fz)	.0005	.0007	.0010	.0013	.0015	.0020	.0025	.0031	.0034	.0043	.0055		
RPM		5500			3700	2800	2200	1800	1400	1100	900	800	700	550				
7	0.1D	1.5D	SFM(Vc)	120	105	100	95	105	100	95	105	105	100	100				
			IPT(fz)	.0004	.0008	.0010	.0013	.0016	.0021	.0026	.0031	.0036	.0042	.0052				
			RPM	4800	3200	2400	1900	1600	1200	950	800	700	600	480				
8-9	0.1D	1.5D	SFM(Vc)	100	85	80	80	85	80	80	85	85	80	85				
			IPT(fz)	.0004	.0007	.0009	.0011	.0013	.0018	.0022	.0027	.0031	.0045	.0056				
			RPM	4000	2600	2000	1600	1300	1000	800	660	570	500	400				
10	0.1D	1.5D	SFM(Vc)	135	120	115	110	120	115	110	120	120	115	115				
			IPT(fz)	.0005	.0007	.0010	.0013	.0015	.0020	.0025	.0031	.0034	.0043	.0055				
			RPM	5500	3700	2800	2200	1800	1400	1100	900	800	700	550				
11.1	0.1D	1.5D	SFM(Vc)	100	85	80	80	85	80	80	85	85	80	85				
			IPT(fz)	.0004	.0007	.0009	.0011	.0013	.0018	.0022	.0027	.0031	.0045	.0056				
			RPM	4000	2600	2000	1600	1300	1000	800	660	570	500	400				
M	12-14.2	Stainless steel	0.1D	1.5D	SFM(Vc)	195	175	165	155	170	165	155	170	160	165	170		
					IPT(fz)	.0003	.0004	.0005	.0006	.0008	.0010	.0013	.0015	.0018	.0023	.0031		
					RPM	8000	5300	4000	3200	2600	2000	1600	1300	1100	1000	800		
K	15-20	Grey cast iron Nodular cast iron Malleable cast iron	0.1D	1.5D	SFM(Vc)	160	135	130	125	135	130	130	130	135	130	135		
					IPT(fz)	.0007	.0011	.0014	.0018	.0025	.0034	.0046	.0063	.0072	.0084	.0109		
					RPM	6500	4200	3200	2500	2100	1600	1300	1000	900	800	640		
N	21-25	Aluminum-wrought alloy Aluminum-cast, alloyed	0.1D	1.5D	SFM(Vc)	395	360	325	315	345	325	315	340	340	325	340		
					IPT(fz)	.0006	.0009	.0012	.0015	.0019	.0025	.0031	.0038	.0043	.0050	.0063		
					RPM	16000	11000	8000	6400	5300	4000	3200	2600	2300	2000	1600		
N	26-28	Copper and Copper Alloys (Bronze / Brass)	0.1D	1.5D	SFM(Vc)	295	260	245	235	260	245	235	260	250	245	255		
					IPT(fz)	.0005	.0008	.0010	.0013	.0019	.0026	.0032	.0039	.0046	.0052	.0065		
					RPM	12000	8000	6000	4800	4000	3000	2400	2000	1700	1500	1200		



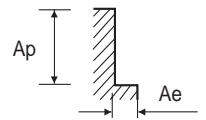
**E5021, E5245, E5012, E5065  
E5023, E5024, E5216 SERIES**

**TiAlN Coated**

**4 FLUTE - SIDE CUTTING**

SFM(Vc) = ft./min.  
IPT(fz) = in./tooth  
RPM = rev./min.  
IPM(Feed) = in./min.

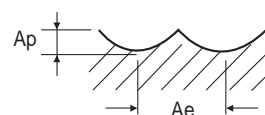
ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø)												
						3/32	1/8	5/32	3/16	1/4	5/16	3/8	1/2	9/16	5/8	13/16		
P	1-2	Non-alloy steel	0.1D	1.5D	SFM(Vc)	210	190	180	170	190	175	165	190	175	175	185		
					IPT(fz)	.0004	.0007	.0010	.0012	.0015	.0020	.0025	.0030	.0035	.0042	.0051		
					RPM	8640	5760	4370	3430	2880	2160	1680	1440	1200	1080	880		
	3-4		0.1D	1.5D	SFM(Vc)	185	165	150	145	155	145	140	155	160	155	155		
					IPT(fz)	.0004	.0007	.0010	.0013	.0016	.0021	.0026	.0031	.0035	.0042	.0054		
					RPM	7440	5040	3720	3000	2400	1800	1440	1200	1080	960	740		
	5		0.1D	1.5D	SFM(Vc)	155	135	130	120	135	130	120	135	130	130	130		
					IPT(fz)	.0004	.0007	.0009	.0011	.0013	.0018	.0023	.0027	.0031	.0045	.0056		
					RPM	6240	4080	3120	2400	2040	1560	1200	1030	890	780	620		
	6		0.1D	1.5D	SFM(Vc)	210	190	180	170	190	175	165	190	175	175	185		
					IPT(fz)	.0004	.0007	.0010	.0012	.0015	.0020	.0025	.0030	.0035	.0042	.0051		
RPM		8640			5760	4370	3430	2880	2160	1680	1440	1200	1080	880				
7	0.1D	1.5D	SFM(Vc)	185	165	150	145	155	145	140	155	160	155	155				
			IPT(fz)	.0004	.0007	.0010	.0013	.0016	.0021	.0026	.0031	.0035	.0042	.0054				
			RPM	7440	5040	3720	3000	2400	1800	1440	1200	1080	960	740				
8-9	0.1D	1.5D	SFM(Vc)	155	135	130	120	135	130	120	135	130	130	130				
			IPT(fz)	.0004	.0007	.0009	.0011	.0013	.0018	.0023	.0027	.0031	.0045	.0056				
			RPM	6240	4080	3120	2400	2040	1560	1200	1030	890	780	620				
10	0.1D	1.5D	SFM(Vc)	210	190	180	170	190	175	165	190	175	175	185				
			IPT(fz)	.0004	.0007	.0010	.0012	.0015	.0020	.0025	.0030	.0035	.0042	.0051				
			RPM	8640	5760	4370	3430	2880	2160	1680	1440	1200	1080	880				
11.1	0.1D	1.5D	SFM(Vc)	155	135	130	120	135	130	120	135	130	130	130				
			IPT(fz)	.0004	.0007	.0009	.0011	.0013	.0018	.0023	.0027	.0031	.0045	.0056				
			RPM	6240	4080	3120	2400	2040	1560	1200	1030	890	780	620				
M	12-14.2	Stainless steel	0.1D	1.5D	SFM(Vc)	295	270	255	245	265	255	235	265	245	255	255		
					IPT(fz)	.0003	.0004	.0005	.0006	.0007	.0010	.0013	.0015	.0018	.0022	.0031		
					RPM	12000	8280	6240	5040	4080	3120	2400	2040	1680	1560	1200		
K	15-20	Grey cast iron Nodular cast iron Malleable cast iron	0.1D	1.5D	SFM(Vc)	250	215	205	195	210	195	200	205	210	195	215		
					IPT(fz)	.0007	.0010	.0013	.0017	.0025	.0036	.0045	.0063	.0071	.0088	.0093		
					RPM	10200	6600	5040	3960	3240	2400	2040	1560	1440	1200	1000		
N	21-25	Aluminum-wrought alloy Aluminum-cast, alloyed	0.1D	1.5D	SFM(Vc)	590	550	490	490	540	510	495	535	530	510	510		
					IPT(fz)	.0006	.0008	.0012	.0014	.0018	.0024	.0030	.0037	.0042	.0049	.0064		
					RPM	24000	16800	12000	9960	8280	6240	5040	4080	3600	3120	2400		
N	26-28	Copper and Copper Alloys (Bronze / Brass)	0.1D	1.5D	SFM(Vc)	440	395	395	365	410	395	365	410	390	395	400		
					IPT(fz)	.0006	.0009	.0011	.0015	.0019	.0024	.0032	.0038	.0045	.0049	.0063		
					RPM	18000	12000	9600	7440	6240	4800	3720	3120	2640	2400	1870		



**E5249, E5014, E5018, E5251 SERIES 2 FLUTE BALL NOSE - PLANE**

SFM(Vc) = ft./min.  
IPT(fz) = in./tooth  
RPM = rev./min.  
IPM(Feed) = in./min.

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø)												
						3/32	1/8	5/32	3/16	1/4	5/16	3/8	1/2	9/16	5/8	11/16	13/16	
P	1-4	Non-alloy steel	0.7D	0.3D	SFM(Vc)	130	115	105	105	110	105	100	115	110	105	105	105	
					IPT(fz)	.0004	.0006	.0008	.0010	.0012	.0016	.0020	.0017	.0020	.0023	.0026	.0030	
	RPM	5200	3500	2600	2100	1700	1270	1000	870	750	650	580	500					
	IPM(Feed)	4	4	4	4	4	4	4	3	3	3	3	3					
	5	Non-alloy steel	0.7D	0.3D	SFM(Vc)	110	95	85	85	95	90	85	95	90	90	85	90	
					IPT(fz)	.0002	.0003	.0005	.0006	.0007	.0009	.0011	.0014	.0016	.0019	.0021	.0023	
	RPM	4400	2900	2100	1700	1430	1100	870	730	620	540	480	430					
	IPM(Feed)	2	2	2	2	2	2	2	2	2	2	2	2					
	6-7	Low alloy steel	0.7D	0.3D	SFM(Vc)	130	115	105	105	110	105	100	115	110	105	105		
					IPT(fz)	.0004	.0006	.0008	.0010	.0012	.0016	.0020	.0017	.0020	.0023	.0026	.0030	
	RPM	5200	3500	2600	2100	1700	1270	1000	870	750	650	580	500					
	IPM(Feed)	4	4	4	4	4	4	4	3	3	3	3	3					
8-9	Low alloy steel	0.7D	0.3D	SFM(Vc)	110	95	85	85	95	90	85	95	90	90	85	90		
				IPT(fz)	.0002	.0003	.0005	.0006	.0007	.0009	.0011	.0014	.0016	.0019	.0021	.0023		
RPM	4400	2900	2100	1700	1430	1100	870	730	620	540	480	430						
IPM(Feed)	2	2	2	2	2	2	2	2	2	2	2	2						
10	High alloyed steel, and tool steel	0.7D	0.3D	SFM(Vc)	130	115	105	105	110	105	100	115	110	105	105			
				IPT(fz)	.0004	.0006	.0008	.0010	.0012	.0016	.0020	.0017	.0020	.0023	.0026	.0030		
RPM	5200	3500	2600	2100	1700	1270	1000	870	750	650	580	500						
IPM(Feed)	4	4	4	4	4	4	4	3	3	3	3	3						
11.1	High alloyed steel, and tool steel	0.7D	0.3D	SFM(Vc)	110	95	85	85	95	90	85	95	90	90	85	90		
				IPT(fz)	.0002	.0003	.0005	.0006	.0007	.0009	.0011	.0014	.0016	.0019	.0021	.0023		
RPM	4400	2900	2100	1700	1430	1100	870	730	620	540	480	430						
IPM(Feed)	2	2	2	2	2	2	2	2	2	2	2	2						
K 15-20	Grey cast iron Nodular cast iron Malleable cast iron	0.7D	0.3D	SFM(Vc)	180	160	145	140	155	145	140	155	145	150	145	155		
				IPT(fz)	.0004	.0006	.0011	.0016	.0021	.0036	.0045	.0054	.0065	.0071	.0080	.0075		
RPM	7300	4900	3600	2900	2400	1800	1430	1200	1000	920	810	730						
IPM(Feed)	6	6	8	9	10	13	13	13	13	13	13	11						
N 21-25	Aluminum-wrought alloy Aluminum-cast, alloyed	0.7D	0.3D	SFM(Vc)	530	470	445	430	475	450	420	470	440	440	430	445		
				IPT(fz)	.0003	.0004	.0005	.0007	.0009	.0014	.0017	.0024	.0028	.0028	.0031	.0036		
RPM	21500	14300	10900	8800	7260	5500	4300	3600	3000	2700	2400	2100						
IPM(Feed)	11	11	11	13	13	15	15	17	17	15	15	15						

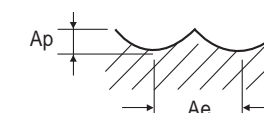


**E5249, E5014, E5018, E5251 SERIES TiAlN Coated**

SFM(Vc) = ft./min.  
IPT(fz) = in./tooth  
RPM = rev./min.  
IPM(Feed) = in./min.

**2 FLUTE BALL NOSE - PLANE**

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø)												
						3/32	1/8	5/32	3/16	1/4	5/16	3/8	1/2	9/16	5/8	11/16	13/16	
P	1-4	Non-alloy steel	0.7D	0.3D	SFM(Vc)	200	175	165	160	175	155	155	175	175	165	160	165	
					IPT(fz)	.0004	.0006	.0007	.0009	.0011	.0016	.0019	.0019	.0021	.0025	.0028	.0032	
	RPM	8110	5400	4080	3240	2640	1920	1560	1320	1180	1020	900	780					
	IPM(Feed)	6	6	6	6	6	6	6	5	5	5	5	5					
	5	Non-alloy steel	0.7D	0.3D	SFM(Vc)	170	150	135	130	150	135	130	150	140	135	135	145	
					IPT(fz)	.0002	.0003	.0005	.0006	.0007	.0009	.0011	.0013	.0016	.0018	.0020	.0022	
	RPM	6840	4560	3240	2640	2270	1680	1320	1140	960	840	740	670					
	IPM(Feed)	3	3	3	3	3	3	3	3	3	3	3	3					
	6-7	Low alloy steel	0.7D	0.3D	SFM(Vc)	200	175	165	160	175	155	155	175	175	165	160	165	
					IPT(fz)	.0004	.0006	.0007	.0009	.0011	.0016	.0019	.0019	.0021	.0025	.0028	.0032	
	RPM	8110	5400	4080	3240	2640	1920	1560	1320	1180	1020	900	780					
	IPM(Feed)	6	6	6	6	6	6	6	5	5	5	5	5					
8-9	Low alloy steel	0.7D	0.3D	SFM(Vc)	170	150	135	130	150	135	130	150	140	135	135	145		
				IPT(fz)	.0002	.0003	.0005	.0006	.0007	.0009	.0011	.0013	.0016	.0018	.0020	.0022		
RPM	6840	4560	3240	2640	2270	1680	1320	1140	960	840	740	670						
IPM(Feed)	3	3	3	3	3	3	3	3	3	3	3	3						
10	High alloyed steel, and tool steel	0.7D	0.3D	SFM(Vc)	200	175	165	160	175	155	155	175	175	165	160	165		
				IPT(fz)	.0004	.0006	.0007	.0009	.0011	.0016	.0019	.0019	.0021	.0025	.0028	.0032		
RPM	8110	5400	4080	3240	2640	1920	1560	1320	1180	1020	900	780						
IPM(Feed)	6	6	6	6	6	6	6	5	5	5	5	5						
11.1	High alloyed steel, and tool steel	0.7D	0.3D	SFM(Vc)	170	150	135	130	150	135	130	150	140	135	135	145		
				IPT(fz)	.0002	.0003	.0005	.0006	.0007	.0009	.0011	.0013	.0016	.0018	.0020	.0022		
RPM	6840	4560	3240	2640	2270	1680	1320	1140	960	840	740	670						
IPM(Feed)	3	3	3	3	3	3	3	3	3	3	3	3						
K 15-20	Grey cast iron Nodular cast iron Malleable cast iron	0.7D	0.3D	SFM(Vc)	280	250	230	225	245	225	165	250	230	235	215	240		
				IPT(fz)	.0004	.0007	.0011	.0015	.0022	.0036	.0060	.0052	.0064	.0069	.0083	.0079		
RPM	11400	7680	5640	4560	3720	2760	1680	1920	1560	1440	1200	1140						
IPM(Feed)	9	10	12	14	16	20	20	20	20	20	20	18						
N 21-25	Aluminum-wrought alloy Aluminum-cast, alloyed	0.7D	0.3D	SFM(Vc)	825	730	685	650	740	705	660	740	690	685	670	690		
				IPT(fz)	.0003	.0004	.0005	.0008	.0009	.0013	.0017	.0024	.0029	.0027	.0031	.0035		
RPM	33600	22320	16800	13200	11280	8640	6720	5640	4680	4200	3720	3240						
IPM(Feed)	17	17	17	20	20	23	23	27	27	23	23	23						

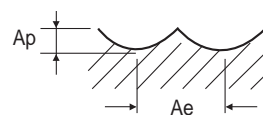




**E5250, E5060, E5062, E5252 SERIES 4 FLUTE BALL NOSE - PLANE**

SFM(Vc) = ft./min.  
IPT(fz) = in./tooth  
RPM = rev./min.  
IPM(Feed) = in./min.

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø)												
						3/32	1/8	5/32	3/16	1/4	5/16	3/8	1/2	9/16	5/8	11/16	13/16	
P	1-4	Non-alloy steel	0.7D	0.3D	SFM(Vc)	130	115	105	105	110	105	100	115	110	105	105	105	
					IPT(fz)	.0003	.0004	.0006	.0007	.0009	.0012	.0015	.0014	.0017	.0019	.0022	.0025	
	RPM				5200	3500	2600	2100	1700	1270	1000	870	750	650	580	500		
	IPM(Feed)				6	6	6	6	6	6	5	5	5	5	5	5		
	SFM(Vc)				110	95	85	85	95	90	85	95	90	90	85	90		
	IPT(fz)				.0002	.0003	.0004	.0004	.0005	.0007	.0009	.0010	.0012	.0014	.0016	.0017		
	5	Low alloy steel	0.7D	0.3D	SFM(Vc)	130	115	105	105	110	105	100	115	110	105	105		
					IPT(fz)	.0003	.0004	.0006	.0007	.0009	.0012	.0015	.0014	.0017	.0019	.0022	.0025	
	RPM				5200	3500	2600	2100	1700	1270	1000	870	750	650	580	500		
	IPM(Feed)				6	6	6	6	6	6	5	5	5	5	5	5		
	SFM(Vc)				110	95	85	85	95	90	85	95	90	90	85	90		
	IPT(fz)				.0002	.0003	.0004	.0004	.0005	.0007	.0009	.0010	.0012	.0014	.0016	.0017		
6-7	High alloyed steel, and tool steel	0.7D	0.3D	SFM(Vc)	130	115	105	105	110	105	100	115	110	105	105			
				IPT(fz)	.0003	.0004	.0006	.0007	.0009	.0012	.0015	.0014	.0017	.0019	.0022	.0025		
RPM				5200	3500	2600	2100	1700	1270	1000	870	750	650	580	500			
IPM(Feed)				6	6	6	6	6	6	5	5	5	5	5	5			
SFM(Vc)				110	95	85	85	95	90	85	95	90	90	85	90			
IPT(fz)				.0002	.0003	.0004	.0004	.0005	.0007	.0009	.0010	.0012	.0014	.0016	.0017			
8-9	High alloyed steel, and tool steel	0.7D	0.3D	SFM(Vc)	130	115	105	105	110	105	100	115	110	105	105			
				IPT(fz)	.0003	.0004	.0006	.0007	.0009	.0012	.0015	.0014	.0017	.0019	.0022	.0025		
RPM				5200	3500	2600	2100	1700	1270	1000	870	750	650	580	500			
IPM(Feed)				6	6	6	6	6	6	5	5	5	5	5	5			
SFM(Vc)				110	95	85	85	95	90	85	95	90	90	85	90			
IPT(fz)				.0002	.0003	.0004	.0004	.0005	.0007	.0009	.0010	.0012	.0014	.0016	.0017			
10	Grey cast iron Nodular cast iron Malleable cast iron	0.7D	0.3D	SFM(Vc)	180	160	145	140	155	145	140	155	145	150	145	155		
				IPT(fz)	.0003	.0005	.0008	.0012	.0016	.0026	.0033	.0040	.0048	.0052	.0059	.0058		
RPM				7300	4900	3600	2900	2400	1800	1430	1200	1000	920	810	730			
IPM(Feed)				9	10	12	14	15	19	19	19	19	19	19	17			
SFM(Vc)				530	470	445	430	475	450	420	470	440	440	430	445			
IPT(fz)				.0002	.0003	.0004	.0006	.0007	.0010	.0013	.0018	.0022	.0020	.0023	.0026			
11.1	Aluminum-wrought alloy Aluminum-cast, alloyed	0.7D	0.3D	SFM(Vc)	530	470	445	430	475	450	420	470	440	440	430	445		
				IPT(fz)	.0002	.0003	.0004	.0006	.0007	.0010	.0013	.0018	.0022	.0020	.0023	.0026		
RPM				21500	14300	10900	8800	7260	5500	4300	3600	3000	2700	2400	2100			
IPM(Feed)				17	17	17	20	20	22	22	26	26	22	22	22			
SFM(Vc)				180	160	145	140	155	145	140	155	145	150	145	155			
IPT(fz)				.0003	.0005	.0008	.0012	.0016	.0026	.0033	.0040	.0048	.0052	.0059	.0058			

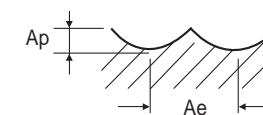


**E5250, E5060, E5062, E5252 SERIES TiAlN Coated**

SFM(Vc) = ft./min.  
IPT(fz) = in./tooth  
RPM = rev./min.  
IPM(Feed) = in./min.

**4 FLUTE BALL NOSE - PLANE**

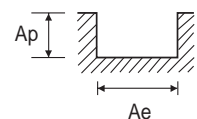
ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø)												
						3/32	1/8	5/32	3/16	1/4	5/16	3/8	1/2	9/16	5/8	11/16	13/16	
P	1-4	Non-alloy steel	0.7D	0.3D	SFM(Vc)	200	175	165	160	175	155	155	175	175	165	160	165	
					IPT(fz)	.0003	.0004	.0006	.0008	.0009	.0012	.0014	.0015	.0017	.0020	.0022	.0026	
	RPM				8110	5400	4080	3240	2640	1920	1560	1320	1180	1020	900	780		
	IPM(Feed)				9	9	9	10	9	9	9	8	8	8	8	8		
	SFM(Vc)				170	150	135	130	150	135	130	150	140	135	135	145		
	IPT(fz)				.0001	.0002	.0003	.0004	.0004	.0006	.0008	.0009	.0010	.0012	.0014	.0015		
	5	Low alloy steel	0.7D	0.3D	SFM(Vc)	200	175	165	160	175	155	155	175	175	165	160	165	
					IPT(fz)	.0003	.0004	.0006	.0008	.0009	.0012	.0014	.0015	.0017	.0020	.0022	.0026	
	RPM				6840	4560	3240	2640	2270	1680	1320	1140	960	840	740	670		
	IPM(Feed)				4	4	4	4	4	4	4	4	4	4	4	4		
	SFM(Vc)				170	150	135	130	150	135	130	150	140	135	135	145		
	IPT(fz)				.0001	.0002	.0003	.0004	.0004	.0006	.0008	.0009	.0010	.0012	.0014	.0015		
6-7	High alloyed steel, and tool steel	0.7D	0.3D	SFM(Vc)	200	175	165	160	175	155	155	175	175	165	160	165		
				IPT(fz)	.0003	.0004	.0006	.0008	.0009	.0012	.0014	.0015	.0017	.0020	.0022	.0026		
RPM				8110	5400	4080	3240	2640	1920	1560	1320	1180	1020	900	780			
IPM(Feed)				9	9	9	10	9	9	9	8	8	8	8	8			
SFM(Vc)				170	150	135	130	150	135	130	150	140	135	135	145			
IPT(fz)				.0001	.0002	.0003	.0004	.0004	.0006	.0008	.0009	.0010	.0012	.0014	.0015			
8-9	High alloyed steel, and tool steel	0.7D	0.3D	SFM(Vc)	200	175	165	160	175	155	155	175	175	165	160	165		
				IPT(fz)	.0003	.0004	.0006	.0008	.0009	.0012	.0014	.0015	.0017	.0020	.0022	.0026		
RPM				6840	4560	3240	2640	2270	1680	1320	1140	960	840	740	670			
IPM(Feed)				4	4	4	4	4	4	4	4	4	4	4	4			
SFM(Vc)				170	150	135	130	150	135	130	150	140	135	135	145			
IPT(fz)				.0001	.0002	.0003	.0004	.0004	.0006	.0008	.0009	.0010	.0012	.0014	.0015			
10	Grey cast iron Nodular cast iron Malleable cast iron	0.7D	0.3D	SFM(Vc)	280	250	230	225	245	225	225	250	230	235	215	240		
				IPT(fz)	.0003	.0005	.0008	.0012	.0015	.0026	.0032	.0038	.0048	.0052	.0063	.0059		
RPM				11400	7680	5640	4560	3720	2770	2270	1920	1560	1440	1200	1140			
IPM(Feed)				14	15	18	21	23	29	29	29	30	30	30	27			
SFM(Vc)				825	730	685	650	740	705	660	740	690	685	670	690			
IPT(fz)				.0002	.0003	.0004	.0006	.0007	.0010	.0013	.0018	.0022	.0021	.0024	.0027			
11.1	Aluminum-wrought alloy Aluminum-cast, alloyed	0.7D	0.3D	SFM(Vc)	825	730	685	650	740	705	660	740	690	685	670	690		
				IPT(fz)	.0002	.0003	.0004	.0006	.0007	.0010	.0013	.0018	.0022	.0021	.0024	.0027		
RPM				33600	22320	16800	13200	11280	8640	6720	5640	4680	4200	3720	3240			
IPM(Feed)				26	26	26	31	31	35	35	41	41	35	35	35			
SFM(Vc)				180	160	145	140	155	145	140	155	145	150	145	155			
IPT(fz)				.0003	.0005	.0008	.0012	.0016	.0026	.0033	.0040	.0048	.0052	.0059	.0058			



**EH527 SERIES** TiAlN Coated **2 FLUTE - SLOTTING**

SFM(Vc) = ft./min.  
IPT(fz) = in./tooth  
RPM = rev./min.  
IPM(Feed) = in./min.

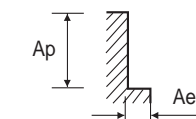
Table with columns: ISO, VDI 3323, Material Description, Ae, Ap, Parameter, Diameter (Ø) [2.0, 3.0, 4.0, 5.0, 6.0, 8.0, 10.0, 12.0, 14.0, 16.0, 20.0]. Rows include materials like Non-alloy steel, Low alloy steel, High alloyed steel, and Stainless steel.



**EH540 SERIES** TiAlN Coated **4 FLUTE - SIDE CUTTING**

SFM(Vc) = ft./min.  
IPT(fz) = in./tooth  
RPM = rev./min.  
IPM(Feed) = in./min.

Table with columns: ISO, VDI 3323, Material Description, Ae, Ap, Parameter, Diameter (Ø) [2.0, 3.0, 4.0, 5.0, 6.0, 8.0, 10.0, 12.0, 14.0, 16.0, 20.0]. Rows include materials like Non-alloy steel, Low alloy steel, High alloyed steel, and Stainless steel.





**PROPERTIES AND APPLICATIONS OF COATINGS**

	Titanium Nitride	Titanium Carbonitride	Super TiAlN "F" Coatings	Super TiAlN "E" Coatings
Hardness	82 Rc	92 Rc	92 Rc	95 Rc
Coefficient of Friction Against Dry Steel (.8)	.4	.4	.4	.4
Coating Thickness 3 Microns = .0001	1-4	1-4	1-5	1-3
Maximum Working Temperature	1100 F	750F	1470 F	1470 F
Coating Color	Gold	Blue - Gray	Violet - Gray	Violet - Gray
Key Characteristics	Good General Purpose	Good Wear Resistance Good Toughness Moderate Heat Resistance	Enhanced Toughness High Heat Resistance	High Hardness Enhanced Toughness High Heat Resistance
Primary Applications	Machining of Iron Based Materials	General Machining of Various Materials	Steel, Cast Iron, Stainless, Nickel Based Alloys, High Temp and Titanium Alloys, High Speed Machining Wet, Dry, or Semi Dry Condition	Hardened Workpieces, Steel, Cast Iron, Stainless, Nickel Based Alloys, High Temp and Titanium Alloys, Machining Wet, Dry, or Semi Dry Condition
<b>YG:TYLON SUPER TiAlN COATED TOOLS CAN BE RUN 20% - 50% FASTER THAN TiN or TiCN ON MOST MATERIALS</b>				





Being the best through innovation



HSS PM60

# ONLY ONE COATED PM60 END MILLS

- Perfect Solution of Carbide Chipping under Vibrations

SELECTION GUIDE



SERIES	GYG64	GYG67
FLUTE	2	4
HELIX ANGLE	30°	30°
CUTTING EDGE SHAPE	SQUARE	BALL NOSE
SIZE MIN	D1/8	R1/16
SIZE MAX	D1	R1/2
PAGE	C726	C727

HSS PM60

ONLY ONE END MILLS

Perfect solution to protect Carbide chipping problems under vibrations



Please visit [globalyg1.com/mat](http://globalyg1.com/mat) for material search

⊙ : Excellent ○ : Good

Recommended cutting conditions : p.C733

	GYG64	GYG67
CENTER CUT		
Y-Coating	Y-Coating	Y-Coating



ISO	VDI 3323	Material Description	Composition / Structure / Heat Treatment	HB	HRc	GYG64	GYG67
P	1	Non-alloy steel	About 0.15% C Annealed	125		⊙	⊙
	2		About 0.45% C Annealed	190	13	⊙	⊙
	3		About 0.45% C Quenched & Tempered	250	25	⊙	⊙
	4		About 0.75% C Annealed	270	28	⊙	⊙
	5		About 0.75% C Quenched & Tempered	300	32	⊙	⊙
	6	Low alloy steel	Annealed	180	10	⊙	⊙
	7		Quenched & Tempered	275	29	⊙	⊙
	8		Quenched & Tempered	300	32	⊙	⊙
	9		Quenched & Tempered	350	38	○	○
	10		High alloyed steel, and tool steel	Annealed	200	15	⊙
	11	Quenched & Tempered		325	35	○	○
M	12	Stainless steel	Ferritic / Martensitic Annealed	200	15	⊙	⊙
	13		Martensitic Quenched & Tempered	240	23	⊙	⊙
	14		Austenitic	180	10	⊙	⊙
K	15	Grey cast iron	Pearlitic / ferritic	180	10	⊙	⊙
	16		Pearlitic (Martensitic)	260	26	⊙	⊙
	17	Nodular cast iron	Ferritic	160	3	⊙	⊙
	18		Pearlitic	250	25	⊙	⊙
	19		Ferritic	130		⊙	⊙
20	Malleable cast iron	Pearlitic	230	21	⊙	⊙	
N	21	Aluminum-wrought alloy	Not Curable	60			
	22		Curable Hardened	100			
	23	Aluminum-cast, alloyed	≤ 12% Si, Not Curable	75			
	24		≤ 12% Si, Curable Hardened	90			
	25		> 12% Si, Not Curable	130			
	26	Copper and Copper Alloys (Bronze / Brass)	Cutting Alloys, PB>1%	110		○	○
	27		CuZn, CuSnZn (Brass)	90		○	○
	28		CuSn, lead-free copper and electrolytic copper	100		○	○
	29		Non Metallic Materials	Duroplastic, Fiber Reinforced Plastic Rubber, Wood, etc.			
	30						
S	31	Heat Resistant Super Alloys	Fe Based Annealed	200	15		
	32		Cured	280	30		
	33		Annealed	250	25		
	34		Ni or Co Based Cured	350	38		
	35	Cast	320	34			
	36	Titanium Alloys	Pure Titanium	400 Rm			
37	Alpha + Beta Alloys Hardened		1050 Rm				
H	38	Hardened steel	Hardened	550	55		
	39		Hardened	630	60		
	40	Chilled Cast Iron	Cast	400	42	○	○
	41	Hardened Cast Iron	Hardened	550	55		

GYG65	GYG66	GYG69	GYG68	GYG70
4	4	4&5	3-6	3-6
30°	M-Helix	M-Helix	30°	30°
SQUARE	SQUARE	CORNER RADIUS ROUGHING	ROUGHING	ROUGHING
D1/8	D1/8	D1/4	D1/4	D1/4
D1	D1	D1	D1-1/4	D1-1/4
C728	C729	C730	C731	C732
CENTER CUT	CENTER CUT	FINE CENTER CUT	FINE CENTER CUT	COARSE CENTER CUT
Y-Coating	Y-Coating	Y-Coating	Y-Coating	Y-Coating



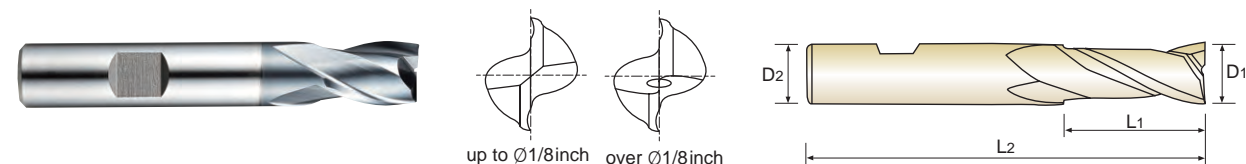
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○	○	○	○	○	27
○	○	○	○	○	28
					29
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					36
					37
					38
					39
○	○	○	○	○	40
					41





FLAT SHANK GYG64 SERIES

PM60, 2 FLUTE (Center Cut)



Unit : Inch

EDP No.	Mill Diameter	Shank Diameter	Length of Cut	Overall Length
Y-COATED	D1	D2	L1	L2
<a href="#">GYG64008</a>	1/8	3/8	3/8	2-5/16
<a href="#">GYG64012</a>	3/16	3/8	7/16	2-5/16
<a href="#">GYG64016</a>	1/4	3/8	1/2	2-5/16
<a href="#">GYG64020</a>	5/16	3/8	9/16	2-5/16
<a href="#">GYG64024</a>	3/8	3/8	9/16	2-5/16
<a href="#">GYG64032</a>	1/2	1/2	1	3
<a href="#">GYG64040</a>	5/8	5/8	1-5/16	3-7/16
<a href="#">GYG64048</a>	3/4	3/4	1-5/16	3-7/16
<a href="#">GYG64064</a>	1	1	1-5/8	4-1/8

Mill Dia. Tolerance (inch)	Shank Dia. Tolerance
0~-0.0012	h6

◎ : Excellent ○ : Good

ISO Material Description	P										M				K						
	Non-alloy steel					Low alloy steel					High alloyed steel, and tool steel				Stainless steel		Grey cast iron		Nodular cast iron		Malleable cast iron
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
HRc	13	25	28	32	38	10	29	32	38	15	35	15	23	10	10	26	3	25	3	25	
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230	
Recommend	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	

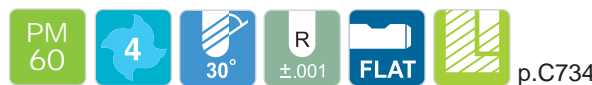
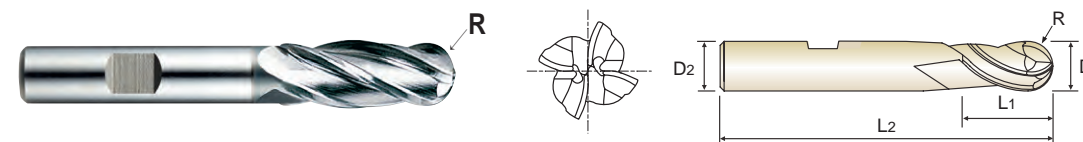
  

ISO Material Description	N						S						H								
	Aluminum-wrought alloy		Aluminum-cast, alloyed		Copper and Copper Alloys (Bronze / Brass)		Non Metallic Materials			Heat Resistant Super Alloys			Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron				
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc	60	100	75	90	130	110	90	100			15	30	25	38	34	400 Rm	1050 Rm	55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend						○	○	○												○	



FLAT SHANK GYG67 SERIES

PM60, 4 FLUTE BALL NOSE



Unit : Inch

EDP No.	Radius of Ball Nose	Mill Diameter	Shank Diameter	Length of Cut	Overall Length
Y-COATED	R	D1	D2	L1	L2
<a href="#">GYG67008</a>	R1/16	1/8	3/8	3/8	2-5/16
<a href="#">GYG67012</a>	R3/32	3/16	3/8	1/2	2-3/8
<a href="#">GYG67016</a>	R1/8	1/4	3/8	5/8	2-7/16
<a href="#">GYG67020</a>	R5/32	5/16	3/8	3/4	2-1/2
<a href="#">GYG67024</a>	R3/16	3/8	3/8	3/4	2-1/2
<a href="#">GYG67032</a>	R1/4	1/2	1/2	1-1/4	3-1/4
<a href="#">GYG67040</a>	R5/16	5/8	5/8	1-5/8	3-3/4
<a href="#">GYG67048</a>	R3/8	3/4	3/4	1-5/8	3-7/8
<a href="#">GYG67064</a>	R1/2	1	1	2	4-1/2

Mill Dia. Tolerance (inch)	Shank Dia. Tolerance
0~-0.0012	h6

◎ : Excellent ○ : Good

ISO Material Description	P										M				K						
	Non-alloy steel					Low alloy steel					High alloyed steel, and tool steel				Stainless steel		Grey cast iron		Nodular cast iron		Malleable cast iron
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
HRc	13	25	28	32	38	10	29	32	38	15	35	15	23	10	10	26	3	25	3	25	
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230	
Recommend	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	

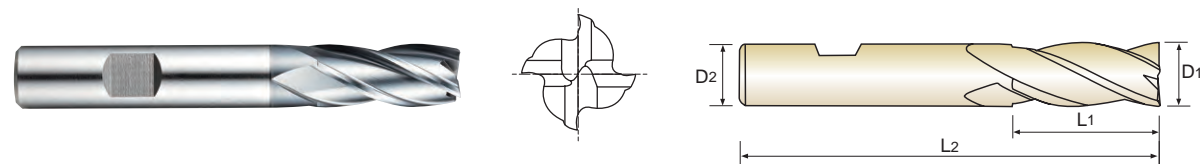
ISO Material Description	N						S						H								
	Aluminum-wrought alloy		Aluminum-cast, alloyed		Copper and Copper Alloys (Bronze / Brass)		Non Metallic Materials			Heat Resistant Super Alloys			Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron				
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc	60	100	75	90	130	110	90	100			15	30	25	38	34	400 Rm	1050 Rm	55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend						○	○	○												○	



**YG** ONLY ONE END MILLS

FLAT SHANK **GYG65** SERIES

**PM60, 4 FLUTE (Center Cut)**



Unit : Inch

EDP No.	Mill Diameter	Shank Diameter	Length of Cut	Overall Length
Y-COATED	D1	D2	L1	L2
<a href="#">GYG65008</a>	1/8	3/8	3/8	2-5/16
<a href="#">GYG65012</a>	3/16	3/8	1/2	2-3/8
<a href="#">GYG65016</a>	1/4	3/8	5/8	2-7/16
<a href="#">GYG65020</a>	5/16	3/8	3/4	2-1/2
<a href="#">GYG65024</a>	3/8	3/8	3/4	2-1/2
<a href="#">GYG65032</a>	1/2	1/2	1-1/4	3-1/4
<a href="#">GYG65040</a>	5/8	5/8	1-5/8	3-3/4
<a href="#">GYG65048</a>	3/4	3/4	1-5/8	3-7/8
<a href="#">GYG65056</a>	7/8	7/8	1-7/8	4-1/8
<a href="#">GYG65064</a>	1	1	2	4-1/2

Mill Dia. Tolerance (inch)	Shank Dia. Tolerance
0~-.0012	h6

◎ : Excellent ○ : Good

ISO Material Description	P										M				K					
	Non-alloy steel					Low alloy steel					High alloyed steel, and tool steel	Stainless steel		Grey cast iron	Nodular cast iron	Malleable cast iron				
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc	13	25	28	32	38	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎

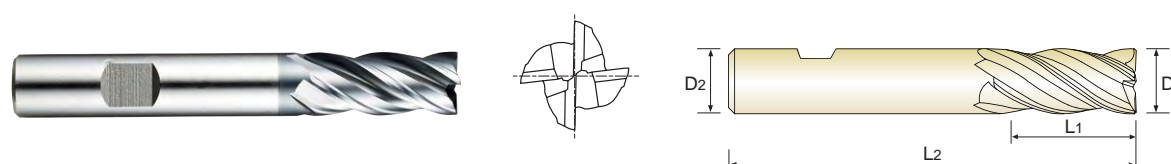
  

ISO Material Description	N					S					H										
	Aluminum-wrought alloy	Aluminum-cast, alloyed		Copper and Copper Alloys (Bronze / Brass)		Non Metallic Materials	Heat Resistant Super Alloys			Titanium Alloys	Hardened steel	Chilled Cast Iron	Hardened Cast Iron								
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34	55	60	42	42	55	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend						○	○	○												○	

**YG** ONLY ONE END MILLS

FLAT SHANK **GYG66** SERIES

**PM60, 4 FLUTE MULTIPLE HELIX (Center Cut)**



Unit : Inch

EDP No.	Mill Diameter	Shank Diameter	Length of Cut	Overall Length
Y-COATED	D1	D2	L1	L2
<a href="#">GYG66008</a>	1/8	3/8	3/8	2-5/16
<a href="#">GYG66012</a>	3/16	3/8	1/2	2-3/8
<a href="#">GYG66016</a>	1/4	3/8	5/8	2-7/16
<a href="#">GYG66020</a>	5/16	3/8	3/4	2-1/2
<a href="#">GYG66024</a>	3/8	3/8	3/4	2-1/2
<a href="#">GYG66032</a>	1/2	1/2	1-1/4	3-1/4
<a href="#">GYG66040</a>	5/8	5/8	1-5/8	3-3/4
<a href="#">GYG66048</a>	3/4	3/4	1-5/8	3-7/8
<a href="#">GYG66064</a>	1	1	2	4-1/2

Mill Dia. Tolerance (inch)	Shank Dia. Tolerance
0~-.0012	h6

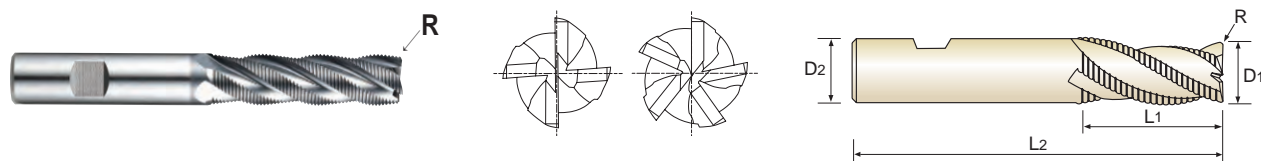
◎ : Excellent ○ : Good

ISO Material Description	P										M				K					
	Non-alloy steel					Low alloy steel					High alloyed steel, and tool steel	Stainless steel		Grey cast iron	Nodular cast iron	Malleable cast iron				
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc	13	25	28	32	38	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎

ISO Material Description	N					S					H										
	Aluminum-wrought alloy	Aluminum-cast, alloyed		Copper and Copper Alloys (Bronze / Brass)		Non Metallic Materials	Heat Resistant Super Alloys			Titanium Alloys	Hardened steel	Chilled Cast Iron	Hardened Cast Iron								
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34	55	60	42	42	55	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend						○	○	○												○	

**PM60, MULTI FLUTE MULTIPLE HELIX CORNER RADIUS ROUGHING - FINE (Center Cut)**



5 Flute, 44°/45°/45°

Unit : Inch

EDP No.	Corner Radius	Mill Diameter	Shank Diameter	Length of Cut	Overall Length	No. of Flute
Y-COATED	R	D1	D2	L1	L2	
<a href="#">GYG69016</a>	R.020	1/4	3/8	5/8	2-7/16	4
<a href="#">GYG69020</a>	R.020	5/16	3/8	3/4	2-1/2	4
<a href="#">GYG69024</a>	R.020	3/8	3/8	3/4	2-1/2	4
<a href="#">GYG69032</a>	R.020	1/2	1/2	1-1/4	3-1/4	4
<a href="#">GYG69040</a>	R.040	5/8	5/8	1-1/4	3-3/8	5
<a href="#">GYG69048</a>	R.040	3/4	3/4	1-5/8	3-7/8	5
<a href="#">GYG69064</a>	R.040	1	1	2	4-1/2	5

Mill Dia. Tolerance (inch)
0 ~ +.0030

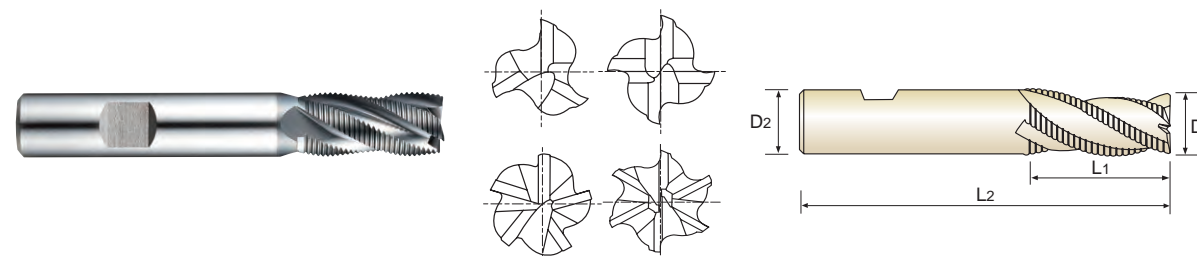
◎ : Excellent ○ : Good

ISO Material Description	P										M				K						
	Non-alloy steel					Low alloy steel					High alloyed steel, and tool steel				Stainless steel		Grey cast iron		Nodular cast iron		Malleable cast iron
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
HRc	13	25	28	32	35	10	29	32	38	42	15	35	40	45	10	26	3	25	10	21	
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230	
Recommend	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	

ISO Material Description	N					S					H										
	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys			Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron			
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HB	60	100	75	90	130	110	90	100			15	30	25	38	34	400 Rm	1050 Rm	55	60	42	55
Recommend						○	○	○													

**PM60, MULTI FLUTE ROUGHING- FINE (Center Cut)**



p.C738

Unit : Inch

EDP No.	Mill Diameter	Shank Diameter	Length of Cut	Overall Length	No. of Flute
Y-COATED	D1	D2	L1	L2	
<a href="#">GYG68016</a>	1/4	3/8	5/8	2-7/16	3
<a href="#">GYG68020</a>	5/16	3/8	3/4	2-1/2	3
<a href="#">GYG68901</a>	5/16	3/8	1-3/8	3_3/16	3
<a href="#">GYG68024</a>	3/8	3/8	3/4	2-1/2	4
<a href="#">GYG68902</a>	3/8	3/8	1-1/2	3-1/4	4
<a href="#">GYG68032</a>	1/2	1/2	1-1/4	3-1/4	4
<a href="#">GYG68903</a>	1/2	1/2	2	4	4
<a href="#">GYG68040</a>	5/8	5/8	1-5/8	3-3/4	4
<a href="#">GYG68904</a>	5/8	5/8	2-1/2	4-5/8	4
<a href="#">GYG68048</a>	3/4	3/4	1-5/8	3-7/8	4
<a href="#">GYG68905</a>	3/4	3/4	2-1/2	4-3/4	4
<a href="#">GYG68906</a>	3/4	3/4	3	5-1/4	4
<a href="#">GYG68064</a>	1	1	2	4-1/2	5
<a href="#">GYG68907</a>	1	1	4	6-1/2	5
<a href="#">GYG68116</a>	1-1/4	1-1/4	2	4-1/2	6

Mill Dia. Tolerance (inch)
up to 1   0~+.0030
over 1   0~+.0060

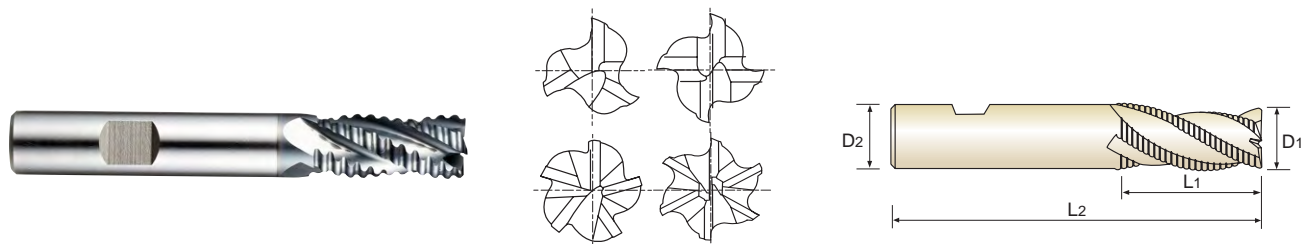
◎ : Excellent ○ : Good

ISO Material Description	P										M				K						
	Non-alloy steel					Low alloy steel					High alloyed steel, and tool steel				Stainless steel		Grey cast iron		Nodular cast iron		Malleable cast iron
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
HRc	13	25	28	32	35	10	29	32	38	42	15	35	40	45	10	26	3	25	10	21	
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230	
Recommend	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	

ISO Material Description	N					S					H										
	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys			Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron			
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HB	60	100	75	90	130	110	90	100			15	30	25	38	34	400 Rm	1050 Rm	55	60	42	55
Recommend						○	○	○													

**PM60, MULTI FLUTE ROUGHING- COARSE (Center Cut)**



Unit : Inch

EDP No.	Mill Diameter	Shank Diameter	Length of Cut	Overall Length	No. of Flute
Y-COATED	D1	D2	L1	L2	
<b>GYG70016</b>	1/4	3/8	5/8	2-7/16	3
<b>GYG70020</b>	5/16	3/8	3/4	2-1/2	3
<b>GYG70024</b>	3/8	3/8	3/4	2-1/2	4
<b>GYG70032</b>	1/2	1/2	1-1/4	3-1/4	4
<b>GYG70040</b>	5/8	5/8	1-5/8	3-3/4	4
<b>GYG70048</b>	3/4	3/4	1-5/8	3-7/8	4
<b>GYG70064</b>	1	1	2	4-1/2	5
<b>GYG70116</b>	1-1/4	1-1/4	2	4-1/2	6

Mill Dia. Tolerance (inch)	
up to 1	0~+.0030
over 1	0~+.0060

◎ : Excellent ○ : Good

ISO	P											M				K						
	Non-alloy steel					Low alloy steel						High alloyed steel, and tool steel				Stainless steel		Grey cast iron		Nodular cast iron		Malleable cast iron
Material Description	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20		
VDI 3323																						
HRc	13	25	28	32	38	42	48	52	58	62	68	72	78	82	88	92	98	102	108	112		
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230		
Recommend	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	

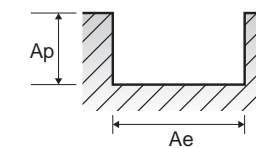
  

ISO	N										S					H					
	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron	
Material Description	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
VDI 3323																					
HRc	60	100	75	90	130	110	90	100			15	30	25	38	34	40	55	60	42	55	
HB	60	200	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend						○	○	○													○

**GYG64** SERIES **2 FLUTE - SLOTTING**

SFM(Vc) = ft./min.  
IPT(fz) = in./tooth  
RPM = rev./min.  
IPM(Feed) = in./min.

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø)										
						1/8	3/16	1/4	5/16	3/8	1/2	5/8	3/4	1		
P	1	Non-alloy steel	1.0D	0.5D	SFM(Vc)	185	245	260	255	260	265	265	235	235		
					IPT(fz)	.0006	.0013	.0015	.0021	.0028	.0030	.0039	.0046	.0041		
					RPM	5710	4950	3960	3130	2640	2030	1620	1200	890		
	2		1.0D	0.5D	SFM(Vc)	150	200	215	215	225	215	225	195	195		
					IPT(fz)	.0006	.0012	.0014	.0022	.0029	.0033	.0034	.0042	.0044		
					RPM	4610	4080	3310	2650	2270	1650	1380	990	750		
	3-4		1.0D	0.5D	SFM(Vc)	125	160	170	180	180	170	175	175	150		
					IPT(fz)	.0007	.0014	.0017	.0022	.0031	.0036	.0039	.0042	.0047		
					RPM	3810	3280	2610	2170	1840	1300	1080	890	580		
	5		1.0D	0.5D	SFM(Vc)	85	105	110	115	110	110	110	110	115		
					IPT(fz)	.0007	.0011	.0015	.0020	.0027	.0031	.0036	.0041	.0041		
RPM		2610			2140	1650	1400	1140	850	680	550	430				
6	1.0D	0.5D	SFM(Vc)	150	200	215	215	225	215	225	195	195				
			IPT(fz)	.0006	.0012	.0014	.0022	.0029	.0033	.0034	.0042	.0044				
			RPM	4610	4080	3310	2650	2270	1650	1380	990	750				
7	1.0D	0.5D	SFM(Vc)	125	160	170	180	180	170	175	175	150				
			IPT(fz)	.0007	.0014	.0017	.0022	.0031	.0036	.0039	.0042	.0047				
			RPM	3810	3280	2610	2170	1840	1300	1080	890	580				
8	1.0D	0.5D	SFM(Vc)	85	105	110	115	110	110	110	110	115				
			IPT(fz)	.0007	.0011	.0015	.0020	.0027	.0031	.0036	.0041	.0041				
			RPM	2610	2140	1650	1400	1140	850	680	550	430				
9	1.0D	0.5D	SFM(Vc)	65	80	85	90	85	85	90	90	80				
			IPT(fz)	.0007	.0011	.0014	.0019	.0028	.0028	.0036	.0039	.0040				
			RPM	2010	1670	1300	1080	870	650	540	450	300				
10	1.0D	0.5D	SFM(Vc)	150	200	215	215	225	215	225	195	195				
			IPT(fz)	.0006	.0012	.0014	.0022	.0029	.0033	.0034	.0042	.0044				
			RPM	4610	4080	3310	2650	2270	1650	1380	990	750				
11.1	1.0D	0.5D	SFM(Vc)	85	105	110	115	110	110	110	110	115				
			IPT(fz)	.0007	.0011	.0015	.0020	.0027	.0031	.0036	.0041	.0041				
			RPM	2610	2140	1650	1400	1140	850	680	550	430				
11.2	1.0D	0.3D	SFM(Vc)	45	60	60	60	60	60	60	65	50				
			IPT(fz)	.0007	.0011	.0014	.0019	.0029	.0028	.0035	.0039	.0038				
			RPM	1400	1200	900	760	630	450	380	320	200				
M	14.1	Stainless steel	1.0D	0.5D	SFM(Vc)	70	90	95	100	95	95	95	100	85		
					IPT(fz)	.0007	.0011	.0014	.0019	.0028	.0028	.0036	.0040	.0038		
					RPM	2210	1870	1450	1200	970	730	580	500	330		
K	15-20	Grey cast iron Nodular cast iron Malleable cast iron	1.0D	0.5D	SFM(Vc)	150	200	215	215	225	215	225	195	195		
					IPT(fz)	.0006	.0012	.0014	.0022	.0029	.0033	.0034	.0042	.0044		
					RPM	4610	4080	3310	2650	2270	1650	1380	990	750		
H	40	Hardened Cast Iron	1.0D	0.3D	SFM(Vc)	45	60	60	60	60	60	60	65	50		
					IPT(fz)	.0007	.0011	.0014	.0019	.0029	.0028	.0035	.0039	.0038		
					RPM	1400	1200	900	760	630	450	380	320	200		







RECOMMENDED CUTTING CONDITIONS



RECOMMENDED CUTTING CONDITIONS

GYG67 SERIES 4 FLUTE BALL NOSE - PLANE

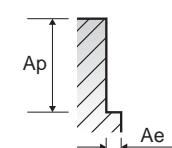
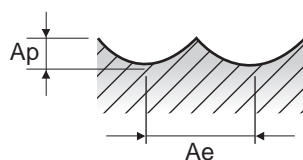
GYG65 SERIES 4 FLUTE - SIDE CUTTING

SFM(Vc) = ft./min.
IPT(fz) = in./tooth
RPM = rev./min.
IPM(Feed) = in./min.

SFM(Vc) = ft./min.
IPT(fz) = in./tooth
RPM = rev./min.
IPM(Feed) = in./min.

Table with columns: ISO, VDI 3323, Material Description, Ae, Ap, Parameter, Diameter (Ø) (1/8, 3/16, 1/4, 5/16, 3/8, 1/2, 5/8, 3/4, 1), SFM(Vc), IPT(fz), RPM, IPM(Feed)

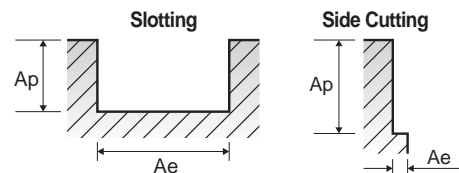
Table with columns: ISO, VDI 3323, Material Description, Ae, Ap, Parameter, Diameter (Ø) (1/8, 3/16, 1/4, 5/16, 3/8, 1/2, 5/8, 3/4, 7/8, 1), SFM(Vc), IPT(fz), RPM, IPM(Feed)



SFM(Vc) = ft./min.  
IPT(fz) = in./tooth  
RPM = rev./min.  
IPM(Feed) = in./min.

**GYG66 SERIES 4 FLUTE - SLOTTING & SIDE CUTTING**

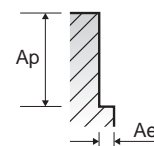
ISO	VDI 3323	Material Description	SLOTTING		SIDE CUTTING		Parameter	Diameter (Ø)								
			Ae	Ap	Ae	Ap										
								1/8	3/16	1/4	5/16	3/8	1/2	5/8	3/4	1
P	1-2	Non-alloy steel	1.0D	0.5D	0.3D	1.5D	SFM(Vc)	230	230	230	230	250	255	250	255	255
							IPT(fz)	.0002	.0005	.0006	.0011	.0015	.0019	.0021	.0026	.0025
							RPM	7020	4680	3510	2810	2570	1930	1540	1290	970
	3-4		1.0D	0.5D	0.3D	1.5D	SFM(Vc)	210	205	210	210	230	230	230	230	230
							IPT(fz)	.0002	.0004	.0006	.0011	.0015	.0019	.0021	.0026	.0025
							RPM	6420	4210	3210	2570	2340	1750	1400	1170	880
	5		1.0D	0.5D	0.3D	1.5D	SFM(Vc)	145	145	145	145	160	160	160	160	160
							IPT(fz)	.0002	.0004	.0006	.0011	.0015	.0018	.0021	.0026	.0026
							RPM	4410	2940	2210	1760	1640	1230	980	820	610
	6		1.0D	0.5D	0.3D	1.5D	SFM(Vc)	230	230	230	230	250	255	250	255	255
							IPT(fz)	.0002	.0005	.0006	.0011	.0015	.0019	.0021	.0026	.0025
							RPM	7020	4680	3510	2810	2570	1930	1540	1290	970
7	1.0D	0.5D	0.3D	1.5D	SFM(Vc)	210	205	210	210	230	230	230	230	230		
					IPT(fz)	.0002	.0004	.0006	.0011	.0015	.0019	.0021	.0026	.0025		
					RPM	6420	4210	3210	2570	2340	1750	1400	1170	880		
8	1.0D	0.5D	0.3D	1.5D	SFM(Vc)	145	145	145	145	160	160	160	160	160		
					IPT(fz)	.0002	.0004	.0006	.0011	.0015	.0018	.0021	.0026	.0026		
					RPM	4410	2940	2210	1760	1640	1230	980	820	610		
9	1.0D	0.5D	0.15D	1.5D	SFM(Vc)	90	90	90	90	100	95	100	100	95		
					IPT(fz)	.0002	.0004	.0006	.0009	.0013	.0016	.0017	.0022	.0021		
					RPM	2710	1800	1350	1080	1000	730	600	500	360		
10	1.0D	0.5D	0.3D	1.5D	SFM(Vc)	230	230	230	230	250	255	250	255	255		
					IPT(fz)	.0002	.0005	.0006	.0011	.0015	.0019	.0021	.0026	.0025		
					RPM	7020	4680	3510	2810	2570	1930	1540	1290	970		
11.1	1.0D	0.5D	0.3D	1.5D	SFM(Vc)	145	145	145	145	160	160	160	160	160		
					IPT(fz)	.0002	.0004	.0006	.0011	.0015	.0018	.0021	.0026	.0026		
					RPM	4410	2940	2210	1760	1640	1230	980	820	610		
11.2	1.0D	0.3D	0.15D	1.5D	SFM(Vc)	90	90	90	90	100	95	100	100	95		
					IPT(fz)	.0002	.0004	.0006	.0009	.0013	.0016	.0017	.0022	.0021		
					RPM	2710	1800	1350	1080	1000	730	600	500	360		
M	14.1	Stainless steel	1.0D	0.5D	0.3D	1.5D	SFM(Vc)	155	160	160	160	155	155	155		
K	15-20	Grey cast iron Nodular cast iron Malleable cast iron	1.0D	0.5D	0.3D	1.5D	SFM(Vc)	230	230	230	230	250	255	250	255	255
							IPT(fz)	.0002	.0005	.0006	.0011	.0015	.0019	.0021	.0026	.0025
							RPM	7020	4680	3510	2810	2570	1930	1540	1290	970
H	40	Chilled Cast Iron	1.0D	0.3D	0.15D	1.5D	SFM(Vc)	90	90	90	90	100	95	100	100	95
							IPT(fz)	.0002	.0004	.0006	.0009	.0013	.0016	.0017	.0022	.0021
							RPM	2710	1800	1350	1080	1000	730	600	500	360



SFM(Vc) = ft./min.  
IPT(fz) = in./tooth  
RPM = rev./min.  
IPM(Feed) = in./min.

**GYG69 SERIES MULTI FLUTE - SIDE CUTTING**

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø)							
						1/4	5/16	3/8	1/2	5/8	3/4	1	
P	1	Non-alloy steel	0.5D	1.5D	SFM(Vc)	250	285	280	285	285	285	295	
					IPT(fz)	.0008	.0012	.0022	.0026	.0027	.0035	.0041	
					RPM	3810	3490	2870	2180	1740	1450	1130	
	2		0.5D	1.5D	SFM(Vc)	195	225	225	215	225	225	225	
					IPT(fz)	.0008	.0012	.0021	.0027	.0027	.0034	.0042	
					RPM	3010	2770	2270	1630	1380	1140	850	
	3-4		0.5D	1.5D	SFM(Vc)	140	170	155	160	155	155	155	
					IPT(fz)	.0007	.0011	.0018	.0025	.0027	.0034	.0042	
					RPM	2160	2050	1570	1230	960	800	590	
	5		0.5D	1.5D	SFM(Vc)	115	125	130	130	130	130	135	
					IPT(fz)	.0008	.0012	.0018	.0024	.0026	.0032	.0040	
					RPM	1750	1520	1340	1000	800	670	510	
6	0.5D	1.5D	SFM(Vc)	195	225	225	215	225	225	225			
			IPT(fz)	.0008	.0012	.0021	.0027	.0027	.0034	.0042			
			RPM	3010	2770	2270	1630	1380	1140	850			
7	0.5D	1.5D	SFM(Vc)	140	170	155	160	155	155	155			
			IPT(fz)	.0007	.0011	.0018	.0025	.0027	.0034	.0042			
			RPM	2160	2050	1570	1230	960	800	590			
8-9	0.5D	1.5D	SFM(Vc)	115	125	130	130	130	130	135			
			IPT(fz)	.0008	.0012	.0018	.0024	.0026	.0032	.0040			
			RPM	1750	1520	1340	1000	800	670	510			
10	0.5D	1.5D	SFM(Vc)	195	225	225	215	225	225	225			
			IPT(fz)	.0008	.0012	.0021	.0027	.0027	.0034	.0042			
			RPM	3010	2770	2270	1630	1380	1140	850			
11.1	0.5D	1.5D	SFM(Vc)	115	125	130	130	130	130	135			
			IPT(fz)	.0008	.0012	.0018	.0024	.0026	.0032	.0040			
			RPM	1750	1520	1340	1000	800	670	510			
11.2	0.3D	1.5D	SFM(Vc)	80	90	90	90	90	90	90			
			IPT(fz)	.0008	.0011	.0017	.0024	.0026	.0031	.0039			
			RPM	1250	1080	940	700	560	470	350			
M	14.1	Stainless steel	0.5D	1.5D	SFM(Vc)	130	140	140	140	140	145	145	
K	15-20	Grey cast iron Nodular cast iron Malleable cast iron	0.5D	1.5D	SFM(Vc)	195	225	225	215	225	225	225	
					IPT(fz)	.0008	.0012	.0021	.0027	.0027	.0034	.0042	
					RPM	3010	2770	2270	1630	1380	1140	850	
H	40	Hardened Cast Iron	0.3D	1.5D	SFM(Vc)	80	90	90	90	90	90	90	
					IPT(fz)	.0008	.0011	.0017	.0024	.0026	.0031	.0039	
					RPM	1250	1080	940	700	560	470	350	





ONLY ONE END MILLS

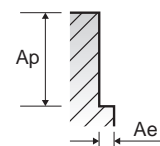
RECOMMENDED CUTTING CONDITIONS

GYG68, GYG70 SERIES

MULTI FLUTE - SIDE CUTTING

SFM(Vc) = ft./min.  
IPT(fz) = in./tooth  
RPM = rev./min.  
IPM(FEED) = in./min.

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø)								
						1/4	5/16	3/8	1/2	5/8	3/4	1	1-1/4	
P	1	Non-alloy steel	0.5D	1.5D	SFM(Vc)	205	235	235	235	235	235	245	175	
					IPT(fz)	.0011	.0016	.0022	.0026	.0034	.0044	.0041	.0044	
					RPM	3160	2890	2410	1800	1440	1200	940	670	
	2		0.5D	1.5D	SFM(Vc)	165	185	185	175	185	185	185	185	130
					IPT(fz)	.0011	.0016	.0021	.0027	.0034	.0043	.0042	.0045	
					RPM	2510	2290	1900	1350	1140	950	710	500	
	3-4		0.5D	1.5D	SFM(Vc)	120	135	130	135	130	130	130	130	90
					IPT(fz)	.0009	.0015	.0018	.0025	.0034	.0042	.0042	.0045	
					RPM	1800	1680	1340	1030	800	670	490	350	
	5		0.5D	1.5D	SFM(Vc)	95	105	110	110	110	110	110	115	80
					IPT(fz)	.0011	.0016	.0017	.0024	.0032	.0040	.0041	.0043	
					RPM	1450	1280	1140	850	660	550	430	300	
6	0.5D	1.5D	SFM(Vc)	165	185	185	175	185	185	185	185	130		
			IPT(fz)	.0011	.0016	.0021	.0027	.0034	.0043	.0042	.0045			
			RPM	2510	2290	1900	1350	1140	950	710	500			
7	0.5D	1.5D	SFM(Vc)	120	135	130	135	130	130	130	130	90		
			IPT(fz)	.0009	.0015	.0018	.0025	.0034	.0042	.0042	.0045			
			RPM	1800	1680	1340	1030	800	670	490	350			
8-9	0.5D	1.5D	SFM(Vc)	95	105	110	110	110	110	110	115	80		
			IPT(fz)	.0011	.0016	.0017	.0024	.0032	.0040	.0041	.0043			
			RPM	1450	1280	1140	850	660	550	430	300			
10	0.5D	1.5D	SFM(Vc)	165	185	185	175	185	185	185	185	130		
			IPT(fz)	.0011	.0016	.0021	.0027	.0034	.0043	.0042	.0045			
			RPM	2510	2290	1900	1350	1140	950	710	500			
11.1	0.5D	1.5D	SFM(Vc)	95	105	110	110	110	110	110	115	80		
			IPT(fz)	.0011	.0016	.0017	.0024	.0032	.0040	.0041	.0043			
			RPM	1450	1280	1140	850	660	550	430	300			
11.2	0.3D	1.5D	SFM(Vc)	70	70	80	75	75	75	80	55			
			IPT(fz)	.0011	.0016	.0018	.0023	.0032	.0040	.0039	.0042			
			RPM	1050	880	800	580	460	380	300	210			
M	14.1	Stainless steel	0.5D	1.5D	SFM(Vc)	110	120	120	120	120	120	120	85	
					IPT(fz)	.0010	.0015	.0018	.0025	.0034	.0042	.0040	.0043	
					RPM	1650	1440	1200	900	720	600	460	330	
K	15-20	Grey cast iron Nodular cast iron Malleable cast iron	0.5D	1.5D	SFM(Vc)	165	185	185	175	185	185	185	130	
					IPT(fz)	.0011	.0016	.0021	.0027	.0034	.0043	.0042	.0045	
					RPM	2510	2290	1900	1350	1140	950	710	500	
H	40	Hardened Cast Iron	0.3D	1.5D	SFM(Vc)	70	70	80	75	75	75	80	55	
					IPT(fz)	.0011	.0016	.0018	.0023	.0032	.0040	.0039	.0042	
					RPM	1050	880	800	580	460	380	300	210	
					IPM(FEED)	3	4	6	5	6	6	6	6	







Being the best through innovation



HSS

# SINE-POWER END MILLS

- High Performane HSS Rongher for Titanium and Titanium Alloys

SELECTION GUIDE

HSS



SERIES	E2F64
FLUTE	4&6
HELIX ANGLE	35°
CUTTING EDGE SHAPE	SQUARE
SIZE MIN	D3/4
SIZE MAX	D2
PAGE	C741

**HSSCo8**  
**SINE-POWER**  
**END MILLS**

Next Generation of Powdered Metal End Mills  
Higher Edge Strength & Feed Rates

Uncoated



Please visit [globalyg1.com/mat](http://globalyg1.com/mat) for material search

◎ : Excellent ○ : Good

Recommended cutting conditions : p. C742

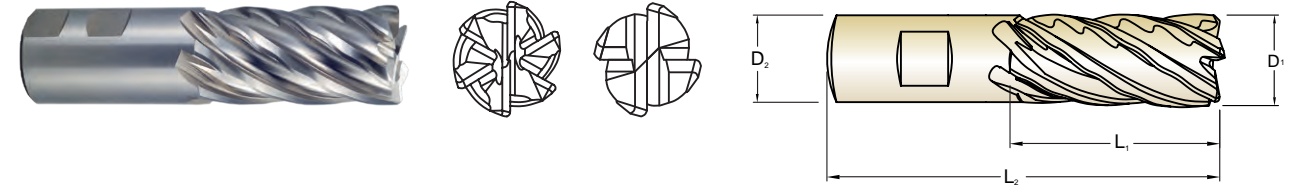
ISO	VDI 3323	Material Description	Composition / Structure / Heat Treatment	HB	HRc
P	1	Non-alloy steel	About 0.15% C Annealed	125	
	2		About 0.45% C Annealed	190	13
	3		About 0.45% C Quenched & Tempered	250	25
	4		About 0.75% C Annealed	270	28
	5	About 0.75% C Quenched & Tempered	300	32	
	6	Low alloy steel	Annealed	180	10
	7		Quenched & Tempered	275	29
	8		Quenched & Tempered	300	32
	9		Quenched & Tempered	350	38
	10	High alloyed steel, and tool steel	Annealed	200	15
11	Quenched & Tempered		325	35	
M	12	Stainless steel	Ferritic / Martensitic Annealed	200	15
	13		Martensitic Quenched & Tempered	240	23
	14	Austenitic	180	10	
K	15	Grey cast iron	Pearlitic / ferritic	180	10
	16		Pearlitic (Martensitic)	260	26
	17	Nodular cast iron	Ferritic	160	3
	18		Pearlitic	250	25
	19	Malleable cast iron	Ferritic	130	
	20		Pearlitic	230	21
N	21	Aluminum-wrought alloy	Not Curable	60	
	22		Curable Hardened	100	
	23	Aluminum-cast, alloyed	≤ 12% Si, Not Curable	75	
	24		≤ 12% Si, Curable Hardened	90	
	25		> 12% Si, Not Curable	130	
	26	Copper and Copper Alloys	Cutting Alloys, PB>1%	110	
	27		CuZn, CuSnZn (Brass)	90	
	28	(Bronze / Brass)	CuSn, lead-free copper and electrolytic copper	100	
	29	Non Metallic Materials	Duroplastic, Fiber Reinforced Plastic		
	30		Rubber, Wood, etc.		
S	31	Heat Resistant Super Alloys	Fe Based Annealed	200	15
	32		Cured	280	30
	33		Annealed	250	25
	34		Cured	350	38
	35	Ni or Co Based Cast	320	34	
	36	Titanium Alloys	Pure Titanium	400 Rm	◎
	37		Alpha + Beta Alloys Hardened	1050 Rm	◎
H	38	Hardened steel	Hardened	550	55
	39		Hardened	630	60
	40	Hardened Cast Iron	Cast	400	42
	41		Hardened	550	55

HSS



FLAT SHANK E2F64 SERIES

HSSCo8, 4&6 FLUTE



Unit : Inch

EDP No.	Mill Diameter	Shank Diameter	Length of Cut	Overall Length	Chamfer	No. of Flute
	D1	D2	L1	L2		
E2F64048	3/4	3/4	1 5/8	3 7/8	.030	4
E2F64901	3/4	3/4	2 1/4	4 1/2	.030	4
E2F64902	3/4	3/4	3	5 1/4	.030	4
E2F64064	1	1	2	4 1/2	.030	4
E2F64903	1	1	2	4 1/2	.030	6
E2F64904	1	1	3	5 1/2	.030	4
E2F64905	1	1	3	5 1/2	.030	6
E2F64906	1	1	4	6 1/2	.030	4
E2F64907	1	1	4	6 1/2	.030	6
E2F64116	1 1/4	1 1/4	2	4 1/2	.040	4
E2F64908	1 1/4	1 1/4	2	4 1/2	.040	6
E2F64909	1 1/4	1 1/4	3	5 1/2	.040	4
E2F64910	1 1/4	1 1/4	3	5 1/2	.040	6
E2F64911	1 1/4	1 1/4	4	6 1/2	.040	4
E2F64912	1 1/4	1 1/4	4	6 1/2	.040	6
E2F64132	1 1/2	1 1/4	2	4 1/2	.040	6
E2F64913	1 1/2	1 1/4	3	5 1/2	.040	6
E2F64914	1 1/2	1 1/4	4	6 1/2	.040	6
E2F64915	1 1/2	1 1/4	6	8 1/2	.040	6
E2F64200	2	2	2	5 3/4	.040	6
E2F64916	2	2	3	6 3/4	.040	6
E2F64917	2	2	4	7 3/4	.040	6
E2F64918	2	2	6	9 3/4	.040	6
E2F64919	2	2	8	11 3/4	.040	6

Cutting Dia. Tolerance(inch)	Shank Dia. Tolerance(inch)
0~ + .0030	- .0001~ - .0005

※ Radius, coatings and HSS-PM available on request

◎ : Excellent ○ : Good

ISO	P										M				K			Malleable cast iron		
	Non-alloy steel					Low alloy steel					High alloyed steel, and tool steel				Stainless steel		Grey cast iron		Nodular cast iron	
Material Description	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc	13	25	28	32	30	10	29	32	38	15	35	15	23	10	10	26	3	25	40	21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended																				

ISO	N					S				H											
	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)		Non Metallic Materials		Heat Resistant Super Alloys		Titanium Alloys		Hardened steel		Chilled Cast Iron		Hardened Cast Iron			
Material Description	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34	400Rm	1050Rm	55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400Rm	1050Rm	550	630	400	550
Recommended																◎	◎				

CBN END MILLS

i-Xmill END MILLS

i-SMART MODULAR END MILLS

X5070 END MILLS

4G MILL END MILLS

X-POWER PRO END MILLS

TitaNox-POWER END MILLS

JET-POWER END MILLS

V7 PLUS A END MILLS

V7 MILL INOX

ALU-POWER HPC END MILLS

ALU-POWER END MILLS

D-POWER GRAPHITE END MILLS

STANDARD CARBIDE

ONLY ONE COATED PM60 END MILLS

SINE-POWER

TANK-POWER END MILLS

STANDARD COBALT & HSS

TECHNICAL DATA



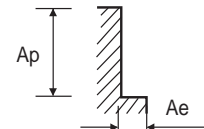
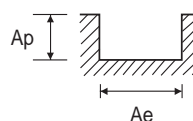
E2F64 SERIES

4&6 FLUTE - SLOTTING

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø)						
						4FL			6FL			
						3/4	1	1 1/4	1	1 1/4	1 1/2	2
S	1-2	Titanium Alloys	1D	1D	SFM (Vc)	40	40	40	40	40	40	40
					IPT (fz)	.0025	.0033	.0041	.0022	.0027	.0033	.0066
					RPM	200	150	120	150	120	100	80
	IPM (FEED)		2	2	2	2	2	2	3			
	3-4		1D	1D	SFM (Vc)	65	65	65	65	65	65	65
					IPT (fz)	.0023	.0040	.0050	.0027	.0034	.0040	.0054
RPM		330			250	200	250	200	170	120		
IPM (FEED)	3	4	4	4	4	4	4					

4&6 FLUTE - SIDE CUTTING

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø)						
						4FL			6FL			
						3/4	1	1 1/4	1	1 1/4	1 1/2	2
S	1-2	Titanium Alloys	0.5D	1.5D	SFM (Vc)	60	60	60	60	60	60	60
					IPT (fz)	.0025	.0033	.0041	.0022	.0027	.0033	.0043
					RPM	310	230	180	230	180	150	120
	IPM (FEED)		3	3	3	3	3	3	3			
	3-4		0.5D	1.5D	SFM (Vc)	75	75	75	75	75	75	75
					IPT (fz)	.0026	.0035	.0044	.0023	.0029	.0035	.0047
RPM		380			290	230	290	230	190	140		
IPM (FEED)	4	4	4	4	4	4	4					







Being the best through innovation



HSS-PM

# TANK-POWER END MILLS

- High Toughness for Stainless Steels, Carbon steels and Alloy Steels

### SELECTION GUIDE



SERIES	E9983	E9984	E9985
FLUTE	2	2	4
HELIX ANGLE	30°	30°	30°
CUTTING EDGE SHAPE	SQUARE	SQUARE	SQUARE
SIZE MIN	D1/8	D1/8	D1/8
SIZE MAX	D1	D1	D1
PAGE	C746	C747	C748

HSS-PM

# TANK-POWER END MILLS

- Next Generation of Powdered Metal End Mills  
Higher Edge Strength & Feed Rates

Please visit [globalyg1.com/mat](http://globalyg1.com/mat) for material search

⊙ : Excellent ○ : Good

Recommended cutting conditions : p. C757

REGULAR LENGTH	REGULAR LENGTH DOUBLE	REGULAR LENGTH
Uncoated	Uncoated	Uncoated
TiAlN	TiAlN	TiAlN
U.S.A Stock		



ISO	VDI 3323	Material Description	Composition / Structure / Heat Treatment	HB	HRc				
P	1	Non-alloy steel	About 0.15% C Annealed	125		⊙	⊙	⊙	
	2		About 0.45% C Annealed	190	13	⊙	⊙	⊙	
	3		About 0.45% C Quenched & Tempered	250	25	⊙	⊙	⊙	
	4		About 0.75% C Annealed	270	28	⊙	⊙	⊙	
	5		About 0.75% C Quenched & Tempered	300	32	⊙	⊙	⊙	
	6	Low alloy steel	Annealed	180	10	⊙	⊙	⊙	
	7		Quenched & Tempered	275	29	⊙	⊙	⊙	
	8		Quenched & Tempered	300	32	⊙	⊙	⊙	
	9		Quenched & Tempered	350	38	⊙	⊙	⊙	
	10		High alloyed steel, and tool steel	Annealed	200	15	⊙	⊙	⊙
	11	Quenched & Tempered		325	35	⊙	⊙	⊙	
M	12	Stainless steel	Ferritic / Martensitic Annealed	200	15				
	13		Martensitic Quenched & Tempered	240	23				
K	14	Grey cast iron	Austenitic	180	10	⊙	⊙	⊙	
	15		Pearlitic / ferritic	180	10	⊙	⊙	⊙	
	16		Pearlitic (Martensitic)	260	26	⊙	⊙	⊙	
	17		Nodular cast iron	Ferritic	160	3	⊙	⊙	⊙
	18		Pearlitic	250	25	⊙	⊙	⊙	
N	19	Malleable cast iron	Ferritic	130		⊙	⊙	⊙	
	20		Pearlitic	230	21	⊙	⊙	⊙	
	21		Aluminum-wrought alloy	Not Curable	60				
S	22	Aluminum-cast, alloyed	Curable Hardened	100					
	23		≤ 12% Si, Not Curable	75					
	24	> 12% Si, Not Curable	Hardened	90					
	25		Hardened	130					
	26	Copper and Copper Alloys (Bronze / Brass)	Cutting Alloys, PB>1%	110		○	○	○	
	27		CuZn, CuSnZn (Brass)	90		○	○	○	
	28		CuSn, lead-free copper and electrolytic copper	100		○	○	○	
	29		Non Metallic Materials	Duroplastic, Fiber Reinforced Plastic					
H	30		Rubber, Wood, etc.						
	31	Heat Resistant Super Alloys	Fe Based Annealed	200	15				
	32		Cured	280	30				
	33		Annealed	250	25				
	34		Cured	350	38				
	35		Cast	320	34				
36	Titanium Alloys	Pure Titanium	400 Rm						
37		Alpha + Beta Alloys Hardened	1050 Rm						
38	Hardened steel	Hardened	550	55					
39		Hardened	630	60					
40		Cast	400	42					
	41	Hardened Cast Iron	Hardened	550	55				

E9986	E9988	E9992	E9990	E9991	E9A86	E9A87	E9921
4	3&4	2	3~6	3~6	3~6	3~6	5~6
30°	60°	30°	30°	30°	30°	30°	35°
SQUARE	SQUARE	BALL NOSE	ROUGHING	ROUGHING	ROUGHING	ROUGHING	ROUGHING
D1/8	D1/4	R1/16	D1/4	D1/4	D5/16	D5/16	D1/2
D1	D1	R1/2	D1-1/4	D1-1/4	D1-1/4	D1-1/4	D1-1/4
C749	C750	C751	C752	C753	C754	C755	C756
REGULAR LENGTH DOUBLE	REGULAR LENGTH	REGULAR LENGTH	REGULAR LENGTH FINE PITCH	REGULAR LENGTH COARSE PITCH	LONG LENGTH FINE PITCH	LONG LENGTH COARSE PITCH	EXTENDED NECK FINE PITCH CENTER CUTTING
Uncoated	Uncoated	Uncoated	Uncoated	Uncoated	Uncoated	Uncoated	Uncoated
TiAlN	TiAlN	TiAlN	TiAlN	TiAlN	TiAlN	TiAlN	TiAlN
U.S.A Stock							



⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙
⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙
⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙
⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙
⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙
⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙
⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙
⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙
⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙
⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙
⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙
⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙
○	○	○	○	○	○	○	○
○	○	○	○	○	○	○	○
○	○	○	○	○	○	○	○
○	○	○	○	○	○	○	○

**PREMIUM HSS-PM, 2 FLUTE REGULAR LENGTH**

▶ Faster feed & speed than normal HSS can be applied to hardened steels up to Rc 45. Accordingly, HSS-PM made by powder metallurgy makes much higher productivity possible.



◆ U.S.A Stock

Unit : Inch

EDP No.	UNCOATED	TiAIN COATED	Mill Diameter	Shank Diameter	Length of Cut	Overall Length
<b>E9983012</b>	<b>E9983012TE</b>	3/16	3/8	7/16	2-5/16	
<b>E9983016</b>	<b>E9983016TE</b>	1/4	3/8	1/2	2-5/16	
<b>E9983020</b>	<b>E9983020TE</b>	5/16	3/8	9/16	2-5/16	
<b>E9983024</b>	<b>E9983024TE</b>	3/8	3/8	9/16	2-5/16	
<b>E9983032</b>	<b>E9983032TE</b>	1/2	1/2	1	3	
<b>E9983040</b>	<b>E9983040TE</b>	5/8	5/8	1-5/16	3-7/16	
<b>E9983048</b>	<b>E9983048TE</b>	3/4	3/4	1-5/16	3-7/16	
<b>E9983056</b>	<b>E9983056TE</b>	7/8	7/8	1-1/2	3-3/4	
<b>E9983064</b>	<b>E9983064TE</b>	1	1	1-5/8	4-1/8	

Mill Dia. Tolerance (inch)	
0~+.0010	** 0~+.0015

\*\* The shank of end mills is the same diameter as the cutting portion.

◎ : Excellent ○ : Good

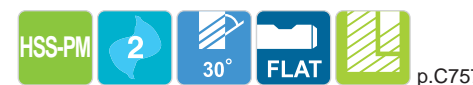
ISO	P										M				K					
	Non-alloy steel					Low alloy steel					High alloyed steel, and tool steel	Stainless steel		Grey cast iron	Nodular cast iron	Malleable cast iron				
Material Description	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc	13	25	28	32	38	10	29	32	38	15	35	15	23	10	10	26	3	25	21	21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎

ISO	N					S					H										
	Aluminum-wrought alloy	Aluminum-cast, alloyed		Copper and Copper Alloys (Bronze / Brass)		Non Metallic Materials	Heat Resistant Super Alloys			Titanium Alloys	Hardened steel	Chilled Cast Iron	Hardened Cast Iron								
Material Description	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HB	60	100	75	90	130	110	90	100			15	30	25	38	34	400 Rm	1050 Rm	55	60	42	55
Recommend						○	○	○													

**PREMIUM HSS-PM, 2 FLUTE REGULAR LENGTH DOUBLE**

▶ Series E9984, E9984 two flute, end mills are the double end version of E9983, E9983 single-end tools. Faster feed & speed than normal HSS can be applied to hardened steels up to Rc 45. Accordingly, HSS-PM made by powder metallurgy makes much higher productivity possible.



◆ U.S.A Stock

Unit : Inch

EDP No.	UNCOATED	TiAIN COATED	Mill Diameter	Shank Diameter	Length of Cut	Overall Length
<b>E9984012</b>	<b>E9984012TE</b>	3/16	3/8	7/16	3-1/8	
<b>E9984016</b>	<b>E9984016TE</b>	1/4	3/8	1/2	3-1/8	
<b>E9984020</b>	<b>E9984020TE</b>	5/16	3/8	9/16	3-1/8	
<b>E9984024</b>	<b>E9984024TE</b>	3/8	3/8	9/16	3-1/8	
<b>E9984032</b>	<b>E9984032TE</b>	1/2	1/2	13/16	3-3/4	
<b>E9984040</b>	<b>E9984040TE</b>	5/8	5/8	1-1/8	4-1/2	
<b>E9984048</b>	<b>E9984048TE</b>	3/4	3/4	1-5/16	5	
<b>E9984056</b>	<b>E9984056TE</b>	7/8	7/8	1-9/16	5-1/2	
<b>E9984064</b>	<b>E9984064TE</b>	1	1	1-5/8	5-7/8	

Mill Dia. Tolerance (inch)	
0~+.0010	** 0~- .0020

\*\* The shank of end mills is the same diameter as the cutting portion.

◎ : Excellent ○ : Good

ISO	P										M				K					
	Non-alloy steel					Low alloy steel					High alloyed steel, and tool steel	Stainless steel		Grey cast iron	Nodular cast iron	Malleable cast iron				
Material Description	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc	13	25	28	32	38	10	29	32	38	15	35	15	23	10	10	26	3	25	21	21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎

ISO	N					S					H										
	Aluminum-wrought alloy	Aluminum-cast, alloyed		Copper and Copper Alloys (Bronze / Brass)		Non Metallic Materials	Heat Resistant Super Alloys			Titanium Alloys	Hardened steel	Chilled Cast Iron	Hardened Cast Iron								
Material Description	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HB	60	100	75	90	130	110	90	100			15	30	25	38	34	400 Rm	1050 Rm	55	60	42	55
Recommend						○	○	○													



**PREMIUM HSS-PM, 4 FLUTE REGULAR LENGTH**

▶ Faster feed & speed than normal HSS can be applied to hardened steels up to Rc 45. Accordingly, HSS-PM made by powder metallurgy makes much higher productivity possible.



◆ U.S.A Stock

Unit : Inch

EDP No.		Mill Diameter	Shank Diameter	Length of Cut	Overall Length
UNCOATED	TiAIN COATED				
<a href="#">E9985008</a>	<a href="#">E9985008TE</a>	1/8	3/8	3/8	2-5/16
<a href="#">E9985012</a>	<a href="#">E9985012TE</a>	3/16	3/8	1/2	2-3/8
<a href="#">E9985016</a>	<a href="#">E9985016TE</a>	1/4	3/8	5/8	2-7/16
<a href="#">E9985020</a>	<a href="#">E9985020TE</a>	5/16	3/8	3/4	2-1/2
<a href="#">E9985024</a>	<a href="#">E9985024TE</a>	3/8	3/8	3/4	2-1/2
<a href="#">E9985032</a>	<a href="#">E9985032TE</a>	1/2	1/2	1-1/4	3-1/4
<a href="#">E9985040</a>	<a href="#">E9985040TE</a>	5/8	5/8	1-5/8	3-3/4
<a href="#">E9985048</a>	<a href="#">E9985048TE</a>	3/4	3/4	1-5/8	3-7/8
<a href="#">E9985056</a>	<a href="#">E9985056TE</a>	7/8	7/8	1-7/8	4-1/8
<a href="#">E9985064</a>	<a href="#">E9985064TE</a>	1	1	2	4-1/2

Mill Dia. Tolerance (inch)	
0~+.0010	** 0~-.0015

\*\* The shank of end mills is the same diameter as the cutting portion.

◎ : Excellent ○ : Good

ISO	P										M				K					
	Non-alloy steel					Low alloy steel					High alloyed steel, and tool steel	Stainless steel		Grey cast iron	Nodular cast iron	Malleable cast iron				
Material Description	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc	13	25	28	32	30	10	29	32	38	15	35	15	23	10	10	26	3	25	21	21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎

ISO	N					S					H										
	Aluminum-wrought alloy	Aluminum-cast, alloyed		Copper and Copper Alloys (Bronze / Brass)		Non Metallic Materials	Heat Resistant Super Alloys			Titanium Alloys	Hardened steel	Chilled Cast Iron	Hardened Cast Iron								
Material Description	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HB	60	100	75	90	130	110	90	100			15	30	25	38	34	400 Rm	1050 Rm	55	60	42	55
Recommend						○	○	○													

**PREMIUM HSS-PM, 4 FLUTE REGULAR LENGTH DOUBLE**

▶ Series E9986,EP986 four flute end mills are the double end version of E9985,EP985 single-end tools. Faster feed & speed than normal HSS can be applied to hardened steels up to Rc 45. Accordingly, HSS-PM made by powder metallurgy makes much higher productivity possible.



◆ U.S.A Stock

Unit : Inch

EDP No.		Mill Diameter	Shank Diameter	Length of Cut	Overall Length
UNCOATED	TiAIN COATED				
<a href="#">E9986008</a>	<a href="#">E9986008TE</a>	1/8	3/8	3/8	3-1/16
<a href="#">E9986012</a>	<a href="#">E9986012TE</a>	3/16	3/8	1/2	3-1/4
<a href="#">E9986016</a>	<a href="#">E9986016TE</a>	1/4	3/8	5/8	3-3/8
<a href="#">E9986020</a>	<a href="#">E9986020TE</a>	5/16	3/8	3/4	3-1/2
<a href="#">E9986024</a>	<a href="#">E9986024TE</a>	3/8	3/8	3/4	3-1/2
<a href="#">E9986032</a>	<a href="#">E9986032TE</a>	1/2	1/2	1	4-1/8
<a href="#">E9986040</a>	<a href="#">E9986040TE</a>	5/8	5/8	1-3/8	5
<a href="#">E9986048</a>	<a href="#">E9986048TE</a>	3/4	3/4	1-5/8	5-5/8
<a href="#">E9986056</a>	<a href="#">E9986056TE</a>	7/8	7/8	1-7/8	6-1/8
<a href="#">E9986064</a>	<a href="#">E9986064TE</a>	1	1	1-7/8	6-3/8

Mill Dia. Tolerance (inch)	
0~+.0010	** 0~-.0015

\*\* The shank of end mills is the same diameter as the cutting portion.

◎ : Excellent ○ : Good

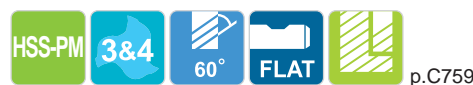
ISO	P										M				K					
	Non-alloy steel					Low alloy steel					High alloyed steel, and tool steel	Stainless steel		Grey cast iron	Nodular cast iron	Malleable cast iron				
Material Description	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc	13	25	28	32	30	10	29	32	38	15	35	15	23	10	10	26	3	25	21	21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎

ISO	N					S					H										
	Aluminum-wrought alloy	Aluminum-cast, alloyed		Copper and Copper Alloys (Bronze / Brass)		Non Metallic Materials	Heat Resistant Super Alloys			Titanium Alloys	Hardened steel	Chilled Cast Iron	Hardened Cast Iron								
Material Description	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HB	60	100	75	90	130	110	90	100			15	30	25	38	34	400 Rm	1050 Rm	55	60	42	55
Recommend						○	○	○													

**PREMIUM HSS-PM, 3&4 FLUTE 60° HELIX REGULAR LENGTH**

▶ Faster feed & speed than normal HSS can be applied to hardened steels up to Rc 45. Accordingly, HSS-PM made by powder metallurgy makes much higher productivity possible.



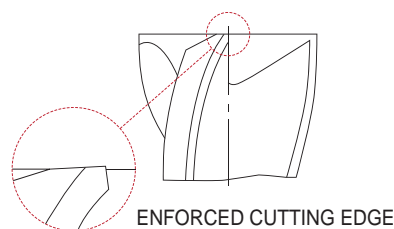
◆ U.S.A Stock

Unit : Inch

EDP No.		Mill Diameter	Shank Diameter	Length of Cut	Overall Length	Overall Length
UNCOATED	TiAIN COATED					
<a href="#">E9988016</a>	<a href="#">E9988016TE</a>	1/4	3/8	5/8	2-7/16	3
<a href="#">E9988020</a>	<a href="#">E9988020TE</a>	5/16	3/8	3/4	2-1/2	3
<a href="#">E9988024</a>	<a href="#">E9988024TE</a>	3/8	3/8	3/4	2-1/2	3
<a href="#">E9988028</a>	<a href="#">E9988028TE</a>	7/16	3/8	1	2-11/16	3
<a href="#">E9988032</a>	<a href="#">E9988032TE</a>	1/2	1/2	1-1/4	3-1/4	3
<a href="#">E9988040</a>	<a href="#">E9988040TE</a>	5/8	5/8	1-5/8	3-3/4	3
<a href="#">E9988048</a>	<a href="#">E9988048TE</a>	3/4	3/4	1-5/8	3-7/8	3
<a href="#">E9988901</a>	<a href="#">E9988901TE</a>	7/8	3/4	1-7/8	4-1/8	4
<a href="#">E9988056</a>	<a href="#">E9988056TE</a>	7/8	7/8	1-7/8	4-1/8	4
<a href="#">E9988064</a>	<a href="#">E9988064TE</a>	1	1	2	4-1/2	4

Mill Dia. Tolerance (inch)	
0~+.0010	** 0~+.0015

\*\* The shank of end mills is the same diameter as the cutting portion.



ENFORCED CUTTING EDGE

◎ : Excellent ○ : Good

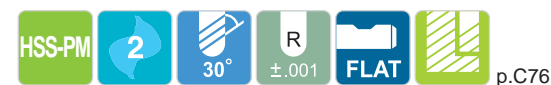
ISO	P										M				K					
	Non-alloy steel					Low alloy steel					High alloyed steel, and tool steel		Stainless steel		Grey cast iron	Nodular cast iron	Malleable cast iron			
Material Description	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc	13	25	28	32	30	10	29	32	38	15	35	15	23	10	10	26	3	25	21	21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎

ISO	N					S					H										
	Aluminum-wrought alloy		Aluminum-cast, alloyed		Copper and Copper Alloys (Bronze / Brass)	Non Metallic Materials		Heat Resistant Super Alloys			Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron						
Material Description	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HB	60	100	75	90	130	110	90	100			15	30	25	38	34	400 Rm	1050 Rm	55	60	42	55
Recommend						○	○	○													

**PREMIUM HSS-PM, 2 FLUTE REGULAR LENGTH BALL NOSE**

▶ The two flute ball end mills are designed for milling of radius bottom slots, fillets and special contours. The end teeth are cut to center allowing these end mills to drill into material at the beginning of a slotting cut. The two flute design provides good chip removal ability in slotting.



◆ U.S.A Stock

Unit : Inch

EDP No.		Radius of Ball Nose R (±.001)	Mill Diameter	Shank Diameter	Length of Cut	Overall Length
UNCOATED	TiAIN COATED					
<a href="#">E9992008</a>	<a href="#">E9992008TE</a>	R1/16	1/8	3/8	3/8	2-5/16
<a href="#">E9992012</a>	<a href="#">E9992012TE</a>	R3/32	3/16	3/8	1/2	2-3/8
<a href="#">E9992016</a>	<a href="#">E9992016TE</a>	R1/8	1/4	3/8	5/8	2-7/16
<a href="#">E9992020</a>	<a href="#">E9992020TE</a>	R5/32	5/16	3/8	3/4	2-1/2
<a href="#">E9992024</a>	<a href="#">E9992024TE</a>	R3/16	3/8	3/8	3/4	2-1/2
<a href="#">E9992032</a>	<a href="#">E9992032TE</a>	R1/4	1/2	1/2	1	3
<a href="#">E9992040</a>	<a href="#">E9992040TE</a>	R5/16	5/8	5/8	1-3/8	3-1/2
<a href="#">E9992048</a>	<a href="#">E9992048TE</a>	R3/8	3/4	3/4	1-5/8	3-7/8
<a href="#">E9992056</a>	<a href="#">E9992056TE</a>	R7/16	7/8	7/8	2	4-1/4
<a href="#">E9992064</a>	<a href="#">E9992064TE</a>	R1/2	1	1	2-1/4	4-3/4

Mill Dia. Tolerance (inch)
0~-.0015

◎ : Excellent ○ : Good

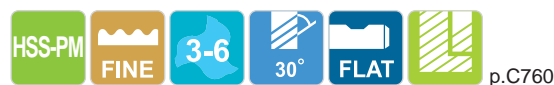
ISO	P										M				K					
	Non-alloy steel					Low alloy steel					High alloyed steel, and tool steel		Stainless steel		Grey cast iron	Nodular cast iron	Malleable cast iron			
Material Description	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc	13	25	28	32	30	10	29	32	38	15	35	15	23	10	10	26	3	25	21	21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎

ISO	N					S					H										
	Aluminum-wrought alloy		Aluminum-cast, alloyed		Copper and Copper Alloys (Bronze / Brass)	Non Metallic Materials		Heat Resistant Super Alloys			Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron						
Material Description	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HB	60	100	75	90	130	110	90	100			15	30	25	38	34	400 Rm	1050 Rm	55	60	42	55
Recommend						○	○	○													

## PREMIUM HSS-PM, MULTI FLUTE REGULAR LENGTH FINE PITCH ROUGHING

► This TANK-POWER rougher is designed for high production metal removal in a wide range of work piece material. It is suitable for a very broad spectrum of materials having up to high tensile strengths. In many cases, the milled surfaces are of acceptable quality.

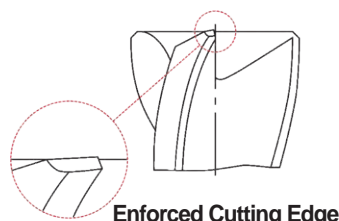


◆ U.S.A Stock

Unit : Inch

EDP No.	UNCOATED	TiAIN COATED	Mill Diameter	Shank Diameter	Length of Cut	Overall Length	No. of Flute
E9990016		F9990016TE	1/4	3/8	5/8	2-7/16	3
E9990907		F9990907TE	1/4	3/8	1-1/8	2-15/16	3
E9990020		F9990020TE	5/16	3/8	3/4	2-1/2	3
E9990024		F9990024TE	3/8	3/8	3/4	2-1/2	4
E9990028		F9990028TE	7/16	3/8	1	2-11/16	4
E9990032		F9990032TE	1/2	1/2	1-1/4	3-1/4	4
E9990908		F9990908TE	1/2	1/2	1-5/8	3-5/8	4
E9990036		F9990036TE	9/16	1/2	1-3/8	3-3/8	4
E9990040		F9990040TE	5/8	5/8	1-5/8	3-3/4	4
E9990048		F9990048TE	3/4	3/4	1-5/8	3-7/8	4
E9990948		F9990948TE	3/4	5/8	1-5/8	3-7/8	4
E9990909		F9990909TE	3/4	3/4	2-1/2	4-3/4	4
E9990056		F9990056TE	7/8	7/8	1-7/8	4-1/8	5
E9990901		F9990901TE	7/8	3/4	1-7/8	4-1/8	5
E9990064		F9990064TE	1	1	2	4-1/2	5
E9990905		F9990905TE	1	1	3	5-1/2	5
E9990108		F9990108TE	1-1/8	1	2	4-1/2	6
E9990116		F9990116TE	1-1/4	1-1/4	2	4-1/2	6
E9990906		F9990906TE	1-1/4	1-1/4	3	5-1/2	6

Mill Dia. Tolerance (inch)	
up to 1	0~+.0030
over 1	0~+.0060



Enforced Cutting Edge

◎ : Excellent ○ : Good

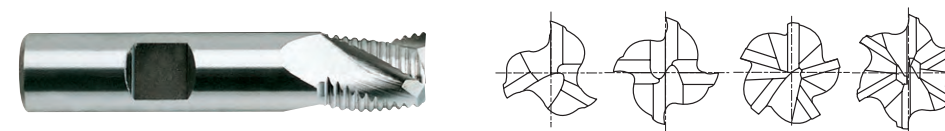
ISO	P										M				K			H			
	Non-alloy steel					Low alloy steel					High alloyed steel, and tool steel				Stainless steel		Grey cast iron	Nodular cast iron		Malleable cast iron	
Material Description	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
HRc	13	25	28	32	30	10	29	32	38	15	35	15	23	10	10	26	3	25	21	21	
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230	
Recommend	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎

ISO	N					S					H											
	Aluminum-wrought alloy		Aluminum-cast, alloyed		Copper and Copper Alloys (Bronze / Brass)	Non Metallic Materials		Heat Resistant Super Alloys			Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron							
Material Description	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	
HRc	60	100	75	90	130	110	90	100			15	30	25	38	34	400 Rm	1050 Rm	55	60	42	55	
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550	
Recommend						○	○	○														

## PREMIUM HSS-PM, MULTI FLUTE REGULAR LENGTH COARSE PITCH ROUGHING

► This TANK-POWER rougher is designed for high production metal removal in a wide range of work piece material. It is suitable for a very broad spectrum of materials having up to high tensile strengths.

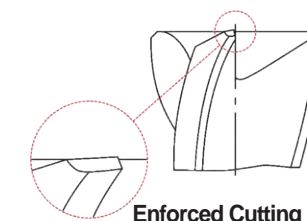


◆ U.S.A Stock

Unit : Inch

EDP No.	UNCOATED	TiAIN COATED	Mill Diameter	Shank Diameter	Length of Cut	Overall Length	No. of Flute
E9991016		F9991016TE	1/4	3/8	5/8	2-7/16	3
E9991902		F9991902TE	1/4	3/8	1-1/8	2-15/16	3
E9991020		F9991020TE	5/16	3/8	3/4	2-1/2	3
E9991024		F9991024TE	3/8	3/8	3/4	2-1/2	4
E9991028		F9991028TE	7/16	3/8	1	2-11/16	4
E9991032		F9991032TE	1/2	1/2	1-1/4	3-1/4	4
E9991903		F9991903TE	1/2	1/2	1-5/8	3-5/8	4
E9991036		F9991036TE	9/16	1/2	1-3/8	3-3/8	4
E9991040		F9991040TE	5/8	5/8	1-5/8	3-3/4	4
E9991048		F9991048TE	3/4	3/4	1-5/8	3-7/8	4
E9991948		F9991948TE	3/4	5/8	1-5/8	3-7/8	4
E9991904		F9991904TE	3/4	3/4	2-1/2	4-3/4	4
E9991056		F9991056TE	7/8	7/8	1-7/8	4-1/8	5
E9991901		F9991901TE	7/8	3/4	1-7/8	4-1/8	5
E9991064		F9991064TE	1	1	2	4-1/2	5
E9991905		F9991905TE	1	1	3	5-1/2	5
E9991108		F9991108TE	1-1/8	1	2	4-1/2	6
E9991116		F9991116TE	1-1/4	1-1/4	2	4-1/2	6
E9991906		F9991906TE	1-1/4	1-1/4	3	5-1/2	6

Mill Dia. Tolerance (inch)	
up to 1	0~+.0030
over 1	0~+.0060



Enforced Cutting Edge

◎ : Excellent ○ : Good

ISO	P										M				K			H			
	Non-alloy steel					Low alloy steel					High alloyed steel, and tool steel				Stainless steel		Grey cast iron	Nodular cast iron		Malleable cast iron	
Material Description	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
HRc	13	25	28	32	30	10	29	32	38	15	35	15	23	10	10	26	3	25	21	21	
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230	
Recommend	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎

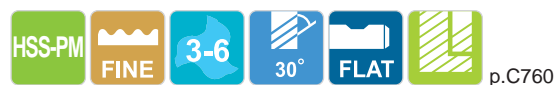
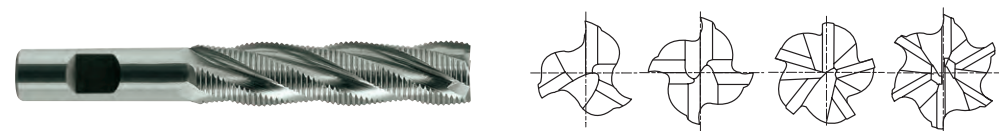
  

ISO	N					S					H											
	Aluminum-wrought alloy		Aluminum-cast, alloyed		Copper and Copper Alloys (Bronze / Brass)	Non Metallic Materials		Heat Resistant Super Alloys			Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron							
Material Description	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	
HRc	60	100	75	90	130	110	90	100			15	30	25	38	34	400 Rm	1050 Rm	55	60	42	55	
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550	
Recommend						○	○	○														



**PREMIUM HSS-PM, MULTI FLUTE LONG LENGTH FINE PITCH ROUGHING**

▶ This TANK-POWER rougher is designed for high production metal removal in a wide range of work piece material. It is suitable for a very broad spectrum of materials having up to high tensile strengths.

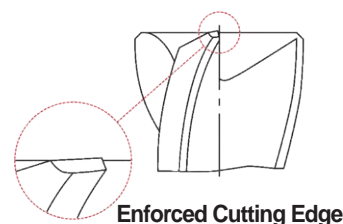


◆ U.S.A Stock

Unit : Inch

EDP No.	UNCOATED	TiAIN COATED	Mill Diameter	Shank Diameter	Length of Cut	Overall Length	No. of Flute
<b>E9A86024</b>	<b>E9A86024TE</b>	3/8	3/8	1-1/2	3-1/4	4	
<b>E9A86924</b>	<b>E9A86924TE</b>	3/8	3/8	1-1/2	4	4	
<b>E9A86032</b>	<b>E9A86032TE</b>	1/2	1/2	2	4	4	
<b>E9A86040</b>	<b>E9A86040TE</b>	5/8	5/8	2-1/2	4-5/8	4	
<b>E9A86048</b>	<b>E9A86048TE</b>	3/4	5/8	3	5-1/8	4	
<b>E9990902</b>	<b>E9990902TE</b>	3/4	3/4	3	5-1/4	4	
<b>E9A86056</b>	<b>E9A86056TE</b>	7/8	3/4	3-1/2	5-3/4	5	
<b>E9A86956</b>	<b>E9A86956TE</b>	7/8	7/8	3-1/2	5-3/4	5	
<b>E9990903</b>	<b>E9990903TE</b>	1	1	4	6-1/2	5	
<b>E9A86116</b>	<b>E9A86116TE</b>	1-1/4	3/4	4	6-1/4	6	
<b>E9990904</b>	<b>E9990904TE</b>	1-1/4	1-1/4	4	6-1/2	6	

Mill Dia. Tolerance (inch)	
up to 1	0~+.0030
over 1	0~+.0060



Enforced Cutting Edge

◎ : Excellent ○ : Good

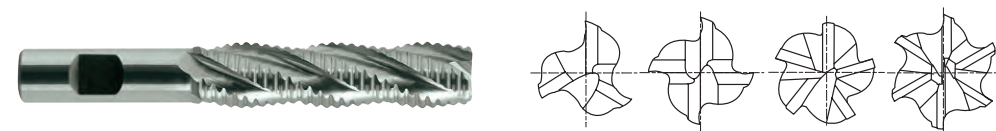
ISO	P										M				K			H		
	Non-alloy steel					Low alloy steel					High alloyed steel, and tool steel				Stainless steel		Grey cast iron		Nodular cast iron	Malleable cast iron
Material Description	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc	13	25	28	32	38	10	29	32	38	15	35	15	23	10	10	26	3	25	130	21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎

ISO	N					S					H										
	Aluminum-wrought alloy		Aluminum-cast, alloyed		Copper and Copper Alloys (Bronze / Brass)	Non Metallic Materials		Heat Resistant Super Alloys			Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron						
Material Description	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HB	60	100	75	90	130	110	90	100			15	30	25	38	34	400 Rm	1050 Rm	55	60	42	55
Recommend						○	○	○													

**PREMIUM HSS-PM, MULTI FLUTE LONG LENGTH COARSE PITCH ROUGHING**

▶ This TANK-POWER rougher is designed for high production metal removal in a wide range of work piece material. It is suitable for a very broad spectrum of materials having up to high tensile strengths.

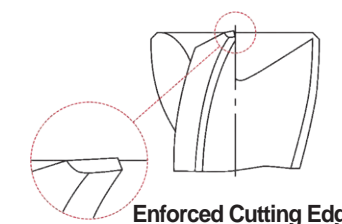


◆ U.S.A Stock

Unit : Inch

EDP No.	UNCOATED	TiAIN COATED	Mill Diameter	Shank Diameter	Length of Cut	Overall Length	No. of Flute
<b>E9A87024</b>	<b>E9A87024TE</b>	3/8	3/8	1-1/2	3-1/4	4	
<b>E9A87924</b>	<b>E9A87924TE</b>	3/8	3/8	1-1/2	4	4	
<b>E9A87032</b>	<b>E9A87032TE</b>	1/2	1/2	2	4	4	
<b>E9A87040</b>	<b>E9A87040TE</b>	5/8	5/8	2-1/2	4-5/8	4	
<b>E9A87048</b>	<b>E9A87048TE</b>	3/4	5/8	3	5-1/8	4	
<b>E9A87948</b>	<b>E9A87948TE</b>	3/4	3/4	3	5-1/4	4	
<b>E9A87056</b>	<b>E9A87056TE</b>	7/8	3/4	3-1/2	5-3/4	5	
<b>E9A87956</b>	<b>E9A87956TE</b>	7/8	7/8	3-1/2	5-3/4	5	
<b>E9A87064</b>	<b>E9A87064TE</b>	1	1	4	6-1/2	5	
<b>E9A87116</b>	<b>E9A87116TE</b>	1-1/4	3/4	4	6-1/4	6	
<b>E9A87917</b>	<b>E9A87917TE</b>	1-1/4	1-1/4	4	6-1/2	6	

Mill Dia. Tolerance (inch)	
up to 1	0~+.0030
over 1	0~+.0060



Enforced Cutting Edge

◎ : Excellent ○ : Good

ISO	P										M				K			H		
	Non-alloy steel					Low alloy steel					High alloyed steel, and tool steel				Stainless steel		Grey cast iron		Nodular cast iron	Malleable cast iron
Material Description	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc	13	25	28	32	38	10	29	32	38	15	35	15	23	10	10	26	3	25	130	21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎

ISO	N					S					H										
	Aluminum-wrought alloy		Aluminum-cast, alloyed		Copper and Copper Alloys (Bronze / Brass)	Non Metallic Materials		Heat Resistant Super Alloys			Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron						
Material Description	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HB	60	100	75	90	130	110	90	100			15	30	25	38	34	400 Rm	1050 Rm	55	60	42	55
Recommend						○	○	○													



FLAT SHANK E9921 SERIES

PREMIUM HSS-PM, MULTI FLUTE FINE PITCH ROUGHING EXTENDED NECK CENTER CUTTING

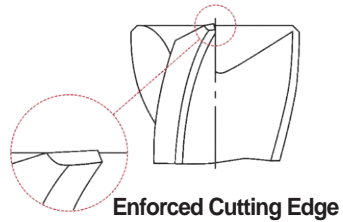
This TANK-POWER rougher is designed for high production metal removal in a wide range of work piece material. It is suitable for a very broad spectrum of materials having up to high tensile strengths.



U.S.A Stock

Table with columns: EDP No., UNCOATED, TiAIN COATED, Mill Diameter, Shank Diameter, Length of Cut, Reach Extended Neck, Overall Length, No. of Flute. Lists various end mill models like EP20322, EP20402, etc.

Table for Mill Dia. Tolerance (inch) with rows for up to 1 and over 1, and columns for UNCOATED and TiAIN COATED.



Large material compatibility table with columns for ISO, Material Description, and various material groups like Non-alloy steel, Low alloy steel, High alloyed steel, etc.

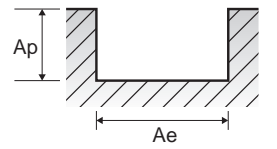


RECOMMENDED CUTTING CONDITIONS

E9983, E9984 SERIES 2 FLUTE - SLOTTING

SFM(Vc) = ft./min. IPT(fz) = in./tooth RPM = rev./min. IPM(Feed) = in./min.

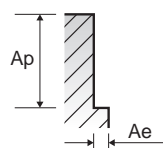
Large cutting conditions table with columns for ISO, VDI 3323, Material Description, Ae, Ap, Parameter, and Diameter (Ø) with sub-columns for various diameters from 1/8 to 1.



### E9985, E9986 SERIES 4 FLUTE - SIDE CUTTING

SFM(Vc) = ft./min.  
IPT(fz) = in./tooth  
RPM = rev./min.  
IPM(Feed) = in./min.

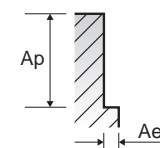
ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø)												
						1/8	3/16	1/4	5/16	3/8	1/2	5/8	3/4	7/8	1			
P	1	Non-alloy steel	0.1D	1.5D	SFM(Vc)	205	225	250	255	245	250	260	275	235	260			
					IPT(fz)	.0007	.0011	.0015	.0018	.0025	.0029	.0031	.0032	.0038	.0037			
					RPM	6300	4600	3800	3100	2500	1900	1600	1400	1030	1000			
	2		0.1D	1.5D	SFM(Vc)	195	200	215	215	215	225	230	225	215	215			
					IPT(fz)	.0006	.0010	.0014	.0018	.0023	.0027	.0030	.0033	.0033	.0036			
					RPM	6000	4100	3300	2600	2200	1720	1410	1150	930	830			
	3-4		0.1D	1.5D	SFM(Vc)	140	150	165	165	165	165	165	165	155	160			
					IPT(fz)	.0006	.0010	.0013	.0018	.0022	.0028	.0033	.0035	.0036	.0035			
					RPM	4250	3040	2500	2000	1680	1270	1000	830	680	620			
	5		0.1D	1.5D	SFM(Vc)	90	100	110	115	115	115	115	115	110	110			
					IPT(fz)	.0007	.0010	.0014	.0017	.0022	.0027	.0032	.0031	.0034	.0033			
RPM		2700			2070	1700	1400	1180	860	690	580	470	420					
6	0.1D	1.5D	SFM(Vc)	195	200	215	215	215	225	230	225	215	215					
			IPT(fz)	.0006	.0010	.0014	.0018	.0023	.0027	.0030	.0033	.0033	.0036					
			RPM	6000	4100	3300	2600	2200	1720	1410	1150	930	830					
7	0.1D	1.5D	SFM(Vc)	140	150	165	165	165	165	165	165	155	160					
			IPT(fz)	.0006	.0010	.0013	.0018	.0022	.0028	.0033	.0035	.0036	.0035					
			RPM	4250	3040	2500	2000	1680	1270	1000	830	680	620					
8	0.1D	1.5D	SFM(Vc)	90	100	110	115	115	115	115	115	110	110					
			IPT(fz)	.0007	.0010	.0014	.0017	.0022	.0027	.0032	.0031	.0034	.0033					
			RPM	2700	2070	1700	1400	1180	860	690	580	470	420					
9	0.1D	1.5D	SFM(Vc)	75	85	90	95	95	90	100	90	90	95					
			IPT(fz)	.0005	.0009	.0013	.0016	.0020	.0010	.0027	.0030	.0033	.0034					
			RPM	2320	1780	1400	1150	960	690	620	470	390	360					
10	0.1D	1.5D	SFM(Vc)	195	200	215	215	215	225	230	225	215	215					
			IPT(fz)	.0006	.0010	.0014	.0018	.0023	.0027	.0030	.0033	.0033	.0036					
			RPM	6000	4100	3300	2600	2200	1720	1410	1150	930	830					
11.1	0.1D	1.5D	SFM(Vc)	90	100	110	115	115	115	115	115	110	110					
			IPT(fz)	.0007	.0010	.0014	.0017	.0022	.0027	.0032	.0031	.0034	.0033					
			RPM	2700	2070	1700	1400	1180	860	690	580	470	420					
M	14.1	Stainless steel	0.1D	0.5D	SFM(Vc)	75	85	90	95	95	90	90	90	95				
					IPT(fz)	.0005	.0009	.0013	.0016	.0020	.0010	.0027	.0030	.0033	.0034			
					RPM	2320	1780	1400	1150	960	690	620	470	390	360			
K	15-20	Grey cast iron Nodular cast iron Malleable cast iron	0.1D	1.5D	SFM(Vc)	195	200	215	215	215	225	230	225	215	215			
					IPT(fz)	.0006	.0010	.0014	.0018	.0023	.0027	.0030	.0033	.0033	.0036			
					RPM	6000	4100	3300	2600	2200	1720	1410	1150	930	830			



### E9988 SERIES 3&4 FLUTE - SIDE CUTTING

SFM(Vc) = ft./min.  
IPT(fz) = in./tooth  
RPM = rev./min.  
IPM(Feed) = in./min.

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø)												
						1/4	5/16	3/8	1/2	5/8	3/4	7/8	1					
P	1-2	Non-alloy steel	0.3D	1.5D	SFM(Vc)	250	250	265	240	215	175	165	165					
					IPT(fz)	.0007	.0009	.0010	.0017	.0028	.0054	.0058	.0075					
					RPM	3850	3050	2700	1850	1300	900	720	630					
	3-4		0.3D	1.5D	SFM(Vc)	165	170	165	155	140	115	110	110					
					IPT(fz)	.0007	.0010	.0012	.0018	.0034	.0068	.0074	.0096					
					RPM	2500	2100	1700	1200	850	580	480	420					
	5		0.3D	1.5D	SFM(Vc)	125	140	140	125	115	95	85	90					
					IPT(fz)	.0006	.0007	.0009	.0014	.0026	.0055	.0058	.0075					
					RPM	1900	1700	1450	960	690	480	380	340					
	6		0.3D	1.5D	SFM(Vc)	250	250	265	240	215	175	165	165					
					IPT(fz)	.0007	.0009	.0010	.0017	.0028	.0054	.0058	.0075					
RPM		3850			3050	2700	1850	1300	900	720	630							
7	0.3D	1.5D	SFM(Vc)	165	170	165	155	140	115	110	110							
			IPT(fz)	.0007	.0010	.0012	.0018	.0034	.0068	.0074	.0096							
			RPM	2500	2100	1700	1200	850	580	480	420							
8-9	0.3D	1.5D	SFM(Vc)	125	140	140	125	115	95	85	90							
			IPT(fz)	.0006	.0007	.0009	.0014	.0026	.0055	.0058	.0075							
			RPM	1900	1700	1450	960	690	480	380	340							
10	0.3D	1.5D	SFM(Vc)	250	250	265	240	215	175	165	165							
			IPT(fz)	.0007	.0009	.0010	.0017	.0028	.0054	.0058	.0075							
			RPM	3850	3050	2700	1850	1300	900	720	630							
11.1	0.3D	1.5D	SFM(Vc)	125	140	140	125	115	95	85	90							
			IPT(fz)	.0006	.0007	.0009	.0014	.0026	.0055	.0058	.0075							
			RPM	1900	1700	1450	960	690	480	380	340							
M	14.1	Stainless steel	0.3D	1.5D	SFM(Vc)	125	140	140	125	115	95	85	90					
					IPT(fz)	.0006	.0007	.0009	.0014	.0026	.0055	.0058	.0075					
					RPM	1900	1700	1450	960	690	480	380	340					
K	15-20	Grey cast iron Nodular cast iron Malleable cast iron	0.3D	1.5D	SFM(Vc)	250	250	265	240	215	175	165	165					
					IPT(fz)	.0007	.0009	.0010	.0017	.0028	.0054	.0058	.0075					
					RPM	3850	3050	2700	1850	1300	900	720	630					







RECOMMENDED CUTTING CONDITIONS



RECOMMENDED CUTTING CONDITIONS

E9990, E9991, E9A86, E9A87, E9921 SERIES MULTI FLUTE - SIDE CUTTING

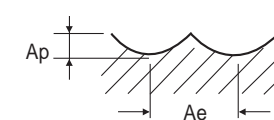
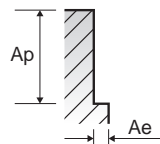
E9992 SERIES 2 FLUTE BALL NOSE - PROFILING

SFM(Vc) = ft./min.
IPT(fz) = in./tooth
RPM = rev./min.
IPM(Feed) = in./min.

Table with columns: ISO, VDI 3323, Material Description, Ae, Ap, Parameter, Diameter (Ø) (1/4, 3/8, 1/2, 5/8, 3/4, 7/8, 1). Rows include Non-alloy steel, Low alloy steel, High alloyed steel, and tool steel, Stainless steel, and Grey cast iron.

Table with columns: ISO, VDI 3323, Material Description, Ae, Ap, Parameter, Diameter (Ø) (1/8, 3/16, 1/4, 5/16, 3/8, 1/2, 5/8, 3/4, 7/8, 1). Rows include Non-alloy steel, Low alloy steel, High alloyed steel, and tool steel, Stainless steel, and Grey cast iron.

SFM(Vc) = ft./min.
IPT(fz) = in./tooth
RPM = rev./min.
IPM(Feed) = in./min.



※ The Feed, in long & extra long types, should be reduced by around 50%.



Global Cutting Tool Leader **YG-1**



MILLING



Being the best through innovation

HSSCo8 & HSS

# COBALT & HSS END MILLS

- General Purpose / Coating Available



SELECTION GUIDE



SERIES	Inch					
	E2030 E1030	E2080 E1080	E2033 E1033	E2050 E1050	E2110 E1110	E2111 E1111
FLUTE	2	2	2	2	2	2
HELIX ANGLE	30°	30°	30°	30°	30°	30°
CUTTING EDGE SHAPE	SQUARE	SQUARE	SQUARE	SQUARE	BALL NOSE	BALL NOSE
SIZE MIN	D1/8	D1/4	D1/8	D1/8	R1/16	R1/16
SIZE MAX	D2	D2	D1-1/4	D1	R1	R1/2
PAGE	C771	C773	C774	C775	C777	C778

## HSSCo8 & HSS

# COBALT & HSS

## END MILLS

General Purpose, Non-coated, Any Coating Available

Please visit [globalyg1.com/mat](http://globalyg1.com/mat) for material search

© : Excellent ○ : Good

Recommended cutting conditions : p. C833

ISO	VDI 3323	Material Description	Composition / Structure / Heat Treatment		HB	HRc	Inch						
P	1	Non-alloy steel	About 0.15% C	Annealed	125		○	○	○	○	○	○	
	2		About 0.45% C	Annealed	190	13	○	○	○	○	○	○	
	3		About 0.45% C	Quenched & Tempered	250	25	○	○	○	○	○	○	
	4		About 0.75% C	Annealed	270	28	○	○	○	○	○	○	
	5		About 0.75% C	Quenched & Tempered	300	32	○	○	○	○	○	○	
	6	Low alloy steel	Annealed	180	10	○	○	○	○	○	○	○	
	7		Quenched & Tempered	275	29	○	○	○	○	○	○	○	
	8		Quenched & Tempered	300	32	○	○	○	○	○	○	○	
	9		Quenched & Tempered	350	38	○	○	○	○	○	○	○	
	10		High alloyed steel, and tool steel	Annealed	200	15	○	○	○	○	○	○	○
	11			Quenched & Tempered	325	35	○	○	○	○	○	○	○
M	12	Stainless steel	Ferritic / Martensitic	Annealed	200	15							
	13		Martensitic	Quenched & Tempered	240	23							
	14		Austenitic		180	10							
K	15	Grey cast iron	Pearlitic / ferritic		180	10							
	16		Pearlitic (Martensitic)		260	26							
	17	Nodular cast iron	Ferritic		160	3							
	18		Pearlitic		250	25							
	19		Ferritic		130								
20	Malleable cast iron	Pearlitic		230	21								
N	21	Aluminum-wrought alloy	Not Curable		60		○	○	○	○	○	○	
	22		Curable Hardened		100		○	○	○	○	○	○	
	23	Aluminum-cast, alloyed	≤ 12% Si, Not Curable		75		○	○	○	○	○	○	
	24		≤ 12% Si, Curable Hardened		90		○	○	○	○	○	○	
	25		> 12% Si, Not Curable		130		○	○	○	○	○	○	
	26		Cutting Alloys, PB>1%		110		○	○	○	○	○	○	
	27	Copper and Copper Alloys (Bronze / Brass)	CuZn, CuSnZn (Brass)		90		○	○	○	○	○	○	
	28		CuSn, lead-free copper and electrolytic copper		100		○	○	○	○	○	○	
	29												
	30	Non Metallic Materials	Duroplastic, Fiber Reinforced Plastic Rubber, Wood, etc.										
S	31	Heat Resistant Super Alloys	Fe Based	Annealed	200	15							
	32		Cured	280	30								
	33		Annealed	250	25								
	34		Ni or Co Based	Cured	350	38							
	35		Cast	320	34								
	36	Titanium Alloys	Pure Titanium		400 Rm								
37	Alpha + Beta Alloys		Hardened	1050 Rm									
H	38	Hardened steel	Hardened		550	55							
	39		Hardened		630	60							
	40	Chilled Cast Iron	Cast		400	42							
	41	Hardened Cast Iron	Hardened		550	55							

Inch															Inch					
E2112 E1112	E2031 E1031	E2032 E1032	E2034 E1034	E2035 E1035	E2036 E1036	E2037 E1037	E2051 E1051	E2031 E1031	E2032 E1032	E2020	E2021	E2069	E2039 E1039	E2042 E1042						
2	4	6	4	6	4	6	4	4	6&8	4	4	4	4	6						
30°	30°	30°	30°	30°	30°	30°	30°	30°	30°	30°	30°	30°	30°	30°						
BALL NOSE	SQUARE	SQUARE	SQUARE	SQUARE	SQUARE	SQUARE	SQUARE	SQUARE	SQUARE	BALL NOSE	BALL NOSE	BALL NOSE	SQUARE	SQUARE						
R1/16	D1/8	D5/8	D1/4	D1-1/8	D1/4	D1-1/4	D1/8	D3/4	D1-1/8	R1/16	R1/8	R1/16	D1/8	D1/2						
R1/2	D1	D2	D1	D2	D1	D2	D1	D1	D2	R1	R1/2	R1/2	D1-1/2	D2						
C779	C780	C782	C783		C784		C785	C787		C788	C789	C790	C791	C793						
REGULAR LENGTH DOUBLE	REGULAR LENGTH	REGULAR LENGTH	LONG LENGTH	LONG LENGTH	EXTRA LONG LENGTH	EXTRA LONG LENGTH	REGULAR LENGTH DOUBLE	REGULAR LENGTH 3/4 SHANK	REGULAR LENGTH 3/4 SHANK	REGULAR LENGTH	LONG LENGTH	REGULAR LENGTH DOUBLE	REGULAR LENGTH CENTER CUTTING	REGULAR LENGTH CENTER CUTTING						
Uncoated HSSCo8 & HSS	Uncoated HSSCo8 & HSS	Uncoated HSSCo8 & HSS	Uncoated HSSCo8 & HSS	Uncoated HSSCo8 & HSS	Uncoated HSSCo8 & HSS	Uncoated HSSCo8 & HSS	Uncoated HSSCo8 & HSS	Uncoated HSSCo8 & HSS	Uncoated HSSCo8 & HSS	Uncoated HSSCo8	Uncoated HSSCo8	Uncoated HSSCo8	Uncoated HSSCo8 & HSS	Uncoated HSSCo8 & HSS						

HSS  
CBN END MILLS  
i-Xmill END MILLS  
i-SMART MODULAR END MILLS  
X5070 END MILLS  
4G MILL END MILLS  
X-POWER PRO END MILLS  
TitaNox-POWER END MILLS  
JET-POWER END MILLS  
V7 PLUS A END MILLS  
V7 MILL INOX  
ALU-POWER HPC END MILLS  
ALU-POWER END MILLS  
D-POWER GRAPHITE END MILLS  
STANDARD CARBIDE  
ONLY ONE COATED PM60 END MILLS  
SINE-POWER  
TANK-POWER END MILLS  
STANDARD COBALT & HSS  
TECHNICAL DATA



MILLING TOOLS

Table with columns: SERIES, FLUTE, HELIX ANGLE, CUTTING EDGE SHAPE, SIZE MIN, SIZE MAX, PAGE. Rows include E2039, E2040, E2162, E2041, E2175, E2053.

HSS

COBALT & HSS END MILLS

General Purpose, Non-coated, Any Coating Available



Please visit global.yg1.com/mat for material search

⊙ : Excellent ○ : Good

Recommended cutting conditions : p. C833

Main selection table with columns: ISO, VDI 3323, Material Description, Composition / Structure / Heat Treatment, HB, HRC, and 6 tool variants.

Table with columns: SERIES, FLUTE, HELIX ANGLE, CUTTING EDGE SHAPE, SIZE MIN, SIZE MAX, PAGE. Rows include E2100, E2001, E2003, E2005, E2002, E2004, E2006, E2008, E2013, E2015, E1070, E1071, E1072, E2086, E2085.

Material compatibility table with columns for tool types (E2100, E2001, etc.) and rows for materials (P, M, K, N, S, H).

SELECTION GUIDE



MILLING TOOLS

HSS

CBN END MILLS

i-Xmill END MILLS

i-SMART MODULAR END MILLS

X5070 END MILLS

4G MILL END MILLS

X-POWER PRO END MILLS

TitaNox-POWER END MILLS

JET-POWER END MILLS

V7 PLUS A END MILLS

V7 MILL INOX

ALU-POWER HPC END MILLS

ALU-POWER END MILLS

D-POWER GRAPHITE END MILLS

STANDARD CARBIDE

ONLY ONE COATED PM60 END MILLS

SINE-POWER

TANK-POWER END MILLS

STANDARD COBALT & HSS

TECHNICAL DATA

SERIES	Inch					
	E2079	E2077	E2086	E2170	E2171	E2172
FLUTE	3~6	4~6	3	3~8	5~8	4~8
HELIX ANGLE	30°	30°	30°	30°	30°	30°
CUTTING EDGE SHAPE	ROUGHING	ROUGHING	ROUGHING	ROUGHING	ROUGHING	ROUGHING
SIZE MIN	D1/4	D1/2	D1/4	D1/4	D1	D1/2
SIZE MAX	D2	D2	D1	D2	D2	D2
PAGE	C813	C814	C815	C816	C817	C818

HSS

# COBALT & HSS END MILLS

General Purpose, Non-coated, Any Coating Available



Please visit [globaly1.com/mat](http://globaly1.com/mat) for material search

◎: Excellent ○: Good

Recommended cutting conditions : p. C833

REGULAR LENGTH FINE PITCH	LONG LENGTH FINE PITCH	STUB LENGTH FINE PITCH CENTER CUTTING	REGULAR LENGTH COARSE PITCH ROUGHING	MEDIUM LENGTH COARSE PITCH	LONG LENGTH COARSE PITCH
Uncoated HSSCo8	Uncoated HSSCo8 & HSS	Uncoated HSSCo8 & HSS	Uncoated HSSCo8 & HSS	Uncoated HSSCo8 & HSS	Uncoated HSSCo8 & HSS

ISO	VDI 3323	Material Description	Composition / Structure / Heat Treatment	HB	HRc	
P	1	Non-alloy steel	About 0.15% C Annealed	125		
	2		About 0.45% C Annealed	190	13	
	3		About 0.45% C Quenched & Tempered	250	25	
	4		About 0.75% C Annealed	270	28	
	5		About 0.75% C Quenched & Tempered	300	32	
	6	Low alloy steel	Annealed	180	10	
	7		Quenched & Tempered	275	29	
	8		Quenched & Tempered	300	32	
	9		Quenched & Tempered	350	38	
	10		High alloyed steel, and tool steel	Annealed	200	15
	11			Quenched & Tempered	325	35
M	12	Stainless steel	Ferritic / Martensitic Annealed	200	15	
	13		Martensitic Quenched & Tempered	240	23	
	14		Austenitic	180	10	
K	15	Grey cast iron	Pearlitic / ferritic	180	10	
	16		Pearlitic (Martensitic)	260	26	
	17	Nodular cast iron	Ferritic	160	3	
	18		Pearlitic	250	25	
	19		Ferritic	130		
	20	Malleable cast iron	Pearlitic	230	21	
N	21	Aluminum-wrought alloy	Not Curable	60		
	22		Curable Hardened	100		
	23	Aluminum-cast, alloyed	≤ 12% Si, Not Curable	75		
	24		≤ 12% Si, Curable Hardened	90		
	25		> 12% Si, Not Curable	130		
	26	Copper and Copper Alloys (Bronze / Brass)	Cutting Alloys, PB>1%	110		
	27		CuZn, CuSnZn (Brass)	90		
	28	Non Metallic Materials	CuSn, lead-free copper and electrolytic copper	100		
	29		Duroplastic, Fiber Reinforced Plastic			
	30		Rubber, Wood, etc.			
S	31	Heat Resistant Super Alloys	Fe Based Annealed	200	15	
	32		Cured	280	30	
	33		Annealed	250	25	
	34		Ni or Co Based Cured	350	38	
	35		Cast	320	34	
	36	Titanium Alloys	Pure Titanium	400 Rm		
	37		Alpha + Beta Alloys Hardened	1050 Rm		
H	38	Hardened steel	Hardened	550	55	
	39		Hardened	630	60	
	40	Chilled Cast Iron	Cast	400	42	
	41	Hardened Cast Iron	Hardened	550	55	

HSS

CBN END MILLS

i-Xmill END MILLS

i-SMART MODULAR END MILLS

X5070 END MILLS

4G MILL END MILLS

X-POWER PRO END MILLS

TitaNox-POWER END MILLS

JET-POWER END MILLS

V7 PLUS A END MILLS

V7 MILL INOX

ALU-POWER HPC END MILLS

ALU-POWER END MILLS

D-POWER GRAPHITE END MILLS

STANDARD CARBIDE

ONLY ONE COATED PM60 END MILLS

SINE-POWER

TANK-POWER END MILLS

STANDARD COBALT & HSS

TECHNICAL DATA

Inch													
E2241	E2195	E2197	E2193 E2125	E2248	E2191	E2226 E2192	E2163 E1163	E2120 E2121	E2160	E2161	E2237 E1237	E2482 E1482	E2483 E1483
3	4~6	4~6	3~6	4~8	3	3	2	3&4	3	3	4	2	4
30°	30°	30°	30°	30°	37°	37°	15°	60°	30°	30°	0°	30°	30°
ROUGHING	ROUGHING	ROUGHING	BALL NOSE ROUGHING	ROUGHING & FINISHING	ROUGHING	ROUGHING	SQUARE	SQUARE	SQUARE	SQUARE	CORNER ROUNDING	SQUARE	SQUARE
D1/4	D1/2	D1/2	R1/8	D1/4	D1/4	D1/2	D1/8	D1/4 D7/8	D1/16	D1/16	D1/4	D2.0(.0787)	D2.0(.0787)
D1	D1-1/2	D1-1/2	R3/4	D2	D1-1/2	D1-1/2	D1	D3/4 D2	D1/4	D1/4	D5/8	D45.0(1.772)	D45.0(1.772)
C819	C820		C821	C822	C823	C824	C825	C826	C827		C828	C829	C830
STUB LENGTH COARSE PITCH CENTER CUTTING	REGULAR LENGTH COARSE PITCH CENTER CUTTING	LONG LENGTH COARSE PITCH CENTER CUTTING	REGULAR & LONG LENGTH COARSE PITCH	ROUGHING & FINISHING CENTER CUTTING	REGULAR LENGTH ALUMINUM CENTER CUTTING	MEDIUM & LONG LENGTH ALUMINUM CENTER CUTTING	KEYWAY CUTTING	REGULAR LENGTH	SHORT LENGTH THROW AWAY	LONG LENGTH THROW AWAY		REGULAR LENGTH	REGULAR LENGTH
Uncoated HSSCo8	Uncoated HSSCo8	Uncoated HSSCo8	Uncoated HSSCo8	Uncoated HSSCo8	Uncoated HSSCo8	Uncoated HSSCo8	Uncoated HSSCo8	Uncoated HSSCo8	Uncoated HSSCo8	Uncoated HSSCo8	Uncoated HSSCo8 & HSS	Uncoated HSSCo8 & HSS	Uncoated HSSCo8 & HSS



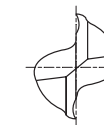
**SUPER CUTTING END MILLS**

TYPE	DESCRIPTION			YG-1	**ANSI	REMARK
	NO. OF FLUTE	LENGTH OF CUT	TYPE OF END			
SINGLE END	2	REGULAR LONG EX. LONG	ALL	+ .0010 .0000 * ( + .0015 ) .0000	+ .0030 .0000	
	MULTIPLE	ALL	ALL	+ .0010 .0000 * ( + .0015 ) .0000	+ .0030 .0000	
KEY WAY	2	ALL	CENTER CUTTING	+ .0000 - .0015	+ .0000 - .0015	
DOUBLE END	2	REGULAR	ALL	.0000 - .0010 * ( .0000 ) - .0020	.0000 - .0015	
	4	ALL	CENTER CUTTING	.0000 - .0010 * ( .0000 ) - .0020	.0000 - .0015	
	4	ALL	NON CENTER CUTTING	+ .0010 .0000 * ( .0000 ) - .0020	+ .0030 .0000 * ( .0000 ) - .0025	
3/16 SHANK DOUBLE END	2	STUB REGULAR	ALL	.0000 - .0010 * ( .0000 ) - .0020	.0000 - .0015	
		LONG	ALL	+ .0010 .0000 * ( .0000 ) - .0020	+ .0030 .0000 * ( .0000 ) - .0025	
	4	ALL	ALL	+ .0010 .0000 * ( .0000 ) - .0020	+ .0030 .0000 * ( .0000 ) - .0025	
ROUGHING	MULTIPLE	ALL	ALL	+ .0060 .0000	+ .025 - .005	
ROUGHING & FINISHING	MULTIPLE	REGULAR	ALL	+ .0025 + .0005		
HELICAL 60°	3.4	REGULAR	CENTER CUTTING	+ .0010 .0000 * ( + .0015 ) .0000		
THROW AWAY 1/4 SHANK	3	ALL	CENTER CUTTING	- .0005 - .0013		

\* The shank of End Mills is the same diameter as the cutting portion.  
\*\* ANSI B94-19-1977 published by the American Society of Mechanical Engineers.

**HSSCo8 & HSS, 2 FLUTE REGULAR LENGTH**

► These end mills are furnished as regular with right-hand cutting and right-hand helical flutes. All shanks are flatted for holder set screw. These are designed for slotting, drilling, pocketing and general-purpose operation.



p.C833, C834, C835

Unit : Inch

EDP No.	8% COBALT (M42)		Mill Diameter	Shank Diameter	Length of Cut	Overall Length
	HSS (M2)					
01289	01039	1/8	3/8	3/8	2-5/16	
01291	01041	5/32	3/8	7/16	2-5/16	
01293	01043	3/16	3/8	7/16	2-5/16	
01295	01045	7/32	3/8	1/2	2-5/16	
01297	01047	1/4	3/8	1/2	2-5/16	
01299	01049	9/32	3/8	9/16	2-5/16	
01301	01051	5/16	3/8	9/16	2-5/16	
01303	01053	11/32	3/8	9/16	2-5/16	
01305	01055	3/8	3/8	9/16	2-5/16	
01308	01058	13/32	3/8	13/16	2-1/2	
01312	01062	7/16	3/8	13/16	2-1/2	
01316	01066	15/32	3/8	13/16	2-1/2	
01320	01070	1/2	3/8	13/16	2-1/2	
01321	01071	1/2	1/2	1	3	
01328	01078	9/16	1/2	1-1/8	3-1/8	
01336	01086	5/8	1/2	1-1/8	3-1/8	
01337	01087	5/8	5/8	1-5/16	3-7/16	
01348	01098	11/16	5/8	1-5/16	3-7/16	
01357	01107	3/4	1/2	1-5/16	3-5/16	
01358	01108	3/4	5/8	1-5/16	3-7/16	
01359	01109	3/4	3/4	1-5/16	3-7/16	
01373	01123	13/16	5/8	1-1/2	3-5/8	
01391	01141	7/8	3/4	1-1/2	3-3/4	
01394	01144	7/8	7/8	1-1/2	3-3/4	
01409	01159	15/16	7/8	1-1/2	3-3/4	
01420	01170	1	5/8	1-1/2	3-5/8	

■ The TiN coated, TiCN coated or TiAlN coated is available on your request. ► NEXT PAGE  
 ■ Coating Codes for Cobalt  
 Uncoated EDP NO. + CN(TiN), CC(TiCN), CF(TiAlN F), CE(TiAlN E), CH(Hardslick)  
 ■ Coating Codes for HSS  
 Uncoated EDP NO. + HN(TiN), HC(TiCN), HF(TiAlN F), HE(TiAlN E), HH(Hardslick)  
 ► Coated Price Shown in Price List. Call for Availability.

◎ : Excellent ○ : Good

ISO	P											M				K				
	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel				Grey cast iron		Nodular cast iron		Malleable cast iron
Material Description	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
VDI 3323																				
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend	◎	◎	◎	◎	○	◎	◎	○	○	◎	○									

ISO	N										S					H					
	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys			Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron			
Material Description	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
VDI 3323																					
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend	○	○	○	○	○	○	○	○													



8% COBALT (M42) FLAT SHANK E2030 SERIES  
HSS (M2) FLAT SHANK E1030 SERIES

### HSSCo8 & HSS, 2 FLUTE REGULAR LENGTH

► These end mills are furnished as regular with right-hand cutting and right-hand helical flutes. All shanks are flatted for holder set screw. These are designed for slotting, drilling, pocketing and general-purpose operation.



p.C833, C834, C835

Unit : Inch

EDP No.		Mill Diameter	Shank Diameter	Length of Cut	Overall Length
8% COBALT (M42)	HSS (M2)				
01422	01172	1	3/4	1-1/2	3-3/4
01426	01176	1	1	1-5/8	4-1/8
01435	01185	1-1/8	1	1-5/8	4-1/8
01445	01195	1-1/4	1-1/4	1-5/8	4-1/8
01451	01201	1-3/8	1	1-5/8	4-1/8
01453	01203	1-3/8	1-1/4	1-5/8	4-1/8
01459	01209	1-1/2	1	1-5/8	4-1/8
01461	01211	1-1/2	1-1/4	1-5/8	4-1/8
01469	01219	1-3/4	1-1/4	1-5/8	4-1/8
01477	01227	2	1-1/4	1-5/8	4-1/8
*01480	*01230	2	2	2	5-3/4

- The TiN coated, TiCN coated or TiAlN coated is available on your request.
  - Coating Codes for Cobalt  
Uncoated EDP NO. + CN(TiN), CC(TiCN), CF(TiAlN F), CE(TiAlN E), CH(Hardslick)
  - Coating Codes for HSS  
Uncoated EDP NO. + HN(TiN), HC(TiCN), HF(TiAlN F), HE(TiAlN E), HH(Hardslick)
  - Coated Price Shown in Price List. Call for Availability.
- \* Combination Shank

Mill Dia. Tolerance (inch)	
0~+.0010	** 0~+.0015

\*\* The shank of end mills is the same diameter as the cutting portion.

◎ : Excellent ○ : Good

ISO Material Description	P										M				K						
	Non-alloy steel					Low alloy steel					High alloyed steel, and tool steel				Stainless steel		Grey cast iron		Nodular cast iron		Malleable cast iron
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
HRc	13	25	28	32	30	10	29	32	38	15	35	15	23	10	10	26	3	25	3	25	
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230	
Recommend	◎	◎	◎	◎	○	◎	◎	○	○	◎	○	○	○	○	○	○	○	○	○	○	

ISO Material Description	N						S					H									
	Aluminum-wrought alloy		Aluminum-cast, alloyed		Copper and Copper Alloys (Bronze / Brass)		Non Metallic Materials			Heat Resistant Super Alloys		Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron					
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc	60	100	75	90	130	110	90	100			15	30	25	38	34	400 Rm	1050 Rm	55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○



8% COBALT (M42) FLAT SHANK E2080 SERIES  
HSS (M2) FLAT SHANK E1080 SERIES

### HSSCo8 & HSS, 2 FLUTE LONG LENGTH

► Longer flute length than E2030 type and allows deeper cutting.



p.C833, C834, C835

Unit : Inch

EDP No.		Mill Diameter	Shank Diameter	Length of Cut	Overall Length
8% COBALT (M42)	HSS (M2)				
02297	02047	1/4	3/8	1-1/4	3-1/8
02301	02051	5/16	3/8	1-3/8	3-1/8
02305	02055	3/8	3/8	1-1/2	3-1/4
02321	02071	1/2	1/2	2	4
02337	02087	5/8	5/8	2	4-1/8
02359	02109	3/4	3/4	2-1/4	4-1/2
02394	02144	7/8	7/8	2-1/2	4-3/4
02426	02176	1	1	3	5-1/2
02435	02185	1-1/8	1	3	5-1/2
02443	02193	1-1/4	1	3	5-1/2
02445	02195	1-1/4	1-1/4	3	5-1/2
02461	02211	1-1/2	1-1/4	3	5-1/2
02469	02219	1-3/4	1-1/4	3	5-1/2
02477	02227	2	1-1/4	3	5-1/2
*02482	*02232	2	2	3	6-3/4

- The TiN coated, TiCN coated or TiAlN coated is available on your request.
  - Coating Codes for Cobalt  
Uncoated EDP NO. + CN(TiN), CC(TiCN), CF(TiAlN F), CE(TiAlN E), CH(Hardslick)
  - Coating Codes for HSS  
Uncoated EDP NO. + HN(TiN), HC(TiCN), HF(TiAlN F), HE(TiAlN E), HH(Hardslick)
  - Coated Price Shown in Price List. Call for Availability.
- \* Combination Shank

Mill Dia. Tolerance (inch)	
0~+.0010	** 0~+.0015

\*\* The shank of end mills is the same diameter as the cutting portion.

◎ : Excellent ○ : Good

ISO Material Description	P										M				K						
	Non-alloy steel					Low alloy steel					High alloyed steel, and tool steel				Stainless steel		Grey cast iron		Nodular cast iron		Malleable cast iron
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
HRc	13	25	28	32	30	10	29	32	38	15	35	15	23	10	10	26	3	25	3	25	
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230	
Recommend	◎	◎	◎	◎	○	◎	◎	○	○	◎	○	○	○	○	○	○	○	○	○	○	

ISO Material Description	N						S					H									
	Aluminum-wrought alloy		Aluminum-cast, alloyed		Copper and Copper Alloys (Bronze / Brass)		Non Metallic Materials			Heat Resistant Super Alloys		Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron					
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc	60	100	75	90	130	110	90	100			15	30	25	38	34	400 Rm	1050 Rm	55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○



8% COBALT (M42) FLAT SHANK E2033 SERIES  
HSS (M2) FLAT SHANK E1033 SERIES

### HSSCo8 & HSS, 2 FLUTE EXTENDED LENGTH

► Provided with the longest flute length and suitable for high accuracy machining of deep step.



p.C833, C834, C835

Unit : Inch

EDP No.	8% COBALT (M42)		Mill Diameter	Shank Diameter	Length of Cut	Length Below Shank	Overall Length
	HSS (M2)						
03289	03039		1/8	3/8	3/8	13/16	2-3/8
03293	03043		3/16	3/8	1/2	1-1/8	2-11/16
03297	03047		1/4	3/8	5/8	1-1/2	3-1/16
03301	03051		5/16	3/8	3/4	1-3/4	3-5/16
03305	03055		3/8	3/8	3/4	1-3/4	3-5/16
03321	03071		1/2	1/2	1	2-7/32	4
03337	03087		5/8	5/8	1-3/8	2-23/32	4-5/8
03359	03109		3/4	3/4	1-5/8	3-11/32	5-3/8
03394	03144		7/8	7/8	2	4	6
03426	03176		1	1	2-1/2	4-31/32	7-1/4
03445	03195		1-1/4	1-1/4	3	4-31/32	7-1/4

- The TiN coated, TiCN coated or TiAlN coated is available on your request.
- Coating Codes for Cobalt  
Uncoated EDP NO. + CN(TiN), CC(TiCN), CF(TiAlN F), CE(TiAlN E), CH(Hardslick)
- Coating Codes for HSS  
Uncoated EDP NO. + HN(TiN), HC(TiCN), HF(TiAlN F), HE(TiAlN E), HH(Hardslick)
- Coated Price Shown in Price List. Call for Availability.

Mill Dia. Tolerance (inch)	
0~+.0010	** 0~+.0015

\*\* The shank of end mills is the same diameter as the cutting portion.

◎ : Excellent ○ : Good

ISO	P											M				K				
	Non-alloy steel					Low alloy steel						High alloyed steel, and tool steel		Stainless steel		Grey cast iron		Nodular cast iron		Malleable cast iron
Material Description	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc	13	25	28	32	38	42	48	52	58	62	68	72	78	82	88	92	98	102	108	112
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend	◎	◎	◎	◎	○	◎	◎	○	○	◎	○	◎	◎	◎	◎	◎	◎	◎	◎	◎

ISO	N						S					H									
	Aluminum-wrought alloy		Aluminum-cast, alloyed		Copper and Copper Alloys (Bronze / Brass)		Heat Resistant Super Alloys			Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron							
Material Description	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc	60	100	75	90	130	110	90	100			15	30	25	38	34	40	55	60	42	55	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend	○	○	○	○	○	○	○	○			○	○	○	○	○	○	○	○	○	○	○



8% COBALT (M42) FLAT SHANK E2050 SERIES  
HSS (M2) FLAT SHANK E1050 SERIES

### HSSCo8 & HSS, 2 FLUTE REGULAR LENGTH DOUBLE

► Series E2050 two flute end mills are the double-end version of E2030 single-end tools. Same excellent tool geometry for slotting, keying and general purpose milling, plus the added economy offered by the double-end design.



p.C833, C834, C835

Unit : Inch

EDP No.	8% COBALT (M42)		Mill Diameter	Shank Diameter	Length of Cut	Overall Length
	HSS (M2)					
11289	11039		1/8	3/8	3/8	3-1/16
11290	11040		9/64	3/8	7/16	3-1/8
11291	11041		5/32	3/8	7/16	3-1/8
11292	11042		11/64	3/8	7/16	3-1/8
11293	11043		3/16	3/8	7/16	3-1/8
11294	11044		13/64	3/8	1/2	3-1/8
11295	11045		7/32	3/8	1/2	3-1/8
11296	11046		15/64	3/8	1/2	3-1/8
11297	11047		1/4	3/8	1/2	3-1/8
11298	11048		17/64	3/8	9/16	3-1/8
11299	11049		9/32	3/8	9/16	3-1/8
11300	11050		19/64	3/8	9/16	3-1/8
11301	11051		5/16	3/8	9/16	3-1/8
11302	11052		21/64	3/8	9/16	3-1/8
11303	11053		11/32	3/8	9/16	3-1/8
11304	11054		23/64	3/8	9/16	3-1/8
11305	11055		3/8	3/8	9/16	3-1/8
11307	11057		25/64	1/2	13/16	3-3/4
11309	11059		13/32	1/2	13/16	3-3/4
11311	11061		27/64	1/2	13/16	3-3/4
11313	11063		7/16	1/2	13/16	3-3/4
11315	11065		29/64	1/2	13/16	3-3/4
11317	11067		15/32	1/2	13/16	3-3/4
11319	11069		31/64	1/2	13/16	3-3/4
11321	11071		1/2	1/2	13/16	3-3/4
11326	11076		17/32	5/8	1-1/8	4-1/2

- The TiN coated, TiCN coated or TiAlN coated is available on your request.
- Coating Codes for Cobalt  
Uncoated EDP NO. + CN(TiN), CC(TiCN), CF(TiAlN F), CE(TiAlN E), CH(Hardslick)
- Coating Codes for HSS  
Uncoated EDP NO. + HN(TiN), HC(TiCN), HF(TiAlN F), HE(TiAlN E), HH(Hardslick)
- Coated Price Shown in Price List. Call for Availability.

► NEXT PAGE

◎ : Excellent ○ : Good

ISO	P											M				K				
	Non-alloy steel					Low alloy steel						High alloyed steel, and tool steel		Stainless steel		Grey cast iron		Nodular cast iron		Malleable cast iron
Material Description	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc	13	25	28	32	38	42	48	52	58	62	68	72	78	82	88	92	98	102	108	112
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend	◎	◎	◎	◎	○	◎	◎	○	○	◎	○	◎	◎	◎	◎	◎	◎	◎	◎	◎

ISO	N						S					H									
	Aluminum-wrought alloy		Aluminum-cast, alloyed		Copper and Copper Alloys (Bronze / Brass)		Heat Resistant Super Alloys			Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron							
Material Description	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc	60	100	75	90	130	110	90	100			15	30	25	38	34	40	55	60	42	55	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend	○	○	○	○	○	○	○	○			○	○	○	○	○	○	○	○	○	○	○





8% COBALT (M42) FLAT SHANK E2050 SERIES  
HSS (M2) FLAT SHANK E1050 SERIES

### HSSCo8 & HSS, 2 FLUTE REGULAR LENGTH DOUBLE

► Series E2050 two flute end mills are the double-end version of E2030 single-end tools. Same excellent tool geometry for slotting, keying and general purpose milling, plus the added economy offered by the double-end design.



HSS Co8 HSS 2 30° FLAT p.C833, C834, C835

EDP No.	8% COBALT (M42)		Mill Diameter	Shank Diameter	Length of Cut	Overall Length
	8% COBALT (M42)	HSS (M2)				
11330	11080	9/16	5/8	1-1/8	4-1/2	
11334	11084	19/32	5/8	1-1/8	4-1/2	
11337	11087	5/8	5/8	1-1/8	4-1/2	
11344	11094	21/32	3/4	1-5/16	5	
11350	11100	11/16	3/4	1-5/16	5	
11354	11104	23/32	3/4	1-5/16	5	
11359	11109	3/4	3/4	1-5/16	5	
11368	11118	25/32	7/8	1-9/16	5-1/2	
11377	11127	13/16	7/8	1-9/16	5-1/2	
11384	11134	27/32	7/8	1-9/16	5-1/2	
11394	11144	7/8	7/8	1-9/16	5-1/2	
11402	11152	29/32	1	1-5/8	5-7/8	
11410	11160	15/16	1	1-5/8	5-7/8	
11417	11167	31/32	1	1-5/8	5-7/8	
11426	11176	1	1	1-5/8	5-7/8	

- The TiN coated, TiCN coated or TiAIN coated is available on your request.
- Coating Codes for Cobalt  
Uncoated EDP NO. + CN(TiN), CC(TiCN), CF(TiAIN F), CE(TiAIN E), CH(Hardslick)
- Coating Codes for HSS  
Uncoated EDP NO. + HN(TiN), HC(TiCN), HF(TiAIN F), HE(TiAIN E), HH(Hardslick)
- Coated Price Shown in Price List. Call for Availability.

Mill Dia. Tolerance (inch)	
0~+.0010	** 0~-.0020

\*\* The shank of end mills is the same diameter as the cutting portion.

◎ : Excellent ○ : Good

ISO	P										M				K					
	Non-alloy steel					Low alloy steel					High alloyed steel, and tool steel				Stainless steel		Grey cast iron	Nodular cast iron	Malleable cast iron	
Material Description	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc	13	25	28	32	30	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎

ISO	N					S					H											
	Aluminum-wrought alloy		Aluminum-cast, alloyed		Copper and Copper Alloys (Bronze / Brass)	Heat Resistant Super Alloys			Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron									
Material Description	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	
HRc	60	100	75	90	130	110	90	100			15	30	25	38	34	400 Rm	1050 Rm	55	60	42	55	
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550	
Recommend	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎



8% COBALT (M42) FLAT SHANK E2110 SERIES  
HSS (M2) FLAT SHANK E1110 SERIES

### HSSCo8 & HSS, 2 FLUTE REGULAR LENGTH BALL NOSE

► The two flute ball end mills are designed for milling of radius bottom slots, fillets and special contours. The end teeth are cut to center allowing these end mills to drill into material at the beginning of a slotting cut. The two flute design provides good chip removal ability in slotting.



HSS Co8 HSS 2 30° FLAT p.C844, C845, C846

EDP No.	8% COBALT (M42)		Radius of Ball Nose R	Mill Diameter	Shank Diameter	Length of Cut	Overall Length
	8% COBALT (M42)	HSS (M2)					
41289	41039	R1/16	1/8	3/8	3/8	2-5/16	
41293	41043	R3/32	3/16	3/8	1/2	2-3/8	
41297	41047	R1/8	1/4	3/8	5/8	2-7/16	
41301	41051	R5/32	5/16	3/8	3/4	2-1/2	
41305	41055	R3/16	3/8	3/8	3/4	2-1/2	
41313	41063	R7/32	7/16	1/2	1	3	
41321	41071	R1/4	1/2	1/2	1	3	
41328	41078	R9/32	9/16	1/2	1-1/8	3-1/8	
41336	41086	R5/16	5/8	1/2	1-1/8	3-1/8	
41337	41087	R5/16	5/8	5/8	1-3/8	3-1/2	
41357	41107	R3/8	3/4	1/2	1-5/16	3-5/16	
41359	41109	R3/8	3/4	3/4	1-5/8	3-7/8	
41391	41141	R7/16	7/8	3/4	2	4-1/4	
41394	41144	R7/16	7/8	7/8	2	4-1/4	
41422	41172	R1/2	1	3/4	2-1/4	4-1/2	
41426	41176	R1/2	1	1	2-1/4	4-3/4	
41431	41181	R9/16	1-1/8	3/4	1-5/8	3-7/8	
41435	41185	R9/16	1-1/8	1	2-1/4	4-3/4	
41439	41189	R5/8	1-1/4	3/4	1-5/8	3-7/8	
41445	41195	R5/8	1-1/4	1-1/4	2-1/2	5	
41449	41199	R11/16	1-3/8	3/4	1-5/8	4-1/8	
41453	41203	R11/16	1-3/8	1-1/4	2-1/2	5	
41457	41207	R3/4	1-1/2	3/4	1-5/8	4-1/8	
41461	41211	R3/4	1-1/2	1-1/4	2-1/2	5	
41478	41227	R1	2	1-1/4	2-1/2	5	

Mill Dia. Tolerance (inch)	
0~+.0010	** 0~+.0015

\*\* The shank of end mills is the same diameter as the cutting portion.

- The TiN coated, TiCN coated or TiAIN coated is available on your request.
- Coating Codes for Cobalt  
Uncoated EDP NO. + CN(TiN), CC(TiCN), CF(TiAIN F), CE(TiAIN E), CH(Hardslick)
- Coating Codes for HSS  
Uncoated EDP NO. + HN(TiN), HC(TiCN), HF(TiAIN F), HE(TiAIN E), HH(Hardslick)
- Coated Price Shown in Price List. Call for Availability.

◎ : Excellent ○ : Good

ISO	P										M				K					
	Non-alloy steel					Low alloy steel					High alloyed steel, and tool steel				Stainless steel		Grey cast iron	Nodular cast iron	Malleable cast iron	
Material Description	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc	13	25	28	32	30	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎

ISO	N					S					H											
	Aluminum-wrought alloy		Aluminum-cast, alloyed		Copper and Copper Alloys (Bronze / Brass)	Heat Resistant Super Alloys			Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron									
Material Description	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	
HRc	60	100	75	90	130	110	90	100			15	30	25	38	34	400 Rm	1050 Rm	55	60	42	55	
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550	
Recommend	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎



8% COBALT (M42) FLAT SHANK E2111 SERIES  
HSS (M2) FLAT SHANK E1111 SERIES

### HSSCo8 & HSS, 2 FLUTE EXTENDED LENGTH BALL NOSE

► Longer flute length than E2110 type and suitable for high efficient copying process and deep cutting of die mold corner radius.



HSS Co8 HSS 2 30° FLAT p.C844, C845, C846

Unit : Inch

EDP No.	Radius of Ball Nose		Mill Diameter	Shank Diameter	Length of Cut	Length Below Shank	Overall Length
	8% COBALT (M42)	HSS (M2)					
<a href="#">42289</a>	<a href="#">42039</a>	R1/16	1/8	3/8	3/8	-	2-3/8
<a href="#">42293</a>	<a href="#">42043</a>	R3/32	3/16	3/8	1/2	1-1/8	2-11/16
<a href="#">42297</a>	<a href="#">42047</a>	R1/8	1/4	3/8	5/8	1-1/2	3-1/16
<a href="#">42301</a>	<a href="#">42051</a>	R5/32	5/16	3/8	3/4	1-3/4	3-5/16
<a href="#">42305</a>	<a href="#">42055</a>	R3/16	3/8	3/8	3/4	1-3/4	3-5/16
<a href="#">42313</a>	<a href="#">42063</a>	R7/32	7/16	1/2	1	1-7/8	3-11/16
<a href="#">42321</a>	<a href="#">42071</a>	R1/4	1/2	1/2	1	2-1/4	4
<a href="#">42337</a>	<a href="#">42087</a>	R5/16	5/8	5/8	1-3/8	2-3/4	4-5/8
<a href="#">42359</a>	<a href="#">42109</a>	R3/8	3/4	3/4	1-5/8	3-3/8	5-3/8
<a href="#">42426</a>	<a href="#">42176</a>	R1/2	1	1	2-1/2	5	7-1/4

- The TiN coated, TiCN coated or TiAlN coated is available on your request.
- Coating Codes for Cobalt  
Uncoated EDP NO. + CN(TiN), CC(TiCN), CF(TiAlN F), CE(TiAlN E), CH(Hardslick)
- Coating Codes for HSS  
Uncoated EDP NO. + HN(TiN), HC(TiCN), HF(TiAlN F), HE(TiAlN E), HH(Hardslick)
- Coated Price Shown in Price List. Call for Availability.

Mill Dia. Tolerance (inch)	
0~+.0010	** 0~-.0015

\*\* The shank of end mills is the same diameter as the cutting portion.

◎ : Excellent ○ : Good

ISO	P										M			K						
	Non-alloy steel					Low alloy steel					High alloyed steel, and tool steel	Stainless steel		Grey cast iron	Nodular cast iron	Malleable cast iron				
Material Description	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc	13	25	28	32	38	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend	◎	◎	◎	◎	○	◎	◎	○	○	◎	○									

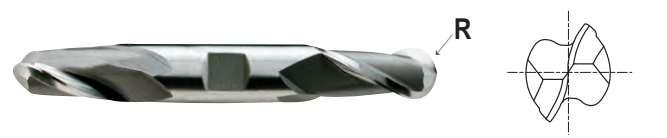
ISO	N					S					H										
	Aluminum-wrought alloy	Aluminum-cast, alloyed		Copper and Copper Alloys (Bronze / Brass)		Non Metallic Materials	Heat Resistant Super Alloys			Titanium Alloys	Hardened steel	Chilled Cast Iron	Hardened Cast Iron								
Material Description	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend	○	○	○	○	○	○	○	○													



8% COBALT (M42) FLAT SHANK E2112 SERIES  
HSS (M2) FLAT SHANK E1112 SERIES

### HSSCo8 & HSS, 2 FLUTE REGULAR LENGTH BALL NOSE DOUBLE

► Same construction features as E2110 end mill in a more economical version. Removes more material per grind. Machine ground notch assures positive anchorage in tool holder.



HSS Co8 HSS 2 30° FLAT p.C844, C845, C846

Unit : Inch

EDP No.	Radius of Ball Nose		Mill Diameter	Shank Diameter	Length of Cut	Overall Length
	8% COBALT (M42)	HSS (M2)				
<a href="#">45289</a>	<a href="#">45039</a>	R1/16	1/8	3/8	3/8	3-1/16
<a href="#">45293</a>	<a href="#">45043</a>	R3/32	3/16	3/8	7/16	3-1/8
<a href="#">45297</a>	<a href="#">45047</a>	R1/8	1/4	3/8	1/2	3-1/8
<a href="#">45301</a>	<a href="#">45051</a>	R5/32	5/16	3/8	9/16	3-1/8
<a href="#">45305</a>	<a href="#">45055</a>	R3/16	3/8	3/8	9/16	3-1/8
<a href="#">45313</a>	<a href="#">45063</a>	R7/32	7/16	1/2	13/16	3-3/4
<a href="#">45321</a>	<a href="#">45071</a>	R1/4	1/2	1/2	13/16	3-3/4
<a href="#">45337</a>	<a href="#">45087</a>	R5/16	5/8	5/8	1-1/8	4-1/2
<a href="#">45359</a>	<a href="#">45109</a>	R3/8	3/4	3/4	1-5/16	5
<a href="#">45426</a>	<a href="#">45176</a>	R1/2	1	1	1-5/8	5-7/8

- The TiN coated, TiCN coated or TiAlN coated is available on your request.
- Coating Codes for Cobalt  
Uncoated EDP NO. + CN(TiN), CC(TiCN), CF(TiAlN F), CE(TiAlN E), CH(Hardslick)
- Coating Codes for HSS  
Uncoated EDP NO. + HN(TiN), HC(TiCN), HF(TiAlN F), HE(TiAlN E), HH(Hardslick)
- Coated Price Shown in Price List. Call for Availability.

Mill Dia. Tolerance (inch)	
0~+.0010	** 0~-.0020

\*\* The shank of end mills is the same diameter as the cutting portion.

◎ : Excellent ○ : Good

ISO	P										M			K						
	Non-alloy steel					Low alloy steel					High alloyed steel, and tool steel	Stainless steel		Grey cast iron	Nodular cast iron	Malleable cast iron				
Material Description	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc	13	25	28	32	38	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend	◎	◎	◎	◎	○	◎	◎	○	○	◎	○									

ISO	N					S					H										
	Aluminum-wrought alloy	Aluminum-cast, alloyed		Copper and Copper Alloys (Bronze / Brass)		Non Metallic Materials	Heat Resistant Super Alloys			Titanium Alloys	Hardened steel	Chilled Cast Iron	Hardened Cast Iron								
Material Description	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend	○	○	○	○	○	○	○	○													



8% COBALT (M42) FLAT SHANK E2031 SERIES  
HSS (M2) FLAT SHANK E1031 SERIES

HSSCo8 & HSS, 4 FLUTE REGULAR LENGTH

► Possible for high-speed cutting, suitable for high efficiency machining. Easy to regrind.



HSS Co8 HSS 4 30° FLAT p.C847, C848, C849

Unit : Inch

EDP No.	8% COBALT (M42)		Mill Diameter	Shank Diameter	Length of Cut	Overall Length
	8% COBALT (M42)	HSS (M2)				
04289	04039	1/8	3/8	3/8	2-5/16	
04290	04040	9/64	3/8	7/16	2-3/8	
04291	04041	5/32	3/8	7/16	2-3/8	
04292	04042	11/64	3/8	1/2	2-3/8	
04293	04043	3/16	3/8	1/2	2-3/8	
04294	04044	13/64	3/8	9/16	2-7/16	
04295	04045	7/32	3/8	9/16	2-7/16	
04296	04046	15/64	3/8	5/8	2-7/16	
04297	04047	1/4	3/8	5/8	2-7/16	
04298	04048	17/64	3/8	11/16	2-1/2	
04299	04049	9/32	3/8	11/16	2-1/2	
04300	04050	19/64	3/8	3/4	2-1/2	
04301	04051	5/16	3/8	3/4	2-1/2	
04302	04052	21/64	3/8	3/4	2-1/2	
04303	04053	11/32	3/8	3/4	2-1/2	
04304	04054	23/64	3/8	3/4	2-1/2	
04305	04055	3/8	3/8	3/4	2-1/2	
04306	04056	25/64	3/8	1	2-11/16	
04308	04058	13/32	3/8	1	2-11/16	
04310	04060	27/64	3/8	1	2-11/16	
04312	04062	7/16	3/8	1	2-11/16	
04315	04065	29/64	1/2	1-1/4	3-1/4	
04317	04067	15/32	1/2	1-1/4	3-1/4	
04319	04069	31/64	1/2	1-1/4	3-1/4	

- The TiN coated, TiCN coated or TiAlN coated is available on your request.
  - Coating Codes for Cobalt  
Uncoated EDP NO. + CN(TiN), CC(TiCN), CF(TiAlN F), CE(TiAlN E), CH(Hardslick)
  - Coating Codes for HSS  
Uncoated EDP NO. + HN(TiN), HC(TiCN), HF(TiAlN F), HE(TiAlN E), HH(Hardslick)
  - Coated Price Shown in Price List. Call for Availability.
- NEXT PAGE

◎ : Excellent ○ : Good

ISO	P											M				K				
	Non-alloy steel					Low alloy steel						High alloyed steel, and tool steel		Stainless steel		Grey cast iron		Nodular cast iron		Malleable cast iron
Material Description	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc	13	25	28	32	30	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎

ISO	N					S					H										
	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)		Non Metallic Materials			Heat Resistant Super Alloys		Titanium Alloys	Hardened steel	Chilled Cast Iron	Hardened Cast Iron					
Material Description	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc	60	100	75	90	130	110	90	100			15	30	25	38	34	400 Rm	1050 Rm	55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend	◎	◎	◎	◎	◎	◎	◎	◎			◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎



8% COBALT (M42) FLAT SHANK E2031 SERIES  
HSS (M2) FLAT SHANK E1031 SERIES

HSSCo8 & HSS, 4 FLUTE REGULAR LENGTH

► Possible for high-speed cutting, suitable for high efficiency machining. Easy to regrind.



HSS Co8 HSS 4 30° FLAT p.C847, C848, C849

Unit : Inch

EDP No.	8% COBALT (M42)		Mill Diameter	Shank Diameter	Length of Cut	Overall Length
	8% COBALT (M42)	HSS (M2)				
04320	04070	1/2	3/8	1	2-11/16	
04321	04071	1/2	1/2	1-1/4	3-1/4	
04324	04074	17/32	1/2	1-3/8	3-3/8	
04328	04078	9/16	1/2	1-3/8	3-3/8	
04332	04082	19/32	1/2	1-3/8	3-3/8	
04336	04086	5/8	1/2	1-3/8	3-3/8	
04337	04087	5/8	5/8	1-5/8	3-3/4	
04340	04090	21/32	1/2	1-5/8	3-5/8	
04348	04098	11/16	5/8	1-5/8	3-3/4	
04352	04102	23/32	1/2	1-5/8	3-5/8	
04357	04107	3/4	1/2	1-5/8	3-5/8	
04358	04108	3/4	5/8	1-5/8	3-3/4	
04359	04109	3/4	3/4	1-5/8	3-7/8	
04364	04114	25/32	5/8	1-7/8	4	
04375	04125	13/16	3/4	1-7/8	4-1/8	
04380	04130	27/32	5/8	1-7/8	4	
04391	04141	7/8	3/4	1-7/8	4-1/8	
04394	04144	7/8	7/8	1-7/8	4-1/8	
04399	04149	29/32	3/4	1-7/8	4-1/8	
04407	04157	15/16	3/4	1-7/8	4-1/8	
04414	04164	31/32	3/4	1-7/8	4-1/8	
04420	04170	1	5/8	1-7/8	4	
04422	04172	1	3/4	1-7/8	4-1/8	
04426	04176	1	1	2	4-1/2	

- The TiN coated, TiCN coated or TiAlN coated is available on your request.
  - Coating Codes for Cobalt  
Uncoated EDP NO. + CN(TiN), CC(TiCN), CF(TiAlN F), CE(TiAlN E), CH(Hardslick)
  - Coating Codes for HSS  
Uncoated EDP NO. + HN(TiN), HC(TiCN), HF(TiAlN F), HE(TiAlN E), HH(Hardslick)
  - Coated Price Shown in Price List. Call for Availability.
- Mill Dia. Tolerance (inch)  
0~+.0010    \*\* 0~+.0015
- \*\* The shank of end mills is the same diameter as the cutting portion.

◎ : Excellent ○ : Good

ISO	P											M				K				
	Non-alloy steel					Low alloy steel						High alloyed steel, and tool steel		Stainless steel		Grey cast iron		Nodular cast iron		Malleable cast iron
Material Description	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc	13	25	28	32	30	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎

ISO	N					S					H										
	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)		Non Metallic Materials			Heat Resistant Super Alloys		Titanium Alloys	Hardened steel	Chilled Cast Iron	Hardened Cast Iron					
Material Description	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc	60	100	75	90	130	110	90	100			15	30	25	38	34	400 Rm	1050 Rm	55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend	◎	◎	◎	◎	◎	◎	◎	◎			◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎

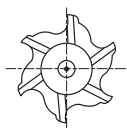
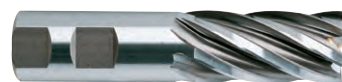


# YG COBALT & HSS END MILLS

8% COBALT (M42) FLAT SHANK E2032 SERIES  
HSS (M2) FLAT SHANK E1032 SERIES

## HSSCo8 & HSS, 6 FLUTE REGULAR LENGTH

► Possible for high-speed cutting, suitable for high efficiency machining. Easy to regrind.



p.C850, C851, C852

Unit : Inch

EDP No.		Mill Diameter	Shank Diameter	Length of Cut	Overall Length
8% COBALT (M42)	HSS (M2)				
04338	04088	5/8	5/8	1-5/8	3-3/4
04360	04110	3/4	3/4	1-5/8	3-7/8
04376	04126	13/16	3/4	1-7/8	4-1/8
04390	04140	7/8	5/8	1-7/8	4
04395	04145	7/8	7/8	1-7/8	4-1/8
04405	04155	15/16	5/8	1-7/8	4
04421	04171	1	5/8	1-7/8	4
04427	04177	1	1	2	4-1/2
04432	04182	1-1/8	3/4	2	4-1/4
04436	04186	1-1/8	1	2	4-1/2
04440	04190	1-1/4	3/4	2	4-1/4
04444	04194	1-1/4	1	2	4-1/2
04446	04196	1-1/4	1-1/4	2	4-1/2
04452	04202	1-3/8	1	2	4-1/2
04460	04210	1-1/2	1	2	4-1/2
04462	04212	1-1/2	1-1/4	2	4-1/2
04470	04220	1-3/4	1-1/4	2	4-1/2
04478	04228	2	1-1/4	2	4-1/2
* 04481	* 04231	2	2	2	5-3/4

\* Combination Shank

Mill Dia. Tolerance (inch)	
0~+.0010	** 0~+.0015

\*\* The shank of end mills is the same diameter as the cutting portion.

- The TiN coated, TiCN coated or TiAlN coated is available on your request.
- Coating Codes for Cobalt  
Uncoated EDP NO. + CN(TiN), CC(TiCN), CF(TiAlN F), CE(TiAlN E), CH(Hardslick)
- Coating Codes for HSS  
Uncoated EDP NO. + HN(TiN), HC(TiCN), HF(TiAlN F), HE(TiAlN E), HH(Hardslick)
- Coated Price Shown in Price List. Call for Availability.

◎ : Excellent ○ : Good

ISO	P										M				K			H		
	Non-alloy steel					Low alloy steel					High alloyed steel, and tool steel				Stainless steel		Grey cast iron		Nodular cast iron	Malleable cast iron
Material Description	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc	13	25	28	32	30	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎

ISO	N						S					H									
	Aluminum-wrought alloy		Aluminum-cast, alloyed		Copper and Copper Alloys (Bronze / Brass)		Heat Resistant Super Alloys			Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron							
Material Description	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc	60	100	75	90	130	110	90	100			15	30	25	38	34	40	55	60	42	55	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend	◎	◎	◎	◎	◎	◎	◎	◎			◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎

# YG COBALT & HSS END MILLS

8% COBALT (M42) FLAT SHANK E2034 / E2035 SERIES  
HSS (M2) FLAT SHANK E1034 / E1035 SERIES

## HSSCo8 & HSS, 4&6 FLUTE LONG LENGTH

► Longer flute length than E2031 type and allows deeper cutting. Easy to regrind.



p.C847, C848, C849 / p.C850, C851, C852

### E2034(8% COBALT) , E1034(HSS) Series ■ 4 FLUTE

Unit : Inch

EDP No.		Mill Diameter	Shank Diameter	Length of Cut	Overall Length
8% COBALT (M42)	HSS (M2)				
05297	05047	1/4	3/8	1-1/4	3-1/16
05301	05051	5/16	3/8	1-3/8	3-1/8
05305	05055	3/8	3/8	1-1/2	3-1/4
05313	05063	7/16	1/2	1-3/4	3-3/4
05321	05071	1/2	1/2	2	4
05337	05087	5/8	5/8	2-1/2	4-5/8
05359	05109	3/4	3/4	3	5-1/4
05394	05144	7/8	7/8	3-1/2	5-3/4
05426	05176	1	1	4	6-1/2

### E2035(8% COBALT) , E1035(HSS) Series ■ 6 FLUTE

Unit : Inch

EDP No.		Mill Diameter	Shank Diameter	Length of Cut	Overall Length
8% COBALT (M42)	HSS (M2)				
05436	05186	1-1/8	1	4	6-1/2
05444	05194	1-1/4	1	4	6-1/2
05446	05196	1-1/4	1-1/4	4	6-1/2
05460	05210	1-1/2	1	4	6-1/2
05462	05212	1-1/2	1-1/4	4	6-1/2
05470	05220	1-3/4	1-1/4	4	6-1/2
05478	05228	2	1-1/4	4	6-1/2
* 05485	* 05235	2	2	4	7-3/4

\* Combination Shank

Mill Dia. Tolerance (inch)	
0~+.0010	** 0~+.0015

\*\* The shank of end mills is the same diameter as the cutting portion.

- The TiN coated, TiCN coated or TiAlN coated is available on your request.
- Coating Codes for Cobalt  
Uncoated EDP NO. + CN(TiN), CC(TiCN), CF(TiAlN F), CE(TiAlN E), CH(Hardslick)
- Coating Codes for HSS  
Uncoated EDP NO. + HN(TiN), HC(TiCN), HF(TiAlN F), HE(TiAlN E), HH(Hardslick)
- Coated Price Shown in Price List. Call for Availability.

◎ : Excellent ○ : Good

ISO	P										M				K			H		
	Non-alloy steel					Low alloy steel					High alloyed steel, and tool steel				Stainless steel		Grey cast iron		Nodular cast iron	Malleable cast iron
Material Description	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc	13	25	28	32	30	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎

ISO	N						S					H									
	Aluminum-wrought alloy		Aluminum-cast, alloyed		Copper and Copper Alloys (Bronze / Brass)		Heat Resistant Super Alloys			Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron							
Material Description	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc	60	100	75	90	130	110	90	100			15	30	25	38	34	40	55	60	42	55	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend	◎	◎	◎	◎	◎	◎	◎	◎			◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎



8% COBALT (M42) FLAT SHANK E2036 / E2037 SERIES  
HSS (M2) FLAT SHANK E1036 / E1037 SERIES

**HSSCo8 & HSS, 4&6 FLUTE EXTRA LONG LENGTH**

► Provided with the longest flute length and suitable for high accuracy machining of deep step. Easy to regrind.



p.C847, C848, C849 / p.C850, C851, C852

**E2036(8% COBALT) , E1036(HSS) Series ■ 4 FLUTE**

Unit : Inch

EDP No.		Mill Diameter	Shank Diameter	Length of Cut	Overall Length
8% COBALT (M42)	HSS (M2)				
<a href="#">06297</a>	<a href="#">06047</a>	1/4	3/8	1-3/4	3-9/16
<a href="#">06301</a>	<a href="#">06051</a>	5/16	3/8	2	3-3/4
<a href="#">06305</a>	<a href="#">06055</a>	3/8	3/8	2-1/2	4-1/4
<a href="#">06321</a>	<a href="#">06071</a>	1/2	1/2	3	5
<a href="#">06337</a>	<a href="#">06087</a>	5/8	5/8	4	6-1/8
<a href="#">06359</a>	<a href="#">06109</a>	3/4	3/4	4	6-1/4
<a href="#">06394</a>	<a href="#">06144</a>	7/8	7/8	5	7-1/4
<a href="#">06426</a>	<a href="#">06176</a>	1	1	6	8-1/2

**E2037(8% COBALT) , E1037(HSS) Series ■ 6 FLUTE**

Unit : Inch

EDP No.		Mill Diameter	Shank Diameter	Length of Cut	Overall Length
8% COBALT (M42)	HSS (M2)				
<a href="#">06446</a>	<a href="#">06196</a>	1-1/4	1-1/4	6	8-1/2
<a href="#">06462</a>	<a href="#">06212</a>	1-1/2	1-1/4	8	10-1/2
* <a href="#">06491</a>	* <a href="#">06241</a>	2	2	8	11-3/4

- The TiN coated, TiCN coated or TiAlN coated is available on your request.
- Coating Codes for Cobalt  
Uncoated EDP NO. + CN(TiN), CC(TiCN), CF(TiAlN F), CE(TiAlN E), CH(Hardslick)
- Coating Codes for HSS  
Uncoated EDP NO. + HN(TiN), HC(TiCN), HF(TiAlN F), HE(TiAlN E), HH(Hardslick)
- Coated Price Shown in Price List. Call for Availability.

\* Combination Shank

Mill Dia. Tolerance (inch)	
0~+.0010	** 0~+.0015

\*\* The shank of end mills is the same diameter as the cutting portion.

◎ : Excellent ○ : Good

ISO	P											M				K				
	Non-alloy steel					Low alloy steel						High alloyed steel, and tool steel				Stainless steel		Grey cast iron		Nodular cast iron
Material Description	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc	13	25	28	32	30	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend	◎	◎	◎	◎	○	◎	◎	○	○	◎	○									

ISO	N						S					H									
	Aluminum-wrought alloy		Aluminum-cast, alloyed		Copper and Copper Alloys (Bronze / Brass)		Heat Resistant Super Alloys			Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron							
Material Description	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc	60	100	75	90	130	110	90	100			15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend	○	○	○	○	○	○	○	○													



8% COBALT (M42) FLAT SHANK E2051 SERIES  
HSS (M2) FLAT SHANK E1051 SERIES

**HSSCo8 & HSS, 4 FLUTE REGULAR LENGTH DOUBLE**

► Series E2051 four flute end mills are the double-end version of E2031 four flute tools and are used for the same type of finishing operation. Two tools on one shank saves on sharpening set-up as well as on initial tool costs. Easy to regrind.



p.C847, C848, C849

**E2051(8% COBALT) , E1051(HSS) Series ■ 4 FLUTE**

Unit : Inch

EDP No.		Mill Diameter	Shank Diameter	Length of Cut	Overall Length
8% COBALT (M42)	HSS (M2)				
<a href="#">12289</a>	<a href="#">12039</a>	1/8	3/8	3/8	3-1/16
<a href="#">12290</a>	<a href="#">12040</a>	9/64	3/8	7/16	3-1/8
<a href="#">12291</a>	<a href="#">12041</a>	5/32	3/8	7/16	3-1/8
<a href="#">12292</a>	<a href="#">12042</a>	11/64	3/8	1/2	3-1/4
<a href="#">12293</a>	<a href="#">12043</a>	3/16	3/8	1/2	3-1/4
<a href="#">12294</a>	<a href="#">12044</a>	13/64	3/8	9/16	3-1/4
<a href="#">12295</a>	<a href="#">12045</a>	7/32	3/8	9/16	3-1/4
<a href="#">12296</a>	<a href="#">12046</a>	15/64	3/8	5/8	3-3/8
<a href="#">12297</a>	<a href="#">12047</a>	1/4	3/8	5/8	3-3/8
<a href="#">12298</a>	<a href="#">12048</a>	17/64	3/8	11/16	3-3/8
<a href="#">12299</a>	<a href="#">12049</a>	9/32	3/8	11/16	3-3/8
<a href="#">12300</a>	<a href="#">12050</a>	19/64	3/8	3/4	3-1/2
<a href="#">12301</a>	<a href="#">12051</a>	5/16	3/8	3/4	3-1/2
<a href="#">12302</a>	<a href="#">12052</a>	21/64	3/8	3/4	3-1/2
<a href="#">12303</a>	<a href="#">12053</a>	11/32	3/8	3/4	3-1/2
<a href="#">12304</a>	<a href="#">12054</a>	23/64	3/8	3/4	3-1/2
<a href="#">12305</a>	<a href="#">12055</a>	3/8	3/8	3/4	3-1/2
<a href="#">12307</a>	<a href="#">12057</a>	25/64	1/2	1	4-1/8
<a href="#">12309</a>	<a href="#">12059</a>	13/32	1/2	1	4-1/8
<a href="#">12311</a>	<a href="#">12061</a>	27/64	1/2	1	4-1/8
<a href="#">12313</a>	<a href="#">12063</a>	7/16	1/2	1	4-1/8
<a href="#">12315</a>	<a href="#">12065</a>	29/64	1/2	1	4-1/8
<a href="#">12317</a>	<a href="#">12067</a>	15/32	1/2	1	4-1/8
<a href="#">12319</a>	<a href="#">12069</a>	31/64	1/2	1	4-1/8

- The TiN coated, TiCN coated or TiAlN coated is available on your request.
- Coating Codes for Cobalt  
Uncoated EDP NO. + CN(TiN), CC(TiCN), CF(TiAlN F), CE(TiAlN E), CH(Hardslick)
- Coating Codes for HSS  
Uncoated EDP NO. + HN(TiN), HC(TiCN), HF(TiAlN F), HE(TiAlN E), HH(Hardslick)
- Coated Price Shown in Price List. Call for Availability.

► NEXT PAGE

◎ : Excellent ○ : Good

ISO	P											M				K				
	Non-alloy steel					Low alloy steel						High alloyed steel, and tool steel				Stainless steel		Grey cast iron		Nodular cast iron
Material Description	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc	13	25	28	32	30	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend	◎	◎	◎	◎	○	◎	◎	○	○	◎	○									

ISO	N						S					H									
	Aluminum-wrought alloy		Aluminum-cast, alloyed		Copper and Copper Alloys (Bronze / Brass)		Heat Resistant Super Alloys			Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron							
Material Description	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc	60	100	75	90	130	110	90	100			15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend	○	○	○	○	○	○	○	○													



8% COBALT (M42) FLAT SHANK E2051 SERIES  
HSS (M2) FLAT SHANK E1051 SERIES

HSSCo8 & HSS, 4 FLUTE REGULAR LENGTH DOUBLE

► Series E2051 four flute end mills are the double-end version of E2031 four flute tools and are used for the same type of finishing operation. Two tools on one shank saves on sharpening set-up as well as on initial tool costs. Easy to regrind.



HSS Co8 HSS 4 30° FLAT p.C847, C848, C849

EDP No.		Mill Diameter	Shank Diameter	Length of Cut	Overall Length
8% COBALT (M42)	HSS (M2)				
12321	12071	1/2	1/2	1	4-1/8
12330	12080	9/16	5/8	1-3/8	5
12337	12087	5/8	5/8	1-3/8	5
12350	12100	11/16	3/4	1-5/8	5-5/8
12359	12109	3/4	3/4	1-5/8	5-5/8
12377	12127	13/16	7/8	1-7/8	6-1/8
12394	12144	7/8	7/8	1-7/8	6-1/8
12410	12160	15/16	1	1-7/8	6-3/8
12426	12176	1	1	1-7/8	6-3/8

- The TiN coated, TiCN coated or TiAlN coated is available on your request.
- Coating Codes for Cobalt  
Uncoated EDP NO. + CN(TiN), CC(TiCN), CF(TiAlN F), CE(TiAlN E), CH(Hardslick)
- Coating Codes for HSS  
Uncoated EDP NO. + HN(TiN), HC(TiCN), HF(TiAlN F), HE(TiAlN E), HH(Hardslick)
- Coated Price Shown in Price List. Call for Availability.

Mill Dia. Tolerance (inch)	
0~+.0010	** 0~-.0020

\*\* The shank of end mills is the same diameter as the cutting portion.

◎ : Excellent ○ : Good

ISO	P										M				K										
	Non-alloy steel					Low alloy steel					High alloyed steel, and tool steel		Stainless steel		Grey cast iron		Nodular cast iron		Malleable cast iron						
Material Description	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
HRc	13	25	28	32	38	10	29	32	38	15	35	15	23	10	10	26	3	25	3	25	3	25	3	25	21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230	130	230	130	230	21
Recommend	◎	◎	◎	◎	○	◎	◎	○	○	◎	○	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎

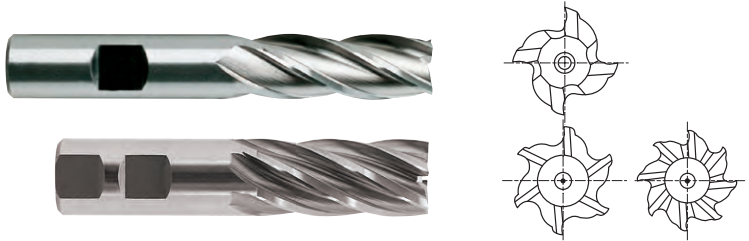
ISO	N					S					H														
	Aluminum-wrought alloy		Aluminum-cast, alloyed		Copper and Copper Alloys (Bronze / Brass)	Non Metallic Materials		Heat Resistant Super Alloys			Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron										
Material Description	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	
HRc	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	
HB	60	100	75	90	130	110	90	100			15	30	25	38	34	400 Rm	1050 Rm	55	60	42	55	55	60	42	55
Recommend	○	○	○	○	○	○	○	○			○	○	○	○	○	○	○	○	○	○	○	○	○	○	○



8% COBALT (M42) FLAT SHANK E2031 / E2032 SERIES  
HSS (M2) FLAT SHANK E1031 / E1032 SERIES

HSSCo8 & HSS, 4, 6&8 FLUTE REGULAR LENGTH 3/4" SHANK

► E2031(3/4" shank, multi flute, general purpose end mills) are recommended for finishing operations for Bridgeport machines and other similar operations. Easy to regrind.



HSS Co8 HSS 4-8 30° FLAT p.C847, C848, C849 / p.C850, C851, C852

E2031(8% COBALT) , E1031(HSS) Series ■ 4 FLUTE Unit : Inch

EDP No.		Mill Diameter	Shank Diameter	Length of Cut	Overall Length
8% COBALT (M42)	HSS (M2)				
04359	04109	3/4	3/4	1-5/8	3-7/8
04375	04125	13/16	3/4	1-7/8	4-1/8
04391	04141	7/8	3/4	1-7/8	4-1/8
04407	04157	15/16	3/4	1-7/8	4-1/8
04422	04172	1	3/4	1-7/8	4-1/8

E2032(8% COBALT) , E1032(HSS) Series ■ 6&8 FLUTE Unit : Inch

EDP No.		Mill Diameter	Shank Diameter	Length of Cut	Overall Length	No.of Flute
8% COBALT (M42)	HSS (M2)					
04432	04182	1-1/8	3/4	2	4-1/4	6
04440	04190	1-1/4	3/4	2	4-1/4	6
04458	04208	1-1/2	3/4	2	4-1/4	6
04468	04218	1-3/4	3/4	2	4-1/2	6
04476	04226	2	3/4	2	4-1/2	8

- The TiN coated, TiCN coated or TiAlN coated is available on your request.
- Coating Codes for Cobalt  
Uncoated EDP NO. + CN(TiN), CC(TiCN), CF(TiAlN F), CE(TiAlN E), CH(Hardslick)
- Coating Codes for HSS  
Uncoated EDP NO. + HN(TiN), HC(TiCN), HF(TiAlN F), HE(TiAlN E), HH(Hardslick)
- Coated Price Shown in Price List. Call for Availability.

Mill Dia. Tolerance (inch)	
0~+.0010	** 0~+.0015

\*\* The shank of end mills is the same diameter as the cutting portion.

◎ : Excellent ○ : Good

ISO	P										M				K										
	Non-alloy steel					Low alloy steel					High alloyed steel, and tool steel		Stainless steel		Grey cast iron		Nodular cast iron		Malleable cast iron						
Material Description	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
HRc	13	25	28	32	38	10	29	32	38	15	35	15	23	10	10	26	3	25	3	25	3	25	3	25	21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230	130	230	130	230	21
Recommend	◎	◎	◎	◎	○	◎	◎	○	○	◎	○	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎

ISO	N					S					H														
	Aluminum-wrought alloy		Aluminum-cast, alloyed		Copper and Copper Alloys (Bronze / Brass)	Non Metallic Materials		Heat Resistant Super Alloys			Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron										
Material Description	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	
HRc	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	
HB	60	100	75	90	130	110	90	100			15	30	25	38	34	400 Rm	1050 Rm	55	60	42	55	55	60	42	55
Recommend	○	○	○	○	○	○	○	○			○	○	○	○	○	○	○	○	○	○	○	○	○	○	○





8% COBALT (M42) FLAT SHANK E2020 SERIES

### HSSCo8, 4 FLUTE REGULAR LENGTH BALL NOSE

► The four flute ball end mills are designed for milling of radius bottom slots fillets and special contours. The end teeth are cut to center allowing these end mills to drill into material at the beginning of a slotting cut.



p.C853, C854, C855

Unit : Inch

EDP No.	Radius of Ball Nose	Mill Diameter	Shank Diameter	Length of Cut	Overall Length
8% COBALT (M42)	R				
<a href="#">43289</a>	R1/16	1/8	3/8	3/8	2-5/16
<a href="#">43293</a>	R3/32	3/16	3/8	1/2	2-3/8
<a href="#">43297</a>	R1/8	1/4	3/8	5/8	2-7/16
<a href="#">43301</a>	R5/32	5/16	3/8	3/4	2-1/2
<a href="#">43305</a>	R3/16	3/8	3/8	3/4	2-1/2
<a href="#">43312</a>	R7/32	7/16	3/8	1	2-11/16
<a href="#">43321</a>	R1/4	1/2	1/2	1-1/4	3-1/4
<a href="#">43337</a>	R5/16	5/8	5/8	1-5/8	3-3/4
<a href="#">43350</a>	R11/32	11/16	5/8	1-5/8	3-3/4
<a href="#">43359</a>	R3/8	3/4	3/4	1-5/8	3-7/8
<a href="#">43394</a>	R7/16	7/8	7/8	1-7/8	4-1/8
<a href="#">43426</a>	R1/2	1	1	2	4-1/2
<a href="#">43435</a>	R9/16	1-1/8	1	2	4-1/2
<a href="#">43445</a>	R5/8	1-1/4	1-1/4	2	4-1/2
<a href="#">43461</a>	R3/4	1-1/2	1-1/4	2	4-1/2
<a href="#">43477</a>	R1	2	1-1/4	2	4-1/2

■ The TiN coated, TiCN coated or TiAlN coated is available on your request.  
 ■ Coating Codes for Cobalt  
 Uncoated EDP NO. + CN(TiN), CC(TiCN), CF(TiAlN F), CE(TiAlN E), CH(Hardslick)  
 ► Coated Price Shown in Price List. Call for Availability.

Mill Dia. Tolerance (inch)	
0~+.0010	** 0~+.0015

\*\* The shank of end mills is the same diameter as the cutting portion.

◎ : Excellent ○ : Good

ISO Material Description	P										M				K					
	Non-alloy steel					Low alloy steel					High alloyed steel, and tool steel		Stainless steel		Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc	13	25	28	32	30	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend	◎	◎	◎	◎	○	◎	◎	○	○	◎	○									

ISO Material Description	N					S					H										
	Aluminum-wrought alloy		Aluminum-cast, alloyed		Copper and Copper Alloys (Bronze / Brass)	Non Metallic Materials		Heat Resistant Super Alloys			Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron						
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc	60	100	75	90	130	110	90	100			15	30	25	38	34	400 Rm	1050 Rm	55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend	○	○	○	○	○	○	○	○													



8% COBALT (M42) FLAT SHANK E2021 SERIES

### HSSCo8, 4 FLUTE LONG LENGTH BALL NOSE

► Longer flute length than E2020 type and suitable for high efficient copying process and deep cutting of die mold corner radius.



p.C853, C854, C855

Unit : Inch

EDP No.	Radius of Ball Nose	Mill Diameter	Shank Diameter	Length of Cut	Overall Length
8% COBALT (M42)	R				
<a href="#">44297</a>	R1/8	1/4	3/8	1-1/4	3-1/16
<a href="#">44301</a>	R5/32	5/16	3/8	1-3/8	3-1/8
<a href="#">44305</a>	R3/16	3/8	3/8	1-1/2	3-1/4
<a href="#">44321</a>	R1/4	1/2	1/2	2	4
<a href="#">44337</a>	R5/16	5/8	5/8	2-1/2	4-5/8
<a href="#">44359</a>	R3/8	3/4	3/4	3	5-1/4
<a href="#">44394</a>	R7/16	7/8	7/8	3-1/2	5-3/4
<a href="#">44426</a>	R1/2	1	1	4	6-1/2

■ The TiN coated, TiCN coated or TiAlN coated is available on your request.  
 ■ Coating Codes for Cobalt  
 Uncoated EDP NO. + CN(TiN), CC(TiCN), CF(TiAlN F), CE(TiAlN E), CH(Hardslick)  
 ► Coated Price Shown in Price List. Call for Availability.

Mill Dia. Tolerance (inch)	
0~+.0010	** 0~+.0015

\*\* The shank of end mills is the same diameter as the cutting portion.

◎ : Excellent ○ : Good

ISO Material Description	P										M				K					
	Non-alloy steel					Low alloy steel					High alloyed steel, and tool steel		Stainless steel		Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc	13	25	28	32	30	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend	◎	◎	◎	◎	○	◎	◎	○	○	◎	○									

ISO Material Description	N					S					H										
	Aluminum-wrought alloy		Aluminum-cast, alloyed		Copper and Copper Alloys (Bronze / Brass)	Non Metallic Materials		Heat Resistant Super Alloys			Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron						
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc	60	100	75	90	130	110	90	100			15	30	25	38	34	400 Rm	1050 Rm	55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend	○	○	○	○	○	○	○	○													



8% COBALT (M42) FLAT SHANK E2069 SERIES

### HSSCo8, 4 FLUTE REGULAR LENGTH BALL NOSE DOUBLE

► Same construction features as E2020 end mill in a more economical version.  
Removes more material per grind. Machine ground notch assures positive anchorage in tool holder.



HSS Co8 4 30° FLAT p.C853, C854, C855

Unit : Inch

EDP No.	Radius of Ball Nose	Mill Diameter	Shank Diameter	Length of Cut	Overall Length
8% COBALT (M42)	R				
<a href="#">46289</a>	R1/16	1/8	3/8	3/8	3-1/16
<a href="#">46293</a>	R3/32	3/16	3/8	1/2	3-1/4
<a href="#">46297</a>	R1/8	1/4	3/8	5/8	3-3/8
<a href="#">46301</a>	R5/32	5/16	3/8	3/4	3-1/2
<a href="#">46305</a>	R3/16	3/8	3/8	3/4	3-1/2
<a href="#">46313</a>	R7/32	7/16	1/2	1	4-1/8
<a href="#">46321</a>	R1/4	1/2	1/2	1	4-1/8
<a href="#">46337</a>	R5/16	5/8	5/8	1-3/8	5
<a href="#">46359</a>	R3/8	3/4	3/4	1-5/8	5-5/8
<a href="#">46426</a>	R1/2	1	1	1-7/8	6-3/8

- The TiN coated, TiCN coated or TiAlN coated is available on your request.
- Coating Codes for Cobalt  
Uncoated EDP NO. + CN(TiN), CC(TiCN), CF(TiAlN F), CE(TiAlN E), CH(Hardslick)
- Coated Price Shown in Price List. Call for Availability.

Mill Dia. Tolerance (inch)	
0~+.0010	** 0~- .0020

\*\* The shank of end mills is the same diameter as the cutting portion.

◎ : Excellent ○ : Good

ISO Material Description	P										M				K					
	Non-alloy steel					Low alloy steel					High alloyed steel, and tool steel	Stainless steel		Grey cast iron		Nodular cast iron		Malleable cast iron		
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc	13	25	28	32	30	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend	◎	◎	◎	◎	○	◎	◎	○	○	◎	○									

ISO Material Description	N					S					H										
	Aluminum-wrought alloy		Aluminum-cast, alloyed		Copper and Copper Alloys (Bronze / Brass)	Non Metallic Materials	Heat Resistant Super Alloys			Titanium Alloys	Hardened steel	Chilled Cast Iron	Hardened Cast Iron								
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34	55	60	42	42	55	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend	○	○	○	○	○	○	○	○													



8% COBALT (M42) FLAT SHANK E2039 SERIES  
HSS (M2) FLAT SHANK E1039 SERIES

### HSSCo8 & HSS, 4 FLUTE REGULAR LENGTH CENTER CUTTING

► Center cutting allows these end mills to drill into the part for the beginning of a slot.  
These center cutting end mills are recommended for pocketing, tracer milling, cam milling, die sinking and slotting.



HSS Co8 HSS 4 30° FLAT p.C847, C848, C849

Unit : Inch

EDP No.		Mill Diameter	Shank Diameter	Length of Cut	Overall Length
8% COBALT (M42)	HSS (M2)				
<a href="#">07289</a>	<a href="#">07039</a>	1/8	3/8	3/8	2-5/16
<a href="#">07291</a>	<a href="#">07041</a>	5/32	3/8	7/16	2-3/8
<a href="#">07293</a>	<a href="#">07043</a>	3/16	3/8	1/2	2-3/8
<a href="#">07295</a>	<a href="#">07045</a>	7/32	3/8	9/16	2-7/16
<a href="#">07297</a>	<a href="#">07047</a>	1/4	3/8	5/8	2-7/16
<a href="#">07299</a>	<a href="#">07049</a>	9/32	3/8	11/16	2-1/2
<a href="#">07301</a>	<a href="#">07051</a>	5/16	3/8	3/4	2-1/2
<a href="#">07303</a>	<a href="#">07053</a>	11/32	3/8	3/4	2-1/2
<a href="#">07305</a>	<a href="#">07055</a>	3/8	3/8	3/4	2-1/2
<a href="#">07308</a>	<a href="#">07058</a>	13/32	3/8	1	2-11/16
<a href="#">07312</a>	<a href="#">07062</a>	7/16	3/8	1	2-11/16
<a href="#">07316</a>	<a href="#">07066</a>	15/32	3/8	1	2-11/16
<a href="#">07320</a>	<a href="#">07070</a>	1/2	3/8	1	2-11/16
<a href="#">07321</a>	<a href="#">07071</a>	1/2	1/2	1-1/4	3-1/4

- The TiN coated, TiCN coated or TiAlN coated is available on your request.
- Coating Codes for Cobalt  
Uncoated EDP NO. + CN(TiN), CC(TiCN), CF(TiAlN F), CE(TiAlN E), CH(Hardslick)
- Coating Codes for HSS  
Uncoated EDP NO. + HN(TiN), HC(TiCN), HF(TiAlN F), HE(TiAlN E), HH(Hardslick)
- Coated Price Shown in Price List. Call for Availability.

► NEXT PAGE

Mill Dia. Tolerance (inch)	
0~+.0010	** 0~+.0015

\*\* The shank of end mills is the same diameter as the cutting portion.

◎ : Excellent ○ : Good

ISO Material Description	P										M				K					
	Non-alloy steel					Low alloy steel					High alloyed steel, and tool steel	Stainless steel		Grey cast iron		Nodular cast iron		Malleable cast iron		
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc	13	25	28	32	30	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend	◎	◎	◎	◎	○	◎	◎	○	○	◎	○									

ISO Material Description	N					S					H										
	Aluminum-wrought alloy		Aluminum-cast, alloyed		Copper and Copper Alloys (Bronze / Brass)	Non Metallic Materials	Heat Resistant Super Alloys			Titanium Alloys	Hardened steel	Chilled Cast Iron	Hardened Cast Iron								
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34	55	60	42	42	55	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend	○	○	○	○	○	○	○	○													



8% COBALT (M42) FLAT SHANK E2039 SERIES  
HSS (M2) FLAT SHANK E1039 SERIES

### HSSCo8 & HSS, 4 FLUTE REGULAR LENGTH CENTER CUTTING

► Center cutting allows these end mills to drill into the part for the beginning of a slot. These center cutting end mills are recommended for pocketing, tracer milling, cam milling, die sinking and slotting.



p.C847, C848, C849

Unit : Inch

EDP No.	8% COBALT (M42)	HSS (M2)	Mill Diameter	Shank Diameter	Length of Cut	Overall Length
<a href="#">07337</a>	<a href="#">07087</a>	<a href="#">07088</a>	5/8	5/8	1-5/8	3-3/4
<a href="#">07348</a>	<a href="#">07098</a>	<a href="#">07099</a>	11/16	5/8	1-5/8	3-3/4
<a href="#">07357</a>	<a href="#">07107</a>	<a href="#">07108</a>	3/4	1/2	1-5/8	3-5/8
<a href="#">07358</a>	<a href="#">07108</a>	<a href="#">07109</a>	3/4	5/8	1-5/8	3-3/4
<a href="#">07359</a>	<a href="#">07109</a>	<a href="#">07110</a>	3/4	3/4	1-5/8	3-7/8
<a href="#">07391</a>	<a href="#">07141</a>	<a href="#">07142</a>	7/8	3/4	1-7/8	4-1/8
<a href="#">07394</a>	<a href="#">07144</a>	<a href="#">07145</a>	7/8	7/8	1-7/8	4-1/8
<a href="#">07420</a>	<a href="#">07170</a>	<a href="#">07171</a>	1	5/8	1-7/8	4
<a href="#">07422</a>	<a href="#">07172</a>	<a href="#">07173</a>	1	3/4	1-7/8	4-1/8
<a href="#">07426</a>	<a href="#">07176</a>	<a href="#">07177</a>	1	1	2	4-1/2
<a href="#">07435</a>	<a href="#">07185</a>	<a href="#">07186</a>	1-1/8	1	2	4-1/2
<a href="#">07445</a>	<a href="#">07195</a>	<a href="#">07196</a>	1-1/4	1-1/4	2	4-1/2
<a href="#">07461</a>	<a href="#">07211</a>	<a href="#">07212</a>	1-1/2	1-1/4	2	4-1/2

- The TiN coated, TiCN coated or TiAlN coated is available on your request.
- Coating Codes for Cobalt  
Uncoated EDP NO. + CN(TiN), CC(TiCN), CF(TiAlN F), CE(TiAlN E), CH(Hardslick)
- Coating Codes for HSS  
Uncoated EDP NO. + HN(TiN), HC(TiCN), HF(TiAlN F), HE(TiAlN E), HH(Hardslick)
- Coated Price Shown in Price List. Call for Availability.

Mill Dia. Tolerance (inch)
0~+.0010
** 0~+.0015

\*\* The shank of end mills is the same diameter as the cutting portion.

◎ : Excellent ○ : Good

ISO	P										M				K					
	Non-alloy steel					Low alloy steel					High alloyed steel, and tool steel		Stainless steel		Grey cast iron		Nodular cast iron		Malleable cast iron	
Material Description	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc	13	25	28	32	38	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎

ISO	N					S					H											
	Aluminum-wrought alloy		Aluminum-cast, alloyed		Copper and Copper Alloys (Bronze / Brass)	Non Metallic Materials		Heat Resistant Super Alloys			Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron							
Material Description	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	
HRc	60	100	75	90	130	110	90	100			15	30	25	38	34	40	55	60	42	55	55	
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550	
Recommend	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎



8% COBALT (M42) FLAT SHANK E2042 SERIES  
HSS (M2) FLAT SHANK E1042 SERIES

### HSSCo8 & HSS, 6 FLUTE REGULAR LENGTH CENTER CUTTING

► Center cutting allows these end mills to drill into the part for the beginning of a slot. These center cutting end mills are recommended for pocketing, tracer milling, cam milling, die sinking and slotting.



p.C850, C851, C852

Unit : Inch

EDP No.	8% COBALT (M42)	HSS (M2)	Mill Diameter	Shank Diameter	Length of Cut	Overall Length
<a href="#">07338</a>	<a href="#">07088</a>	<a href="#">07089</a>	5/8	5/8	1-5/8	3-3/4
<a href="#">07349</a>	<a href="#">07099</a>	<a href="#">07100</a>	11/16	5/8	1-5/8	3-3/4
<a href="#">07360</a>	<a href="#">07110</a>	<a href="#">07111</a>	3/4	3/4	1-5/8	3-7/8
<a href="#">07395</a>	<a href="#">07145</a>	<a href="#">07146</a>	7/8	7/8	1-7/8	4-1/8
<a href="#">07427</a>	<a href="#">07177</a>	<a href="#">07178</a>	1	1	2	4-1/2
<a href="#">07436</a>	<a href="#">07186</a>	<a href="#">07187</a>	1-1/8	1	2	4-1/2
<a href="#">07446</a>	<a href="#">07196</a>	<a href="#">07197</a>	1-1/4	1-1/4	2	4-1/2
<a href="#">07448</a>	<a href="#">07196</a>	<a href="#">07197</a>	1-5/16	3/4	2	4-1/4
<a href="#">07462</a>	<a href="#">07212</a>	<a href="#">07213</a>	1-1/2	1-1/4	2	4-1/2
<a href="#">07478</a>	<a href="#">07228</a>	<a href="#">07229</a>	2	1-1/4	2	4-1/2
* <a href="#">07481</a>	* <a href="#">07231</a>	<a href="#">07232</a>	2	2	2	5-3/4

- The TiN coated, TiCN coated or TiAlN coated is available on your request.
- Coating Codes for Cobalt  
Uncoated EDP NO. + CN(TiN), CC(TiCN), CF(TiAlN F), CE(TiAlN E), CH(Hardslick)
- Coating Codes for HSS  
Uncoated EDP NO. + HN(TiN), HC(TiCN), HF(TiAlN F), HE(TiAlN E), HH(Hardslick)
- Coated Price Shown in Price List. Call for Availability.

Mill Dia. Tolerance (inch)
0~+.0010
** 0~+.0015

\*\* The shank of end mills is the same diameter as the cutting portion.

◎ : Excellent ○ : Good

ISO	P										M				K						
	Non-alloy steel					Low alloy steel					High alloyed steel, and tool steel		Stainless steel		Grey cast iron		Nodular cast iron		Malleable cast iron		
Material Description	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
HRc	13	25	28	32	38	10	29	32	38	15	35	15	23	10	10	26	3	25		21	
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230	
Recommend	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎

ISO	N					S					H											
	Aluminum-wrought alloy		Aluminum-cast, alloyed		Copper and Copper Alloys (Bronze / Brass)	Non Metallic Materials		Heat Resistant Super Alloys			Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron							
Material Description	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	
HRc	60	100	75	90	130	110	90	100			15	30	25	38	34	40	55	60	42	55	55	
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550	
Recommend	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎

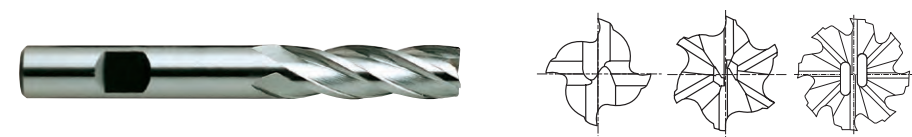




8% COBALT (M42) FLAT SHANK E2039 SERIES  
 8% COBALT (M42) FLAT SHANK E2042 SERIES

### HSSCo8, MULTI FLUTE MEDIUM LENGTH CENTER CUTTING

► Center cutting allows these end mills to drill into the part for the beginning of a slot. These center cutting end mills are recommended for pocketing, tracer milling, cam milling, die sinking and slotting.



HSS Co8 4-8 30° FLAT p.C847, C848, C849 / p.C850, C851, C852

#### E2039(4 FLUTE), E2042(6&8 FLUTE) Series Unit : Inch

EDP No.	Mill Diameter	Shank Diameter	Length of Cut	Overall Length	No. of Flute
<b>07901</b>	1	1	3	5-1/2	4
<b>07902</b>	1-1/4	1-1/4	3	5-1/2	4
<b>07903</b>	1-1/2	1-1/4	3	5-1/2	4
<b>07094</b>	1	1	3	5-1/2	6
<b>07095</b>	1-1/4	1-1/4	3	5-1/2	6
<b>07096</b>	1-1/2	1-1/4	3	5-1/2	6
<b>07097</b>	1-3/4	1-1/4	3	5-1/2	6
<b>99098</b>	2	1-1/4	3	5-1/2	8

■ The TiN coated, TiCN coated or TiAlN coated is available on your request.  
 ■ Coating Codes for Cobalt  
 Uncoated EDP NO. + CN(TiN), CC(TiCN), CF(TiAlN F), CE(TiAlN E), CH(Hardslick)  
 ► Coated Price Shown in Price List. Call for Availability.

Mill Dia. Tolerance (inch)	
0~+.0010	** 0~+.0015

\*\* The shank of end mills is the same diameter as the cutting portion.

◎ : Excellent ○ : Good

ISO	P										M				K					
	Non-alloy steel					Low alloy steel					High alloyed steel, and tool steel				Stainless steel		Grey cast iron		Nodular cast iron	Malleable cast iron
Material Description	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc	13	25	28	32	30	29	32	38	35	35	15	23	10	10	10	26	3	25	3	21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend	◎	◎	◎	◎	○	◎	◎	○	○	◎	○	○	○	○	○	○	○	○	○	○

ISO	N					S					H										
	Aluminum-wrought alloy		Aluminum-cast, alloyed		Copper and Copper Alloys (Bronze / Brass)	Non Metallic Materials		Heat Resistant Super Alloys			Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron						
Material Description	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc	60	100	75	90	130	110	90	100			15	30	25	38	34	55	60	42	42	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend	○	○	○	○	○	○	○	○			○	○	○	○	○	○	○	○	○	○	○



8% COBALT (M42) FLAT SHANK E2040 / E2162 SERIES  
 HSS (M2) FLAT SHANK E1040 / E1162 SERIES

### HSSCo8 & HSS, 4&6 FLUTE LONG LENGTH CENTER CUTTING

► Longer flute length than E2039 type, E2042 and allows deeper cutting.



HSS Co8 HSS 4&6 30° FLAT p.C847, C848, C849 / p.C850, C851, C852

#### E2040(8% COBALT), E1040(HSS) Series 4 FLUTE Unit : Inch

EDP No.	Mill Diameter	Shank Diameter	Length of Cut	Overall Length
<b>08297</b>	1/4	3/8	1-1/4	3-1/16
<b>08301</b>	5/16	3/8	1-3/8	3-1/8
<b>08305</b>	3/8	3/8	1-1/2	3-1/4
<b>08321</b>	1/2	1/2	2	4
<b>08337</b>	5/8	5/8	2-1/2	4-5/8
<b>08359</b>	3/4	3/4	3	5-1/4
<b>08394</b>	7/8	7/8	3-1/2	5-3/4
<b>08426</b>	1	1	4	6-1/2
<b>08445</b>	1-1/4	1-1/4	4	6-1/2
<b>08461</b>	1-1/2	1-1/4	4	6-1/2

#### E2162(8% COBALT), E1162(HSS) Series 6 FLUTE Unit : Inch

EDP No.	Mill Diameter	Shank Diameter	Length of Cut	Overall Length
<b>08322</b>	1/2	1/2	2	4
<b>08338</b>	5/8	5/8	2-1/2	4-5/8
<b>08360</b>	3/4	3/4	3	5-1/4
<b>08395</b>	7/8	7/8	3-1/2	5-3/4
<b>08427</b>	1	1	4	6-1/2
<b>08446</b>	1-1/4	1-1/4	4	6-1/2
<b>08462</b>	1-1/2	1-1/4	4	6-1/2
<b>08478</b>	2	1-1/4	4	6-1/2
* <b>08485</b>	2	2	4	7-3/4
* <b>08489</b>	2	2	6	9-3/4

\* Combination Shank

Mill Dia. Tolerance (inch)	
0~+.0010	** 0~+.0015

\*\* The shank of end mills is the same diameter as the cutting portion.

■ The TiN coated, TiCN coated or TiAlN coated is available on your request.  
 ■ Coating Codes for Cobalt  
 Uncoated EDP NO. + CN(TiN), CC(TiCN), CF(TiAlN F), CE(TiAlN E), CH(Hardslick)  
 ■ Coating Codes for HSS  
 Uncoated EDP NO. + HN(TiN), HC(TiCN), HF(TiAlN F), HE(TiAlN E), HH(Hardslick)  
 ► Coated Price Shown in Price List. Call for Availability.

◎ : Excellent ○ : Good

ISO	P										M				K					
	Non-alloy steel					Low alloy steel					High alloyed steel, and tool steel				Stainless steel		Grey cast iron		Nodular cast iron	Malleable cast iron
Material Description	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc	13	25	28	32	30	29	32	38	35	35	15	23	10	10	10	26	3	25	3	21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend	◎	◎	◎	◎	○	◎	◎	○	○	◎	○	○	○	○	○	○	○	○	○	○

ISO	N					S					H										
	Aluminum-wrought alloy		Aluminum-cast, alloyed		Copper and Copper Alloys (Bronze / Brass)	Non Metallic Materials		Heat Resistant Super Alloys			Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron						
Material Description	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc	60	100	75	90	130	110	90	100			15	30	25	38	34	55	60	42	42	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend	○	○	○	○	○	○	○	○			○	○	○	○	○	○	○	○	○	○	○



8% COBALT (M42) FLAT SHANK E2041 / E2175 SERIES
HSS (M2) FLAT SHANK E1041 / E1175 SERIES

HSSCo8 & HSS, 4&6 FLUTE EXTRA LONG LENGTH CENTER CUTTING

► Provided with longest flute length and suitable for high accuracy machining of deep step.



p.C847, C848, C849 / p.C850, C851, C852

E2041(8% COBALT) , E1041(HSS) Series ■ 4 FLUTE

Unit : Inch

Table with 6 columns: EDP No., Mill Diameter, Shank Diameter, Length of Cut, Overall Length. Rows include 8% COBALT (M42) and HSS (M2) series.

E2175(8% COBALT) , E1175(HSS) Series ■ 6 FLUTE

Unit : Inch

Table with 6 columns: EDP No., Mill Diameter, Shank Diameter, Length of Cut, Overall Length. Rows include 8% COBALT (M42) and HSS (M2) series.

\* Combination Shank

Table with 2 columns: Mill Dia. Tolerance (inch). Values: 0~+.0010, \*\* 0~+.0015

- The TiN coated, TiCN coated or TiAlN coated is available on your request.
■ Coating Codes for Cobalt
■ Coating Codes for HSS

\*\* The shank of end mills is the same diameter as the cutting portion.

ISO Material Compatibility Chart showing suitability for various materials like Non-alloy steel, Low alloy steel, High alloyed steel, etc.



8% COBALT (M42) FLAT SHANK E2053 SERIES
HSS (M2) FLAT SHANK E1053 SERIES

HSSCo8 & HSS, 4 FLUTE REGULAR LENGTH DOUBLE CENTER CUTTING

► Series E2053 end mills are the double-end version of E2039 center cutting single-end tools. They are used for slotting, shallow pocketing, tracer milling or die sinking and similar operation.



p.C847, C848, C849

Table with 6 columns: EDP No., Mill Diameter, Shank Diameter, Length of Cut, Overall Length. Rows include 8% COBALT (M42) and HSS (M2) series.

► NEXT PAGE

- The TiN coated, TiCN coated or TiAlN coated is available on your request.
■ Coating Codes for Cobalt
■ Coating Codes for HSS

ISO Material Compatibility Chart showing suitability for various materials like Non-alloy steel, Low alloy steel, High alloyed steel, etc.



8% COBALT (M42) FLAT SHANK E2053 SERIES  
HSS (M2) FLAT SHANK E1053 SERIES

### HSSCo8 & HSS, 4 FLUTE REGULAR LENGTH DOUBLE CENTER CUTTING

► Series E2053 end mills are the double-end version of E2039 center cutting single-end tools. They are used for slotting, shallow pocketing, tracer milling or die sinking and similar operation.



p.C847, C848, C849

EDP No.		Mill Diameter	Shank Diameter	Length of Cut	Overall Length
8% COBALT (M42)	HSS (M2)				
<a href="#">13319</a>	<a href="#">13069</a>	31/64	1/2	1	4-1/8
<a href="#">13321</a>	<a href="#">13071</a>	1/2	1/2	1	4-1/8
<a href="#">13330</a>	<a href="#">13080</a>	9/16	5/8	1-3/8	5
<a href="#">13337</a>	<a href="#">13087</a>	5/8	5/8	1-3/8	5
<a href="#">13350</a>	<a href="#">13100</a>	11/16	3/4	1-5/8	5-5/8
<a href="#">13359</a>	<a href="#">13109</a>	3/4	3/4	1-5/8	5-5/8
<a href="#">13377</a>	<a href="#">13127</a>	13/16	7/8	1-7/8	6-1/8
<a href="#">13394</a>	<a href="#">13144</a>	7/8	7/8	1-7/8	6-1/8
<a href="#">13426</a>	<a href="#">13176</a>	1	1	1-7/8	6-3/8

Unit : Inch

- The TiN coated, TiCN coated or TiAlN coated is available on your request.
- Coating Codes for Cobalt  
Uncoated EDP NO. + CN(TiN), CC(TiCN), CF(TiAlN F), CE(TiAlN E), CH(Hardslick)
- Coating Codes for HSS  
Uncoated EDP NO. + HN(TiN), HC(TiCN), HF(TiAlN F), HE(TiAlN E), HH(Hardslick)
- Coated Price Shown in Price List. Call for Availability.

Mill Dia. Tolerance (inch)	
0~+.0010	** 0~-.0020

\*\* The shank of end mills is the same diameter as the cutting portion.

◎ : Excellent ○ : Good

ISO Material Description	P										M				K					
	Non-alloy steel					Low alloy steel					High alloyed steel, and tool steel	Stainless steel		Grey cast iron	Nodular cast iron	Malleable cast iron				
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc	13	25	28	32	38	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend	◎	◎	◎	◎	○	◎	◎	○	○	◎	○									

ISO Material Description	N					S					H										
	Aluminum-wrought alloy	Aluminum-cast, alloyed		Copper and Copper Alloys (Bronze / Brass)		Non Metallic Materials	Heat Resistant Super Alloys			Titanium Alloys	Hardened steel	Chilled Cast Iron	Hardened Cast Iron								
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc	60	100	75	90	130	110	90	100			15	30	25	38	34	400 Rm	1050 Rm	55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend	○	○	○	○	○	○	○	○													



8% COBALT (M42) FLAT SHANK E2100 SERIES  
HSS (M2) FLAT SHANK E1100 SERIES

### HSSCo8 & HSS, 6 FLUTE REGULAR with COMBINATION 2" SHANK CENTER CUTTING

► These are to be used for heavy hogging cuts in die-sinking, tape & tracer controlled milling and similar work. The Heavy-Duty end mills are made with toughened Combination shank, heavy web construction, accurate machine-ground end-teeth notching and a special surface treatment to reduce cutting-edge wear.



p.C850, C851, C852

EDP No.		Mill Diameter	Shank Diameter	Length of Cut	Overall Length
8% COBALT (M42)	HSS (M2)				
<a href="#">10481</a>	<a href="#">10231</a>	2	2	2	5-3/4
<a href="#">10485</a>	<a href="#">10235</a>	2	2	4	7-3/4
<a href="#">10487</a>	<a href="#">10237</a>	2	2	5	8-3/4
<a href="#">10489</a>	<a href="#">10239</a>	2	2	6	9-3/4
<a href="#">10491</a>	<a href="#">10241</a>	2	2	8	11-3/4

Unit : Inch

- The TiN coated, TiCN coated or TiAlN coated is available on your request.
- Coating Codes for Cobalt  
Uncoated EDP NO. + CN(TiN), CC(TiCN), CF(TiAlN F), CE(TiAlN E), CH(Hardslick)
- Coating Codes for HSS  
Uncoated EDP NO. + HN(TiN), HC(TiCN), HF(TiAlN F), HE(TiAlN E), HH(Hardslick)
- Coated Price Shown in Price List. Call for Availability.

Mill Dia. Tolerance (inch)
0~+.0030

◎ : Excellent ○ : Good

ISO Material Description	P										M				K					
	Non-alloy steel					Low alloy steel					High alloyed steel, and tool steel	Stainless steel		Grey cast iron	Nodular cast iron	Malleable cast iron				
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc	13	25	28	32	38	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend	◎	◎	◎	◎	○	◎	◎	○	○	◎	○									

ISO Material Description	N					S					H										
	Aluminum-wrought alloy	Aluminum-cast, alloyed		Copper and Copper Alloys (Bronze / Brass)		Non Metallic Materials	Heat Resistant Super Alloys			Titanium Alloys	Hardened steel	Chilled Cast Iron	Hardened Cast Iron								
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc	60	100	75	90	130	110	90	100			15	30	25	38	34	400 Rm	1050 Rm	55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend	○	○	○	○	○	○	○	○													

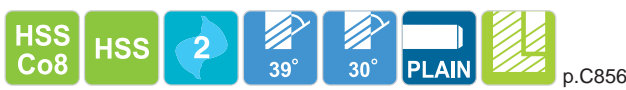




8% COBALT (M42) PLAIN SHANK E2001 SERIES  
HSS (M2) PLAIN SHANK E1001 SERIES

### HSSCo8 & HSS, 2 FLUTE MINIATURE STUB LENGTH DOUBLE

► Tools under Miniature end mills have 3/16" shank diameter without flats. They are designed with positive rake angle geometry and a high helix angle to insure free cutting action. The flute design provides good strength behind the cutting edge. Suitable for finishing of precision components such as watch, camera, electronic apparatus molds, etc.



EDP No.		Mill Diameter	Shank Diameter	Length of Cut	Overall Length
8% COBALT (M42)	HSS (M2)				
49252	49002	1/32	3/16	3/64	2
49254	49004	3/64	3/16	1/16	2
49256	49006	1/16	3/16	3/32	2
49258	49008	5/64	3/16	1/8	2
49260	49010	3/32	3/16	9/64	2
49262	49012	7/64	3/16	5/32	2
49264	49014	1/8	3/16	3/16	2
49266	49016	9/64	3/16	7/32	2
49268	49018	5/32	3/16	15/64	2
49270	49020	11/64	3/16	1/4	2
49272	49022	3/16	3/16	9/32	2

- The TiN coated, TiCN coated or TiAlN coated is available on your request.
- Coating Codes for Cobalt  
Uncoated EDP NO. + CN(TiN), CC(TiCN), CF(TiAlN F), CE(TiAlN E), CH(Hardslick)
- Coating Codes for HSS  
Uncoated EDP NO. + HN(TiN), HC(TiCN), HF(TiAlN F), HE(TiAlN E), HH(Hardslick)
- Coated Price Shown in Price List. Call for Availability.

Mill Dia. Tolerance (inch)	
0~+.0010	** 0~-.0020

\*\* The shank of end mills is the same diameter as the cutting portion.

◎ : Excellent ○ : Good

ISO	P										M				K					
	Non-alloy steel					Low alloy steel					High alloyed steel, and tool steel		Stainless steel		Grey cast iron		Nodular cast iron		Malleable cast iron	
Material Description	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc	13	25	28	32	38	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend	◎	◎	◎	◎	○	◎	◎	○	○	◎	○									

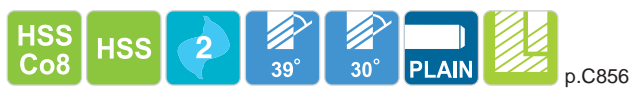
ISO	N					S					H										
	Aluminum-wrought alloy		Aluminum-cast, alloyed		Copper and Copper Alloys (Bronze / Brass)	Non Metallic Materials		Heat Resistant Super Alloys			Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron						
Material Description	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc	60	100	75	90	130	110	90	100			15	30	25	38	34	400 Rm	1050 Rm	55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend	○	○	○	○	○	○	○	○													



8% COBALT (M42) PLAIN SHANK E2003 SERIES  
HSS (M2) PLAIN SHANK E1003 SERIES

### HSSCo8 & HSS, 2 FLUTE MINIATURE REGULAR LENGTH DOUBLE

► Suitable for finishing of precision components such as watch, camera electronic apparatus molds, etc.



EDP No.		Mill Diameter	Shank Diameter	Length of Cut	Overall Length
8% COBALT (M42)	HSS (M2)				
50252	50002	1/32	3/16	3/32	2-1/4
50254	50004	3/64	3/16	9/64	2-1/4
50256	50006	1/16	3/16	3/16	2-1/4
50258	50008	5/64	3/16	15/64	2-1/4
50260	50010	3/32	3/16	9/32	2-1/4
50262	50012	7/64	3/16	21/64	2-1/4
50264	50014	1/8	3/16	3/8	2-1/4
50266	50016	9/64	3/16	13/32	2-1/4
50268	50018	5/32	3/16	7/16	2-1/4
50270	50020	11/64	3/16	1/2	2-1/4
50272	50022	3/16	3/16	1/2	2-1/4

- The TiN coated, TiCN coated or TiAlN coated is available on your request.
- Coating Codes for Cobalt  
Uncoated EDP NO. + CN(TiN), CC(TiCN), CF(TiAlN F), CE(TiAlN E), CH(Hardslick)
- Coating Codes for HSS  
Uncoated EDP NO. + HN(TiN), HC(TiCN), HF(TiAlN F), HE(TiAlN E), HH(Hardslick)
- Coated Price Shown in Price List. Call for Availability.

Mill Dia. Tolerance (inch)	
0~+.0010	** 0~-.0020

\*\* The shank of end mills is the same diameter as the cutting portion.

◎ : Excellent ○ : Good

ISO	P										M				K					
	Non-alloy steel					Low alloy steel					High alloyed steel, and tool steel		Stainless steel		Grey cast iron		Nodular cast iron		Malleable cast iron	
Material Description	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc	13	25	28	32	38	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend	◎	◎	◎	◎	○	◎	◎	○	○	◎	○									

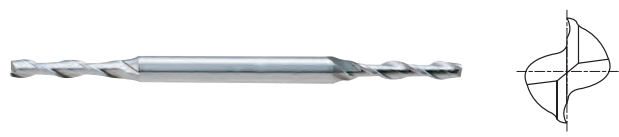
ISO	N					S					H										
	Aluminum-wrought alloy		Aluminum-cast, alloyed		Copper and Copper Alloys (Bronze / Brass)	Non Metallic Materials		Heat Resistant Super Alloys			Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron						
Material Description	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc	60	100	75	90	130	110	90	100			15	30	25	38	34	400 Rm	1050 Rm	55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend	○	○	○	○	○	○	○	○													



8% COBALT (M42) PLAIN SHANK E2005 SERIES  
HSS (M2) PLAIN SHANK E1005 SERIES

### HSSCo8 & HSS, 2 FLUTE MINIATURE LONG LENGTH DOUBLE

► Suitable for finishing of precision components such as watch, camera electronic apparatus molds, etc.



HSS Co8 HSS 2 39° 30° PLAIN p.C856

EDP No.		Mill Diameter	Shank Diameter	Length of Cut	Overall Length
8% COBALT (M42)	HSS (M2)				
51256	51006	1/16	3/16	7/32	2-1/2
51258	51008	5/64	3/16	1/4	2-1/2
51260	51010	3/32	3/16	9/32	2-5/8
51262	51012	7/64	3/16	9/32	2-5/8
51264	51014	1/8	3/16	3/4	3-1/8
51266	51016	9/64	3/16	3/4	3-1/8
51268	51018	5/32	3/16	7/8	3-1/4
51270	51020	11/64	3/16	7/8	3-1/4
51272	51022	3/16	3/16	1	3-3/8

- The TiN coated, TiCN coated or TiAlN coated is available on your request.
- Coating Codes for Cobalt  
Uncoated EDP NO. + CN(TiN), CC(TiCN), CF(TiAlN F), CE(TiAlN E), CH(Hardslick)
- Coating Codes for HSS  
Uncoated EDP NO. + HN(TiN), HC(TiCN), HF(TiAlN F), HE(TiAlN E), HH(Hardslick)
- Coated Price Shown in Price List. Call for Availability.

Mill Dia. Tolerance (inch)	
0~+.0010	** 0~-.0020

\*\* The shank of end mills is the same diameter as the cutting portion.

◎ : Excellent ○ : Good

ISO Material Description	P										M				K					
	Non-alloy steel					Low alloy steel					High alloyed steel, and tool steel	Stainless steel		Grey cast iron		Nodular cast iron		Malleable cast iron		
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend	◎	◎	◎	◎	○	◎	◎	○	○	◎	○									

ISO Material Description	N					S					H										
	Aluminum-wrought alloy	Aluminum-cast, alloyed		Copper and Copper Alloys (Bronze / Brass)		Non Metallic Materials	Heat Resistant Super Alloys			Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron							
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34	55	60	42	42	55	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend	○	○	○	○	○	○	○	○													



8% COBALT (M42) PLAIN SHANK E2002 SERIES  
HSS (M2) PLAIN SHANK E1002 SERIES

### HSSCo8 & HSS, 4FLUTE MINIATURE STUB LENGTH DOUBLE

► Suitable for finishing of precision components such as watch, camera electronic apparatus molds, etc.



HSS Co8 HSS 4 39° 30° PLAIN p.C856

EDP No.		Mill Diameter	Shank Diameter	Length of Cut	Overall Length
8% COBALT (M42)	HSS (M2)				
52256	52006	1/16	3/16	3/32	2
52258	52008	5/64	3/16	1/8	2
52260	52010	3/32	3/16	9/64	2
52262	52012	7/64	3/16	5/32	2
52264	52014	1/8	3/16	3/16	2
52266	52016	9/64	3/16	7/32	2
52268	52018	5/32	3/16	15/64	2
52270	52020	11/64	3/16	1/4	2
52272	52022	3/16	3/16	9/32	2

- The TiN coated, TiCN coated or TiAlN coated is available on your request.
- Coating Codes for Cobalt  
Uncoated EDP NO. + CN(TiN), CC(TiCN), CF(TiAlN F), CE(TiAlN E), CH(Hardslick)
- Coating Codes for HSS  
Uncoated EDP NO. + HN(TiN), HC(TiCN), HF(TiAlN F), HE(TiAlN E), HH(Hardslick)
- Coated Price Shown in Price List. Call for Availability.

Mill Dia. Tolerance (inch)	
0~+.0010	** 0~-.0020

\*\* The shank of end mills is the same diameter as the cutting portion.

◎ : Excellent ○ : Good

ISO Material Description	P										M				K					
	Non-alloy steel					Low alloy steel					High alloyed steel, and tool steel	Stainless steel		Grey cast iron		Nodular cast iron		Malleable cast iron		
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend	◎	◎	◎	◎	○	◎	◎	○	○	◎	○									

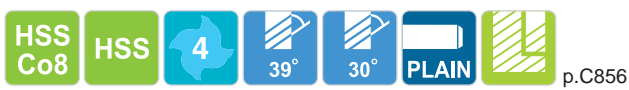
ISO Material Description	N					S					H										
	Aluminum-wrought alloy	Aluminum-cast, alloyed		Copper and Copper Alloys (Bronze / Brass)		Non Metallic Materials	Heat Resistant Super Alloys			Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron							
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34	55	60	42	42	55	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend	○	○	○	○	○	○	○	○													



8% COBALT (M42) PLAIN SHANK E2004 SERIES  
HSS (M2) PLAIN SHANK E1004 SERIES

### HSSCo8 & HSS, 4FLUTE MINIATURE REGULAR LENGTH DOUBLE

► Suitable for finishing of precision components such as watch, camera electronic apparatus molds, etc.



EDP No.		Mill Diameter	Shank Diameter	Length of Cut	Overall Length
8% COBALT (M42)	HSS (M2)				
53256	53006	1/16	3/16	3/16	2-1/4
53258	53008	5/64	3/16	15/64	2-1/4
53260	53010	3/32	3/16	9/32	2-1/4
53262	53012	7/64	3/16	21/64	2-1/4
53264	53014	1/8	3/16	3/8	2-1/4
53266	53016	9/64	3/16	13/32	2-1/4
53268	53018	5/32	3/16	7/16	2-1/4
53270	53020	11/64	3/16	1/2	2-1/4
53272	53022	3/16	3/16	1/2	2-1/4

- The TiN coated, TiCN coated or TiAlN coated is available on your request.
- Coating Codes for Cobalt  
Uncoated EDP NO. + CN(TiN), CC(TiCN), CF(TiAlN F), CE(TiAlN E), CH(Hardslick)
- Coating Codes for HSS  
Uncoated EDP NO. + HN(TiN), HC(TiCN), HF(TiAlN F), HE(TiAlN E), HH(Hardslick)
- Coated Price Shown in Price List. Call for Availability.

Mill Dia. Tolerance (inch)	
0~+.0010	** 0~-.0020

\*\* The shank of end mills is the same diameter as the cutting portion.

◎ : Excellent ○ : Good

ISO	P										M				K					
	Non-alloy steel					Low alloy steel					High alloyed steel, and tool steel	Stainless steel		Grey cast iron	Nodular cast iron	Malleable cast iron				
Material Description	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc	13	25	28	32	30	10	29	32	38	15	35	15	23	10	10	26	3	25	21	21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend	◎	◎	◎	◎	○	◎	◎	○	○	◎	○									

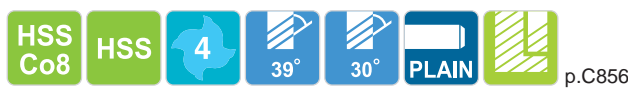
ISO	N					S					H										
	Aluminum-wrought alloy	Aluminum-cast, alloyed		Copper and Copper Alloys (Bronze / Brass)		Non Metallic Materials	Heat Resistant Super Alloys			Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron							
Material Description	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc	60	100	75	90	130	110	90	100			15	30	25	38	34	400 Rm	1050 Rm	55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend	○	○	○	○	○	○	○	○													



8% COBALT (M42) PLAIN SHANK E2006 SERIES  
HSS (M2) PLAIN SHANK E1006 SERIES

### HSSCo8 & HSS, 4FLUTE MINIATURE LONG LENGTH DOUBLE

► Suitable for finishing of precision components such as watch, camera electronic apparatus molds, etc.



EDP No.		Mill Diameter	Shank Diameter	Length of Cut	Overall Length
8% COBALT (M42)	HSS (M2)				
54256	54006	1/16	3/16	7/32	2-1/2
54258	54008	5/64	3/16	1/4	2-1/2
54260	54010	3/32	3/16	9/32	2-5/8
54262	54012	7/64	3/16	9/32	2-5/8
54264	54014	1/8	3/16	3/4	3-1/8
54266	54016	9/64	3/16	3/4	3-1/8
54268	54018	5/32	3/16	7/8	3-1/4
54270	54020	11/64	3/16	7/8	3-1/4
54272	54022	3/16	3/16	1	3-3/8

- The TiN coated, TiCN coated or TiAlN coated is available on your request.
- Coating Codes for Cobalt  
Uncoated EDP NO. + CN(TiN), CC(TiCN), CF(TiAlN F), CE(TiAlN E), CH(Hardslick)
- Coating Codes for HSS  
Uncoated EDP NO. + HN(TiN), HC(TiCN), HF(TiAlN F), HE(TiAlN E), HH(Hardslick)
- Coated Price Shown in Price List. Call for Availability.

Mill Dia. Tolerance (inch)	
0~+.0010	** 0~-.0020

\*\* The shank of end mills is the same diameter as the cutting portion.

◎ : Excellent ○ : Good

ISO	P										M				K					
	Non-alloy steel					Low alloy steel					High alloyed steel, and tool steel	Stainless steel		Grey cast iron	Nodular cast iron	Malleable cast iron				
Material Description	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc	13	25	28	32	30	10	29	32	38	15	35	15	23	10	10	26	3	25	21	21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend	◎	◎	◎	◎	○	◎	◎	○	○	◎	○									

ISO	N					S					H										
	Aluminum-wrought alloy	Aluminum-cast, alloyed		Copper and Copper Alloys (Bronze / Brass)		Non Metallic Materials	Heat Resistant Super Alloys			Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron							
Material Description	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc	60	100	75	90	130	110	90	100			15	30	25	38	34	400 Rm	1050 Rm	55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend	○	○	○	○	○	○	○	○													

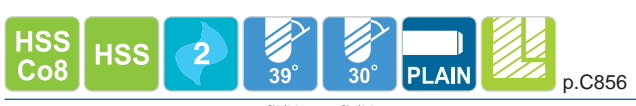




8% COBALT (M42) PLAIN SHANK E2008 SERIES  
HSS (M2) PLAIN SHANK E1008 SERIES

### HSSCo8 & HSS, 2 FLUTE MINIATURE STUB LENGTH BALL NOSE DOUBLE

► Helical flute in the nose radius.  
Suitable for high efficient copying process and cutting of die mold corner radius.



Unit : Inch

EDP No.		Radius of Ball Nose	Mill Diameter	Shank Diameter	Length of Cut	Overall Length
8% COBALT (M42)	HSS (M2)	R				
<a href="#">55256</a>	<a href="#">55006</a>	R1/32	1/16	3/16	3/32	2
<a href="#">55260</a>	<a href="#">55010</a>	R3/64	3/32	3/16	9/64	2
<a href="#">55264</a>	<a href="#">55014</a>	R1/16	1/8	3/16	3/16	2
<a href="#">55268</a>	<a href="#">55018</a>	R5/64	5/32	3/16	15/64	2
<a href="#">55272</a>	<a href="#">55022</a>	R3/32	3/16	3/16	9/32	2

- The TiN coated, TiCN coated or TiAlN coated is available on your request.
- Coating Codes for Cobalt  
Uncoated EDP NO. + CN(TiN), CC(TiCN), CF(TiAlN F), CE(TiAlN E), CH(Hardslick)
- Coating Codes for HSS  
Uncoated EDP NO. + HN(TiN), HC(TiCN), HF(TiAlN F), HE(TiAlN E), HH(Hardslick)
- Coated Price Shown in Price List. Call for Availability.

Mill Dia. Tolerance (inch)	
0~+.0010	** 0~ -.0020

\*\* The shank of end mills is the same diameter as the cutting portion.

◎ : Excellent ○ : Good

ISO	P										M				K					
	Non-alloy steel					Low alloy steel					High alloyed steel, and tool steel	Stainless steel		Grey cast iron	Nodular cast iron		Malleable cast iron			
Material Description	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc	13	25	28	32	35	38	42	45	48	50	55	58	60	62	65	68	70	72	74	76
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend	◎	◎	◎	◎	○	◎	◎	○	○	◎	○	○	○	○	○	○	○	○	○	○

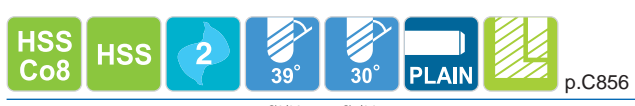
ISO	N					S					H										
	Aluminum-wrought alloy	Aluminum-cast, alloyed		Copper and Copper Alloys (Bronze / Brass)		Non Metallic Materials	Heat Resistant Super Alloys			Titanium Alloys	Hardened steel	Chilled Cast Iron	Hardened Cast Iron								
Material Description	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc	60	100	75	90	130	110	90	100			15	30	25	38	34	40	55	60	42	55	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend	○	○	○	○	○	○	○	○			○	○	○	○	○	○	○	○	○	○	○



8% COBALT (M42) PLAIN SHANK E2013 SERIES  
HSS (M2) PLAIN SHANK E1013 SERIES

### HSSCo8 & HSS, 2 FLUTE MINIATURE REGULAR LENGTH BALL NOSE DOUBLE

► Helical flute in the nose radius.  
Suitable for high efficient copying process and cutting of die mold corner radius.



Unit : Inch

EDP No.		Radius of Ball Nose	Mill Diameter	Shank Diameter	Length of Cut	Overall Length
8% COBALT (M42)	HSS (M2)	R				
<a href="#">56252</a>	<a href="#">56002</a>	R1/64	1/32	3/16	3/32	2-1/4
<a href="#">56254</a>	<a href="#">56004</a>	R3/128	3/64	3/16	9/64	2-1/4
<a href="#">56256</a>	<a href="#">56006</a>	R1/32	1/16	3/16	3/16	2-1/4
<a href="#">56258</a>	<a href="#">56008</a>	R5/128	5/64	3/16	15/64	2-1/4
<a href="#">56260</a>	<a href="#">56010</a>	R3/64	3/32	3/16	9/32	2-1/4
<a href="#">56262</a>	<a href="#">56012</a>	R7/128	7/64	3/16	21/64	2-1/4
<a href="#">56264</a>	<a href="#">56014</a>	R1/16	1/8	3/16	3/8	2-1/4
<a href="#">56266</a>	<a href="#">56016</a>	R9/128	9/64	3/16	13/32	2-1/4
<a href="#">56268</a>	<a href="#">56018</a>	R5/64	5/32	3/16	7/16	2-1/4
<a href="#">56270</a>	<a href="#">56020</a>	R11/128	11/64	3/16	1/2	2-1/4
<a href="#">56272</a>	<a href="#">56022</a>	R3/32	3/16	3/16	1/2	2-1/4

- The TiN coated, TiCN coated or TiAlN coated is available on your request.
- Coating Codes for Cobalt  
Uncoated EDP NO. + CN(TiN), CC(TiCN), CF(TiAlN F), CE(TiAlN E), CH(Hardslick)
- Coating Codes for HSS  
Uncoated EDP NO. + HN(TiN), HC(TiCN), HF(TiAlN F), HE(TiAlN E), HH(Hardslick)
- Coated Price Shown in Price List. Call for Availability.

Mill Dia. Tolerance (inch)	
0~+.0010	** 0~ -.0020

\*\* The shank of end mills is the same diameter as the cutting portion.

◎ : Excellent ○ : Good

ISO	P										M				K					
	Non-alloy steel					Low alloy steel					High alloyed steel, and tool steel	Stainless steel		Grey cast iron	Nodular cast iron		Malleable cast iron			
Material Description	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc	13	25	28	32	35	38	42	45	48	50	55	58	60	62	65	68	70	72	74	76
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend	◎	◎	◎	◎	○	◎	◎	○	○	◎	○	○	○	○	○	○	○	○	○	○

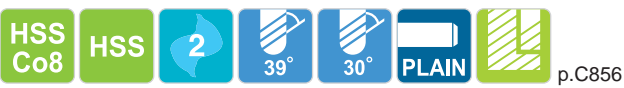
ISO	N					S					H										
	Aluminum-wrought alloy	Aluminum-cast, alloyed		Copper and Copper Alloys (Bronze / Brass)		Non Metallic Materials	Heat Resistant Super Alloys			Titanium Alloys	Hardened steel	Chilled Cast Iron	Hardened Cast Iron								
Material Description	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc	60	100	75	90	130	110	90	100			15	30	25	38	34	40	55	60	42	55	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend	○	○	○	○	○	○	○	○			○	○	○	○	○	○	○	○	○	○	○



8% COBALT (M42) PLAIN SHANK E2015 SERIES  
HSS (M2) PLAIN SHANK E1015 SERIES

### HSSCo8 & HSS, 2 FLUTE MINIATURE LONG LENGTH BALL NOSE DOUBLE

► Helical flute in the nose radius.  
Suitable for high efficient copying process and cutting of die mold corner radius.



EDP No.		Radius of Ball Nose	Mill Diameter	Shank Diameter	Length of Cut	Overall Length
8% COBALT (M42)	HSS (M2)	R				
<a href="#">57256</a>	<a href="#">57006</a>	R1/32	1/16	3/16	7/32	2-1/2
<a href="#">57260</a>	<a href="#">57010</a>	R3/64	3/32	3/16	9/32	2-5/8
<a href="#">57264</a>	<a href="#">57014</a>	R1/16	1/8	3/16	3/4	3-1/8
<a href="#">57268</a>	<a href="#">57018</a>	R5/64	5/32	3/16	7/8	3-1/4
<a href="#">57272</a>	<a href="#">57022</a>	R3/32	3/16	3/16	1	3-3/8

- The TiN coated, TiCN coated or TiAlN coated is available on your request.
- Coating Codes for Cobalt  
Uncoated EDP NO. + CN(TiN), CC(TiCN), CF(TiAlN F), CE(TiAlN E), CH(Hardslick)
- Coating Codes for HSS  
Uncoated EDP NO. + HN(TiN), HC(TiCN), HF(TiAlN F), HE(TiAlN E), HH(Hardslick)
- Coated Price Shown in Price List. Call for Availability.

Mill Dia. Tolerance (inch)	
0~+.0010	** 0~-.0020

\*\* The shank of end mills is the same diameter as the cutting portion.

◎ : Excellent ○ : Good

ISO	P										M				K			H																								
	Non-alloy steel					Low alloy steel					High alloyed steel, and tool steel				Stainless steel		Grey cast iron		Nodular cast iron	Malleable cast iron																						
Material Description	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	
HRc	13	13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25			21																					
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230	21																					
Recommend	◎	◎	◎	◎	○	◎	◎	○	○	◎	○																															

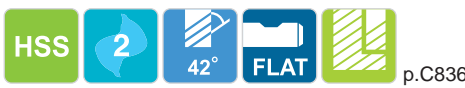
ISO	N					S					H										
	Aluminum-wrought alloy		Aluminum-cast, alloyed		Copper and Copper Alloys (Bronze / Brass)	Non Metallic Materials			Heat Resistant Super Alloys			Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron					
Material Description	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc	60	100	75	90	130	110	90	100			15	30	25	38	34	400 Rm	1050 Rm	55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend	◎	◎	◎	◎	◎	◎	◎	◎			◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎



HSS (M2) FLAT SHANK E1070 SERIES

### HSS, 2 FLUTE 42° HELIX REGULAR & MEDIUM LENGTH for ALUMINUM

► The two flute end mills for aluminum have High Helix flute design making them well suited for milling aluminum and other non-ferrous materials. Special rake angles and low micro inch finishes on the primary clearance angles and flute faces insure free cutting action, fine finishes and longer tool life for both non-ferrous materials as well as harder alloys. These tools are made from regular HSS(M2), which is good for aluminum cutting.



REGULAR LENGTH Unit : Inch

EDP No.	Mill Diameter	Shank Diameter	Length of Cut	Overall Length
HSS (M2)				
<a href="#">17047</a>	1/4	3/8	5/8	2-7/16
<a href="#">17051</a>	5/16	3/8	3/4	2-1/2
<a href="#">17055</a>	3/8	3/8	3/4	2-1/2
<a href="#">17062</a>	7/16	3/8	1	2-11/16
<a href="#">17071</a>	1/2	1/2	1-1/4	3-1/4
<a href="#">17087</a>	5/8	5/8	1-5/8	3-3/4
<a href="#">17109</a>	3/4	3/4	1-5/8	3-7/8
<a href="#">17141</a>	7/8	3/4	1-7/8	4-1/8
<a href="#">17144</a>	7/8	7/8	1-7/8	4-1/8
<a href="#">17172</a>	1	3/4	1-7/8	4-1/8
<a href="#">17176</a>	1	1	2	4-1/2
<a href="#">17195</a>	1-1/4	1-1/4	2	4-1/2
<a href="#">17211</a>	1-1/2	1-1/4	2	4-1/2
<a href="#">17219</a>	1-3/4	1-1/4	2	4-1/2
<a href="#">17227</a>	2	1-1/4	2	4-1/2

MEDIUM LENGTH Unit : Inch

EDP No.	Mill Diameter	Shank Diameter	Length of Cut	Overall Length
HSS (M2)				
<a href="#">99089</a>	1	1	3	5-1/2
<a href="#">99090</a>	1-1/4	1-1/4	3	5-1/2
<a href="#">99091</a>	1-1/2	1-1/4	3	5-1/2
<a href="#">99092</a>	1-3/4	1-1/4	3	5-1/2
<a href="#">99093</a>	2	1-1/4	3	5-1/2

Mill Dia. Tolerance (inch)	
0~+.0010	** 0~+.0015

- The TiN coated, TiCN coated or TiAlN coated is available on your request.
- Coating Codes for HSS  
Uncoated EDP NO. + HN(TiN), HC(TiCN), HF(TiAlN F), HE(TiAlN E), HH(Hardslick)
- Coated Price Shown in Price List. Call for Availability.

\*\* The shank of end mills is the same diameter as the cutting portion.

◎ : Excellent ○ : Good

ISO	P										M				K			H																								
	Non-alloy steel					Low alloy steel					High alloyed steel, and tool steel				Stainless steel		Grey cast iron		Nodular cast iron	Malleable cast iron																						
Material Description	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	
HRc	13	13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25			21																					
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230	21																					
Recommend	◎	◎	◎	◎	○	◎	◎	○	○	◎	○																															

ISO	N					S					H										
	Aluminum-wrought alloy		Aluminum-cast, alloyed		Copper and Copper Alloys (Bronze / Brass)	Non Metallic Materials			Heat Resistant Super Alloys			Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron					
Material Description	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc	60	100	75	90	130	110	90	100			15	30	25	38	34	400 Rm	1050 Rm	55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend	◎	◎	◎	◎	◎	◎	◎	◎			◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎



HSS (M2) FLAT SHANK E1071 SERIES  
HSS (M2) FLAT SHANK E1072 SERIES

**HSS, 2 FLUTE 42° HELIX LONG & EXTRA LONG LENGTH for ALUMINUM**

► Sharp cutting most suitable flute shape for cutting aluminum alloy, etc.  
These tools are made from regular HSS(M2), which is good for aluminum cutting.



p.C836

**LONG LENGTH**

Unit : Inch

EDP No. HSS (M2)	Mill Diameter	Shank Diameter	Length of Cut	Overall Length
18047	1/4	3/8	1-1/4	3-1/16
18051	5/16	3/8	1-3/8	3-1/8
18055	3/8	3/8	1-1/2	3-1/4
18063	7/16	1/2	1-3/4	3-3/4
18071	1/2	1/2	2	4
18087	5/8	5/8	2-1/2	4-5/8
18109	3/4	3/4	3	5-1/4
18176	1	1	4	6-1/2
18195	1-1/4	1-1/4	4	6-1/2
18211	1-1/2	1-1/4	4	6-1/2
18227	2	1-1/4	4	6-1/2

**EXTRA LONG LENGTH**

Unit : Inch

EDP No. HSS (M2)	Mill Diameter	Shank Diameter	Length of Cut	Overall Length
19047	1/4	3/8	1-3/4	3-9/16
19051	5/16	3/8	2	3-3/4
19055	3/8	3/8	2-1/2	4-1/4
19071	1/2	1/2	3	5
19087	5/8	5/8	4	6-1/8
19109	3/4	3/4	4	6-1/4
19176	1	1	6	8-1/2
19195	1-1/4	1-1/4	6	8-1/2
19211	1-1/2	1-1/4	8	10-1/2

■ The TiN coated, TiCN coated or TiAlN coated is available on your request.  
■ Coating Codes for HSS  
Uncoated EDP NO. + HN(TiN), HC(TiCN), HF(TiAlN F), HE(TiAlN E), HH(Hardslick)  
► Coated Price Shown in Price List. Call for Availability.

Mill Dia. Tolerance (inch)	
up to 1	0~+.0010
over 1	** 0~+.0015

\*\* The shank of end mills is the same diameter as the cutting portion.

◎ : Excellent ○ : Good

ISO Material Description	P										M				K						
	Non-alloy steel					Low alloy steel					High alloyed steel, and tool steel				Stainless steel		Grey cast iron		Nodular cast iron		Malleable cast iron
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
HRc	13	25	28	32	30	10	29	32	38	15	35	15	23	10	10	26	3	25		21	
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230	
Recommend	○	○				○				○											

ISO Material Description	N					S					H										
	Aluminum-wrought alloy		Aluminum-cast, alloyed		Copper and Copper Alloys (Bronze / Brass)	Non Metallic Materials		Heat Resistant Super Alloys			Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron						
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc	60	100	75	90	130	110	90	100			15	30	25	38	34	400 Rm	1050 Rm	55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend	◎	◎	◎	◎	◎																



8% COBALT (M42) FLAT SHANK E2086 SERIES

**HSSCo8, MULTI FLUTE STUB LENGTH FINE PITCH ROUGHING CENTER CUTTING**

► This general purpose rougher is designed for high production metal removal in a wide range of work piece material. It is suitable for a very broad spectrum of materials having up to high tensile strengths. In many cases, the milled surfaces are of acceptable quality.



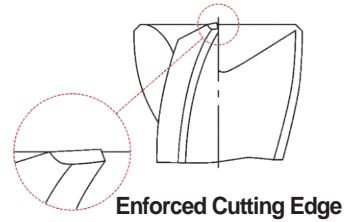
p.C857, C858, C859

Unit : Inch

EDP No. 8% COBALT (M42)	Mill Diameter	Shank Diameter	Length of Cut	Overall Length	No.of Flute
75297	1/4	3/8	1/4	2-1/16	4
75305	3/8	3/8	3/8	2-5/32	4
75313	7/16	1/2	1/2	2-1/2	4
75321	1/2	1/2	1/2	2-1/2	4
75337	5/8	5/8	5/8	2-3/4	4
75359	3/4	3/4	3/4	2-7/8	4
75391	7/8	3/4	7/8	3-1/8	5
75426	1	1	1	3-1/2	5

■ The TiN coated, TiCN coated or TiAlN coated is available on your request.  
■ Coating Codes for Cobalt  
Uncoated EDP NO. + CN(TiN), CC(TiCN), CF(TiAlN F), CE(TiAlN E), CH(Hardslick)  
► Coated Price Shown in Price List. Call for Availability.

Mill Dia. Tolerance (inch)	
up to 1	0~+.0030
over 1	0~+.0060



◎ : Excellent ○ : Good

ISO Material Description	P										M				K						
	Non-alloy steel					Low alloy steel					High alloyed steel, and tool steel				Stainless steel		Grey cast iron		Nodular cast iron		Malleable cast iron
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
HRc	13	25	28	32	30	10	29	32	38	15	35	15	23	10	10	26	3	25		21	
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230	
Recommend	○	○				○				○											

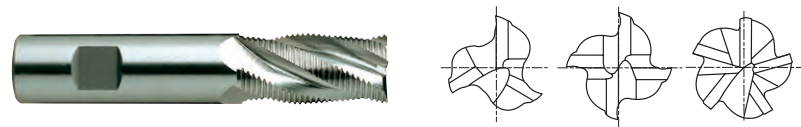
  

ISO Material Description	N					S					H										
	Aluminum-wrought alloy		Aluminum-cast, alloyed		Copper and Copper Alloys (Bronze / Brass)	Non Metallic Materials		Heat Resistant Super Alloys			Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron						
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc	60	100	75	90	130	110	90	100			15	30	25	38	34	400 Rm	1050 Rm	55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend	◎	◎	◎	◎	◎																



**HSSCo8, MULTI FLUTE REGULAR LENGTH FINE PITCH ROUGHING CENTER CUTTING**

► This general purpose rougher is designed for high production metal removal in a wide range of work piece material. It is suitable for a very broad spectrum of materials having up to high tensile strengths. In many cases, the milled surfaces are of acceptable quality.

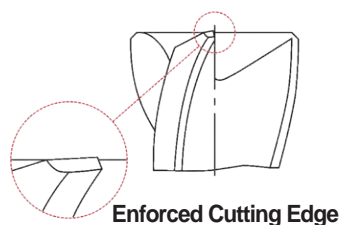


p.C857, C858, C859

Unit : Inch

EDP No. 8% COBALT (M42)	Mill Diameter	Shank Diameter	Length of Cut	Overall Length	No.of Flute
<a href="#">76297</a>	1/4	3/8	5/8	2-7/16	3
<a href="#">76301</a>	5/16	3/8	3/4	2-1/2	3
<a href="#">76305</a>	3/8	3/8	3/4	2-1/2	4
<a href="#">76312</a>	7/16	3/8	1	2-11/16	4
<a href="#">76321</a>	1/2	1/2	1-1/4	3-1/4	4
<a href="#">76328</a>	9/16	1/2	1-3/8	3-3/8	4
<a href="#">76337</a>	5/8	5/8	1-5/8	3-3/4	4
<a href="#">76359</a>	3/4	3/4	1-5/8	3-7/8	4
<a href="#">76391</a>	7/8	3/4	1-7/8	4-1/8	5
<a href="#">76394</a>	7/8	7/8	1-7/8	4-1/8	5
<a href="#">76422</a>	1	3/4	2	4-1/4	5
<a href="#">76426</a>	1	1	2	4-1/2	5

- The TiN coated, TiCN coated or TiAlN coated is available on your request.
- Coating Codes for Cobalt  
Uncoated EDP NO. + CN(TiN), CC(TiCN), CF(TiAlN F), CE(TiAlN E), CH(Hardslick)
- Coated Price Shown in Price List. Call for Availability.



Mill Dia. Tolerance (inch)	
up to 1	0~+.0030
over 1	0~+.0060

◎ : Excellent ○ : Good

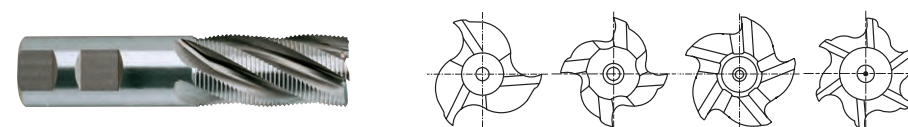
ISO Material Description	P										M				K					
	Non-alloy steel					Low alloy steel					High alloyed steel, and tool steel				Stainless steel		Grey cast iron		Nodular cast iron	Malleable cast iron
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend	◎	◎	◎	◎	○	◎	◎	○	○	◎	○									

ISO Material Description	N					S					H										
	Aluminum-wrought alloy		Aluminum-cast, alloyed		Copper and Copper Alloys (Bronze / Brass)	Non Metallic Materials		Heat Resistant Super Alloys			Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron						
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend	○	○	○	○	○	○	○	○													

**HSSCo8, MULTI FLUTE REGULAR LENGTH FINE PITCH ROUGHING**

► This general purpose rougher is designed for high production metal removal in a wide range of work piece material. It is suitable for a very broad spectrum of materials having up to high tensile strengths. In many cases, the milled surfaces are of acceptable quality.

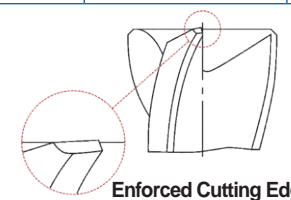


p.C857, C858, C859

Unit : Inch

EDP No. 8% COBALT (M42)	Mill Diameter	Shank Diameter	Length of Cut	Overall Length	No.of Flute
<a href="#">70297</a>	1/4	3/8	5/8	2-7/16	3
<a href="#">70301</a>	5/16	3/8	3/4	2-1/2	3
<a href="#">70305</a>	3/8	3/8	3/4	2-1/2	4
<a href="#">70312</a>	7/16	3/8	1	2-11/16	4
<a href="#">70321</a>	1/2	1/2	1-1/4	3-1/4	4
<a href="#">70328</a>	9/16	1/2	1-3/8	3-3/8	4
<a href="#">70337</a>	5/8	5/8	1-5/8	3-3/4	4
<a href="#">70358</a>	3/4	5/8	1-5/8	3-3/4	4
<a href="#">70359</a>	3/4	3/4	1-5/8	3-7/8	4
<a href="#">70391</a>	7/8	3/4	1-7/8	4-1/8	5
<a href="#">70394</a>	7/8	7/8	1-7/8	4-1/8	5
<a href="#">70422</a>	1	3/4	2	4-1/4	5
<a href="#">70426</a>	1	1	2	4-1/2	5
<a href="#">70431</a>	1-1/8	3/4	2	4-1/4	6
<a href="#">70435</a>	1-1/8	1	2	4-1/2	6
<a href="#">70439</a>	1-1/4	3/4	2	4-1/4	6
<a href="#">70445</a>	1-1/4	1-1/4	2	4-1/2	6
<a href="#">70449</a>	1-3/8	3/4	2	4-1/4	6
<a href="#">70457</a>	1-1/2	3/4	2	4-1/4	6
<a href="#">70461</a>	1-1/2	1-1/4	2	4-1/2	6
<a href="#">70469</a>	1-3/4	1-1/4	2	4-1/2	6
<a href="#">70475</a>	2	3/4	2	4-1/4	6
<a href="#">70477</a>	2	1-1/4	2	4-1/2	6

- The TiN coated, TiCN coated or TiAlN coated is available on your request.
- Coating Codes for Cobalt  
Uncoated EDP NO. + CN(TiN), CC(TiCN), CF(TiAlN F), CE(TiAlN E), CH(Hardslick)
- Coated Price Shown in Price List. Call for Availability.



◎ : Excellent ○ : Good

ISO Material Description	P										M				K					
	Non-alloy steel					Low alloy steel					High alloyed steel, and tool steel				Stainless steel		Grey cast iron		Nodular cast iron	Malleable cast iron
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend	◎	◎	◎	◎	○	◎	◎	○	○	◎	○									

ISO Material Description	N					S					H										
	Aluminum-wrought alloy		Aluminum-cast, alloyed		Copper and Copper Alloys (Bronze / Brass)	Non Metallic Materials		Heat Resistant Super Alloys			Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron						
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend	○	○	○	○	○	○	○	○													

**HSSCo8, MULTI FLUTE LONG LENGTH FINE PITCH ROUGHING**

► This general purpose rougher is designed for high production metal removal in a wide range of work piece material. It is suitable for a very broad spectrum of materials having up to high tensile strengths. In many cases, the milled surfaces are of acceptable quality.

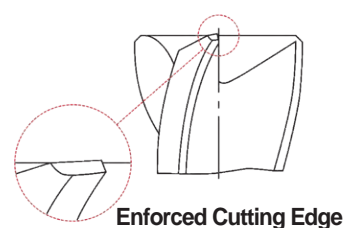


p.C857, C858, C859

Unit : Inch

EDP No. 8% COBALT (M42)	Mill Diameter	Shank Diameter	Length of Cut	Overall Length	No.of Flute
<a href="#">71321</a>	1/2	1/2	2	4	4
<a href="#">71337</a>	5/8	5/8	2-1/2	4-5/8	4
<a href="#">71358</a>	3/4	5/8	3	5-1/4	4
<a href="#">71359</a>	3/4	3/4	3	5-1/4	4
<a href="#">71394</a>	7/8	7/8	3-1/2	5-3/4	5
<a href="#">71426</a>	1	1	4	6-1/2	5
<a href="#">71445</a>	1-1/4	1-1/4	4	6-1/2	6
<a href="#">71457</a>	1-1/2	3/4	4	6-1/4	6
<a href="#">71461</a>	1-1/2	1-1/4	4	6-1/2	6
<a href="#">71469</a>	1-3/4	1-1/4	4	6-1/2	6
<a href="#">71477</a>	2	1-1/4	4	6-1/2	6

- The TiN coated, TiCN coated or TiAlN coated is available on your request.
- Coating Codes for Cobalt  
Uncoated EDP NO. + CN(TiN), CC(TiCN), CF(TiAlN F), CE(TiAlN E), CH(Hardslick)
- Coated Price Shown in Price List. Call for Availability.



Mill Dia. Tolerance (inch)	
up to 1	0~+.0030
over 1	0~+.0060

◎ : Excellent ○ : Good

ISO	P										M				K										
	Non-alloy steel					Low alloy steel					High alloyed steel, and tool steel		Stainless steel		Grey cast iron		Nodular cast iron		Malleable cast iron						
Material Description	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
HRc	13	25	28	32	38	10	29	32	38	15	35	15	23	10	10	26	3	25			3	25			
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230					
Recommend	◎	◎	◎	◎	○	◎	◎	○	○	◎	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○

ISO	N										S					H								
	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)		Non Metallic Materials			Heat Resistant Super Alloys					Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron				
Material Description	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44
HRc	60	100	75	90	130	110	90	100			15	30	25	38	34	40	55	60	42	55		55	60	42
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550			
Recommend	○	○	○	○	○	○	○	○			○	○	○	○	○	○	○	○	○	○	○	○	○	○

**HSSCo8, 3 FLUTE STUB LENGTH FINE PITCH ROUGHING CENTER CUTTING**

► This general purpose rougher is designed for high production metal removal in a wide range of work piece material. It is suitable for a very broad spectrum of materials having up to high tensile strengths. In many cases, the milled surfaces are of acceptable quality.

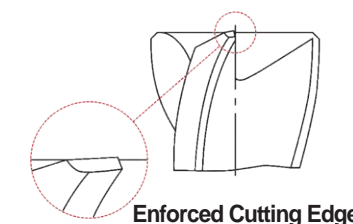


p.C857, C858, C859

Unit : Inch

EDP No. 8% COBALT (M42)	Mill Diameter	Shank Diameter	Length of Cut	Overall Length
<a href="#">72297</a>	1/4	3/8	1/4	2-1/16
<a href="#">72305</a>	3/8	3/8	3/8	2-5/32
<a href="#">72321</a>	1/2	1/2	1/2	2-1/2
<a href="#">72337</a>	5/8	5/8	5/8	2-3/4
<a href="#">72359</a>	3/4	3/4	3/4	2-7/8
<a href="#">72391</a>	7/8	3/4	7/8	3-1/8
<a href="#">72422</a>	1	3/4	1	3-1/4
<a href="#">72426</a>	1	1	1	3-1/2

- The TiN coated, TiCN coated or TiAlN coated is available on your request.
- Coating Codes for Cobalt  
Uncoated EDP NO. + CN(TiN), CC(TiCN), CF(TiAlN F), CE(TiAlN E), CH(Hardslick)
- Coated Price Shown in Price List. Call for Availability.



Mill Dia. Tolerance (inch)	
up to 1	0~+.0030
over 1	0~+.0060

◎ : Excellent ○ : Good

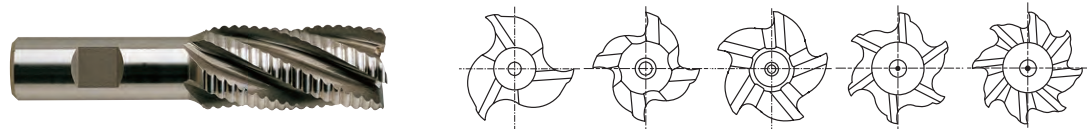
ISO	P										M				K										
	Non-alloy steel					Low alloy steel					High alloyed steel, and tool steel		Stainless steel		Grey cast iron		Nodular cast iron		Malleable cast iron						
Material Description	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
HRc	13	25	28	32	38	10	29	32	38	15	35	15	23	10	10	26	3	25			3	25			
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230					
Recommend	◎	◎	◎	◎	○	◎	◎	○	○	◎	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○

ISO	N										S					H								
	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)		Non Metallic Materials			Heat Resistant Super Alloys					Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron				
Material Description	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44
HRc	60	100	75	90	130	110	90	100			15	30	25	38	34	40	55	60	42	55		55	60	42
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550			
Recommend	○	○	○	○	○	○	○	○			○	○	○	○	○	○	○	○	○	○	○	○	○	○

**HSSCo8, MULTI FLUTE REGULAR LENGTH COARSE PITCH ROUGHING**

► This general purpose rougher is designed for high production metal removal in a wide range of work piece material. It is recommended for cutting steel grades and many non-ferrous materials. The end tooth of this tool has a center hole design for many accurate resharpenings between centers.

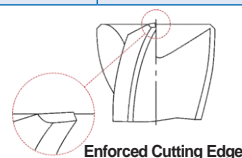


Unit : Inch

EDP No. 8% COBALT (M42)	Mill Diameter	Shank Diameter	Length of Cut	Overall Length	No. of Flute
60297	1/4	3/8	5/8	2-7/16	3
60301	5/16	3/8	3/4	2-1/2	3
60305	3/8	3/8	3/4	2-1/2	4
60312	7/16	3/8	1	2-11/16	4
60321	1/2	1/2	1-1/4	3-1/4	4
60328	9/16	1/2	1-3/8	3-3/8	4
60337	5/8	5/8	1-5/8	3-3/4	4
60348	11/16	5/8	1-5/8	3-3/4	4
60358	3/4	5/8	1-5/8	3-3/4	4
60359	3/4	3/4	1-5/8	3-3/4	4
60375	13/16	3/4	1-7/8	4-1/8	4
60391	7/8	3/4	1-7/8	4-1/8	5
60394	7/8	7/8	1-7/8	4-1/8	5
60409	15/16	7/8	1-7/8	4-1/8	5
60422	1	3/4	2	4-1/4	5
60426	1	1	2	4-1/2	5
60431	1-1/8	3/4	2	4-1/4	6
60435	1-1/8	1	2	4-1/2	6
60439	1-1/4	3/4	2	4-1/4	6
60445	1-1/4	1-1/4	2	4-1/2	6
60449	1-3/8	3/4	2	4-1/4	6
60457	1-1/2	3/4	2	4-1/4	6
60461	1-1/2	1-1/4	2	4-1/2	6
60467	1-3/4	3/4	2	4-1/4	6
60469	1-3/4	1-1/4	2	4-1/2	6
60475	2	3/4	2	4-1/4	6
60477	2	1-1/4	2	4-1/2	6
* 60480	2	2	2	5-3/4	8
* 60482	2	2	3	6-3/4	8
* 60484	2	2	4	7-3/4	8

Mill Dia. Tolerance (inch)

up to 1	0~+.0030
over 1	0~+.0060



■ The TiN coated, TiCN coated or TiAlN coated is available on your request.  
 ■ Coating Codes for Cobalt  
 Uncoated EDP NO. + CN(TiN), CC(TiCN), CF(TiAlN F), CE(TiAlN E), CH(Hardslick)  
 ► Coated Price Shown in Price List. Call for Availability.

◎ : Excellent ○ : Good

ISO	P										M				K			H			
Material Description	Non-alloy steel					Low alloy steel					High alloyed steel, and tool steel				Stainless steel		Grey cast iron		Nodular cast iron	Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
HRc	13	25	28	32	30	10	29	32	38	15	35	15	23	10	10	26	3	25		21	
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230	
Recommend	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	

ISO	N					S					H										
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed		Copper and Copper Alloys (Bronze / Brass)	Heat Resistant Super Alloys			Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron								
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc	60	100	75	90	130	110	90	100			15	30	25	38	34	400 Rm	1050 Rm	55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎

**HSSCo8, MULTI FLUTE MEDIUM LENGTH COARSE PITCH ROUGHING**

► This general purpose rougher is designed for high production metal removal in a wide range of work piece material. It is recommended for cutting steel grades and many non-ferrous materials. The end tooth of this tool has a center hole design for many accurate resharpenings between centers.

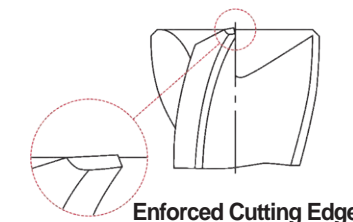


Unit : Inch

EDP No. 8% COBALT (M42)	Mill Diameter	Shank Diameter	Length of Cut	Overall Length	No. of Flute
61426	1	1	3	5-1/2	5
61445	1-1/4	1-1/4	3	5-1/2	6
61461	1-1/2	1-1/4	3	5-1/2	6
* 61488	2	2	6	9-3/4	8

\* Combination Shank

■ The TiN coated, TiCN coated or TiAlN coated is available on your request.  
 ■ Coating Codes for Cobalt  
 Uncoated EDP NO. + CN(TiN), CC(TiCN), CF(TiAlN F), CE(TiAlN E), CH(Hardslick)  
 ► Coated Price Shown in Price List. Call for Availability.



Mill Dia. Tolerance (inch)

up to 1	0~+.0030
over 1	0~+.0060

ISO	P										M				K			H			
Material Description	Non-alloy steel					Low alloy steel					High alloyed steel, and tool steel				Stainless steel		Grey cast iron		Nodular cast iron	Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
HRc	13	25	28	32	30	10	29	32	38	15	35	15	23	10	10	26	3	25		21	
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230	
Recommend	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	

ISO	N					S					H										
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed		Copper and Copper Alloys (Bronze / Brass)	Heat Resistant Super Alloys			Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron								
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc	60	100	75	90	130	110	90	100			15	30	25	38	34	400 Rm	1050 Rm	55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎

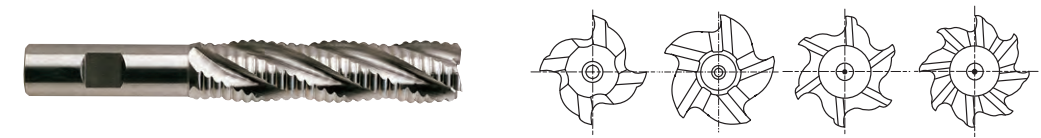




8% COBALT (M42) FLAT SHANK E2172 SERIES

### HSSCo8, MULTI FLUTE LONG LENGTH COARSE PITCH ROUGHING

► This general purpose rougher is designed for high production metal removal in a wide range of work piece material. It is recommended for cutting steel grades and many non-ferrous materials. The end tooth of this tool has a center hole design for many accurate resharpenings between centers.



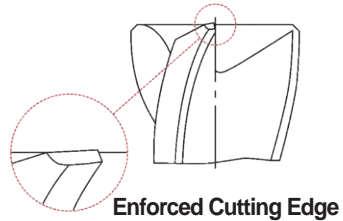
HSS Co8 COARSE 4-8 30° FLAT p.C857, C858, C859

EDP No. 8% COBALT (M42)	Mill Diameter	Shank Diameter	Length of Cut	Overall Length	No.of Flute
62321	1/2	1/2	2	4	4
62337	5/8	5/8	2-1/2	4-5/8	4
62358	3/4	5/8	3	5-1/8	4
62359	3/4	3/4	3	5-1/4	4
62391	7/8	3/4	3-1/2	5-3/4	5
62422	1	3/4	4	6-1/4	5
62426	1	1	4	6-1/2	5
62439	1-1/4	3/4	4	6-1/4	6
62445	1-1/4	1-1/4	4	6-1/2	6
62457	1-1/2	3/4	4	6-1/4	6
62461	1-1/2	1-1/4	4	6-1/2	6
62469	1-3/4	1-1/4	4	6-1/2	6
62477	2	1-1/4	4	6-1/2	6
* 62490	2	2	8	11-3/4	8

Unit : Inch

- The TiN coated, TiCN coated or TiAlN coated is available on your request.
- Coating Codes for Cobalt  
Uncoated EDP NO. + CN(TiN), CC(TiCN), CF(TiAlN F), CE(TiAlN E), CH(Hardslick)
- Coated Price Shown in Price List. Call for Availability.

\* Combination Shank



Mill Dia. Tolerance (inch)	
up to 1	0~+.0030
over 1	0~+.0060

◎ : Excellent ○ : Good

ISO	P										M				K					
	Non-alloy steel					Low alloy steel					High alloyed steel, and tool steel				Stainless steel		Grey cast iron		Nodular cast iron	Malleable cast iron
Material Description	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc	13	25	28	32	30	29	32	38	15	35	15	23	10	10	26	3	25		21	
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend	◎	◎	◎	◎	○	◎	◎	○	○	◎	○	○	○	○	○	○	○	○	○	○

ISO	N					S					H										
	Aluminum-wrought alloy		Aluminum-cast, alloyed		Copper and Copper Alloys (Bronze / Brass)	Non Metallic Materials			Heat Resistant Super Alloys		Titanium Alloys	Hardened steel	Chilled Cast Iron	Hardened Cast Iron							
Material Description	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc	60	100	75	90	130	110	90	100			15	30	25	38	34	400 Rm	1050 Rm	55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend	○	○	○	○	○	○	○	○			○	○	○	○	○	○	○	○	○	○	○



8% COBALT (M42) FLAT SHANK E2241 SERIES

### HSSCo8, 3FLUTE STUB LENGTH COARSE PITCH ROUGHING CENTER CUTTING

► This general purpose rougher is designed for high production metal removal in a wide range of work piece material. It is recommended for cutting steel grades and many non-ferrous materials. The end tooth of this tool has a center hole design for many accurate resharpenings between centers.



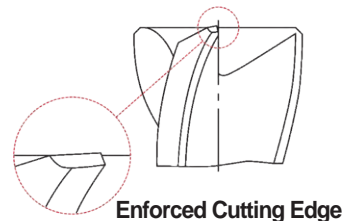
HSS Co8 COARSE 3 30° FLAT p.C857, C858, C859

EDP No. 8% COBALT (M42)	Mill Diameter	Shank Diameter	Length of Cut	Overall Length
63297	1/4	3/8	1/4	2-1/16
63305	3/8	3/8	3/8	2-5/32
63321	1/2	1/2	1/2	2-1/2
63337	5/8	5/8	5/8	2-3/4
63359	3/4	3/4	3/4	2-7/8
63426	1	1	1	3-1/2

Unit : Inch

- The TiN coated, TiCN coated or TiAlN coated is available on your request.
- Coating Codes for Cobalt  
Uncoated EDP NO. + CN(TiN), CC(TiCN), CF(TiAlN F), CE(TiAlN E), CH(Hardslick)
- Coated Price Shown in Price List. Call for Availability.

Mill Dia. Tolerance (inch)	
up to 1	0~+.0030
over 1	0~+.0060



◎ : Excellent ○ : Good

ISO	P										M				K					
	Non-alloy steel					Low alloy steel					High alloyed steel, and tool steel				Stainless steel		Grey cast iron		Nodular cast iron	Malleable cast iron
Material Description	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc	13	25	28	32	30	29	32	38	15	35	15	23	10	10	26	3	25		21	
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend	◎	◎	◎	◎	○	◎	◎	○	○	◎	○	○	○	○	○	○	○	○	○	○

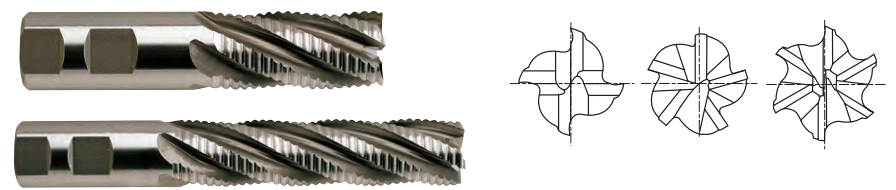
ISO	N					S					H										
	Aluminum-wrought alloy		Aluminum-cast, alloyed		Copper and Copper Alloys (Bronze / Brass)	Non Metallic Materials			Heat Resistant Super Alloys		Titanium Alloys	Hardened steel	Chilled Cast Iron	Hardened Cast Iron							
Material Description	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc	60	100	75	90	130	110	90	100			15	30	25	38	34	400 Rm	1050 Rm	55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend	○	○	○	○	○	○	○	○			○	○	○	○	○	○	○	○	○	○	○



8% COBALT (M42) FLAT SHANK E2195 SERIES  
8% COBALT (M42) FLAT SHANK E2197 SERIES

### HSSCo8, MULTI FLUTE REGULAR & LONG LENGTH COARSE PITCH ROUGHING CENTER CUTTING

► This general purpose rougher is designed for high production metal removal in a wide range of work piece material. It is recommended for cutting steel grades and many non-ferrous materials.



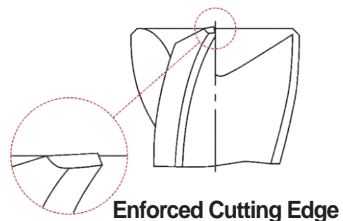
**E2195 Series ■ REGULAR LENGTH** Unit : Inch

EDP No. 8% COBALT (M42)	Mill Diameter	Shank Diameter	Length of Cut	Overall Length	No.of Flute
64321	1/2	1/2	1-1/4	3-1/4	4
64337	5/8	5/8	1-5/8	3-3/4	4
64359	3/4	3/4	1-5/8	3-7/8	4
64426	1	1	2	4-1/2	5
64445	1-1/4	1-1/4	2	4-1/2	6
64461	1-1/2	1-1/4	2	4-1/2	6

**E2197 Series ■ LONG LENGTH** Unit : Inch

EDP No. 8% COBALT (M42)	Mill Diameter	Shank Diameter	Length of Cut	Overall Length	No.of Flute
65321	1/2	1/2	2	4	4
65337	5/8	5/8	2-1/2	4-5/8	4
65359	3/4	3/4	3	5-1/4	4
65426	1	1	4	6-1/2	5
65445	1-1/4	1-1/4	4	6-1/2	6
65461	1-1/2	1-1/4	4	6-1/2	6

■ The TiN coated, TiCN coated or TiAlN coated is available on your request.  
■ Coating Codes for Cobalt  
Uncoated EDP NO. + CN(TiN), CC(TiCN), CF(TiAlN F), CE(TiAlN E), CH(Hardslick)  
► Coated Price Shown in Price List. Call for Availability.



Mill Dia. Tolerance (inch)	
up to 1	0~+.0030
over 1	0~+.0060

◎ : Excellent ○ : Good

ISO Material Description	P										M				K					
	Non-alloy steel					Low alloy steel					High alloyed steel, and tool steel				Stainless steel		Grey cast iron	Nodular cast iron		Malleable cast iron
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc	13	25	28	32	30	10	29	32	38	15	35	15	23	10	10	26	3	25	21	
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend	◎	◎	◎	◎	○	◎	◎	○	○	◎	○									

ISO Material Description	N					S					H										
	Aluminum-wrought alloy		Aluminum-cast, alloyed		Copper and Copper Alloys (Bronze / Brass)	Non Metallic Materials		Heat Resistant Super Alloys			Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron						
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc	60	100	75	90	130	110	90	100			15	30	25	38	34	40	55	60	42	55	
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend	○	○	○	○	○	○	○	○													



8% COBALT (M42) FLAT SHANK E2193 SERIES  
8% COBALT (M42) FLAT SHANK E2125 SERIES

### HSSCo8, MULTI FLUTE REGULAR & LONG LENGTH COARSE PITCH ROUGHING BALL NOSE

► This general purpose rougher is designed for high production metal removal in a wide range of work piece material. It is recommended for cutting steel grades and many non-ferrous materials.



**E2193 Series ■ REGULAR LENGTH** Unit : Inch

EDP No. 8% COBALT (M42)	Radius of Ball Nose	Mill Diameter	Shank Diameter	Length of Cut	Overall Length	No.of Flute
68297	R1/8	1/4	3/8	5/8	2-7/16	3
68301	R5/32	5/16	3/8	3/4	2-1/2	3
68305	R3/16	3/8	3/8	3/4	2-1/2	4
68321	R1/4	1/2	1/2	1-1/4	3-1/4	4
68337	R5/16	5/8	5/8	1-5/8	3-3/4	4
68359	R3/8	3/4	3/4	1-3/4	4	4
68422	R1/2	1	3/4	2	4-1/2	5
68426	R1/2	1	1	2	4-1/2	5
68439	R5/8	1-1/4	3/4	2	4-1/2	6
68445	R5/8	1-1/4	1-1/4	2	4-1/2	6
68457	R3/4	1-1/2	3/4	2	4-1/2	6
68461	R3/4	1-1/2	1-1/4	2	4-1/2	6

**E2125 Series ■ LONG LENGTH** Unit : Inch

EDP No. 8% COBALT (M42)	Radius of Ball Nose	Mill Diameter	Shank Diameter	Length of Cut	Overall Length	No.of Flute
69321	R1/4	1/2	1/2	2-1/2	4-1/2	4
69337	R5/16	5/8	5/8	2-1/2	4-5/8	4
69359	R3/8	3/4	3/4	3	5-1/4	4
69426	R1/2	1	1	4	6-1/2	5
69445	R5/8	1-1/4	1-1/4	4	6-1/2	6
69461	R3/4	1-1/2	1-1/4	4	6-1/2	6

■ The TiN coated, TiCN coated or TiAlN coated is available on your request.  
■ Coating Codes for Cobalt  
Uncoated EDP NO. + CN(TiN), CC(TiCN), CF(TiAlN F), CE(TiAlN E), CH(Hardslick)  
► Coated Price Shown in Price List. Call for Availability.

Mill Dia. Tolerance (inch)	
up to 1	0~+.0030
over 1	0~+.0060

◎ : Excellent ○ : Good

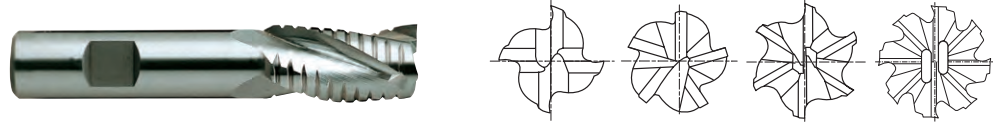
ISO Material Description	P										M				K					
	Non-alloy steel					Low alloy steel					High alloyed steel, and tool steel				Stainless steel		Grey cast iron	Nodular cast iron		Malleable cast iron
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc	13	25	28	32	30	10	29	32	38	15	35	15	23	10	10	26	3	25	21	
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend	◎	◎	◎	◎	○	◎	◎	○	○	◎	○									

ISO Material Description	N					S					H										
	Aluminum-wrought alloy		Aluminum-cast, alloyed		Copper and Copper Alloys (Bronze / Brass)	Non Metallic Materials		Heat Resistant Super Alloys			Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron						
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc	60	100	75	90	130	110	90	100			15	30	25	38	34	40	55	60	42	55	
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend	○	○	○	○	○	○	○	○													

**HSSCo8, MULTI FLUTE REGULAR LENGTH ROUGHING & FINISHING**

► This general purpose rougher is designed for high production metal removal in a wide range of work piece material. It is suitable for a very broad spectrum of materials having up to high tensile strengths. In many cases, the milled surfaces are of acceptable quality.



Unit : Inch

EDP No. 8% COBALT (M42)	Mill Diameter	Shank Diameter	Length of Cut	Overall Length	No. of Flute
<a href="#">73297</a>	1/4	3/8	5/8	2-7/16	4
<a href="#">73301</a>	5/16	3/8	3/4	2-1/2	4
<a href="#">73305</a>	3/8	3/8	3/4	2-1/2	4
<a href="#">73312</a>	7/16	3/8	1	2-11/16	4
<a href="#">73321</a>	1/2	1/2	1-1/4	3-1/4	4
<a href="#">73328</a>	9/16	1/2	1-3/8	3-3/8	4
<a href="#">73337</a>	5/8	5/8	1-5/8	3-3/4	4
<a href="#">73348</a>	11/16	5/8	1-5/8	3-3/4	4
<a href="#">73358</a>	3/4	5/8	1-5/8	3-3/4	4
<a href="#">73359</a>	3/4	3/4	1-5/8	3-3/4	4
<a href="#">73391</a>	7/8	3/4	1-7/8	4-1/8	5
<a href="#">73394</a>	7/8	7/8	1-7/8	4-1/8	5
<a href="#">73422</a>	1	3/4	2	4-1/4	5
<a href="#">73426</a>	1	1	2	4-1/2	5
<a href="#">73431</a>	1-1/8	3/4	2	4-1/4	6
<a href="#">73435</a>	1-1/8	1	2	4-1/2	6
<a href="#">73439</a>	1-1/4	3/4	2	4-1/4	6
<a href="#">73445</a>	1-1/4	1-1/4	2	4-1/2	6
<a href="#">73457</a>	1-1/2	3/4	2	4-1/4	6
<a href="#">73461</a>	1-1/2	1-1/4	2	4-1/2	6
<a href="#">73467</a>	1-3/4	3/4	2	4-1/4	6
<a href="#">73469</a>	1-3/4	1-1/4	2	4-1/2	6
<a href="#">73475</a>	2	3/4	2	4-1/4	6
<a href="#">73477</a>	2	1-1/4	2	4-1/2	6
* <a href="#">73480</a>	2	2	2	5-3/4	8
* <a href="#">73482</a>	2	2	3	6-3/4	8
* <a href="#">73484</a>	2	2	4	7-3/4	8

\* Combination Shank

Mill Dia. Tolerance (inch)
+ .0025
+ .0005

- The TiN coated, TiCN coated or TiAlN coated is available on your request.
- Coating Codes for Cobalt  
Uncoated EDP NO. + CN(TiN), CC(TiCN), CF(TiAlN F), CE(TiAlN E), CH(Hardslick)
- Coated Price Shown in Price List. Call for Availability.

◎ : Excellent ○ : Good

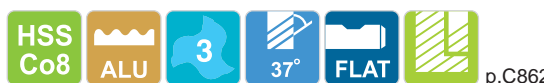
ISO Material Description	P										M				K			H		
	Non-alloy steel					Low alloy steel					High alloyed steel, and tool steel				Stainless steel		Grey cast iron		Nodular cast iron	Malleable cast iron
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc	13	25	28	32	30	10	29	32	38	15	35	15	23	10	10	26	3	25	3	21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend	◎	◎	◎	◎	○	◎	◎	○	○	◎	○	○	○	○	○	○	○	○	○	○

ISO Material Description	N						S					H									
	Aluminum-wrought alloy		Aluminum-cast, alloyed		Copper and Copper Alloys (Bronze / Brass)		Non Metallic Materials		Heat Resistant Super Alloys			Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron					
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc	60	100	75	90	130	110	90	100			15	30	25	38	34	40	55	60	42	55	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○

**HSSCo8, 3 FLUTE 37° HELIX REGULAR LENGTH ROUGHING for ALUMINUM**

► This general purpose rougher is designed for high production metal removal in a wide range of work piece material. It is suitable for a very broad spectrum of materials having up to high tensile strengths. In many cases, the milled surfaces are of acceptable quality.

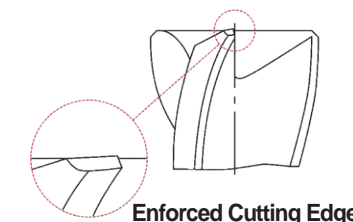


Unit : Inch

EDP No. 8% COBALT (M42)	Mill Diameter	Shank Diameter	Length of Cut	Overall Length
<a href="#">66297</a>	1/4	3/8	5/8	2-7/16
<a href="#">66301</a>	5/16	3/8	3/4	2-1/2
<a href="#">66305</a>	3/8	3/8	3/4	2-1/2
<a href="#">66321</a>	1/2	1/2	1-1/4	3-1/4
<a href="#">66337</a>	5/8	5/8	1-5/8	3-3/4
<a href="#">66359</a>	3/4	3/4	1-5/8	3-7/8
<a href="#">66391</a>	7/8	3/4	1-7/8	4-1/8
<a href="#">66426</a>	1	1	2	4-1/2
<a href="#">66445</a>	1-1/4	1-1/4	2	4-1/2
<a href="#">66461</a>	1-1/2	1-1/4	2	4-1/2

- The TiN coated, TiCN coated or TiAlN coated is available on your request.
- Coating Codes for Cobalt  
Uncoated EDP NO. + CN(TiN), CC(TiCN), CF(TiAlN F), CE(TiAlN E), CH(Hardslick)
- Coated Price Shown in Price List. Call for Availability.

Mill Dia. Tolerance (inch)	
up to 1	0~+.0030
over 1	0~+.0060



Enforced Cutting Edge

◎ : Excellent ○ : Good

ISO Material Description	P										M				K			H		
	Non-alloy steel					Low alloy steel					High alloyed steel, and tool steel				Stainless steel		Grey cast iron		Nodular cast iron	Malleable cast iron
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc	13	25	28	32	30	10	29	32	38	15	35	15	23	10	10	26	3	25	3	21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend	◎	◎	◎	◎	○	◎	◎	○	○	◎	○	○	○	○	○	○	○	○	○	○

ISO Material Description	N						S					H									
	Aluminum-wrought alloy		Aluminum-cast, alloyed		Copper and Copper Alloys (Bronze / Brass)		Non Metallic Materials		Heat Resistant Super Alloys			Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron					
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc	60	100	75	90	130	110	90	100			15	30	25	38	34	40	55	60	42	55	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend	◎	◎	◎	◎	◎	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○





8% COBALT (M42) FLAT SHANK E2226 SERIES  
8% COBALT (M42) FLAT SHANK E2192 SERIES

### HSSCo8, 3 FLUTE 37° HELIX MEDIUM & LONG LENGTH ROUGHING for ALUMINUM

► This general purpose rougher is designed for high production metal removal in a wide range of work piece material. It is recommended for cutting aluminum, aluminum alloy and many non-ferrous materials.



#### E2226 Series ■ MEDIUM LENGTH

Unit : Inch

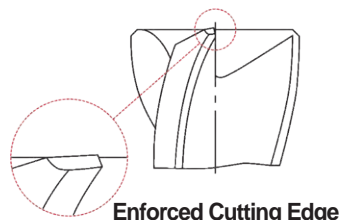
EDP No.	Mill Diameter	Shank Diameter	Length of Cut	Overall Length
8% COBALT (M42)				
<a href="#">66901</a>	1	1	3	5-1/2
<a href="#">66902</a>	1-1/4	1-1/4	3	5-1/2

#### E2192 Series ■ LONG LENGTH

Unit : Inch

EDP No.	Mill Diameter	Shank Diameter	Length of Cut	Overall Length
8% COBALT (M42)				
<a href="#">67321</a>	1/2	1/2	2	4
<a href="#">67337</a>	5/8	5/8	2-1/2	4-5/8
<a href="#">67359</a>	3/4	3/4	3	5-1/4
<a href="#">67426</a>	1	1	4	6-1/2
<a href="#">67445</a>	1-1/4	1-1/4	4	6-1/2
<a href="#">67461</a>	1-1/2	1-1/4	4	6-1/2

- The TiN coated, TiCN coated or TiAlN coated is available on your request.
- Coating Codes for Cobalt  
Uncoated EDP NO. + CN(TiN), CC(TiCN), CF(TiAlN F), CE(TiAlN E), CH(Hardslick)
- Coated Price Shown in Price List. Call for Availability.



Mill Dia.	Tolerance (inch)
up to 1	0~+.0030
over 1	0~+.0060

◎ : Excellent ○ : Good

ISO Material Description	P										M				K						
	Non-alloy steel					Low alloy steel					High alloyed steel, and tool steel				Stainless steel		Grey cast iron		Nodular cast iron		Malleable cast iron
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
HRc	13	25	28	32	30	10	29	32	38	15	35	15	23	10	10	26	3	25		21	
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230	
Recommend	◎	◎	◎	◎	○	◎	◎	○	○	◎	○										

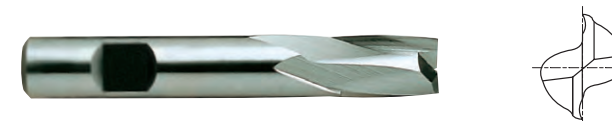
ISO Material Description	N					S					H										
	Aluminum-wrought alloy		Aluminum-cast, alloyed		Copper and Copper Alloys (Bronze / Brass)	Heat Resistant Super Alloys			Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron								
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc	60	100	75	90	130	110	90	100			15	30	25	38	34	400 Rm	1050 Rm	55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend	◎	◎	◎	◎	◎	○	○	○													



8% COBALT (M42) FLAT SHANK E2163 SERIES  
HSS (M2) FLAT SHANK E1163 SERIES

### HSSCo8 & HSS, 2 FLUTE 15° HELIX for KEYWAY CUTTING

► E2163(E1163) are keyway cutting end mills that have the same design as the general purpose of two flute single end mill, but are held to a mill diameter tolerance of +.0000 -.0015. These close tolerance end mills are recommended for cutting keyway which must be held close to nominal size.



Unit : Inch

EDP No.		Mill Diameter	Shank Diameter	Length of Cut	Overall Length
8% COBALT (M42)	HSS (M2)				
<a href="#">14289</a>	<a href="#">14039</a>	1/8	3/8	3/8	2-5/16
<a href="#">14293</a>	<a href="#">14043</a>	3/16	3/8	7/16	2-5/16
<a href="#">14297</a>	<a href="#">14047</a>	1/4	3/8	1/2	2-5/16
<a href="#">14301</a>	<a href="#">14051</a>	5/16	3/8	9/16	2-5/16
<a href="#">14305</a>	<a href="#">14055</a>	3/8	3/8	9/16	2-5/16
<a href="#">14312</a>	<a href="#">14062</a>	7/16	3/8	13/16	2-1/2
<a href="#">14321</a>	<a href="#">14071</a>	1/2	1/2	1	3
<a href="#">14337</a>	<a href="#">14087</a>	5/8	5/8	1-5/16	3-7/16
<a href="#">14359</a>	<a href="#">14109</a>	3/4	3/4	1-5/16	3-9/16
<a href="#">14394</a>	<a href="#">14144</a>	7/8	7/8	1-1/2	3-3/4
<a href="#">14426</a>	<a href="#">14176</a>	1	1	1-5/8	4-1/8

- The TiN coated, TiCN coated or TiAlN coated is available on your request.
- Coating Codes for Cobalt  
Uncoated EDP NO. + CN(TiN), CC(TiCN), CF(TiAlN F), CE(TiAlN E), CH(Hardslick)
- Coating Codes for HSS  
Uncoated EDP NO. + HN(TiN), HC(TiCN), HF(TiAlN F), HE(TiAlN E), HH(Hardslick)
- Coated Price Shown in Price List. Call for Availability.

Mill Dia.	Tolerance (inch)
0~.0015	

◎ : Excellent ○ : Good

ISO Material Description	P										M				K						
	Non-alloy steel					Low alloy steel					High alloyed steel, and tool steel				Stainless steel		Grey cast iron		Nodular cast iron		Malleable cast iron
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
HRc	13	25	28	32	30	10	29	32	38	15	35	15	23	10	10	26	3	25		21	
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230	
Recommend	◎	◎	◎	◎	○	◎	◎	○	○	◎	○										

ISO Material Description	N					S					H										
	Aluminum-wrought alloy		Aluminum-cast, alloyed		Copper and Copper Alloys (Bronze / Brass)	Heat Resistant Super Alloys			Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron								
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc	60	100	75	90	130	110	90	100			15	30	25	38	34	400 Rm	1050 Rm	55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend	○	○	○	○	○	○	○	○													



8% COBALT (M42) FLAT SHANK E2120 SERIES  
HSS (M2) FLAT SHANK E2121 SERIES

### HSSCo8, 3&4 FLUTE 60° HELIX REGULAR LENGTH

- Provided with high helix angle(60°). Smooth cutting and small cutting resistance. Suitable for machining of difficult-to-cut materials.



HSS Co8 3&4 60° FLAT p.C843

#### E2120 Series ■ 3 FLUTE Unit : Inch

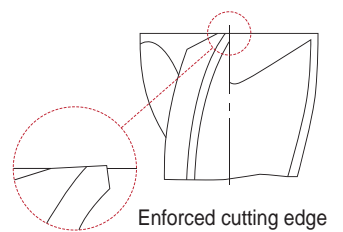
EDP No. 8% COBALT (M42)	Mill Diameter	Shank Diameter	Length of Cut	Overall Length
20297	1/4	3/8	5/8	2-7/16
20301	5/16	3/8	3/4	2-1/2
20305	3/8	3/8	3/4	2-1/2
20312	7/16	3/8	1	2-11/16
20321	1/2	1/2	1-1/4	3-1/4
20337	5/8	5/8	1-5/8	3-3/4
20359	3/4	3/4	1-5/8	3-7/8

#### E2121 Series ■ 4 FLUTE Unit : Inch

EDP No. 8% COBALT (M42)	Mill Diameter	Shank Diameter	Length of Cut	Overall Length
20394	7/8	7/8	1-7/8	4-1/8
20426	1	1	2	4-1/2
20445	1-1/4	1-1/4	2	4-1/2
20461	1-1/2	1-1/4	2	4-1/2
20477	2	1-1/4	2	4-1/2

- The TiN coated, TiCN coated or TiAlN coated is available on your request.
- Coating Codes for Cobalt  
Uncoated EDP NO. + CN(TiN), CC(TiCN), CF(TiAlN F), CE(TiAlN E), CH(Hardslick)
- Coated Price Shown in Price List. Call for Availability.

Mill Dia. Tolerance (inch)	
0~+.0010	** 0~+.0015



\*\* The shank of end mills is the same diameter as the cutting portion.

◎ : Excellent ○ : Good

ISO Material Description	P										M				K			H		
	Non-alloy steel					Low alloy steel					High alloyed steel, and tool steel				Stainless steel		Grey cast iron	Nodular cast iron	Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc	13	25	28	32	30	10	29	32	38	15	35	15	23	10	10	26	3	25	21	21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend	◎	◎	◎	◎	○	◎	◎	○	○	◎	○	○	○	○	○	○	○	○	○	○

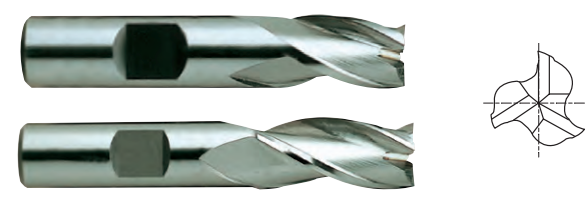
ISO Material Description	N										S					H					
	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron	
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc	60	100	75	90	130	110	90	100			15	30	25	38	34	40	55	60	42	55	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○



8% COBALT (M42) FLAT SHANK E2160 SERIES  
HSS (M2) FLAT SHANK E2161 SERIES

### HSSCo8, 3 FLUTE SHORT & LONG LENGTH THROW AWAY

- Well balanced web design to minimize deflection & chattering. High accuracy for O.D. is guaranteed under the strict tolerance control. Much higher(50%) table speed than 2 Flute is allowed.



HSS Co8 3 30° FLAT p.C837, C838, C839, C840, C841, C842, C843

#### E2160 Series ■ SHORT LENGTH Unit : Inch

EDP No. 8% COBALT (M42)	Mill Diameter	Shank Diameter	Length of Cut	Overall Length
22257	1/16	1/4	3/32	31/32
22261	3/32	1/4	5/32	1-1/64
22265	1/8	1/4	3/16	1-3/32
22269	5/32	1/4	1/4	1-9/32
22273	3/16	1/4	9/32	1-11/32
22277	7/32	1/4	5/16	1-13/32
22281	1/4	1/4	3/8	1-13/32

#### E2161 Series ■ LONG LENGTH Unit : Inch

EDP No. 8% COBALT (M42)	Mill Diameter	Shank Diameter	Length of Cut	Overall Length
23257	1/16	1/4	5/32	1-3/32
23261	3/32	1/4	1/4	1-1/4
23265	1/8	1/4	5/16	1-11/32
23269	5/32	1/4	3/8	1-17/32
23273	3/16	1/4	7/16	1-21/32
23277	7/32	1/4	1/2	1-3/4
23281	1/4	1/4	5/8	1-3/4

- The TiN coated, TiCN coated or TiAlN coated is available on your request.
- Coating Codes for Cobalt  
Uncoated EDP NO. + CN(TiN), CC(TiCN), CF(TiAlN F), CE(TiAlN E), CH(Hardslick)
- Coated Price Shown in Price List. Call for Availability.

Mill Dia. Tolerance (inch)
-.0005
-.0013

◎ : Excellent ○ : Good

ISO Material Description	P										M				K			H		
	Non-alloy steel					Low alloy steel					High alloyed steel, and tool steel				Stainless steel		Grey cast iron	Nodular cast iron	Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc	13	25	28	32	30	10	29	32	38	15	35	15	23	10	10	26	3	25	21	21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend	◎	◎	◎	◎	○	◎	◎	○	○	◎	○	○	○	○	○	○	○	○	○	○

ISO Material Description	N										S					H					
	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron	
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc	60	100	75	90	130	110	90	100			15	30	25	38	34	40	55	60	42	55	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○



8% COBALT (M42) FLAT SHANK E2237 SERIES
HSS (M2) FLAT SHANK E1237 SERIES

HSSCo8 & HSS, 4 FLUTE CORNER ROUNDING

This general corner rounding end mills are designed for machining fillets on work piece.



Table with 7 columns: EDP No., 8% COBALT (M42), HSS (M2), Radius, Pilot Diameter, Outside Diameter, Shank Diameter, Overall Length. Lists various end mill models and their specifications.

- The TiN coated, TiCN coated or TiAlN coated is available on your request.
Coating Codes for Cobalt
Uncoated EDP NO. + CN(TiN), CC(TiCN), CF(TiAlN F), CE(TiAlN E), CH(Hardslick)
Coating Codes for HSS
Uncoated EDP NO. + HN(TiN), HC(TiCN), HF(TiAlN F), HE(TiAlN E), HH(Hardslick)
Coated Price Shown in Price List. Call for Availability.

ISO Material Compatibility Chart showing suitability for various materials like Non-alloy steel, Low alloy steel, High alloyed steel, Stainless steel, Grey cast iron, etc.



8% COBALT (M42) FLAT SHANK E2482 SERIES
HSS (M2) FLAT SHANK E1482 SERIES

HSSCo8 & HSS, 2 FLUTE REGULAR LENGTH

Two flute end mills with metric cutting diameter are especially recommended for slotting operation, pocketing keyway cutting and other general purpose work including plunge cutting.

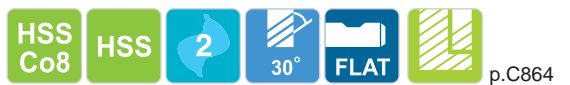
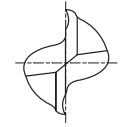


Table with 6 columns: EDP No., 8% COBALT (M42), HSS (M2), Mill Diameter (Metric/Inch), Shank Diameter, Length of Cut, Overall Length. Lists various end mill models and their specifications.

Table for Mill Dia. Tolerance (inch) showing 0~+.0010 and \*\* 0~+.0015

\*\* The shank of end mills is the same diameter as the cutting portion.

- The TiN coated, TiCN coated or TiAlN coated is available on your request.
Coating Codes for Cobalt
Uncoated EDP NO. + CN(TiN), CC(TiCN), CF(TiAlN F), CE(TiAlN E), CH(Hardslick)
Coating Codes for HSS
Uncoated EDP NO. + HN(TiN), HC(TiCN), HF(TiAlN F), HE(TiAlN E), HH(Hardslick)
Coated Price Shown in Price List. Call for Availability.

ISO Material Compatibility Chart showing suitability for various materials like Non-alloy steel, Low alloy steel, High alloyed steel, Stainless steel, Grey cast iron, etc.





8% COBALT (M42) FLAT SHANK E2483 SERIES
HSS (M2) FLAT SHANK E1483 SERIES

HSSCo8 & HSS, 4 FLUTE REGULAR LENGTH

E2483 have an extensive range of standard regular length in metric diameter. End mills with center cutting are recommended for a wide range of cutting jobs, including slotting, shallow pocketing and tracer milling.



Unit : Inch

Table with columns: EDP No., Mill Diameter (Metric/Inch), Shank Diameter, Length of Cut, Overall Length. Lists various end mill models and their specifications.

Table with columns: Mill Dia. Tolerance (inch). Values: 0~+.0010, \*\* 0~+.0015

- The TiN coated, TiCN coated or TiAlN coated is available on your request.
Coating Codes for Cobalt
Coating Codes for HSS

\*\* The shank of end mills is the same diameter as the cutting portion.

ISO Material Recommendation Chart showing suitability for various materials like Non-alloy steel, Stainless steel, Grey cast iron, etc.



END MILL SET SERIES

Various range of sizes in these end mill sets gives you plenty of opportunities to reduce manufacturing costs and improve productivity.

SET OF MINIATURE, (3/16" SHANK) DOUBLE

Table with columns: EDP No., ITEM No., Type, Length, Mill Diameter, No. of Flute. Lists miniature end mill sets.

- The TiN coated, TiCN coated or TiAlN coated is available on your request.
Coating Codes for Cobalt
Coating Codes for HSS

SET OF 3/8" SHANK, (WELDON) SINGLE

Table with columns: EDP No., ITEM No., Type, Length, Mill Diameter, No. of Flute. Lists 3/8" shank end mill sets.

- The TiN coated, TiCN coated or TiAlN coated is available on your request.
Coating Codes for Cobalt
Coating Codes for HSS

**END MILL SET SERIES**

► Various range of sizes in these end mill sets gives you a plenty of opportunities to reduce manufacturing costs and improve productivity.

**SET OF 3/8" SHANK, (WELDON) DOUBLE**

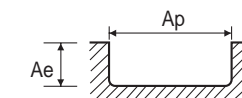
EDP No.	ITEM No.	EDP No.	ITEM No.	Type	Length	Mill Diameter	No. of Flute
8% COBALT (M42)		HSS (M2)					
<a href="#">96016</a>	CDR209	<a href="#">96015</a>	DR209	Sq. END (9PCS.)	REGULAR	1/8, 5/32, 3/16, 7/32, 1/4, 9/32, 5/16, 11/32, 3/8	2
<a href="#">96018</a>	CDR409	<a href="#">96017</a>	DR409	Sq. END (9PCS.)	REGULAR	1/8, 5/32, 3/16, 7/32, 1/4, 9/32, 5/16, 11/32, 3/8	4
<a href="#">96020</a>	CDRC09	<a href="#">96019</a>	DRC09	CENTER CUT (9PCS.)	REGULAR	1/8, 5/32, 3/16, 7/32, 1/4, 9/32, 5/16, 11/32, 3/8	4

- The TiN coated, TiCN coated or TiAlN coated is available on your request. \* WITH TRANSPARENT PLASTIC CASE
- Coating Codes for Cobalt  
Uncoated EDP NO. + CN(TiN), CC(TiCN), CF(TiAlN F), CE(TiAlN E), CH(Hardslick)
- Coating Codes for HSS  
Uncoated EDP NO. + HN(TiN), HC(TiCN), HF(TiAlN F), HE(TiAlN E), HH(Hardslick)
- Coated Price Shown in Price List. Call for Availability.

**E2030, E1030, E2080, E1080, E2033, E1033, E2050, E1050, E2163, E1163** SERIES

**2FLUTE - SLOTTING**

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø)															
						1/8	1/4	3/8	1/2	5/8	3/4	7/8	1	1-1/8	1-3/8	1-1/2	1-3/4	2			
P	1	Non-alloy steel	1.0D	0.5D	SFM	115	120	110	120	115	125	115	120	120	110	120	130	130			
					IPT	.0003	.0010	.0018	.0024	.0031	.0032	.0040	.0039	.0039	.0039	.0039	.0043	.0040			
					RPM	3500	1800	1100	900	700	630	500	450	400	310	310	280	250			
	2		1.0D	0.5D	SFM	105	105	90	105	90	100	105	105	105	90	100	100	100			
					IPT	.0003	.0010	.0019	.0025	.0031	.0035	.0039	.0039	.0040	.0040	.0040	.0045	.0047			
					RPM	3200	1600	900	800	560	500	450	400	350	250	250	220	190			
	3-4		1.0D	0.5D	SFM	80	80	80	80	75	80	80	80	80	70	80	80	60			
					IPT	.0003	.0010	.0019	.0025	.0031	.0035	.0040	.0039	.0039	.0040	.0040	.0044	.0045			
					RPM	2500	1200	800	630	450	400	350	310	280	200	200	180	110			
	5		1.0D	0.5D	SFM	50	50	45	50	45	50	50	45	45	45	45	50	40			
					IPT	.0003	.0010	.0020	.0025	.0032	.0036	.0041	.0039	.0038	.0042	.0042	.0045	.0050			
RPM		1600			800	450	400	280	250	220	180	160	120	120	110	80					
6	1.0D	0.5D	SFM	105	105	90	105	90	100	105	105	105	90	100	100	100					
			IPT	.0003	.0010	.0019	.0025	.0031	.0035	.0039	.0039	.0040	.0040	.0040	.0045	.0047					
			RPM	3200	1600	900	800	560	500	450	400	350	250	250	220	190					
7	1.0D	0.5D	SFM	80	80	80	80	75	80	80	80	80	70	80	80	60					
			IPT	.0003	.0010	.0019	.0025	.0031	.0035	.0040	.0039	.0039	.0040	.0040	.0044	.0045					
			RPM	2500	1200	800	630	450	400	350	310	280	200	200	180	110					
8-9	1.0D	0.5D	SFM	50	50	45	50	45	50	50	45	45	45	45	50	40					
			IPT	.0003	.0010	.0020	.0025	.0032	.0036	.0041	.0039	.0038	.0042	.0042	.0045	.0050					
			RPM	1600	800	450	400	280	250	220	180	160	120	120	110	80					
10	1.0D	0.5D	SFM	105	105	90	105	90	100	105	105	105	90	100	100	100					
			IPT	.0003	.0010	.0019	.0025	.0031	.0035	.0039	.0039	.0040	.0040	.0040	.0045	.0047					
			RPM	3200	1600	900	800	560	500	450	400	350	250	250	220	190					
11.1	1.0D	0.5D	SFM	50	50	45	50	45	50	50	45	45	45	45	50	40					
			IPT	.0003	.0010	.0020	.0025	.0032	.0036	.0041	.0039	.0038	.0042	.0042	.0045	.0050					
			RPM	1600	800	450	400	280	250	220	180	160	120	120	110	80					
21-22	1.0D	0.5D	SFM	360	365	305	325	325	355	320	315	325	325	355	365	330					
			IPT	.0004	.0011	.0025	.0030	.0035	.0038	.0042	.0046	.0048	.0048	.0048	.0049	.0050					
			RPM	11000	5600	3100	2500	2000	1800	1400	1200	1100	900	900	800	630					
23-25	1.0D	0.5D	SFM	360	365	305	325	325	355	320	315	325	325	355	365	330					
			IPT	.0004	.0011	.0025	.0030	.0035	.0038	.0042	.0046	.0048	.0048	.0048	.0049	.0050					
			RPM	11000	5600	3100	2500	2000	1800	1400	1200	1100	900	900	800	630					



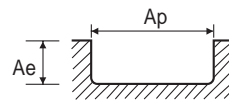
※ The Feed, in long & extra long types, should be reduced by around 50%.



E2030, E1030, E2080, E1080, E2033, E1033, E2050, E1050, E2163, E1163 SERIES

TiN Coated 2FLUTE - SLOTTING

Table with columns for ISO, VDI 3323, Material Description, Ae, Ap, Parameter, and Diameter (Ø) from 1/8 to 2. Rows are categorized by material groups P (Non-alloy steel, Low alloy steel, High alloyed steel, and tool steel) and N (Aluminum-wrought alloy, Aluminum-cast, alloyed).



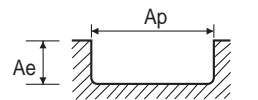
※ The Feed, in long & extra long types, should be reduced by around 50%.



E2030, E1030, E2080, E1080, E2033, E1033, E2050, E1050, E2163, E1163 SERIES

TiCN Coated 2FLUTE - SLOTTING

Table with columns for ISO, VDI 3323, Material Description, Ae, Ap, Parameter, and Diameter (Ø) from 1/8 to 2. Rows are categorized by material groups P (Non-alloy steel, Low alloy steel, High alloyed steel, and tool steel) and N (Aluminum-wrought alloy, Aluminum-cast, alloyed).



※ The Feed, in long & extra long types, should be reduced by around 50%.



**E1070, E1071, E1072 SERIES 2FLUTE for ALUMINIUM - SIDE CUTTING & SLOTTING**

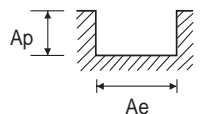
**E2160, E2161 SERIES 3 FLUTE - SLOTTING**

ISO	VDI 3323	Material Description	SIDE CUTTING		SLOTTING		Parameter	Diameter (Ø)										
			Ae	Ap	Ae	Ap		1/8	3/16	1/4	5/16	7/16	1/2	9/16	5/8	3/4	13/16	
K	15-16	Grey cast iron	$\phi 1/8 \sim \phi 5/16 = 0.25D$ $\phi 7/16 \sim \phi 13/16 = 0.5D$	1.0D	1.0D	0.5D	SFM	260	365	445	425	575	590	515	575	450	425	
							IPT	.0018	.0022	.0027	.0053	.0047	.0068	.0090	.0090	.0146	.0168	
							RPM	8000	7400	6800	5200	5000	4500	3500	3500	2300	2000	
							IPM	29	33	37	55	47	61	63	63	67	67	
							SFM	260	365	445	425	575	590	515	575	450	425	
							IPT	.0018	.0022	.0027	.0053	.0047	.0068	.0090	.0090	.0146	.0168	
	17-18	Nodular cast iron	$\phi 1/8 \sim \phi 5/16 = 0.25D$ $\phi 7/16 \sim \phi 13/16 = 0.5D$	1.0D	1.0D	0.5D	SFM	260	365	445	425	575	590	515	575	450	425	
							IPT	.0018	.0022	.0027	.0053	.0047	.0068	.0090	.0090	.0146	.0168	
							RPM	8000	7400	6800	5200	5000	4500	3500	3500	2300	2000	
							IPM	29	33	37	55	47	61	63	63	67	67	
							SFM	260	365	445	425	575	590	515	575	450	425	
							IPT	.0018	.0022	.0027	.0053	.0047	.0068	.0090	.0090	.0146	.0168	
19-20	Low alloy steel	$\phi 1/8 \sim \phi 5/16 = 0.25D$ $\phi 7/16 \sim \phi 13/16 = 0.5D$	1.0D	1.0D	0.5D	SFM	260	365	445	425	575	590	515	575	450	425		
						IPT	.0018	.0022	.0027	.0053	.0047	.0068	.0090	.0090	.0146	.0168		
						RPM	8000	7400	6800	5200	5000	4500	3500	3500	2300	2000		
						IPM	29	33	37	55	47	61	63	63	67	67		
						SFM	260	365	445	425	575	590	515	575	450	425		
						IPT	.0014	.0017	.0021	.0042	.0047	.0052	.0070	.0070	.0111	.0128		
N	21-22	Aluminum-wrought alloy	1.0D	1.0D	0.5D	SFM	170	235	290	275	370	385	335	370	295	275		
						IPT	.0014	.0017	.0021	.0042	.0047	.0052	.0070	.0070	.0111	.0128		
						RPM	8000	7400	6800	5200	5000	4500	3500	3500	2300	2000		
	23-25	Aluminum-cast, alloyed				SFM	170	235	290	275	370	385	335	370	295	275		
						IPT	.0014	.0017	.0021	.0042	.0047	.0052	.0070	.0070	.0111	.0128		
						RPM	5200	4810	4420	3380	3250	2930	2280	2280	1500	1300		
IPM	15	16	19	28	31	31	32	32	33	33								

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø)										
						3/32	1/8	1/4	3/8	1/2	9/16	5/8	7/8	1	1-1/8	
P	1	Non-alloy steel	1.0D	0.5D	SFM	135	115	120	110	120	120	115	115	120	120	
					IPT	.0001	.0003	.0010	.0018	.0024	.0027	.0031	.0040	.0039	.0039	
					RPM	5600	3500	1800	1100	900	800	700	500	450	400	
					IPM	2	3	5	6	7	7	6	5	5	5	
					SFM	110	105	105	90	105	105	90	105	105	105	
					IPT	.0001	.0003	.0010	.0020	.0025	.0025	.0032	.0039	.0039	.0039	
	2	Non-alloy steel	1.0D	0.5D	SFM	110	105	105	90	105	105	90	105	105	105	
					IPT	.0001	.0003	.0010	.0020	.0025	.0025	.0032	.0039	.0039	.0039	
					RPM	4500	3200	1600	900	800	700	560	450	400	350	
					IPM	2	3	5	5	6	5	5	5	5	4	
					SFM	100	80	80	80	80	75	80	80	80	80	
					IPT	.0002	.0003	.0010	.0020	.0025	.0028	.0030	.0039	.0038	.0037	
3-4	Non-alloy steel	1.0D	0.5D	SFM	100	80	80	80	80	75	80	80	80	80		
				IPT	.0002	.0003	.0010	.0020	.0025	.0028	.0030	.0039	.0038	.0037		
				RPM	4000	2500	1200	800	630	560	450	350	310	280		
				IPM	2	2	4	5	5	4	4	4	4	3		
				SFM	55	50	50	45	50	50	45	50	45	45		
				IPT	.0001	.0003	.0010	.0019	.0025	.0029	.0031	.0039	.0037	.0038		
5	Non-alloy steel	1.0D	0.5D	SFM	55	50	50	45	50	50	45	50	45	45		
				IPT	.0001	.0003	.0010	.0019	.0025	.0029	.0031	.0039	.0037	.0038		
				RPM	2200	1600	800	450	400	350	280	220	180	160		
				IPM	1	1	2	3	3	3	3	3	2	2		
				SFM	110	105	105	90	105	105	90	105	105	105		
				IPT	.0001	.0003	.0010	.0020	.0025	.0025	.0032	.0039	.0039	.0039		
6	Low alloy steel	1.0D	0.5D	SFM	110	105	105	90	105	105	90	105	105	105		
				IPT	.0001	.0003	.0010	.0020	.0025	.0025	.0032	.0039	.0039	.0039		
				RPM	4500	3200	1600	900	800	700	560	450	400	350		
				IPM	2	3	5	5	6	5	5	5	5	4		
				SFM	100	80	80	80	80	75	80	80	80	80		
				IPT	.0002	.0003	.0010	.0020	.0025	.0028	.0030	.0039	.0038	.0037		
7	Low alloy steel	1.0D	0.5D	SFM	100	80	80	80	80	75	80	80	80	80		
				IPT	.0002	.0003	.0010	.0020	.0025	.0028	.0030	.0039	.0038	.0037		
				RPM	4000	2500	1200	800	630	560	450	350	310	280		
				IPM	2	2	4	5	5	4	4	4	4	3		
				SFM	55	50	50	45	50	50	45	50	45	45		
				IPT	.0001	.0003	.0010	.0019	.0025	.0029	.0031	.0039	.0037	.0038		
8-9	Low alloy steel	1.0D	0.5D	SFM	55	50	50	45	50	50	45	50	45	45		
				IPT	.0001	.0003	.0010	.0019	.0025	.0029	.0031	.0039	.0037	.0038		
				RPM	2200	1600	800	450	400	350	280	220	180	160		
				IPM	1	1	2	3	3	3	3	3	2	2		
				SFM	110	105	105	90	105	105	90	105	105	105		
				IPT	.0001	.0003	.0010	.0020	.0025	.0025	.0032	.0039	.0039	.0039		
10	High alloyed steel, and tool steel	1.0D	0.5D	SFM	110	105	105	90	105	105	90	105	105	105		
				IPT	.0001	.0003	.0010	.0020	.0025	.0025	.0032	.0039	.0039	.0039		
				RPM	4500	3200	1600	900	800	700	560	450	400	350		
				IPM	2	3	5	5	6	5	5	5	5	4		
				SFM	55	50	50	45	50	50	45	50	45	45		
				IPT	.0001	.0003	.0010	.0019	.0025	.0029	.0031	.0039	.0037	.0038		
11.1	High alloyed steel, and tool steel	1.0D	0.5D	SFM	55	50	50	45	50	50	45	50	45	45		
				IPT	.0001	.0003	.0010	.0019	.0025	.0029	.0031	.0039	.0037	.0038		
				RPM	2200	1600	800	450	400	350	280	220	180	160		
				IPM	1	1	2	3	3	3	3	3	2	2		
				SFM	295	360	365	305	325	325	325	320	315	325		
				IPT	.0003	.0005	.0011	.0025	.0030	.0032	.0035	.0042	.0046	.0048		
N	21-22	Aluminum-wrought alloy	1.0D	0.5D	SFM	295	360	365	305	325	325	325	320	315	325	
					IPT	.0003	.0005	.0011	.0025	.0030	.0032	.0035	.0042	.0046	.0048	
					RPM	12000	11000	5600	3100	2500	2200	2000	1400	1200	1100	
	23-25	Aluminum-cast, alloyed			SFM	295	360	365	305	325	325	325	320	315	325	
					IPT	.0003	.0005	.0011	.0025	.0030	.0032	.0035	.0042	.0046	.0048	
					RPM	12000	11000	5600	3100	2500	2200	2000	1400	1200	1100	
IPM	9	15	19	24	22	21	21	18	17	16						



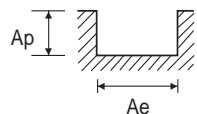
※ The Feed, in long & extra long types, should be reduced by around 50%.



※ The Feed, in long & extra long types, should be reduced by around 50%.

**E2160, E2161 SERIES** TiN Coated **3 FLUTE - SLOTTING**

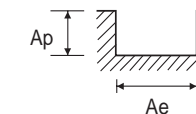
ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø)												
						3/32	1/8	1/4	3/8	1/2	9/16	5/8	7/8	1	1-1/8	1-3/16		
P	1	Non-alloy steel	1.0D	0.5D	SFM	165	135	140	130	140	125	125	135	140	125	130		
					IPT	.0001	.0003	.0010	.0018	.0024	.0031	.0032	.0040	.0040	.0043	.0039		
					RPM	6720	4200	2160	1320	1080	840	760	600	540	430	420		
					IPM	3	4	6	7	8	8	7	6	6	5	5		
	2		SFM	135	125	125	105	125	100	100	125	125	125	110				
			IPT	.0001	.0003	.0010	.0020	.0025	.0032	.0036	.0040	.0039	.0039	.0038				
			RPM	5400	3840	1920	1080	960	670	600	540	480	420	370				
			IPM	2	3	6	6	7	6	6	6	6	5	4				
	3-4		SFM	120	100	95	95	100	80	80	95	95	100	90				
			IPT	.0002	.0003	.0010	.0019	.0025	.0030	.0034	.0039	.0038	.0037	.0040				
			RPM	4800	3000	1440	960	760	540	480	420	370	340	300				
IPM		2	3	4	6	6	5	5	5	4	4	4						
5	SFM	65	65	65	55	65	50	50	60	55	55	55						
	IPT	.0001	.0002	.0010	.0019	.0025	.0031	.0034	.0039	.0037	.0038	.0038						
	RPM	2640	1920	960	540	480	340	300	260	220	190	190						
	IPM	1	1	3	3	4	3	3	3	2	2	2						
6	SFM	135	125	125	105	125	100	100	125	125	125	110						
	IPT	.0001	.0003	.0010	.0020	.0025	.0032	.0036	.0040	.0039	.0039	.0038						
	RPM	5400	3840	1920	1080	960	670	600	540	480	420	370						
	IPM	2	3	6	6	7	6	6	6	6	5	4						
7	SFM	120	100	95	95	100	80	80	95	95	100	90						
	IPT	.0002	.0003	.0010	.0019	.0025	.0030	.0034	.0039	.0038	.0037	.0040						
	RPM	4800	3000	1440	960	760	540	480	420	370	340	300						
	IPM	2	3	4	6	6	5	5	5	4	4	4						
8-9	SFM	65	65	65	55	65	50	50	60	55	55	55						
	IPT	.0001	.0002	.0010	.0019	.0025	.0031	.0034	.0039	.0037	.0038	.0038						
	RPM	2640	1920	960	540	480	340	300	260	220	190	190						
	IPM	1	1	3	3	4	3	3	3	2	2	2						
10	SFM	135	125	125	105	125	100	100	125	125	125	110						
	IPT	.0001	.0003	.0010	.0020	.0025	.0032	.0036	.0040	.0039	.0039	.0038						
	RPM	5400	3840	1920	1080	960	670	600	540	480	420	370						
	IPM	2	3	6	6	7	6	6	6	6	5	4						
11.1	SFM	65	65	65	55	65	50	50	60	55	55	55						
	IPT	.0001	.0002	.0010	.0019	.0025	.0031	.0034	.0039	.0037	.0038	.0038						
	RPM	2640	1920	960	540	480	340	300	260	220	190	190						
	IPM	1	1	3	3	4	3	3	3	2	2	2						
N	21-22	Aluminum-wrought alloy	1.0D	0.5D	SFM	355	430	440	365	395	355	355	385	375	390	390		
					IPT	.0003	.0005	.0011	.0025	.0030	.0035	.0039	.0042	.0046	.0048	.0048		
	RPM				14400	13200	6720	3720	3000	2400	2160	1680	1440	1320	1320			
	IPM				11	18	22	28	27	25	25	21	20	19	19			
23-25	Aluminum-cast, alloyed	SFM	355	430	440	365	395	355	355	385	375	390	390					
		IPT	.0003	.0005	.0011	.0025	.0030	.0035	.0039	.0042	.0046	.0048	.0048					
		RPM	14400	13200	6720	3720	3000	2400	2160	1680	1440	1320	1320					
		IPM	11	18	22	28	27	25	25	21	20	19	19					



※ The Feed, in long & extra long types, should be reduced by around 50%.

**E2160, E2161 SERIES** TiCN Coated **3 FLUTE - SLOTTING**

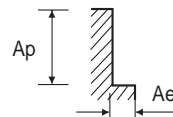
ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø)												
						3/32	1/8	1/4	3/8	1/2	9/16	5/8	7/8	1	1-1/8			
P	1	Non-alloy steel	1.0D	0.5D	SFM	180	150	155	140	155	155	150	150	155	155			
					IPT	.0001	.0003	.0010	.0018	.0024	.0027	.0031	.0040	.0039	.0044			
					RPM	7280	4550	2340	1430	1170	1040	910	650	590	520			
					IPM	3	4	7	8	9	9	8	7	7	7			
	2		SFM	145	75	135	115	135	135	120	135	135	135	135				
			IPT	.0001	.0005	.0010	.0020	.0025	.0025	.0032	.0039	.0039	.0039					
			RPM	5850	2340	2080	1170	1040	910	730	590	520	460					
			IPM	2	3	6	7	8	7	7	7	6	5					
	3-4		SFM	130	105	100	100	105	105	95	105	105	105	105				
			IPT	.0001	.0003	.0010	.0020	.0025	.0028	.0030	.0039	.0038	.0039					
			RPM	5200	3250	1560	1040	820	730	590	460	400	360					
IPM		2	3	5	6	6	6	5	5	5	4							
5	SFM	70	70	70	55	70	65	60	65	60	60	60						
	IPT	.0001	.0003	.0010	.0019	.0024	.0028	.0031	.0040	.0037	.0037							
	RPM	2860	2080	1040	590	520	460	360	290	230	210							
	IPM	1	2	3	3	4	4	3	3	3	2							
6	SFM	145	75	135	115	135	135	120	135	135	135	135						
	IPT	.0001	.0005	.0010	.0020	.0025	.0025	.0032	.0039	.0039	.0039							
	RPM	5850	2340	2080	1170	1040	910	730	590	520	460							
	IPM	2	3	6	7	8	7	7	7	6	5							
7	SFM	130	105	100	100	105	105	95	105	105	105	105						
	IPT	.0001	.0003	.0010	.0020	.0025	.0028	.0030	.0039	.0038	.0039							
	RPM	5200	3250	1560	1040	820	730	590	460	400	360							
	IPM	2	3	5	6	6	6	5	5	5	4							
8-9	SFM	70	70	70	55	70	65	60	65	60	60	60						
	IPT	.0001	.0003	.0010	.0019	.0024	.0028	.0031	.0040	.0037	.0037							
	RPM	2860	2080	1040	590	520	460	360	290	230	210							
	IPM	1	2	3	3	4	4	3	3	3	2							
10	SFM	145	75	135	115	135	135	120	135	135	135	135						
	IPT	.0001	.0005	.0010	.0020	.0025	.0025	.0032	.0039	.0039	.0039							
	RPM	5850	2340	2080	1170	1040	910	730	590	520	460							
	IPM	2	3	6	7	8	7	7	7	6	5							
11.1	SFM	70	70	70	55	70	65	60	65	60	60	60						
	IPT	.0001	.0003	.0010	.0019	.0024	.0028	.0031	.0040	.0037	.0037							
	RPM	2860	2080	1040	590	520	460	360	290	230	210							
	IPM	1	2	3	3	4	4	3	3	3	2							
N	21-22	Aluminum-wrought alloy	1.0D	0.5D	SFM	385	470	475	395	425	420	425	415	410	420			
					IPT	.0003	.0005	.0011	.0025	.0030	.0032	.0035	.0042	.0046	.0048			
	RPM				15600	14300	7280	4030	3250	2860	2600	1820	1560	1430				
	IPM				12	20	24	31	29	27	27	23	22	21				
23-25	Aluminum-cast, alloyed	SFM	385	470	475	395	425	420	425	415	410	420						
		IPT	.0003	.0005	.0011	.0025	.0030	.0032	.0035	.0042	.0046	.0048						
		RPM	15600	14300	7280	4030	3250	2860	2600	1820	1560	1430						
		IPM	12	20	24	31	29	27	27	23	22	21						



※ The Feed, in long & extra long types, should be reduced by around 50%.

**E2160, E2161 SERIES 3 FLUTE - SIDE CUTTING**

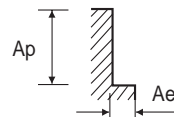
Table with columns for ISO, VDI 3323, Material Description, Ae, Ap, Parameter, and Diameter (Ø) with sub-columns for various diameters from 3/32 to 1-3/16. Rows are categorized by material type (Non-alloy steel, Low alloy steel, High alloyed steel, Aluminum-wrought alloy, Aluminum-cast alloy) and ISO groups (P, N).



※ The Feed, in long & extra long types, should be reduced by around 50%.

**E2160, E2161 SERIES TiN Coated 3 FLUTE - SIDE CUTTING**

Table with columns for ISO, VDI 3323, Material Description, Ae, Ap, Parameter, and Diameter (Ø) with sub-columns for various diameters from 3/32 to 1-3/16. Rows are categorized by material type (Non-alloy steel, Low alloy steel, High alloyed steel, Aluminum-wrought alloy, Aluminum-cast alloy) and ISO groups (P, N).

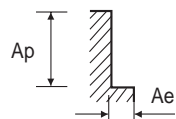


※ The Feed, in long & extra long types, should be reduced by around 50%.



**E2160, E2161 SERIES** TiCN Coated 3 FLUTE - SIDE CUTTING

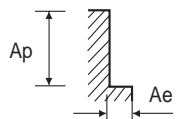
ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø)																	
						3/32	1/8	1/4	5/16	1/2	9/16	5/8	11/16	7/8	1	1-1/8							
						SFM	IPT	RPM	IPM	SFM	IPT	RPM	IPM	SFM	IPT	RPM	IPM	SFM	IPT	RPM	IPM	SFM	IPT
P	1	Non-alloy steel	0.1D	1.5D	SFM	180	150	145	150	155	155	150	145	150	155	155							
					IPT	.0001	.0003	.0010	.0014	.0024	.0027	.0031	.0032	.0040	.0039	.0039							
					RPM	7280	4550	2240	1820	1170	1040	910	820	650	590	520							
	2		SFM	145	135	135	115	135	120	115	135	135	135	135									
			IPT	.0001	.0002	.0009	.0012	.0022	.0022	.0028	.0031	.0035	.0036	.0035									
			RPM	5850	4160	2080	1430	1040	910	730	650	590	520	460									
	3-4		SFM	130	105	100	95	105	95	95	105	105	105	105									
			IPT	.0001	.0002	.0007	.0011	.0019	.0021	.0026	.0026	.0029	.0028	.0029									
			RPM	5200	3250	1560	1170	820	730	590	520	460	400	360									
	5		SFM	70	70	70	60	70	65	60	60	65	60	60									
			IPT	.0001	.0002	.0007	.0012	.0019	.0021	.0026	.0026	.0029	.0028	.0026									
RPM		2860	2080	1040	730	520	460	360	330	290	230	210											
6	SFM	145	135	135	115	135	120	115	135	135	135	135											
	IPT	.0001	.0002	.0009	.0012	.0022	.0022	.0028	.0031	.0035	.0036	.0035											
	RPM	5850	4160	2080	1430	1040	910	730	650	590	520	460											
7	SFM	130	105	100	95	105	95	95	105	105	105	105											
	IPT	.0001	.0002	.0007	.0011	.0019	.0021	.0026	.0026	.0029	.0028	.0029											
	RPM	5200	3250	1560	1170	820	730	590	520	460	400	360											
8-9	SFM	70	70	70	60	70	65	60	60	65	60	60											
	IPT	.0001	.0002	.0007	.0012	.0019	.0021	.0026	.0026	.0029	.0028	.0026											
	RPM	2860	2080	1040	730	520	460	360	330	290	230	210											
10	SFM	145	135	135	115	135	120	115	135	135	135	135											
	IPT	.0001	.0002	.0009	.0012	.0022	.0022	.0028	.0031	.0035	.0036	.0035											
	RPM	5850	4160	2080	1430	1040	910	730	650	590	520	460											
11.1	SFM	70	70	70	60	70	65	60	60	65	60	60											
	IPT	.0001	.0002	.0007	.0012	.0019	.0021	.0026	.0026	.0029	.0028	.0026											
	RPM	2860	2080	1040	730	520	460	360	330	290	230	210											
21-22	SFM	385	470	475	425	425	420	425	420	415	410	420											
	IPT	.0002	.0003	.0008	.0014	.0023	.0024	.0026	.0029	.0032	.0035	.0036											
	RPM	15600	14300	7280	5200	3250	2860	2600	2340	1820	1560	1430											
23-25	SFM	385	470	475	425	425	420	425	420	415	410	420											
	IPT	.0002	.0003	.0008	.0014	.0023	.0024	.0026	.0029	.0032	.0035	.0036											
	RPM	15600	14300	7280	5200	3250	2860	2600	2340	1820	1560	1430											



※ The Feed, in long & extra long types, should be reduced by around 50%.

**E2120, E2121 SERIES** MULTI FLUTE - SIDE CUTTING

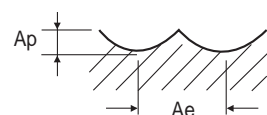
ISO	VDI 3323	Material Description	Parameter	Diameter (Ø)															
				1/4	1/4	5/8	5/8	3/4	3/4	1	1	1-1/2	1-1/2	2	2				
				Ae	0.08D	0.32D	0.03D	0.3D	0.03D	0.35D	0.02D	0.3D	0.13D	0.05D	0.01D	0.8D			
P	1-5	Non-alloy steel	SFM	120	105	125	105	100	90	120	105	110	95	115	100				
			IPT	.0007	.0008	.0013	.0015	.0016	.0019	.0016	.0018	.0022	.0026	.0025	.0029				
			RPM	1840	1600	750	650	520	450	460	400	280	240	220	190				
			IPM	4	4	3	3	3	3	3	3	3	3	2	2				
			6-9	Low alloy steel	SFM	120	105	125	105	100	90	120	105	110	95	115	100		
					IPT	.0007	.0008	.0013	.0015	.0016	.0019	.0016	.0018	.0022	.0026	.0025	.0029		
	RPM	1840			1600	750	650	520	450	460	400	280	240	220	190				
	IPM	4			4	3	3	3	3	3	3	3	3	2	2				
	10-11	High alloyed steel, and tool steel			SFM	80	45	75	65	75	65	75	65	65	60	75	65		
					IPT	.0006	.0011	.0014	.0017	.0016	.0019	.0016	.0018	.0021	.0023	.0023	.0027		
			RPM	1250	650	460	400	370	320	290	250	170	150	140	120				
			IPM	2	2	2	2	2	2	2	2	1	1	1	1				
M			Stainless steel	SFM	65	35	65	55	60	50	65	55	60	50	60	50			
				IPT	.0006	.0010	.0012	.0014	.0016	.0018	.0015	.0017	.0022	.0025	.0024	.0028			
	RPM	980		510	390	340	300	260	240	210	150	130	120	100					
	IPM	2		2	1	1	1	1	1	1	1	1	1	1					
	K	Grey cast iron		SFM	135	70	135	120	125	110	135	115	125	110	135	120			
				IPT	.0008	.0014	.0016	.0019	.0022	.0025	.0021	.0024	.0028	.0032	.0028	.0032			
RPM			2050	1100	840	730	630	550	510	440	320	280	260	230					
IPM			5	5	4	4	4	4	4	4	4	4	3	3					
17-18			Nodular cast iron	SFM	135	70	135	120	125	110	135	115	125	110	135	120			
				IPT	.0008	.0014	.0016	.0019	.0022	.0025	.0021	.0024	.0028	.0032	.0028	.0032			
	RPM	2050		1100	840	730	630	550	510	440	320	280	260	230					
	IPM	5		5	4	4	4	4	4	4	4	4	3	3					
	19-20	Low alloy steel		SFM	135	70	135	120	125	110	135	115	125	110	135	120			
				IPT	.0008	.0014	.0016	.0019	.0022	.0025	.0021	.0024	.0028	.0032	.0028	.0032			
RPM			2050	1100	840	730	630	550	510	440	320	280	260	230					
IPM			5	5	4	4	4	4	4	4	4	4	3	3					



※ The Feed, in long & extra long types, should be reduced by around 50%.

**E2110, E1110, E2111, E1111, E2112, E1112 SERIES 2 FLUTE BALL NOSE- PROFILE MILLING**

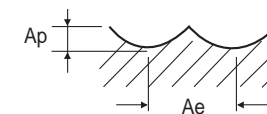
ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø)									
						1/8	5/32	1/4	5/6	3/8	1/2	5/8	3/4	1	
P	1	Non-alloy steel	0.7D	0.3D	SFM	145	130	145	350	130	130	130	120	130	
					IPT	.0004	.0007	.0012	.0020	.0027	.0034	.0038	.0046	.0051	
					RPM	4500	3200	2200	1600	1300	1000	800	600	500	
					IPM	4	5	5	6	7	7	6	6	5	
	2		0.7D	0.3D	SFM	110	100	110	260	100	105	100	100	105	
					IPT	.0004	.0006	.0010	.0017	.0024	.0026	.0033	.0034	.0035	
					RPM	3400	2400	1700	1200	1000	800	600	500	400	
					IPM	3	3	4	4	5	4	4	3	3	
	3-4		0.7D	0.3D	SFM	65	55	65	155	55	60	55	60	60	
					IPT	.0003	.0005	.0009	.0014	.0021	.0024	.0031	.0033	.0036	
					RPM	2000	1400	1000	700	560	450	350	300	220	
					IPM	1	1	2	2	2	2	2	2	2	
5	0.7D	0.3D	SFM	45	40	45	110	40	40	40	40	40			
			IPT	.0003	.0005	.0007	.0012	.0018	.0022	.0028	.0035	.0038			
			RPM	1400	1000	700	500	400	320	250	200	160			
			IPM	1	1	1	1	1	1	1	1	1			
6	0.7D	0.3D	SFM	110	100	110	260	100	105	100	100	105			
			IPT	.0004	.0006	.0010	.0017	.0024	.0026	.0033	.0034	.0035			
			RPM	3400	2400	1700	1200	1000	800	600	500	400			
			IPM	3	3	4	4	5	4	4	3	3			
7	0.7D	0.3D	SFM	65	55	65	155	55	60	55	60	60			
			IPT	.0003	.0005	.0009	.0014	.0021	.0024	.0031	.0033	.0036			
			RPM	2000	1400	1000	700	560	450	350	300	220			
			IPM	1	1	2	2	2	2	2	2	2			
8-9	0.7D	0.3D	SFM	45	40	45	110	40	40	40	40	40			
			IPT	.0003	.0005	.0007	.0012	.0018	.0022	.0028	.0035	.0038			
			RPM	1400	1000	700	500	400	320	250	200	160			
			IPM	1	1	1	1	1	1	1	1	1			
10	0.7D	0.3D	SFM	110	100	110	260	100	105	100	100	105			
			IPT	.0004	.0006	.0010	.0017	.0024	.0026	.0033	.0034	.0035			
			RPM	3400	2400	1700	1200	1000	800	600	500	400			
			IPM	3	3	4	4	5	4	4	3	3			
11.1	0.7D	0.3D	SFM	45	40	45	110	40	40	40	40	40			
			IPT	.0003	.0005	.0007	.0012	.0018	.0022	.0028	.0035	.0038			
			RPM	1400	1000	700	500	400	320	250	200	160			
			IPM	1	1	1	1	1	1	1	1	1			
N	21-22	Aluminum-wrought alloy	0.7D	0.3D	SFM	360	325	365	875	315	325	325	315	340	
					IPT	.0004	.0006	.0010	.0017	.0022	.0027	.0030	.0034	.0038	
					RPM	11000	8000	5600	4000	3200	2500	2000	1600	1300	
					IPM	9	10	11	14	14	13	12	11	10	
23-25	Aluminum-cast, alloyed	0.7D	0.3D	SFM	360	325	365	875	315	325	325	315	340		
				IPT	.0004	.0006	.0010	.0017	.0022	.0027	.0030	.0034	.0038		
				RPM	11000	8000	5600	4000	3200	2500	2000	1600	1300		
				IPM	9	10	11	14	14	13	12	11	10		



※ The Feed, in long & extra long types, should be reduced by around 50%.

**E2110, E1110, E2111, E1111, E2112, E1112 SERIES TiN Coated 2 FLUTE BALL NOSE- PROFILE MILLING**

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø)									
						1/8	5/32	1/4	5/6	3/8	1/2	5/8	3/4	1	
P	1	Non-alloy steel	0.7D	0.3D	SFM	175	155	175	420	155	155	190	165	155	
					IPT	.0004	.0007	.0012	.0020	.0027	.0034	.0038	.0046	.0051	
					RPM	5400	3840	2640	1920	1560	1200	960	720	600	
					IPM	4	5	6	8	9	8	7	7	6	
	2		0.7D	0.3D	SFM	135	120	135	315	120	125	140	135	125	
					IPT	.0004	.0006	.0010	.0017	.0023	.0026	.0033	.0034	.0035	
					RPM	4080	2880	2040	1440	1200	960	720	600	480	
					IPM	3	4	4	5	6	5	5	4	3	
	3-4		0.7D	0.3D	SFM	80	70	80	185	65	70	80	80	70	
					IPT	.0003	.0005	.0009	.0014	.0022	.0024	.0031	.0033	.0036	
					RPM	2400	1680	1200	840	672	540	420	360	264	
					IPM	1	2	2	2	3	3	3	2	2	
5	0.7D	0.3D	SFM	55	50	55	130	45	50	60	55	50			
			IPT	.0003	.0005	.0007	.0012	.0018	.0022	.0028	.0035	.0036			
			RPM	1680	1200	840	600	480	384	300	240	192			
			IPM	1	1	1	1	2	2	2	2	1			
6	0.7D	0.3D	SFM	135	120	135	315	120	125	140	135	125			
			IPT	.0004	.0006	.0010	.0017	.0023	.0026	.0033	.0034	.0035			
			RPM	4080	2880	2040	1440	1200	960	720	600	480			
			IPM	3	4	4	5	6	5	5	4	3			
7	0.7D	0.3D	SFM	80	70	80	185	65	70	80	80	70			
			IPT	.0003	.0005	.0009	.0014	.0022	.0024	.0031	.0033	.0036			
			RPM	2400	1680	1200	840	672	540	420	360	264			
			IPM	1	2	2	2	3	3	3	2	2			
8-9	0.7D	0.3D	SFM	55	50	55	130	45	50	60	55	50			
			IPT	.0003	.0005	.0007	.0012	.0018	.0022	.0028	.0035	.0036			
			RPM	1680	1200	840	600	480	384	300	240	192			
			IPM	1	1	1	1	2	2	2	2	1			
10	0.7D	0.3D	SFM	135	120	135	315	120	125	140	135	125			
			IPT	.0004	.0006	.0010	.0017	.0023	.0026	.0033	.0034	.0035			
			RPM	4080	2880	2040	1440	1200	960	720	600	480			
			IPM	3	4	4	5	6	5	5	4	3			
11.1	0.7D	0.3D	SFM	55	50	55	130	45	50	60	55	50			
			IPT	.0003	.0005	.0007	.0012	.0018	.0022	.0028	.0035	.0036			
			RPM	1680	1200	840	600	480	384	300	240	192			
			IPM	1	1	1	1	2	2	2	2	1			
N	21-22	Aluminum-wrought alloy	0.7D	0.3D	SFM	430	395	440	1045	375	395	470	440	410	
					IPT	.0004	.0006	.0010	.0017	.0022	.0027	.0030	.0034	.0038	
					RPM	13200	9600	6720	4800	3840	3000	2400	1920	1560	
					IPM	11	12	13	17	17	16	14	13	12	
23-25	Aluminum-cast, alloyed	0.7D	0.3D	SFM	430	395	440	1045	375	395	470	440	410		
				IPT	.0004	.0006	.0010	.0017	.0022	.0027	.0030	.0034	.0038		
				RPM	13200	9600	6720	4800	3840	3000	2400	1920	1560		
				IPM	11	12	13	17	17	16	14	13	12		



※ The Feed, in long & extra long types, should be reduced by around 50%.

CBN END MILLS  
i-Xmill END MILLS  
i-SMART MODULAR END MILLS  
X5070 END MILLS  
4G MILL END MILLS  
X-POWER PRO END MILLS  
TitaNox-POWER END MILLS  
JET-POWER END MILLS  
V7 PLUS A END MILLS  
V7 MILL INOX  
ALU-POWER HPC END MILLS  
ALU-POWER END MILLS  
D-POWER GRAPHITE END MILLS  
STANDARD CARBIDE  
ONLY ONE COATED PM60 END MILLS  
SINE-POWER  
TANK-POWER END MILLS  
STANDARD COBALT & HSS

CBN END MILLS  
i-Xmill END MILLS  
i-SMART MODULAR END MILLS  
X5070 END MILLS  
4G MILL END MILLS  
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V7 PLUS A END MILLS  
V7 MILL INOX  
ALU-POWER HPC END MILLS  
ALU-POWER END MILLS  
D-POWER GRAPHITE END MILLS  
STANDARD CARBIDE  
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SINE-POWER  
TANK-POWER END MILLS  
STANDARD COBALT & HSS

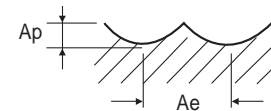
TECHNICAL DATA

TECHNICAL DATA

E2110, E1110, E2111, E1111, E2112, E1112 SERIES

TiCN Coated  
**2 FLUTE BALL NOSE - PROFILE MILLING**

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø)									
						1/8	5/32	1/4	5/16	3/8	1/2	5/8	3/4	1	
P	1	Non-alloy steel	0.7D	0.3D	SFM	190	170	185	455	165	170	170	155	170	
					IPT	.0004	.0007	.0012	.0020	.0027	.0034	.0038	.0046	.0051	
					RPM	5850	4160	2860	2080	1690	1300	1040	780	650	
					IPM	5	6	7	8	9	9	8	7	7	
					SFM	145	130	145	340	130	135	130	130	135	
					IPT	.0004	.0006	.0010	.0017	.0023	.0025	.0033	.0034	.0035	
					RPM	4420	3120	2210	1560	1300	1040	780	650	520	
					IPM	4	4	5	5	6	5	5	4	4	
					SFM	85	75	85	200	70	75	75	75	75	
					IPT	.0003	.0005	.0009	.0014	.0021	.0025	.0032	.0033	.0037	
RPM	2600	1820	1300	910	730	590	460	390	290						
IPM	2	2	2	3	3	3	3	3	2						
SFM	60	55	60	140	50	55	55	50	55						
IPT	.0003	.0005	.0007	.0012	.0017	.0022	.0028	.0034	.0038						
RPM	1820	1300	910	650	520	420	330	260	210						
IPM	1	1	1	2	2	2	2	2	2						
P	6	Low alloy steel	0.7D	0.3D	SFM	145	130	145	340	130	135	130	130	135	
					IPT	.0004	.0006	.0010	.0017	.0023	.0025	.0033	.0034	.0035	
					RPM	4420	3120	2210	1560	1300	1040	780	650	520	
					IPM	4	4	5	5	6	5	5	4	4	
					SFM	85	75	85	200	70	75	75	75	75	
					IPT	.0003	.0005	.0009	.0014	.0021	.0025	.0032	.0033	.0037	
					RPM	2600	1820	1300	910	730	590	460	390	290	
					IPM	2	2	2	3	3	3	3	3	2	
					SFM	60	55	60	140	50	55	55	50	55	
					IPT	.0003	.0005	.0007	.0012	.0017	.0022	.0028	.0034	.0038	
RPM	1820	1300	910	650	520	420	330	260	210						
IPM	1	1	1	2	2	2	2	2	2						
P	7	High alloyed steel, and tool steel	0.7D	0.3D	SFM	145	130	145	340	130	135	130	130	135	
					IPT	.0004	.0006	.0010	.0017	.0023	.0025	.0033	.0034	.0035	
					RPM	4420	3120	2210	1560	1300	1040	780	650	520	
					IPM	4	4	5	5	6	5	5	4	4	
					SFM	60	55	60	140	50	55	55	50	55	
					IPT	.0003	.0005	.0007	.0012	.0017	.0022	.0028	.0034	.0038	
					RPM	1820	1300	910	650	520	420	330	260	210	
					IPM	1	1	1	2	2	2	2	2	2	
					SFM	145	130	145	340	130	135	130	130	135	
					IPT	.0004	.0006	.0010	.0017	.0023	.0025	.0033	.0034	.0035	
RPM	4420	3120	2210	1560	1300	1040	780	650	520						
IPM	4	4	5	5	6	5	5	4	4						
N	21-22	Aluminum-wrought alloy	0.7D	0.3D	SFM	470	425	475	1135	410	425	425	410	440	
					IPT	.0004	.0006	.0008	.0017	.0022	.0027	.0029	.0036	.0038	
					RPM	14300	10400	7280	5200	4160	3250	2600	2080	1690	
					IPM	12	13	12	18	19	17	15	15	13	
					SFM	470	425	475	1135	410	425	425	410	440	
					IPT	.0004	.0006	.0008	.0017	.0022	.0027	.0029	.0036	.0038	
					RPM	14300	10400	7280	5200	4160	3250	2600	2080	1690	
					IPM	12	13	12	18	19	17	15	15	13	
					SFM	470	425	475	1135	410	425	425	410	440	
					IPT	.0004	.0006	.0008	.0017	.0022	.0027	.0029	.0036	.0038	
RPM	14300	10400	7280	5200	4160	3250	2600	2080	1690						
IPM	12	13	12	18	19	17	15	15	13						

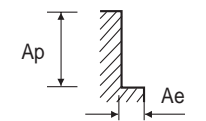


※ The Feed, in long & extra long types, should be reduced by around 50%.

E2031, E1031, E2034, E1034, E2036, E1036, E2051, E1051, E2039, E1039, E2040, E1040, E2041, E1041, E2053, E1053 SERIES

**4 FLUTE - SIDE CUTTING**

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø)													
						1/8	1/4	3/8	1/2	5/8	3/4	13/16	15/16	1	1 1/2	1 3/4	2		
P	1	Non-alloy steel	0.1D	1.5D	SFM	115	120	110	120	115	125	105	125	120	120	145			
					IPT	.0003	.0010	.0018	.0025	.0032	.0032	.0040	.0040	.0039	.0040	.0045	.0045		
					RPM	3500	1800	1100	900	700	630	500	500	450	310	280	280		
					IPM	4	7	8	9	9	8	8	8	7	5	5	5		
					SFM	105	105	90	105	90	100	95	110	105	100	100	100		
					IPT	.0002	.0009	.0017	.0022	.0027	.0030	.0033	.0033	.0038	.0040	.0045	.0053		
					RPM	3200	1600	900	800	560	500	450	450	400	250	220	190		
					IPM	3	6	6	7	6	6	6	6	4	4	4	4		
					SFM	80	80	80	80	75	80	75	85	80	80	70	60		
					IPT	.0002	.0008	.0016	.0020	.0022	.0025	.0029	.0029	.0032	.0025	.0033	.0045		
RPM	2500	1200	800	630	450	400	350	350	310	200	150	110							
IPM	2	4	5	5	4	4	4	4	4	2	2	2							
P	6	Low alloy steel	0.1D	1.5D	SFM	50	50	45	50	45	50	45	55	45	50	40			
					IPT	.0002	.0006	.0017	.0019	.0027	.0030	.0034	.0034	.0028	.0021	.0023	.0031		
					RPM	1600	800	450	400	280	250	220	220	180	120	110	80		
					IPM	1	2	3	3	3	3	3	3	2	1	1	1		
					SFM	105	105	90	105	90	100	95	110	105	100	100	100		
					IPT	.0002	.0009	.0017	.0022	.0027	.0030	.0033	.0033	.0038	.0040	.0045	.0053		
					RPM	3200	1600	900	800	560	500	450	450	400	250	220	190		
					IPM	3	6	6	7	6	6	6	6	4	4	4	4		
					SFM	80	80	80	80	75	80	75	85	80	80	70	60		
					IPT	.0002	.0008	.0016	.0020	.0022	.0025	.0029	.0029	.0032	.0025	.0033	.0045		
RPM	2500	1200	800	630	450	400	350	350	310	200	150	110							
IPM	2	4	5	5	4	4	4	4	4	2	2	2							
P	10	High alloyed steel, and tool steel	0.1D	1.5D	SFM	50	50	45	50	45	50	45	55	45	50	40			
					IPT	.0002	.0006	.0017	.0019	.0027	.0030	.0034	.0034	.0028	.0021	.0023	.0031		
					RPM	1600	800	450	400	280	250	220	220	180	120	110	80		
					IPM	1	2	3	3	3	3	3	3	2	1	1	1		
					SFM	105	105	90	105	90	100	95	110	105	100	100	100		
					IPT	.0002	.0009	.0017	.0022	.0027	.0030	.0033	.0033	.0038	.0040	.0045	.0053		
					RPM	3200	1600	900	800	560	500	450	450	400	250	220	190		
					IPM	3	6	6	7	6	6	6	6	4	4	4	4		
					SFM	50	50	45	50	45	50	45	55	45	45	50	40		
					IPT	.0002	.0006	.0017	.0019	.0027	.0030	.0034	.0034	.0028	.0021	.0023	.0031		
RPM	1600	800	450	400	280	250	220	220	180	120	110	80							
IPM	1	2	3	3	3	3	3	3	2	1	1	1							
N	21-22	Aluminum-wrought alloy	0.1D	1.5D	SFM	360	365	305	325	325	355	300	345	315	355	365	330		
					IPT	.0003	.0008	.0019	.0022	.0026	.0029	.0032	.0032	.0035	.0036	.0038	.0048		
					RPM	11000	5600	3100	2500	2000	1800	1400	1400	1200	900	800	630		
					IPM	15	19	24	22	21	21	18	18	17	13	12	12		
					SFM	360	365	305	325	325	355	300	345	315	355	365	330		
					IPT	.0003	.0008	.0019	.0022	.0026	.0029	.0032	.0032	.0035	.0036	.0038	.0048		
					RPM	11000	5600	3100	2500	2000	1800	1400	1400	1200	900	800	630		
					IPM	15	19	24	22	21	21	18	18	17	13	12	12		
					SFM	360	365	305	325	325	355	300	345	315	355	365	330		
					IPT	.0003	.0008	.0019	.0022	.0026	.0029	.0032	.0032	.0035	.0036	.0038	.0048		
RPM	11000	5600	3100	2500	2000	1800	1400	1400	1200	900	800	630							
IPM	15	19	24	22	21	21	18	18	17	13	12	12							



※ The Feed, in long & extra long types, should be reduced by around 50%.



E2031, E1031, E2034, E1034, E2036, E1036, E2051, E1051, E2039, E1039, E2040, E1040, E2041, E1041, E2053, E1053 SERIES

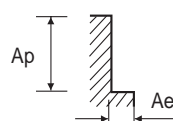
E2031, E1031, E2034, E1034, E2036, E1036, E2051, E1051, E2039, E1039, E2040, E1040, E2041, E1041, E2053, E1053 SERIES

TiN Coated 4 FLUTE - SIDE CUTTING

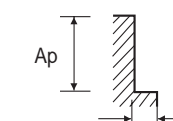
TiN Coated 4 FLUTE - SIDE CUTTING

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø)											
						1/8	1/4	3/8	1/2	5/8	3/4	13/16	15/16	1	1 1/2	1 3/4	2
P	1	Non-alloy steel	0.1D	1.5D	SFM	135	140	130	140	135	150	130	145	140	145	155	175
					IPT	.0003	.0010	.0019	.0023	.0030	.0033	.0042	.0042	.0042	.0041	.0044	.0044
					RPM	4200	2160	1320	1080	840	760	600	600	540	370	340	340
	2		SFM	125	125	105	125	110	120	115	135	125	120	120	120		
			IPT	.0003	.0009	.0019	.0023	.0030	.0033	.0037	.0037	.0036	.0033	.0038	.0043		
			RPM	3840	1920	1080	960	670	600	540	540	480	300	260	230		
	3-4		SFM	100	95	95	100	90	95	90	105	95	95	80	70		
			IPT	.0003	.0007	.0016	.0020	.0023	.0026	.0030	.0030	.0027	.0031	.0042	.0038		
			RPM	3000	1440	960	760	540	480	420	420	370	240	180	130		
	5		SFM	65	65	55	65	55	60	55	65	55	55	60	50		
			IPT	.0001	.0008	.0014	.0021	.0022	.0025	.0029	.0029	.0023	.0036	.0038	.0025		
RPM		1920	960	540	480	340	300	260	260	220	140	130	100				
6	SFM	125	125	105	125	110	120	115	135	125	120	120	120				
	IPT	.0003	.0009	.0019	.0023	.0030	.0033	.0037	.0037	.0036	.0033	.0038	.0043				
	RPM	3840	1920	1080	960	670	600	540	540	480	300	260	230				
7	SFM	100	95	95	100	90	95	90	105	95	95	80	70				
	IPT	.0003	.0007	.0016	.0020	.0023	.0026	.0030	.0030	.0027	.0031	.0042	.0038				
	RPM	3000	1440	960	760	540	480	420	420	370	240	180	130				
8-9	SFM	65	65	55	65	55	60	55	65	55	55	60	50				
	IPT	.0001	.0008	.0014	.0021	.0022	.0025	.0029	.0029	.0023	.0036	.0038	.0025				
	RPM	1920	960	540	480	340	300	260	260	220	140	130	100				
10	SFM	125	125	105	125	110	120	115	135	125	120	120	120				
	IPT	.0003	.0009	.0019	.0023	.0030	.0033	.0037	.0037	.0036	.0033	.0038	.0043				
	RPM	3840	1920	1080	960	670	600	540	540	480	300	260	230				
11.1	SFM	65	65	55	65	55	60	55	65	55	55	60	50				
	IPT	.0001	.0008	.0014	.0021	.0022	.0025	.0029	.0029	.0023	.0036	.0038	.0025				
	RPM	1920	960	540	480	340	300	260	260	220	140	130	100				
21-22	SFM	430	440	365	395	395	425	355	410	375	425	440	395				
	IPT	.0003	.0008	.0019	.0023	.0026	.0029	.0031	.0031	.0035	.0037	.0036	.0046				
	RPM	13200	6720	3720	3000	2400	2160	1680	1680	1440	1080	960	760				
23-25	SFM	430	440	365	395	395	425	355	410	375	425	440	395				
	IPT	.0003	.0008	.0019	.0023	.0026	.0029	.0031	.0031	.0035	.0037	.0036	.0046				
	RPM	13200	6720	3720	3000	2400	2160	1680	1680	1440	1080	960	760				

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø)											
						1/8	1/4	3/8	1/2	5/8	3/4	13/16	15/16	1	1 1/2	1 3/4	2
P	1	Non-alloy steel	0.1D	1.5D	SFM	150	155	140	155	150	160	140	160	155	160	165	190
					IPT	.0003	.0010	.0017	.0024	.0030	.0030	.0038	.0038	.0038	.0038	.0042	.0042
					RPM	4550	2340	1430	1170	910	820	650	650	590	400	360	360
	2		SFM	135	135	115	135	120	130	125	145	135	130	130	130		
			IPT	.0002	.0008	.0017	.0022	.0027	.0031	.0034	.0034	.0034	.0038	.0043	.0050		
			RPM	4160	2090	1170	1040	730	650	590	590	520	330	290	250		
	3-4		SFM	105	100	100	105	95	100	95	110	105	100	105	75		
			IPT	.0002	.0008	.0014	.0018	.0021	.0024	.0027	.0027	.0031	.0029	.0033	.0036		
			RPM	3250	1560	1040	820	590	520	460	460	400	260	230	140		
	5		SFM	70	70	55	70	60	65	60	70	60	60	65	55		
			IPT	.0002	.0007	.0013	.0019	.0021	.0023	.0026	.0026	.0033	.0031	.0036	.0025		
RPM		2080	1040	590	520	360	330	290	290	230	160	140	100				
6	SFM	135	135	115	135	120	130	125	145	135	130	130	130				
	IPT	.0002	.0008	.0017	.0022	.0027	.0031	.0034	.0034	.0034	.0038	.0043	.0050				
	RPM	4160	2090	1170	1040	730	650	590	590	520	330	290	250				
7	SFM	105	100	100	105	95	100	95	110	105	100	105	75				
	IPT	.0002	.0008	.0014	.0018	.0021	.0024	.0027	.0027	.0031	.0029	.0033	.0036				
	RPM	3250	1560	1040	820	590	520	460	460	400	260	230	140				
8-9	SFM	70	70	55	70	60	65	60	70	60	60	65	55				
	IPT	.0002	.0007	.0013	.0019	.0021	.0023	.0026	.0026	.0033	.0031	.0036	.0025				
	RPM	2080	1040	590	520	360	330	290	290	230	160	140	100				
10	SFM	135	135	115	135	120	130	125	145	135	130	130	130				
	IPT	.0002	.0008	.0017	.0022	.0027	.0031	.0034	.0034	.0034	.0038	.0043	.0050				
	RPM	4160	2090	1170	1040	730	650	590	590	520	330	290	250				
11.1	SFM	70	70	55	70	60	65	60	70	60	60	65	55				
	IPT	.0002	.0007	.0013	.0019	.0021	.0023	.0026	.0026	.0033	.0031	.0036	.0025				
	RPM	2080	1040	590	520	360	330	290	290	230	160	140	100				
21-22	SFM	470	475	395	425	425	460	385	445	410	460	475	545				
	IPT	.0003	.0008	.0019	.0022	.0026	.0029	.0032	.0032	.0035	.0036	.0036	.0036				
	RPM	14300	7280	4030	3250	2600	2340	1820	1820	1560	1170	1040	1040				
23-25	SFM	470	475	395	425	425	460	385	445	410	460	475	545				
	IPT	.0003	.0008	.0019	.0022	.0026	.0029	.0032	.0032	.0035	.0036	.0036	.0036				
	RPM	14300	7280	4030	3250	2600	2340	1820	1820	1560	1170	1040	1040				



※ The Feed, in long & extra long types, should be reduced by around 50%.

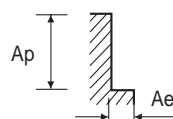


※ The Feed, in long & extra long types, should be reduced by around 50%.

E2032, E1032, E2035, E1035, E2037, E1037, E2042, E1042, E2162, E1162, E2175, E1175, E2100, E1100 SERIES

**6 & 8 FLUTE - SIDE CUTTING**

Table with columns: ISO, VDI 3323, Material Description, Ae, Ap, Parameter, Diameter (Ø) (1/8, 1/4, 3/8, 1/2, 5/8, 3/4, 13/16, 15/16, 1, 1 1/2, 1 3/4, 2 (6 & 8 FL)), SFM, IPT, RPM, IPM. Rows include Non-alloy steel, Low alloy steel, High alloyed steel, and Aluminum-wrought/cast alloy.

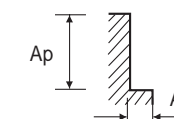


※ The Feed, in long & extra long types, should be reduced by around 50%.

E2032, E1032, E2035, E1035, E2037, E1037, E2042, E1042, E2162, E1162, E2175, E1175, E2100, E1100 SERIES

**TiN Coated 6 & 8 FLUTE - SIDE CUTTING**

Table with columns: ISO, VDI 3323, Material Description, Ae, Ap, Parameter, Diameter (Ø) (1/8, 1/4, 3/8, 1/2, 5/8, 3/4, 13/16, 15/16, 1, 1 1/2, 1 3/4, 2 (6 & 8 FL)), SFM, IPT, RPM, IPM. Rows include Non-alloy steel, Low alloy steel, High alloyed steel, and Aluminum-wrought/cast alloy.

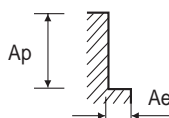


※ The Feed, in long & extra long types, should be reduced by around 50%.

E2032, E1032, E2035, E1035, E2037, E1037, E2042, E1042, E2162, E1162, E2175, E1175, E2100, E1100 SERIES

TiCN Coated 6 & 8 FLUTE - SIDE CUTTING

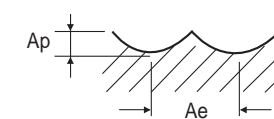
Table with columns: ISO, VDI 3323, Material Description, Ae, Ap, Parameter, Diameter (Ø) (1/8, 1/4, 3/8, 1/2, 5/8, 3/4, 13/16, 15/16, 1, 1 1/2, 1 3/4, 2 (6 & 8 FL)). Rows include Non-alloy steel, Low alloy steel, High alloyed steel, and Aluminum-wrought/cast alloy.



※ The Feed, in long & extra long types, should be reduced by around 50%.

E2020, E2021, E2069 SERIES 4 FLUTE BALL NOSE- PROFILE MILLING

Table with columns: ISO, VDI 3323, Material Description, Ae, Ap, Parameter, Diameter (Ø) (1/4, 5/16, 3/8, 1/2, 5/8, 3/4, 1). Rows include Non-alloy steel, Low alloy steel, High alloyed steel, and Aluminum-wrought/cast alloy.

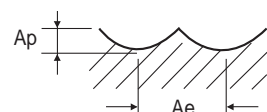


※ The Feed, in long & extra long types, should be reduced by around 50%.



**E2020, E2021, E2069 SERIES** TiN Coated 4 FLUTE BALL NOSE- PROFILE MILLING

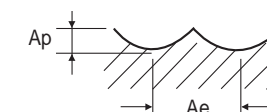
ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø)						
						1/4	5/16	3/8	1/2	5/8	3/4	1
P	1	Non-alloy steel	0.7D	0.3D	SFM	175	155	155	155	155	140	155
					IPT	.0009	.0014	.0021	.0025	.0029	.0035	.0042
					RPM	2640	1920	1560	1200	960	720	600
					IPM	10	11	13	12	11	10	10
	2		SFM	135	120	120	125	120	120	125		
			IPT	.0007	.0014	.0019	.0021	.0024	.0025	.0026		
			RPM	2040	1440	1200	960	720	600	480		
			IPM	6	8	9	8	7	6	5		
	3-4		SFM	80	70	65	70	70	70	70		
			IPT	.0006	.0012	.0015	.0019	.0024	.0028	.0029		
			RPM	1200	840	670	540	420	360	260		
IPM		3	4	4	4	4	4	3				
5	SFM	55	50	45	50	50	45	50				
	IPT	.0006	.0008	.0010	.0013	.0017	.0021	.0026				
	RPM	840	600	480	380	300	240	190				
	IPM	2	2	2	2	2	2	2				
6	SFM	135	120	120	125	120	120	125				
	IPT	.0007	.0014	.0019	.0021	.0024	.0025	.0026				
	RPM	2040	1440	1200	960	720	600	480				
	IPM	6	8	9	8	7	6	5				
7	SFM	80	70	65	70	70	70	70				
	IPT	.0006	.0012	.0015	.0019	.0024	.0028	.0029				
	RPM	1200	840	670	540	420	360	260				
	IPM	3	4	4	4	4	4	3				
8-9	SFM	55	50	45	50	50	45	50				
	IPT	.0006	.0008	.0010	.0013	.0017	.0021	.0026				
	RPM	840	600	480	380	300	240	190				
	IPM	2	2	2	2	2	2	2				
10	SFM	135	120	120	125	120	120	125				
	IPT	.0007	.0014	.0019	.0021	.0024	.0025	.0026				
	RPM	2040	1440	1200	960	720	600	480				
	IPM	6	8	9	8	7	6	5				
11.1	SFM	55	50	45	50	50	45	50				
	IPT	.0006	.0008	.0010	.0013	.0017	.0021	.0026				
	RPM	840	600	480	380	300	240	190				
	IPM	2	2	2	2	2	2	2				
N	21-22	Aluminum-wrought alloy	0.7D	0.3D	SFM	440	395	375	395	395	375	410
					IPT	.0007	.0013	.0017	.0020	.0022	.0026	.0029
					RPM	6720	4800	3840	3000	2400	1920	1560
					IPM	20	25	26	24	21	20	18
23-25	Aluminum-cast, alloyed	0.7D	0.3D	SFM	440	395	375	395	395	375	410	
				IPT	.0007	.0013	.0017	.0020	.0022	.0026	.0029	
				RPM	6720	4800	3840	3000	2400	1920	1560	
				IPM	20	25	26	24	21	20	18	



※ The Feed, in long & extra long types, should be reduced by around 50%.

**E2020, E2021, E2069 SERIES** TiCN Coated 4 FLUTE BALL NOSE- PROFILE MILLING

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø)						
						1/4	5/16	3/8	1/2	5/8	3/4	1
P	1	Non-alloy steel	0.7D	0.3D	SFM	185	170	165	170	170	155	170
					IPT	.0009	.0014	.0021	.0025	.0029	.0035	.0038
					RPM	2860	2080	1690	1300	1040	780	650
					IPM	10	12	14	13	12	11	10
	2		SFM	145	130	130	135	130	130	135		
			IPT	.0008	.0013	.0017	.0019	.0026	.0027	.0024		
			RPM	2210	1560	1300	1040	780	650	520		
			IPM	7	8	9	8	8	7	5		
	3-4		SFM	85	75	70	75	75	75	75		
			IPT	.0008	.0011	.0017	.0017	.0022	.0026	.0026		
			RPM	1300	910	730	590	460	390	290		
IPM		4	4	5	4	4	4	3				
5	SFM	60	55	50	55	55	50	55				
	IPT	.0005	.0008	.0014	.0018	.0023	.0029	.0024				
	RPM	910	650	520	420	330	260	210				
	IPM	2	2	3	3	3	3	2				
6	SFM	145	130	130	135	130	130	135				
	IPT	.0008	.0013	.0017	.0019	.0026	.0027	.0024				
	RPM	2210	1560	1300	1040	780	650	520				
	IPM	7	8	9	8	8	7	5				
7	SFM	85	75	70	75	75	75	75				
	IPT	.0008	.0011	.0017	.0017	.0022	.0026	.0026				
	RPM	1300	910	730	590	460	390	290				
	IPM	4	4	5	4	4	4	3				
8-9	SFM	60	55	50	55	55	50	55				
	IPT	.0005	.0008	.0014	.0018	.0023	.0029	.0024				
	RPM	910	650	520	420	330	260	210				
	IPM	2	2	3	3	3	3	2				
10	SFM	145	130	130	135	130	130	135				
	IPT	.0008	.0013	.0017	.0019	.0026	.0027	.0024				
	RPM	2210	1560	1300	1040	780	650	520				
	IPM	7	8	9	8	8	7	5				
11.1	SFM	60	55	50	55	55	50	55				
	IPT	.0005	.0008	.0014	.0018	.0023	.0029	.0024				
	RPM	910	650	520	420	330	260	210				
	IPM	2	2	3	3	3	3	2				
N	21-22	Aluminum-wrought alloy	0.7D	0.3D	SFM	475	425	410	425	425	410	440
					IPT	.0008	.0013	.0017	.0020	.0022	.0026	.0030
					RPM	7280	5200	4160	3250	2600	2080	1690
					IPM	22	27	28	26	23	22	20
23-25	Aluminum-cast, alloyed	0.7D	0.3D	SFM	475	425	410	425	425	410	440	
				IPT	.0008	.0013	.0017	.0020	.0022	.0026	.0030	
				RPM	7280	5200	4160	3250	2600	2080	1690	
				IPM	22	27	28	26	23	22	20	



※ The Feed, in long & extra long types, should be reduced by around 50%.



RECOMMENDED CUTTING CONDITIONS

E2001, E1001, E2003, E1003, E2005, E1005, E2002, E1002, E2004, E1004, E2006, E1006, E2008, E1008, E2013, E1013, E2015, E1015 SERIES

MINIATURE

Table with columns: ISO, VDI 3323, Material Description, Parameter, Diameter (Ø) [1/64, 1/32, 3/64, 1/16, 5/64, 3/32, 7/64, 1/8, 9/64, 5/32, 11/64, 3/16], SFM, RPM, IPM.

\* The Feed, in long & extra long types, should be reduced by around 50%.

NOTES :

- (1) The cutting conditions in this table are given for reference, which should be varied depending on the machine, tooling, depth of cut, cutting fluid and other conditons.
(2) Use a holder of strong gripping force and machine of high stiffness

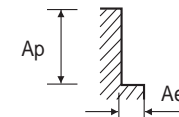


RECOMMENDED CUTTING CONDITIONS

E2086, E2085, E2079, E2077, E2170, E2171, E2172, E2241, E2195, E2197 SERIES

MULTI FLUTE ROUGHING - SIDE CUTTING

Table with columns: ISO, VDI 3323, Material Description, Ae, Ap, Parameter, Diameter (Ø) [1/4, 5/16, 3/8, 1/2, 5/8, 11/16, 7/8, 1, 1 1/8, 1 1/4, 1 3/8, 1 3/4, 2], SFM, RPM, IPM.

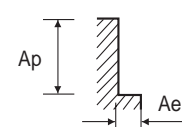


\* The Feed, in long & extra long types, should be reduced by around 50%.

E2086, E2085, E2079, E2077, E2170, E2171, E2172, E2241, E2195, E2197 SERIES

TiN Coated  
MULTI FLUTE ROUGHING  
- SIDE CUTTING

Table with columns: ISO, VDI 3323, Material Description, Ae, Ap, Parameter, Diameter (Ø) [1/4, 5/16, 3/8, 1/2, 5/8, 11/16, 7/8, 1, 1 1/8, 1 1/4, 1 3/8, 1 3/4, 2]. Rows include Non-alloy steel, Low alloy steel, High alloyed steel, and Aluminum-wrought/alloyed.

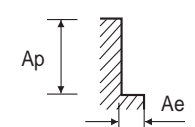


※ The Feed, in long & extra long types, should be reduced by around 50%.

E2086, E2085, E2079, E2077, E2170, E2171, E2172, E2241, E2195, E2197 SERIES

TiCN Coated  
MULTI FLUTE ROUGHING  
- SIDE CUTTING

Table with columns: ISO, VDI 3323, Material Description, Ae, Ap, Parameter, Diameter (Ø) [1/4, 5/16, 3/8, 1/2, 5/8, 11/16, 7/8, 1, 1 1/8, 1 1/4, 1 3/8, 1 3/4, 2]. Rows include Non-alloy steel, Low alloy steel, High alloyed steel, and Aluminum-wrought/alloyed.

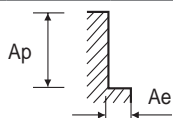


※ The Feed, in long & extra long types, should be reduced by around 50%.



**E2193, E2125 SERIES MULTI FLUTE BALL ROUGHING - SIDE CUTTING**

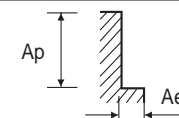
ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø)							
						5/16	3/8	1/2	5/8	3/4	1	1 1/4	1 3/4
P	1	Non-alloy steel	0.5D	1.5D	SFM	115	110	120	115	110	120	115	130
					IPT	.0010	.0014	.0019	.0025	.0031	.0040	.0038	.0048
					RPM	1400	1100	900	700	560	450	350	280
					IPM	4	6	7	7	7	9	8	8
	2		SFM	90	90	105	90	90	105	90	100		
			IPT	.0009	.0014	.0019	.0027	.0033	.0035	.0036	.0045		
			RPM	1100	900	800	560	450	400	280	220		
			IPM	3	5	6	6	6	7	6	6		
	3-4		SFM	75	80	80	75	80	80	70	80		
			IPT	.0011	.0013	.0016	.0022	.0025	.0039	.0038	.0046		
RPM		900	800	630	450	400	310	220	180				
IPM		3	4	4	4	4	6	5	5				
5	SFM	45	45	50	45	45	45	45	50				
	IPT	.0006	.0011	.0019	.0027	.0034	.0033	.0036	.0045				
	RPM	560	450	400	280	220	180	140	110				
	IPM	1	2	3	3	3	3	3	3				
6	SFM	90	90	105	90	90	105	90	100				
	IPT	.0009	.0014	.0019	.0027	.0033	.0035	.0036	.0045				
	RPM	1100	900	800	560	450	400	280	220				
	IPM	3	5	6	6	6	7	6	6				
7	SFM	75	80	80	75	80	80	70	80				
	IPT	.0011	.0013	.0016	.0022	.0025	.0039	.0038	.0046				
	RPM	900	800	630	450	400	310	220	180				
	IPM	3	4	4	4	4	6	5	5				
8-9	SFM	45	45	50	45	45	45	45	50				
	IPT	.0006	.0011	.0019	.0027	.0034	.0033	.0036	.0045				
	RPM	560	450	400	280	220	180	140	110				
	IPM	1	2	3	3	3	3	3	3				
10	SFM	90	90	105	90	90	105	90	100				
	IPT	.0009	.0014	.0019	.0027	.0033	.0035	.0036	.0045				
	RPM	1100	900	800	560	450	400	280	220				
	IPM	3	5	6	6	6	7	6	6				
11.1	SFM	45	45	50	45	45	45	45	50				
	IPT	.0006	.0011	.0019	.0027	.0034	.0033	.0036	.0045				
	RPM	560	450	400	280	220	180	140	110				
	IPM	1	2	3	3	3	3	3	3				
N	21-22	Aluminum-wrought alloy	0.5D	1.5D	SFM	255	245	260	260	235	260	260	290
					IPT	.0010	.0010	.0020	.0028	.0042	.0036	.0042	.0048
					RPM	3100	2500	2000	1600	1200	1000	800	630
					IPM	9	10	16	18	20	18	20	18
23-25	Aluminum-cast, alloyed	0.5D	1.5D	SFM	255	245	260	260	235	260	260	290	
				IPT	.0010	.0010	.0020	.0028	.0042	.0036	.0042	.0048	
				RPM	3100	2500	2000	1600	1200	1000	800	630	
				IPM	9	10	16	18	20	18	20	18	



※ The Feed, in long & extra long types, should be reduced by around 50%.

**E2248 SERIES MULTI FLUTE ROUGHING & FINISHING - SIDE CUTTING**

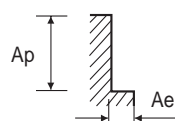
ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø)											
						1/4	5/16	3/8	1/2	5/8	11/16	7/8	1	1 1/4	1 3/8	2 (6 & 8 FL)	
P	1	Non-alloy steel	0.5D	1.5D	SFM	120	115	110	120	115	115	115	120	115	110	125	
					IPT	.0004	.0005	.0011	.0017	.0021	.0024	.0028	.0031	.0033	.0038	.0035 / .0026	
					RPM	1800	1400	1100	900	700	630	500	450	350	310	240	
					IPM	3	3	5	6	6	7	7	7	7	7	5	
	2		SFM	85	90	90	105	90	105	105	90	90	100	100			
			IPT	.0004	.0005	.0011	.0013	.0018	.0020	.0022	.0025	.0030	.0033	.0035 / .0026			
			RPM	1300	1100	900	800	560	500	450	400	280	250	190			
			IPM	2	2	4	4	4	4	5	5	5	5	4			
	3-4		SFM	80	75	80	80	75	70	80	80	70	70	80			
			IPT	.0004	.0006	.0013	.0016	.0022	.0025	.0023	.0026	.0030	.0033	.0035 / .0025			
RPM		1200	900	800	630	450	400	350	310	220	200	150					
IPM		2	2	4	4	4	4	4	4	4	4	3					
5	SFM	50	45	45	50	45	45	50	45	45	45	60					
	IPT	.0003	.0004	.0011	.0013	.0018	.0020	.0027	.0033	.0036	.0042	.0045 / .0034					
	RPM	800	560	450	400	280	250	220	180	140	120	110					
	IPM	1	1	2	2	2	2	3	3	3	3	3					
6	SFM	85	90	90	105	90	90	105	105	90	90	100					
	IPT	.0004	.0005	.0011	.0013	.0018	.0020	.0022	.0025	.0030	.0033	.0035 / .0026					
	RPM	1300	1100	900	800	560	500	450	400	280	250	190					
	IPM	2	2	4	4	4	4	5	5	5	5	4					
7	SFM	80	75	80	80	75	70	80	80	70	70	80					
	IPT	.0004	.0006	.0013	.0016	.0022	.0025	.0023	.0026	.0030	.0033	.0035 / .0025					
	RPM	1200	900	800	630	450	400	350	310	220	200	150					
	IPM	2	2	4	4	4	4	4	4	4	4	3					
8-9	SFM	50	45	45	50	45	45	50	45	45	45	60					
	IPT	.0003	.0004	.0011	.0013	.0018	.0020	.0027	.0033	.0036	.0042	.0045 / .0034					
	RPM	800	560	450	400	280	250	220	180	140	120	110					
	IPM	1	1	2	2	2	2	3	3	3	3	3					
10	SFM	85	90	90	105	90	90	105	105	90	90	100					
	IPT	.0004	.0005	.0011	.0013	.0018	.0020	.0022	.0025	.0030	.0033	.0035 / .0026					
	RPM	1300	1100	900	800	560	500	450	400	280	250	190					
	IPM	2	2	4	4	4	4	5	5	5	5	4					
11.1	SFM	50	45	45	50	45	45	50	45	45	45	60					
	IPT	.0003	.0004	.0011	.0013	.0018	.0020	.0027	.0033	.0036	.0042	.0045 / .0034					
	RPM	800	560	450	400	280	250	220	180	140	120	110					
	IPM	1	1	2	2	2	2	3	3	3	3	3					
N	21-22	Aluminum-wrought alloy	0.5D	1.5D	SFM	295	255	245	260	260	250	250	260	260	250	260	
					IPT	.0003	.0006	.0011	.0016	.0022	.0027	.0027	.0028	.0033	.0036	.0037 / .0028	
					RPM	4500	3100	2500	2000	1600	1400	1100	1000	800	700	500	
					IPM	6	7	11	13	14	15	15	14	16	15	11	
23-25	Aluminum-cast, alloyed	0.5D	1.5D	SFM	295	255	245	260	260	250	250	260	260	250	260		
				IPT	.0003	.0006	.0011	.0016	.0022	.0027	.0027	.0028	.0033	.0036	.0037 / .0028		
				RPM	4500	3100	2500	2000	1600	1400	1100	1000	800	700	500		
				IPM	6	7	11	13	14	15	15	14	16	15	11		



※ The Feed, in long & extra long types, should be reduced by around 50%.

**E2191, E2226, E2192 SERIES 3 FLUTE ROUGHING FOR ALUMINIUM - SIDE CUTTING**

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø)										
						1/4	5/16	3/8	1/2	5/8	3/4	7/8	1	1 1/4	1 1/2	
P	1	Non-alloy steel	0.5D	1.5D	SFM	120	115	110	120	115	115	115	120	115	110	
					IPT	.0006	.0010	.0018	.0026	.0033	.0037	.0060	.0067	.0076	.0086	
					RPM	1800	1400	1100	900	700	630	500	450	350	310	
	2		SFM	105	90	90	105	90	105	90	105	90	90			
			IPT	.0004	.0009	.0019	.0025	.0036	.0040	.0052	.0058	.0071	.0080			
			RPM	1600	1100	900	800	560	500	450	400	280	250			
	3-4		SFM	80	75	80	80	75	70	80	80	70	70			
			IPT	.0006	.0011	.0017	.0021	.0030	.0033	.0057	.0065	.0076	.0083			
			RPM	1200	900	800	630	450	400	350	310	220	200			
	5		SFM	50	45	45	50	45	45	50	45	45	45			
			IPT	.0004	.0006	.0015	.0017	.0024	.0027	.0045	.0056	.0071	.0083			
RPM		800	560	450	400	280	250	220	180	140	120					
6	SFM	105	90	90	105	90	90	105	105	90	90					
	IPT	.0004	.0009	.0019	.0025	.0036	.0040	.0052	.0058	.0071	.0080					
	RPM	1600	1100	900	800	560	500	450	400	280	250					
7	SFM	80	75	80	80	75	70	80	80	70	70					
	IPT	.0006	.0011	.0017	.0021	.0030	.0033	.0057	.0065	.0076	.0083					
	RPM	1200	900	800	630	450	400	350	310	220	200					
8-9	SFM	50	45	45	50	45	45	50	45	45	45					
	IPT	.0004	.0006	.0015	.0017	.0024	.0027	.0045	.0056	.0071	.0083					
	RPM	800	560	450	400	280	250	220	180	140	120					
10	SFM	105	90	90	105	90	90	105	105	90	90					
	IPT	.0004	.0009	.0019	.0025	.0036	.0040	.0052	.0058	.0071	.0080					
	RPM	1600	1100	900	800	560	500	450	400	280	250					
11.1	SFM	50	45	45	50	45	45	50	45	45	45					
	IPT	.0004	.0006	.0015	.0017	.0024	.0027	.0045	.0056	.0071	.0083					
	RPM	800	560	450	400	280	250	220	180	140	120					
21-22	SFM	295	255	245	260	260	250	250	260	260	250					
	IPT	.0004	.0008	.0015	.0022	.0029	.0036	.0045	.0047	.0067	.0071					
	RPM	4500	3100	2500	2000	1600	1400	1100	1000	800	700					
23-25	SFM	295	255	245	260	260	250	250	260	260	250					
	IPT	.0004	.0008	.0015	.0022	.0029	.0036	.0045	.0047	.0067	.0071					
	RPM	4500	3100	2500	2000	1600	1400	1100	1000	800	700					



※ The Feed, in long & extra long types, should be reduced by around 50%.

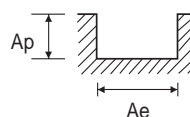
**E2237, E1237 SERIES 4 FLUTE CORNER ROUNDING**

ISO	VDI 3323	Material Description	Parameter	Diameter (Ø)													
				7/16	1/2	5/8	3/4	7/8	1	1 1/8	1 1/4	1 3/8	1 1/2	1 5/8	1 15/16	1 7/8	
P	1	Non-alloy steel	SFM	65	65	65	65	65	65	65	65	65	65	65	65		
			IPT	.0008	.0008	.0011	.0012	.0014	.0016	.0017	.0019	.0019	.0021	.0022	.0023	.0023	
			RPM	580	500	400	340	290	250	220	200	180	170	160	130	130	
	2		SFM	50	50	50	50	50	50	50	50	50	50	50	50	50	
			IPT	.0008	.0008	.0011	.0012	.0014	.0016	.0016	.0018	.0018	.0021	.0021	.0023	.0023	
			RPM	430	370	300	250	210	190	170	150	140	120	120	100	100	
	3-4		SFM	35	35	35	35	35	35	35	35	35	35	35	35	35	
			IPT	.0009	.0010	.0013	.0015	.0018	.0019	.0023	.0025	.0028	.0031	.0031	.0035	.0036	
			RPM	290	250	200	170	140	130	110	100	90	80	80	70	70	
	5		SFM	50	45	45	50	45	45	50	45	45	50	45	45	45	
			IPT	.0004	.0006	.0015	.0017	.0024	.0027	.0045	.0056	.0071	.0083	.0083	.0083	.0083	
RPM		800	560	450	400	280	250	220	180	140	120	120	100	100			
6	SFM	50	50	50	50	50	50	50	50	50	50	50	50	50			
	IPT	.0008	.0008	.0011	.0012	.0014	.0016	.0016	.0018	.0018	.0021	.0021	.0023	.0023			
	RPM	430	370	300	250	210	190	170	150	140	120	120	100	100			
7	SFM	35	35	35	35	35	35	35	35	35	35	35	35	35			
	IPT	.0009	.0010	.0013	.0015	.0018	.0019	.0023	.0025	.0028	.0031	.0031	.0035	.0036			
	RPM	290	250	200	170	140	130	110	100	90	80	80	70	70			
8-9	SFM	50	45	45	50	45	45	50	45	45	50	45	45	45			
	IPT	.0004	.0006	.0015	.0017	.0024	.0027	.0045	.0056	.0071	.0083	.0083	.0083	.0083			
	RPM	800	560	450	400	280	250	220	180	140	120	120	100	100			
10	SFM	50	50	50	50	50	50	50	50	50	50	50	50	50			
	IPT	.0008	.0008	.0011	.0012	.0014	.0016	.0016	.0018	.0018	.0021	.0021	.0023	.0023			
	RPM	430	370	300	250	210	190	170	150	140	120	120	100	100			
11.1	SFM	50	45	45	50	45	45	50	45	45	50	45	45	45			
	IPT	.0004	.0006	.0015	.0017	.0024	.0027	.0045	.0056	.0071	.0083	.0083	.0083	.0083			
	RPM	800	560	450	400	280	250	220	180	140	120	120	100	100			
21-22	SFM	295	295	295	295	295	295	295	295	295	295	295	295	295			
	IPT	.0009	.0009	.0013	.0013	.0016	.0015	.0018	.0019	.0021	.0023	.0022	.0022	.0025			
	RPM	2580	2250	1800	1500	1290	1130	1000	900	820	750	690	580	600			
23-25	SFM	295	295	295	295	295	295	295	295	295	295	295	295	295			
	IPT	.0009	.0009	.0013	.0013	.0016	.0015	.0018	.0019	.0021	.0023	.0022	.0022	.0025			
	RPM	2580	2250	1800	1500	1290	1130	1000	900	820	750	690	580	600			

※ The Feed, in long & extra long types, should be reduced by around 50%.

**E2482, E1482** SERIES **2 FLUTE - SLOTTING**

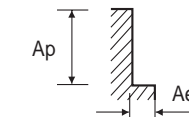
Table with columns for ISO, VDI 3323, Material Description, Ae, Ap, Parameter, and Diameter (Ø) from 2 to 40. Rows are categorized by ISO P (Non-alloy steel, Low alloy steel, High alloyed steel, and tool steel) and ISO N (Aluminum-wrought alloy, Aluminum-cast, alloyed).



※ The Feed, in long & extra long types, should be reduced by around 50%.

**E2483, E1483** SERIES **4 FLUTE - SIDE CUTTING**

Table with columns for ISO, VDI 3323, Material Description, Ae, Ap, Parameter, and Diameter (Ø) from 2 to 40. Rows are categorized by ISO P (Non-alloy steel, Low alloy steel, High alloyed steel, and tool steel) and ISO N (Aluminum-wrought alloy, Aluminum-cast, alloyed).



※ The Feed, in long & extra long types, should be reduced by around 50%.





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MILLING



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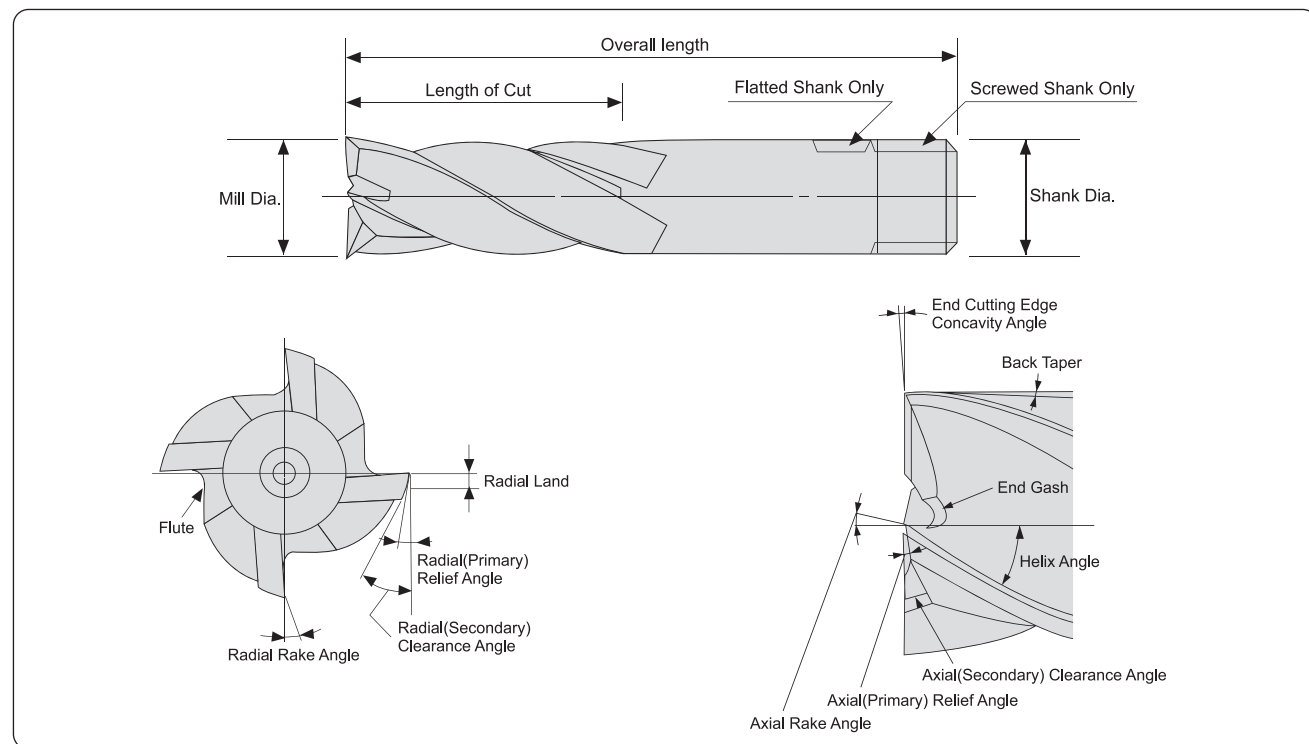


END MILLS

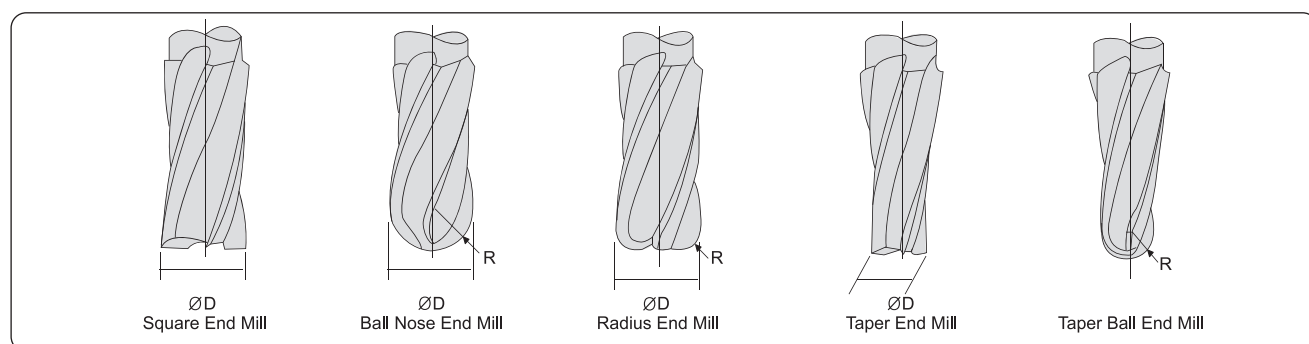
# TECHNICAL DATA



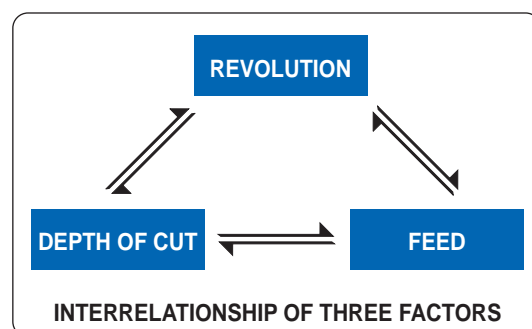
**Names of End Mill Parts**



**Type of End Mill**



Speed, feed and depth of cut are the most important factors to consider for best results in milling. Improper feeds and speeds often cause low production, poor work quality and unnecessary damage to the cutter. This section covers the basic principles of speed and feed selection for milling cutters and end mills. It will serve as a guide in setting-up new milling jobs.



**Speeds**

In milling, Speed is measured in peripheral feet per minute.(revolution per minute × cutter circumference in feet) This is frequently referred to as “peripheral speed” “cutting speed” or “surface speed”.

$$\text{Revolutions per Minute } N = \frac{1000V}{\pi \times D}$$

V : Cutting Speed(m/min)  
D : Diameter of Tool(mm)  
N : Revolution per minute(rev/min)  
π : 3.1416

They will have to be tempered to suit the conditons ON THE JOB. For example:

Use Lower Speed Ranges for	Use Higher Speed Ranges for
<ul style="list-style-type: none"> <li>Hard materials</li> <li>Tough materials</li> <li>Abrasive materials</li> <li>Heavy cuts</li> <li>Minimum tool wear</li> <li>Maximum cutter life</li> </ul>	<ul style="list-style-type: none"> <li>Softer materials</li> <li>Better finishes</li> <li>Smaller diameter cutters</li> <li>Light cuts</li> <li>Frail work pieces or set-ups</li> <li>Hand feed operations</li> <li>Maximum production rates</li> <li>Non-metallics</li> </ul>



**Feeds**

Feed is usually measured in millimeters per minute. It is the product of feed per tooth times revolution per minute times the number of teeth in the cutter. Due to variations in cutter sizes, numbers of teeth and revolutions per minute, all feed rates should be calculated from feed per tooth. Feed per tooth is the basis of all feed rates per minute, whether the cutters are large or small, fine or coarse tooth, and are run at high or low peripheral speed. Because feed per tooth affects chip thickness. It is a very important factor in cutter life.

Highest possible feed per tooth will usually give longer cutter life between grinds and greater production per grind. Excessive feeds may over load the cutter teeth and cause breakage or chipping of the cutting edges. The following factors should be kept in mind when using the recommended starting feed per tooth.

Feed in millimeters per Minute  
F.M = F.R.×R.P.M

F.R. : Feed per Revolutions in millimeters  
R.P.M .: Revolutions per Minutes

The following factors should be kept in mind when using the recommended stating feed per tooth.

Use Higher Feeds For	Use Lower Feeds For
<ul style="list-style-type: none"> <li>Heavy, roughing cuts</li> <li>Rigid set-ups</li> <li>Easy-to-machine work materials</li> <li>Rugged cutters</li> <li>Slab milling cuts</li> <li>Low tensile strength materials</li> <li>Coarse tooth cutters</li> <li>Abrasive materials</li> </ul>	<ul style="list-style-type: none"> <li>Light, and finishing cuts</li> <li>Frail set-ups</li> <li>Hard to machine work materials</li> <li>Frail and small cutters</li> <li>Deep slots</li> <li>High tensile strength materials</li> <li>Fine tooth cutters</li> </ul>





**SPEED AND FEED CALCULATIONS FOR MILLING CUTTERS AND OTHER ROTATING TOOLS**

TO FIND	HAVING	FORMULA
Surface(or Periphery) Speed in meter Per Minute=S.P.M.	Diameter of Tool in millimeters =D Revolutions per Minute =R.P.M.	$V = \frac{D \times 3.1416 \times R.P.M.}{1000}$
Revolutions Per Minute=R.P.M.	Surface Speed in meter per Minute =S.P.M Diameter of Tool in millimeters =D	$R.P.M. = \frac{V \times 1000}{D \times 3.1416}$
Feed per Revolution in millimeters-F.R.	Feed in millimeters per Minute =F.M. Revolution per Minute =R.P.M.	$F.R. = \frac{F.M.}{R.P.M.}$
Feed in millimeters Per Minute-F.M.	Feed per Revolution in millimeters =F.R. Revolution per Minute =R.P.M.	$F.M. = F.R. \times R.P.M.$
Number of Cutting Teeth per Minute=T.M.	Number of Teeth in Tool =T Revolution per Minute =R.P.M.	$T.M. = T \times R.P.M.$
Feed per tooth=F.T.	Number of Teeth in Tool =T Feed per Revolution in millimeters =R.P.M.	$F.T. = \frac{F.R.}{T}$
Feed per Tooth=F.T.	Number of Teeth in Tool =T Feed in millimeters per Minute =F.M. Speed in Revolution per Minute =R.P.M.	$F.T. = \frac{F.M.}{T \times R.P.M.}$

**5 Case of Resharpener**

When the product finish become worse, the cutting edge must get dulled, chips become smaller and the cutting sound gets louder. In such cases, an end mill must be resharpened. The following are the damages of end mills when the resharpening is required.

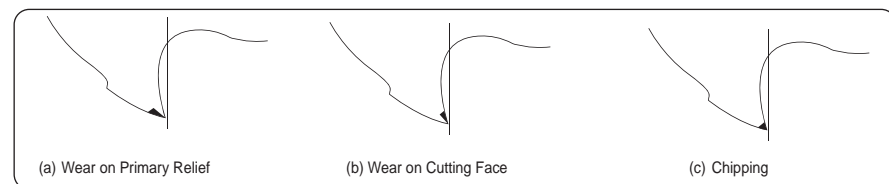


Fig. 1. Damages of Cutting Edge

**6 Sharpen at Predetermined Wear Land**

Cutters should be sharpened as soon as the wear land(Fig. 2.) reaches a predetermined width. This width should permit sharpening without excessive loss of tool life. It may vary from a few hundredths to some tenth of a millimeter, depending on the type of cutter and the finish required on the product. This method is used on production runs where uneven amounts of stock is removed or where the material varies in machinability. It is also used on small quantity product lots.

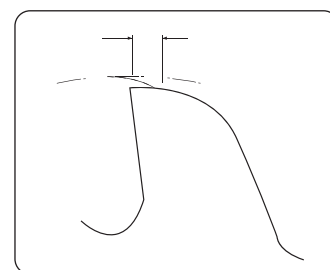


Fig. 2. Wear Land

**7 Resharpener Peripheral Cutting Edge**

**1 RESHARPENING PERIPHERAL CUTTING EDGE**

The geometry of relief angle in an end mill consists of three methods as shown in Fig.3 concave, flat, and eccentric. Recently, most end mills have the eccentric relief(eccentric sharpening). In this method, since the relief is formed an eccentric arc surface in cylindrical grinding method, the roughness of the finished surface of the relief improves and the strength of cutting edge increase at the same time.(Fig.4) As a result, the tool life is improved.

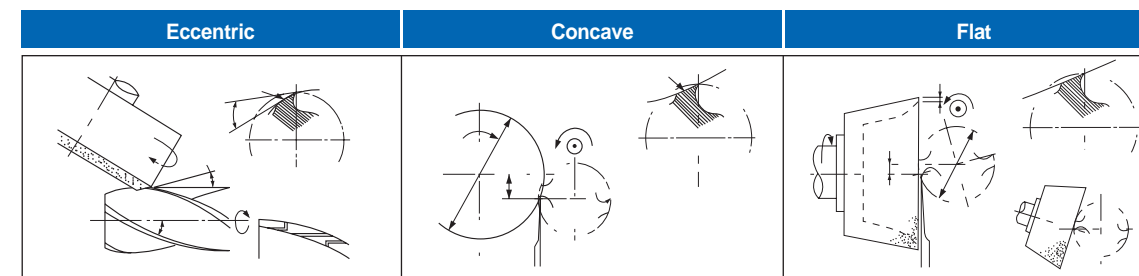


Fig. 3. Three Types of Primary Relief

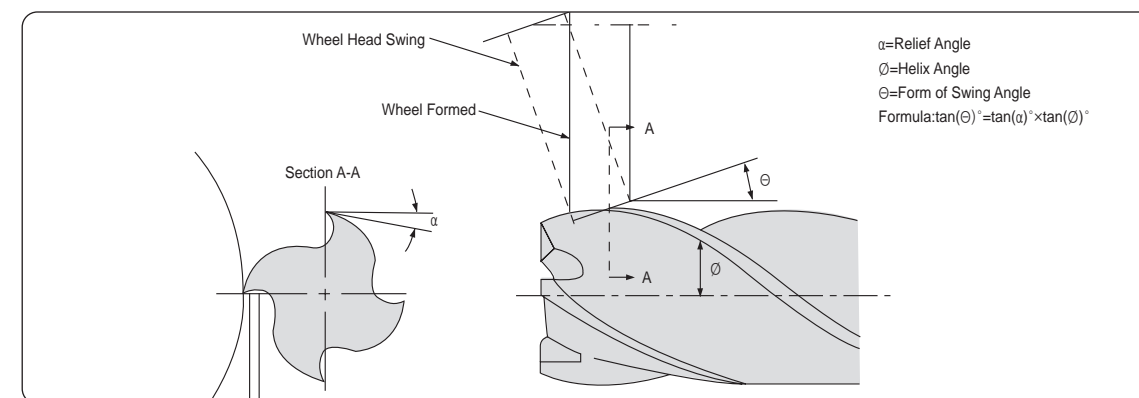


Fig. 4. Tooting of Eccentric Relief Angle

**2 ANGLE OF WHEEL INCLINATION**

Eccentric relief is produced with a plain wheel positioned with its axis parallel or at a slight angle with the cutter axis. The degree of relief is varied by changing the angle of wheel inclination.

Table 1. RECOMMENDED RELIEF ON END MILLS

Mill Diameter (inches)	Eccentric relief indicator drop for relief Angles shown		Checking Distance	Wheel Angles(Deg.)θ			Radial Relief Angles(α1)	Clearance Angles(α2)
	Min	Max.		15° Helix	30° Helix	60° Helix		
-			-	*Angle	*Angle	*Angle	*Angle	*Angle
1/8	.0040	.0052	.015	4°42'	10°02'	27°58'	17°03'	25°
1/4	.0035	.0050	.020	3°15'	6°59'	20°12'	12°00'	25°
1/2	.0040	.0053	.025	2°51'	6°07'	17°51'	10°32'	25°
1	.0038	.0055	1/32	2°16'	4°54'	14°27'	8°27'	25°
1-1/2	.0033	.0050	1/32	2°02'	4°22'	12°57'	7°33'	25°
2	.0033	.0050	1/32	2°02'	4°22'	12°57'	7°33'	25°

The actual at the radial relief angle is normally kept within the range shown but may be varied to suit the cutter material, the work material and the operating conditions.

\* Angle is calculated from the basic mean at the radical angle.

### 8 Resharpener End Teeth

The three necessary operations and one option feature, along with setup suggestions are shown in Fig.5 A to D in each drawing, the shaded area indicates the surface being ground.

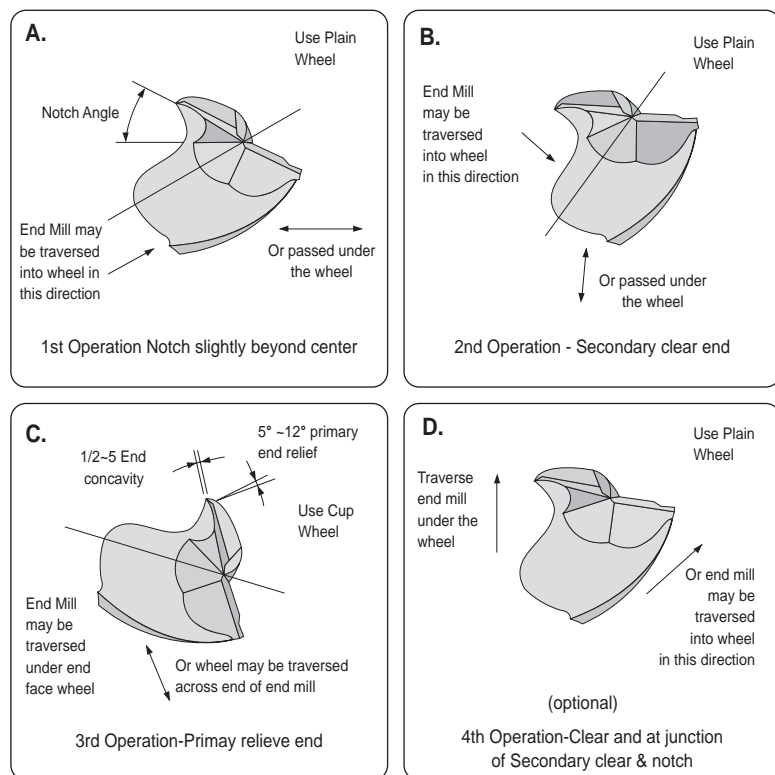


Fig 5. PROCEDURE FOR SHARPENING END OF 2 FLUTE SQUARE END MILLS

### 9 Inspection

The inspection is calculated by using the formula shown in Table 1.

#### Procedure To Check Radial Relief Angles With Indicators.

1. Mount the cutter to rotate freely with no end movement.
2. Adjust the sharp pointed indicator to bear at the very tip of the cutting edge, pointing in a radial line, shown in Figure 6
3. Roll the cutter the tabulated amount gives under "checking distance" using the second indicator as control.
4. Consult chart for amount of drop for the particular diameter and relief angle.

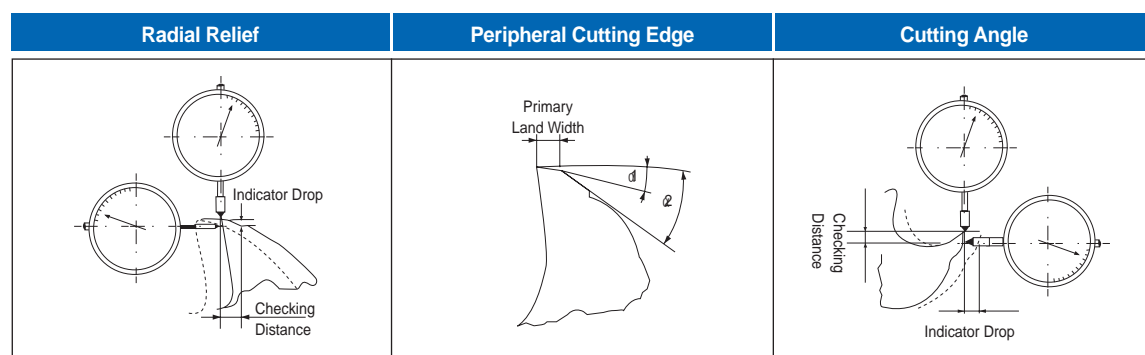
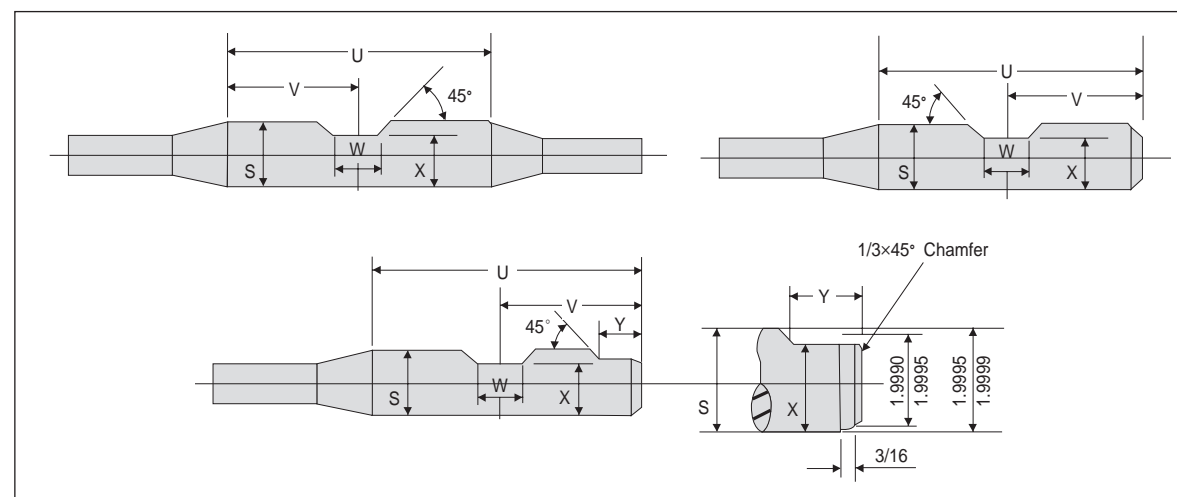


Fig. 6. Indicator Set-Up for Checking

### 10 Standard Weldon Shanks



### 11 Dimensions

All dimensions are given in inches.

Diameter of Shank S	Length of Shank U	V	W		X	Y
			Min.	Max.		
3/8	1-9/16	25/32	0.280	0.282	0.325	-
1/2	1-25/32	57/64	0.330	0.332	0.440	-
5/8	1-29/32	61/64	0.400	0.402	0.560	-
3/4	2-1/32	1-1/64	0.455	0.457	0.675	-
7/8	2-1/32	1-1/64	0.455	0.457	0.810	1/2
1	2-9/32	1-9/64	0.515	0.517	0.925	1/2
1-1/4	2-9/32	1-9/64	0.515	0.517	1.156	1/2
1-1/2	2-11/16	1-3/16	0.515	0.517	1.406	9/16
2	3-1/4	1-27/32	0.700	0.702	1.900	27/32
2-1/2	3-1/2	1-15/16	0.700	0.702	2.400	27/32

### 12 Tolerances

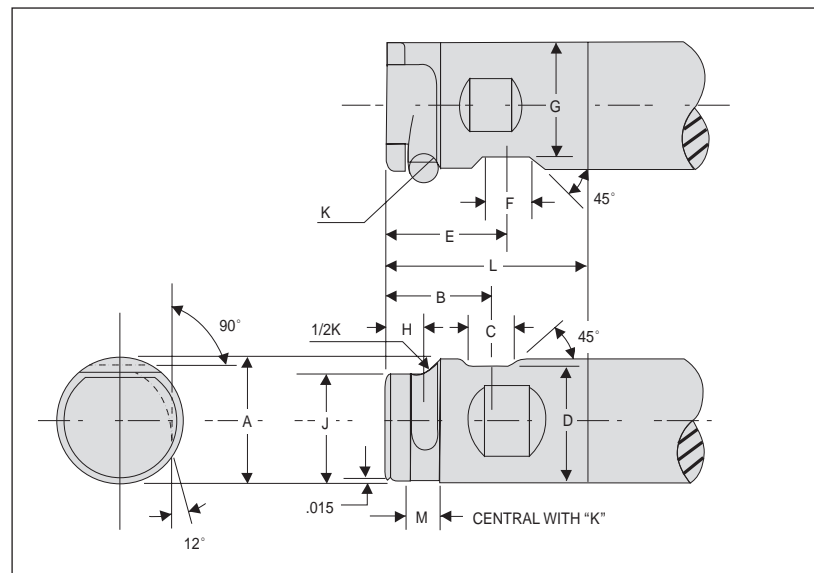
Element	Range	Direction	Tolerance
Diameter of Shank, S	All Sizes	minus	.0001 to .0005
Length of Shank, U	All Sizes	plus or minus	1/32
Dimension, V	All Sizes	plus or minus	1/64
Dimension, X	All Sizes	minus	1/64
Dimension, Y	7/8 to 2-1/2 inc.	plus or minus	1/32

Extracted from Milling Cutters and End Mills. MCTI 1989.



**Combination Shanks for End Mills**

Right hand End Mill shank shown. For left hand End Mills flat "F" and pin groove "K" should be located 180° from that shown, maintaining 12° relationship of flat "F" and groove "K"



**Dimensions**

All dimensions are given in inches.

Diameter of Shank A	Length of Shank L	B	C	D	E	F	G	H	J	K	M
1-1/2	2-11/16	1-3/16	0.515	1.406	1-1/2	0.515	1.371	9/16	1.302	0.377	7/16
2	3-1/4	1-23/32	0.700	1.900	1-3/4	0.700	1.809	5/8	1.772	0.440	1/2
2-1/2	3-1/2	1-15/16	0.700	2.400	2	0.700	2.312	3/4	2.245	0.503	9/16



**Tolerances**

Element	Direction	Tolerance
Diameter of Shank, A	minus	.0001 to .0005
Length of Shank, L	plus or minus	1/32
Dimension, B	plus or minus	1/64
Dimension, C	plus	.002
Dimension, D	minus	1/64
Dimension, E	plus or minus	1/64
Dimension, F	plus or minus	.005
Dimension, G	minus	1/64
Dimension, H	plus	1/64
Dimension, J	plus or minus	.002
Dimension, K	plus	.003

Extracted from Milling Cutters and End Mills. MCTI 1989.



**Troubleshooting in Endmilling**

Trouble	Occurrences of trouble	Countermeasures
Breaking of tool	<ul style="list-style-type: none"> <li>At time of engaging with work material</li> <li>When ending cut</li> </ul>	<ol style="list-style-type: none"> <li>Decrease feed rate.</li> <li>Decrease projection amount</li> <li>Shorten cutting edge length to required minimum limit</li> </ol>
	<ul style="list-style-type: none"> <li>During normal cutting</li> </ul>	<ol style="list-style-type: none"> <li>Decrease feed rate</li> <li>Control wear → replace tool early</li> <li>Replace chuck or collet</li> <li>Decrease projection amount</li> <li>Carry out honing</li> <li>If 4 flute, reduce to 2 flute(clogging of chipping)</li> <li>If dry cutting change to wet cutting utilize cutting fluid. In case of wet cutting flow oil supplied from the front, change to from rear angle of side top. Use ample with rate.</li> </ol>
	<ul style="list-style-type: none"> <li>When changing direction of feed</li> </ul>	<ol style="list-style-type: none"> <li>Utilize circular interpolation(in case of NC machine) or temporarily stop feed(Dowelling)</li> <li>Reduce feed rate before and after change of directions</li> <li>Replace chuck or collect</li> </ol>
Fracture of cutting edge	<ul style="list-style-type: none"> <li>Fracture of corners</li> </ul>	<ol style="list-style-type: none"> <li>Carry out chamfering or nose with hand lapper.</li> <li>Down cut → Up cut</li> </ol>
	<ul style="list-style-type: none"> <li>Fracture at boundary of depth of cut</li> </ul>	<ol style="list-style-type: none"> <li>Down cut → Up cut</li> <li>Reduce cutting speed</li> </ol>
	<ul style="list-style-type: none"> <li>Chipping at center part or overall</li> </ul>	<ol style="list-style-type: none"> <li>Carry out honing. Or enlarge.</li> <li>Change number of rotation(in case machine vibrates)</li> <li>Increase cutting speed</li> <li>In ease of squeaking noise during cutting, increase feed.</li> <li>If dry cutting use cutting fluid or blow air.</li> <li>Replace chuck or collet</li> <li>Reduce cutting speed</li> </ol>
	<ul style="list-style-type: none"> <li>Large fracturing of cutting edge</li> </ul>	<ol style="list-style-type: none"> <li>Decrease feed rate</li> <li>If 4 flute reduce to 2 flute</li> <li>Carry out honing. Or enlarge</li> <li>Replace chuck or collet</li> <li>Reduce cutting speed</li> <li>If dry cutting, change to wet cutting. In case oil supply in wet cutting is from the front, change to rear at an angle or from side top. Use ample supply.</li> </ol>
Rapid tool wear		<ol style="list-style-type: none"> <li>Reduce cutting speed</li> <li>Up cut → Down cut</li> <li>Increase feed</li> <li>Utilize wet cutting or air</li> <li>If reground tool, improve surface roughness of flank.</li> </ol>





Trouble	Occurrences of trouble	Countermeasures
Inferior finished surface	• Surface is good but rough	<ol style="list-style-type: none"> <li>1. Decrease feed</li> <li>2. In case using 2 flute, increase to 4 flute</li> </ol>
	• Small chip welding	<ol style="list-style-type: none"> <li>1. Increase cutting speed</li> <li>2. Utilize wet cutting air blow(ample supply)</li> <li>3. Carry out fine honing</li> <li>4. Up cut → Down cut</li> <li>5. Increase feed or enlarge finish allowance</li> </ol>
	• With transverse streaks	<ol style="list-style-type: none"> <li>1. Carry out fine honing</li> <li>2. Use water insoluble cutting fluid</li> <li>3. Down cut → Up cut</li> </ol>
	• Signs of excessive cutting	<ol style="list-style-type: none"> <li>1. Reduce finishing depth of cut</li> <li>2. Increase cutting speed</li> <li>3. Reduce feed</li> </ol>
Poor machining accuracy	• Finish dimensions are on minus side	<ol style="list-style-type: none"> <li>1. Up cut → Down cut</li> <li>2. Reduce finishing depth of cut</li> <li>3. Replace chuck or collet</li> <li>4. Reduce projection amount</li> <li>5. Increase cutting speed</li> </ol>
	• Poor perpendicularity	<ol style="list-style-type: none"> <li>1. Reduce finishing depth of cut</li> <li>2. Replace chuck or collet</li> <li>3. Reduce projection amount</li> <li>4. Increase cutting speed</li> <li>5. 2Flute → 4 Flute</li> <li>6. Reduce feed</li> <li>7. Check wear rate → Replace tool</li> </ol>
Chattering		<ol style="list-style-type: none"> <li>1. Increase feed rate(in case over 0.05 mm/Zahn, try reducing)</li> <li>2. Change cutting speed</li> <li>3. Replace chuck or collet</li> <li>4. Reduce projection amount</li> <li>5. Use 2 flute cutter for rough cutting and 4 flute for finishing</li> <li>6. Down cut → Up cut</li> </ol>

