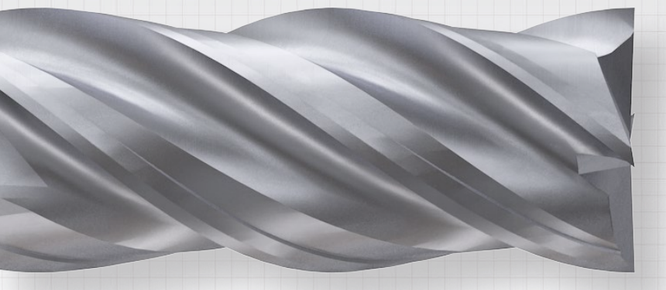
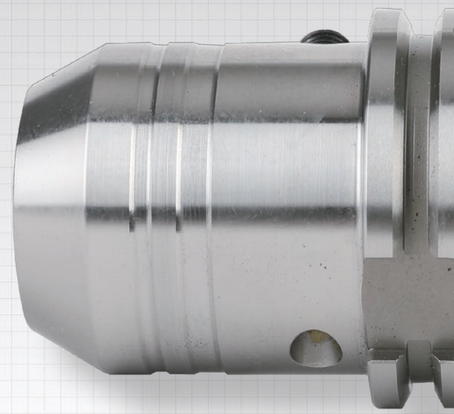
ISO 9001 / ISO 14001

JAS-ANZ



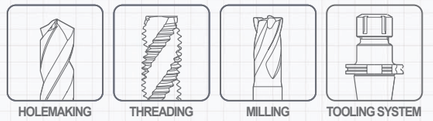






YG CUTTING TOOLS





YG-1 CO., LTD.

HEAD OFFICE

13-40, Songdogwahak-ro 16beon-gil, Yeonsu-gu, Incheon 21984, South Korea

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Note The information is provided for reference only. Tool specifications are subject to change without prior notice.
Although we endeavor to supply accurate and timely information, there can be no guarantee to cover every particular application.
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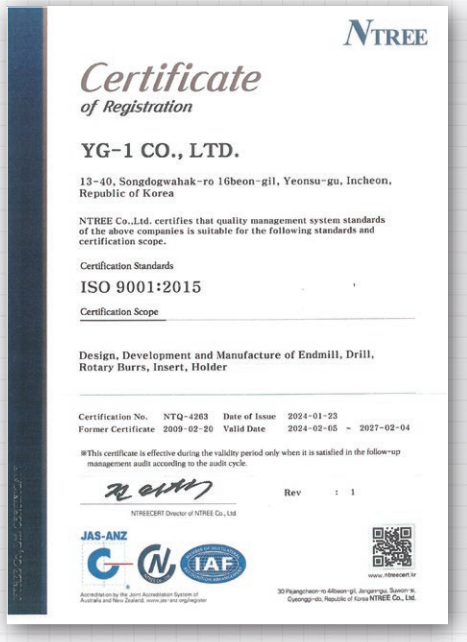
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CUTTING TOOLS ON HAND



NTREE

Certificate
of Registration

YG-1 CO., LTD.

13-40, Songdogwahak-ro 16beon-gil, Yeonsu-gu, Incheon, Republic of Korea

NTREE Co.,Ltd. certifies that quality management system standards of the above companies is suitable for the following standards and certification scope.

Certification Standards

ISO 9001:2015

Certification Scope

Design, Development and Manufacture of Endmill, Drill, Rotary Burrs, Insert, Holder

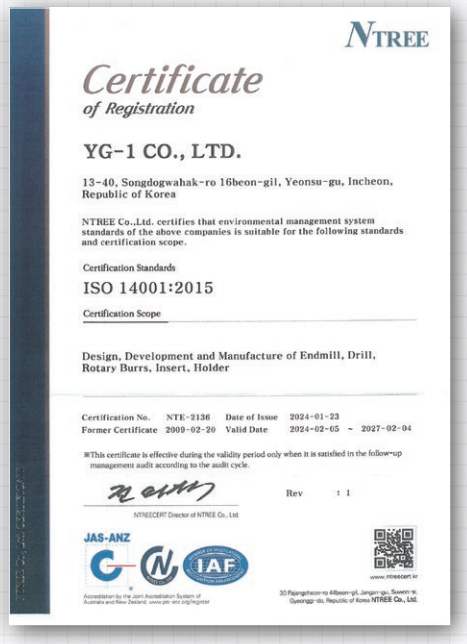
Certification No. NTQ-4263 Date of Issue 2024-01-23
Former Certificate 2009-02-20 Valid Date 2024-02-05 ~ 2027-02-04

※This certificate is effective during the validity period only when it is satisfied in the follow-up management audit according to the audit cycle.

Rev : 1

NTREECERT Director of NTREE Co., Ltd

JAS-ANZ



NTREE

Certificate
of Registration

YG-1 CO., LTD.

13-40, Songdogwahak-ro 16beon-gil, Yeonsu-gu, Incheon, Republic of Korea

NTREE Co.,Ltd. certifies that environmental management system standards of the above companies is suitable for the following standards and certification scope.

Certification Standards

ISO 14001:2015

Certification Scope

Design, Development and Manufacture of Endmill, Drill, Rotary Burrs, Insert, Holder

Certification No. NTE-2136 Date of Issue 2024-01-23
Former Certificate 2009-02-20 Valid Date 2024-02-05 ~ 2027-02-04

※This certificate is effective during the validity period only when it is satisfied in the follow-up management audit according to the audit cycle.

Rev : 1

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YG-1 CO., LTD.

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TOOL SELECTION for MILLING

P M K N S H : Excellent
P M K N S H : Good

SOLID CARBIDE END MILLS

Work Material	Item	OD Size Range	Number of items	Flute	Features	Catalog Page
P H	 **X1-EH**	Ø0.1mm - Ø20.0mm	819 Item	2 Flute	• Highly Accurate **Fine-Finishing** End Mill for **High-Hardened Steel (HRc50-70)** • **Tight Tolearance** / Long Tool Life(Extended Tool Life) / Wide Range Portfolio	C21 - C78
P M K H	 **4G MILL**	Ø0.1mm - Ø25.0mm	2,300 Item	2 - 6 Flute	• For **Pre-Hardened Steels (HRc40-55)** • Full Range Offering / Dry & Wet Cutting	C79 - C256
P M K H	 **X-POWER PRO**	Ø1.0mm - Ø20.0mm	15 Item	4 Flute	• For **Pre-Hardened Steels Up To HRc30-50** • Selected Portfolio (Tailored Selection) / Market-Proven Performance	C257 - C260
P M K S	 **V7 PLUS**	Ø1.0mm - Ø25.0mm	58 Item	4 Flute	• **Heavy Cutting** For Steels, Cast Iron And Stainless Steels, **Optimized for Up To HRc35**	C271 - C280
P M K N S H	 **K-2 PLUS**	Ø1.0mm - Ø20.0mm	203 Item	2 - 6 Flute	• **For General-Purpose** Machining End Mill • Competitive Price	C291 - C310
P M K N S H	 **K-2 PLUS Die & Mold**	Ø0.2mm - Ø20.0mm	55 Item	2 - 4 Flute	• **For Die & Mold Industry End Mill Up To HRc40** • 2 Flute Ball, 4 Flute Corner Radius / Competitive Price	C294 - C296
P M K S	 **TitaNox POWER**	Ø6.0mm - Ø25.0mm	63 Item	4 - 5 Flute	• High Speed Machining for Titanium, Nickel based alloys and Stainless Steel	C257 - C270
N	 **ALU-CUT**	Ø1.0mm - Ø20.0mm	134 Item	3 Flute	• For Aluminum Alloys and other Non-Ferrous Materials	C281 - C290

CARBIDE INSERT END MILLS & HOLDERS

P M K N H	 **i-Xmill**	Ø8.0mm - Ø33.0mm	435 Item	2 Flute	• **Exchangeable End Mill** for General Steels, Pre-Hardened Steels, High Hardened Steels, Stainless Steels and Graphite • For **Die & Mold** Industry	C7 - C20

HSS Co8 END MILLS

P N	 **GENERAL HSS** (HSSCo8)	Ø1.0mm - Ø50.0mm	171 Item	2 - 6 Flute	• For General Purpose	C311 - C326

TOOL SELECTION for HOLEMAKING

P M K N S H : Excellent
P M K N S H : Good

SOLID CARBIDE DRILLS

Work Material	Item	OD Size Range	Number of items	Drilling Depth	Coolant	Features	Catalog Page
P M K H	 **DREAM DRILLS -** GENERAL	Ø1.0mm - Ø20.0mm	359 Item	3xD 5xD 8xD	- With Coolant - Without Coolant	• **Solide Carbide Drill for Carbon Steels, Alloy Steels, and Cast Iron** • Self-Centering / Large Offering(Intermediate sizes)	A5 - A20
P M K	 **DREAM DRILLS -** SOFT	Ø1.0mm - Ø20.0mm	254 Item	Regular Long	- Without Coolant	• For Stainless Steels Lower Torpue / Improved Chip Formation	A21 - A30

HSS-PM & HSS DRILLS

Work Material	Item	OD Size Range	Number of items	Drilling Depth	Tool Material	Features	Catalog Page
P M K N S	 **MULTI-1 DRILLS**	Ø1.0mm - Ø13.0mm	265 Item	Stub Jobber	HSS-PM	• **for Multi-Purpose(Any Material)** • Premium HSS-PM Drill with Excellent Toughness • Maximize self-centering	A31 - A40
P M K N S	 **GOLD-P DRILLS**	Ø1.0mm - Ø13.0mm	120 Item	Regular	HSS	• **TiN-Tip** coated Drill for Enhanced Wear Resistance • Same Performance as Full TiN-coated Drill	A41 - A46
P M K N S	 **SUPER-GP DRILLS**	Ø2.0mm - Ø13.0mm	111 Item	Regular	SUPER HSS	• Super HSS Drill for Steel, Cast Iron, Alloy Steel and Malleable Cast iron • Super HSS Improves Toughness, Wear Resistance, Extends tool Life	A47 - A52
P M K N S	 **STRAIGHT SHANK DRILLS**	Ø1.0mm - Ø13.0mm	480 Item	Regular Long	HSS	• Straight Shank Drill For General Purpose (Soft & Tough Materials)	A53 - A64
P M K N S	 **MORSE TAPER SHANK DRILLS**	Ø13.0mm - Ø60.0mm	69 Item	Regular	HSS	• Morse Taper Shank Drill for Wide Applications	A65 - A70
P M K	 **CENTER DRILLS**	Ø1.0mm - Ø6.0mm	10 Item	-	HSS-E	• For Centering • For General Purpose	A75 - A74
P M K N	 **NC-SPOTTING DRILLS**	Ø2.0mm - Ø20.0mm	12 Item	-	HSSCo8	• For Centering and Chamfering of Holes	A71 - A78

TOOL SELECTION for THREADING

P M K N S H : Excellent

P M K N S H : Good

Work Material P	M	K	N	S	H	Item	Thread Size Range	Thread Form	Tool Material	Features	Catalog Page
P	M	K	N			 COMBO TAPS	M1 - M64	M, MF, UNC, UNF	HSS-E	• **HSS-E Tap for Multi-Purpose** • Prevent Over & Under Feeding	B7-B22
P	M		N			 YG TAP FORMING	M2 - M20	M, MF	HSS-E	• Tapping by Forming Soft Materials	B39 - B42
P	M	K	N			 YG TAP GENERAL	M2 - M36	M	HSS HSS-E	• For General Purpose	B23 - B38

GUIDE LINE TO ICONS

Tool Material

- CARBIDE — Carbide
- HSS PM — YG-1 Premium Powder Metallurgy HSS
- HSS Co8 — 8% Cobalt HSS
- HSS-E — 5% Cobalt HSS
- HSS — High Speed Steel

No. of Flute

2 | 3 | 3&4 | 4-6

Surface Treatment

- C-Coating — YG-1 C-Coating
- RCH-Coating — YG-1 RCH-Coating
- BLUE — YG-1 Blue-Coating
- AlTiN — Aluminum Titanium Nitride Coating
- X-Coating — YG-1 X-Coating
- XC-Coating — YG-1 XC-Coating
- Z-Coating — YG-1 Z-Coating
- Y-Coating — YG-1 Y-Coating
- TiAlN — Titanium Aluminum Nitride Coating
- DLC — Diamond-Like Carbon Coating
- Uncoated — Non-coated
- TiN — Titanium Nitride Coating
- Homo — Steam Tempered (Black Oxide finish)
- Bright — Bright Finish

The Type of Periphery

- NR — Roughing - Coarse
- WR — Roughing - Aluminium
- NF — Roughing & Finishing
- HR — Roughing - Fine

Coolant Supply Pressure

- 45 bar — Internal Coolant Suppy at 45 bar average pressure
- 20 bar — Internal Coolant Suppy at 20 bar average pressure

O.D. Tolerance of Reamer

- H7 — DIN 1420 for H7 Reamed Hole

Chamfer Lead Acc.

- 2.0P/4.0P | 1.5P/5.0P/9.0P — Set of Hand Taps
- 2.5P | 4.0P | 5.0P — Chamfer Lead

Thread Angle

60° | 55°

Class of Thread

YH | GH | ANSI | ANSI G

Working Material

- Material groups GS — Steels with good machinability Rm<850N/mm2
- Material groups GV — Any material with at least 8~10% elongation
- Material groups MU — Multi-Purpose

The Type of Shank

- PLAIN — Plain shank (with DIN Standard)
- FLAT — Flat shank (with DIN Standard)
- 1 ~ 5 — Range of Morse Taper Shank

Helix Angle

- 30° | 30° — End mills
- 30° | N 20~30° — Drills
- R40 | R45 — Taps
- LH7° | LH45° — Reamers

Tolerance of Radius

- R ±0.005 | R ±0.01 — Tolerance of Ball Radius ±0.005, ±0.01 mm
- R ±0.010 | R ±0.015 — Tolerance of Corner Radius ±0.005, ±0.015 mm

Point Angle

120° | 135° | 140° | 180°

Standard of Tools

- YG STD — YG-1 Standard
- DIN 327 | DIN 844 | DIN 1889 — Number of DIN Standard
- JIS | JIS II | JIS III — Number of JIS Standard

Cutting Condition

- Milling
- Drills
- Taps

Tolerance of Dimension

- m7 | h8 — Tolerance of Outside Diameter
- h7 | h8 — Tolerance of Shank Diameter

Comparison Chart Scale for Hardness

Rockwell Hardness C Scale 150kg Brale (HRc)	Diamond Pyramid Hardness Number. Vickers (HV)	Brinell Hardness Standard 10mm Ball 29.42kN (HB)	Rockwell Hardness A Scale 60kg Brale (HRA)	Shore Scleroscope Hardness Number (HS)	Approx. Tensile Strength N/mm^2
68	940	-	85.6	97	-
67	900	-	85.5	95	-
66	865	-	84.5	92	-
65	832	-	83.9	91	-
64	800	-	83.4	88	-
63	772	-	82.8	87	-
62	746	-	82.3	85	-
61	720	-	81.8	83	-
60	697	-	81.2	81	-
59	674	-	80.7	80	-
58	653	-	80.1	78	-
57	633	-	79.6	76	-
56	613	-	79.0	75	-
55	595	-	78.5	74	2079
54	577	-	78.0	72	2010
53	560	-	77.4	71	1952
52	544	500	76.8	69	1883
51	528	487	76.3	68	1824
50	513	475	75.9	67	1755
49	498	464	75.2	66	1687
48	484	451	74.7	64	1639
47	471	442	74.1	63	1578
46	458	432	73.6	62	1530
45	446	421	73.1	60	1481
44	434	409	72.5	58	1432
43	423	400	72.0	57	1383
42	412	390	71.5	56	1334
41	402	381	70.9	55	1294
40	392	371	70.4	54	1245
39	382	362	69.9	52	1216
38	372	353	69.4	51	1177
37	363	344	68.9	50	1157
36	354	336	68.4	49	1118
35	345	327	67.9	48	1079
34	336	319	67.4	47	1059
33	327	311	66.8	46	1030
32	318	301	66.3	44	1000
31	310	294	65.8	43	981
30	302	286	65.3	42	952
29	294	279	64.7	41	932
28	285	271	64.3	41	912
27	279	264	63.8	40	883
26	272	258	63.3	38	863
25	266	253	62.8	38	843
24	260	247	62.4	37	824
23	254	243	62.0	36	804
22	248	237	61.5	35	785
21	243	231	61.0	35	775
20	238	226	60.5	34	755
(18)	230	219	-	33	736
(16)	222	212	-	32	706
(14)	213	203	-	31	677
(12)	204	194	-	29	647
(10)	196	187	-	28	618
(8)	188	179	-	27	598
(6)	180	171	-	26	579
(4)	173	165	-	25	549
(2)	166	158	-	24	530
(0)	160	152	-	24	520

YG CUTTING TOOLS

HOLEMAKING TOOLS

SOLID CARBIDE DREAM DRILLS - GENERAL

SOLID CARBIDE DREAM DRILLS - SOFT

HSS-PM MULTI-1 DRILLS

HSS & HSSCo8 GOLD-P DRILLS

SUPER HSS SUPER-GP DRILLS

HSS & HSSCo8 STRAIGHT SHANK DRILLS

HSS, HSS-E & HSSCo8 MORSE TAPER SHANK DRILLS

HSSCo8 NC-SPOTTING DRILLS

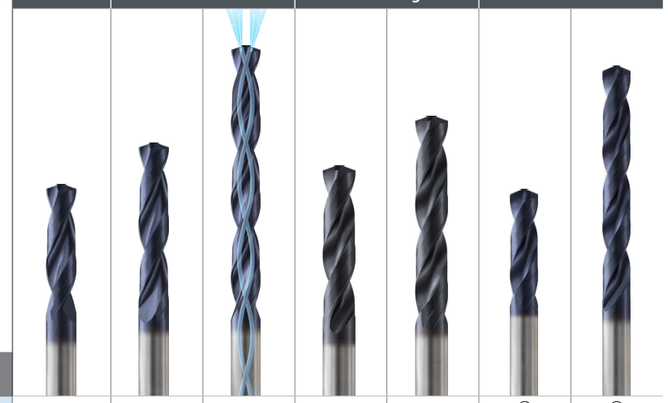
HSS-E CENTER DRILLS

YG-1 CO., LTD.

SELECTION GUIDE

HOLEMAKING TOOLS

	DREAM DRILLS-GENERAL			DREAM DRILLS -SOFT		MULTI-1 DRILLS	
SERIES	DH423	DH424	DH421	DPPA01	DPPA02	CDRA03	CDRA04
DRILLING DEPTH	3XD	5XD	8XD	-	-	HSS-PM	
LENGTH	SHORT	LONG	EXTRA LONG	REGULAR	LONG	STUB	JOBBER
SIZE MIN	D1.0	D1.0	D3.0	D1.0	D1.0	D1.0	D2.0
SIZE MAX	D20.0	D20.0	D14.0	D20.0	D20.0	D13.0	D13.0
PAGE	A8	A11	A14	A23	A26	A33	A37
SURFACE TREATMENT		TiAlN		X-Coating		TiAlN	



Please visit globalyg1.com/mat for material search

◎ : Excellent
○ : Good

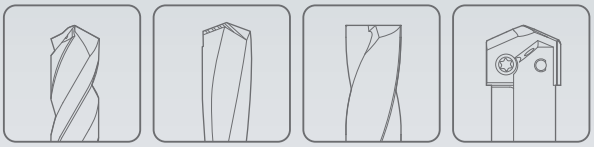
ISO	VDI 3323	Material Description	HB	HRc						
P	1	Non-alloy steel	125						◎	◎
	2		190	13	◎	◎	◎	◎	◎	◎	◎
	3		250	25	◎	◎	◎	○	○	○	○
	4		270	28	◎	◎	◎				
	5		300	32	○	○	○				
	6	Low alloy steel	180	10	◎	◎	◎	◎	◎	◎	◎
	7		275	29	◎	◎	◎	○	○	○	○
	8		300	32	○	○	○				
	9		350	38	○	○	○				
	10	High alloyed steel, 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	Copper and Copper Alloys (Bronze / Brass)	110								
	27		90								
	28		100								
	29	Non Metallic Materials									
	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							

	GOLD-P DRILLS	SUPER-GP DRILLS	STRAIGHT SHANK DRILLS		MORSE TAPER SHANK DRILLS	NC-SPOTTING DRILLS	CENTER DRILLS
	D1GP123	DSH101	D1101	D1102	D1201	D2306	DV301
	JIS	JIS	JIS	-	KS	-	-
	REGULAR	REGULAR	REGULAR	LONG	REGULAR	90°/120°	-
	D1.0	D2.0	D1.0	D2.0	D13.0	D2.0	D1.0
	D13.0	D13.0	D13.0	D13.0	D60.0	D20.0	D6.0
	A43	A49	A55	A57	A67	A73	A77
	TiN	Steam Tempered	Steam Homo		Steam Tempered	Bright	Bright



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Global Cutting Tool Leader **YG-1**



HOLEMAKING

Leading Through Innovation



SOLID CARBIDE

DREAM DRILLS -GENERAL

- For General Purpose (HRc30 to HRc50)

SELECTION GUIDE

HOLEMAKING TOOLS

SOLID CARBIDE
DREAM DRILLS GENERAL

For General Purpose (HRc30 to HRc50)

Please visit globalyg1.com/mat for material search

◎ : Excellent ○ : Good

Recommended cutting conditions : p. A16

SERIES	DH423	DH424	DH421
DRILLING DEPTH	3XD	5XD	8XD
LENGTH	SHORT	LONG	EXTRA LONG
SIZE MIN	D1.0	D1.0	D3.0
SIZE MAX	D20.0	D20.0	D14.0
PAGE	A8	A11	A14
SURFACE TREATMENT	TiAlN	TiAlN	TiAlN







ISO		VDI 3323	Material Description	Composition / Structure / Heat Treatment		HB	HRc	DH423	DH424	DH421	
P		1	Non-alloy steel	About 0.15% C	Annealed	125					1
		2		About 0.45% C	Annealed	190	13	◎	◎	◎	2
		3		About 0.45% C	Quenched & Tempered	250	25	◎	◎	◎	3
		4		About 0.75% C	Annealed	270	28	◎	◎	◎	4
		5		About 0.75% C	Quenched & Tempered	300	32	○	○	○	5
		6	Low alloy steel		Annealed	180	10	◎	◎	◎	6
		7			Quenched & Tempered	275	29	◎	◎	◎	7
		8			Quenched & Tempered	300	32	○	○	○	8
		9			Quenched & Tempered	350	38	○	○	○	9
		10	High alloyed steel, and tool steel		Annealed	200	15	◎	◎	◎	10
		11			Quenched & Tempered	325	35	○	○	○	11
M		12	Stainless steel	Ferritic / Martensitic	Annealed	200	15	○	○	○	12
		13		Martensitic	Quenched & Tempered	240	23	○	○	○	13
		14		Austenitic		180	10				14
K		15	Grey cast iron	Pearlitic / ferritic		180	10	◎	◎	◎	15
		16		Pearlitic (Martensitic)		260	26	○	○	○	16
		17	Nodular cast iron	Ferritic		160	3	◎	◎	◎	17
		18		Pearlitic		250	25	○	○	○	18
		19	Malleable cast iron	Ferritic		130		◎	◎	◎	19
		20		Pearlitic		230	21	○	○	○	20
N		21	Aluminum-wrought alloy	Not Curable		60					21
		22		Curable	Hardened	100					22
		23	Aluminum-cast, alloyed	≤ 12% Si, Not Curable		75					23
		24		≤ 12% Si, Curable	Hardened	90					24
		25		> 12% Si, Not Curable		130					25
		26	Copper and Copper Alloys (Bronze / Brass)	Cutting Alloys, PB>1%		110					26
		27		CuZn, CuSnZn (Brass)		90					27
		28		CuSn, lead-free copper and electrolytic copper		100					28
		29	Non Metallic Materials	Duroplastic, Fiber Reinforced Plastic							29
		30		Rubber, Wood, etc.							30
S		31	Heat Resistant Super Alloys	Fe Based	Annealed	200	15				31
		32			Cured	280	30				32
		33		Ni or Co Based	Annealed	250	25				33
		34			Cured	350	38				34
		35			Cast	320	34				35
		36	Titanium Alloys	Pure Titanium		400 Rm					36
		37		Alpha + Beta Alloys	Hardened	1050 Rm					37
H		38	Hardened steel		Hardened	550	55	○	○		38
		39			Hardened	630	60				39
		40	Chilled Cast Iron		Cast	400	42				40
		41	Hardened Cast Iron		Hardened	550	55				41

CARBIDE
HSS
DREAM DRILLS GENERAL
DREAM DRILLS SOFT
MULTI-1 DRILLS
GOLD-P DRILLS
SUPER-GP DRILLS
STRAIGHT SHANK DRILLS
MORSE TAPER SHANK DRILLS
NC-SPOTTING DRILLS
CENTER DRILLS

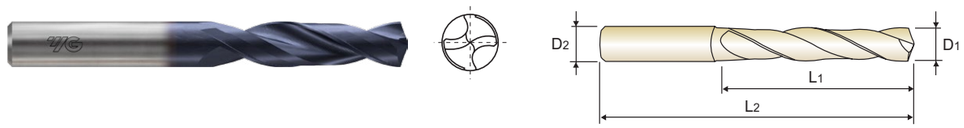
DREAM DRILLS - GENERAL

DH423 SERIES

CARBIDE, DREAM DRILLS GENERAL

SHORT

- ▶ Drilling for Steel, Cast Steel, Cast Iron, Malleable Cast Iron
- ▶ Self centering and chip breaking by R-thinning
- ▶ Wave shape and negative land on the cutting edge for low thrust, stable torque and long tool life
- ▶ Optimized flute shape for strength of drilling and smooth chip evacuation



DIN 6539 | CARBIDE | 30° | h6 | h7 | 140° | TiAlN

p. A16-A17

3 × D

Unit : mm

EDP No.	Drill Diameter	Shank Diameter	Flute Length	Overall Length
TiAlN	D_1	D_2	L_1	L_2
DH423010	1.0	3	7	45
DH423012	1.2	3	7	45
DH423015	1.5	3	14	55
DH423016	1.6	3	14	55
DH423017	1.7	3	14	55
DH423018	1.8	3	14	55
DH423020	2.0	4	20	55
DH423021	2.1	4	20	55
DH423022	2.2	4	20	55
DH423023	2.3	4	20	55
DH423024	2.4	4	20	55
DH423025	2.5	4	20	55
DH423026	2.6	4	20	55
DH423027	2.7	4	20	55
DH423028	2.8	4	20	55
DH423029	2.9	4	20	55
DH423030	3.0	6	20	62
DH423031	3.1	6	20	62
DH423032	3.2	6	20	62
DH423033	3.3	6	20	62
DH423034	3.4	6	20	62
DH423035	3.5	6	20	62
DH423036	3.6	6	20	62
DH423037	3.7	6	20	62

EDP No.	Drill Diameter	Shank Diameter	Flute Length	Overall Length
TiAlN	D_1	D_2	L_1	L_2
DH423038	3.8	6	24	66
DH423039	3.9	6	24	66
DH423040	4.0	6	24	66
DH423041	4.1	6	24	66
DH423042	4.2	6	24	66
DH423043	4.3	6	24	66
DH423044	4.4	6	24	66
DH423045	4.5	6	24	66
DH423046	4.6	6	24	66
DH423047	4.7	6	24	66
DH423048	4.8	6	28	66
DH423049	4.9	6	28	66
DH423050	5.0	6	28	66
DH423051	5.1	6	28	66
DH423052	5.2	6	28	66
DH423053	5.3	6	28	66
DH423054	5.4	6	28	66
DH423055	5.5	6	28	66
DH423056	5.6	6	28	66
DH423057	5.7	6	28	66
DH423058	5.8	6	28	66
DH423059	5.9	6	28	66
DH423060	6.0	6	28	66
DH423061	6.1	8	34	79

▶ Other shank types are available on your request.

▶ 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	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		
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
Recommended																		○			

CARBIDE
HSS
DREAM DRILLS GENERAL
DREAM DRILLS SOFT
MULTI-1 DRILLS
GOLD-P DRILLS
SUPER-GP DRILLS
STRAIGHT SHANK DRILLS
MORSE TAPER SHANK DRILLS
NC-SPOTTING DRILLS
CENTER DRILLS

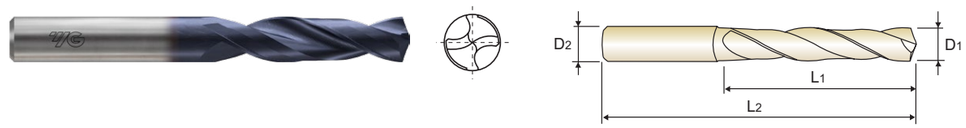
DREAM DRILLS - GENERAL

DH423 SERIES

CARBIDE, DREAM DRILLS GENERAL

SHORT

- ▶ Drilling for Steel, Cast Steel, Cast Iron, Malleable Cast Iron
- ▶ Self centering and chip breaking by R-thinning
- ▶ Wave shape and negative land on the cutting edge for low thrust, stable torque and long tool life
- ▶ Optimized flute shape for strength of drilling and smooth chip evacuation



DIN 6539 | CARBIDE | 30° | h6 | h7 | 140° | TiAlN

p. A16-A17

3 × D

Unit : mm

EDP No.	Drill Diameter	Shank Diameter	Flute Length	Overall Length
TiAlN	D_1	D_2	L_1	L_2
DH423062	6.2	8	34	79
DH423063	6.3	8	34	79
DH423064	6.4	8	34	79
DH423065	6.5	8	34	79
DH423066	6.6	8	34	79
DH423067	6.7	8	34	79
DH423068	6.8	8	34	79
DH423069	6.9	8	34	79
DH423070	7.0	8	34	79
DH423071	7.1	8	41	79
DH423072	7.2	8	41	79
DH423073	7.3	8	41	79
DH423074	7.4	8	41	79
DH423075	7.5	8	41	79
DH423076	7.6	8	41	79
DH423077	7.7	8	41	79
DH423078	7.8	8	41	79
DH423079	7.9	8	41	79
DH423080	8.0	8	41	79
DH423081	8.1	10	47	89
DH423082	8.2	10	47	89
DH423083	8.3	10	47	89
DH423084	8.4	10	47	89
DH423085	8.5	10	47	89

EDP No.	Drill Diameter	Shank Diameter	Flute Length	Overall Length
TiAlN	D_1	D_2	L_1	L_2
DH423086	8.6	10	47	89
DH423087	8.7	10	47	89
DH423088	8.8	10	47	89
DH423089	8.9	10	47	89
DH423090	9.0	10	47	89
DH423091	9.1	10	47	89
DH423092	9.2	10	47	89
DH423093	9.3	10	47	89
DH423094	9.4	10	47	89
DH423095	9.5	10	47	89
DH423096	9.6	10	47	89
DH423097	9.7	10	47	89
DH423098	9.8	10	47	89
DH423099	9.9	10	47	89
DH423100	10.0	10	47	89
DH423101	10.1	12	55	102
DH423102	10.2	12	55	102
DH423103	10.3	12	55	102
DH423104	10.4	12	55	102
DH423105	10.5	12	55	102
DH423106	10.6	12	55	102
DH423107	10.7	12	55	102
DH423108	10.8	12	55	102
DH423109	10.9	12	55	102

▶ Other shank types are available on your request.

▶ 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	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		
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
Recommended																		○			

DREAM DRILLS - GENERAL

DH423 SERIES

CARBIDE, DREAM DRILLS GENERAL — *SHORT*

- ▶ Drilling for Steel, Cast Steel, Cast Iron, Malleable Cast Iron
- ▶ Self centering and chip breaking by R-thinning
- ▶ Wave shape and negative land on the cutting edge for low thrust, stable torque and long tool life
- ▶ Optimized flute shape for strength of drilling and smooth chip evacuation



DIN 6539 | CARBIDE | 30° | h6 | h7 | 140° | TiAlN

p. A16-A17

3 × D

Unit : mm

EDP No.	Drill Diameter	Shank Diameter	Flute Length	Overall Length
TiAlN	D_1	D_2	L_1	L_2
DH423110	11.0	12	55	102
DH423111	11.1	12	55	102
DH423112	11.2	12	55	102
DH423113	11.3	12	55	102
DH423114	11.4	12	55	102
DH423115	11.5	12	55	102
DH423116	11.6	12	55	102
DH423117	11.7	12	55	102
DH423118	11.8	12	55	102
DH423119	11.9	12	55	102
DH423120	12.0	12	55	102
DH423121	12.1	14	60	107
DH423122	12.2	14	60	107
DH423123	12.3	14	60	107
DH423124	12.4	14	60	107
DH423125	12.5	14	60	107
DH423126	12.6	14	60	107
DH423127	12.7	14	60	107
DH423128	12.8	14	60	107
DH423129	12.9	14	60	107
DH423130	13.0	14	60	107
DH423135	13.5	14	60	107
DH423138	13.8	14	60	107
DH423140	14.0	14	60	107

EDP No.	Drill Diameter	Shank Diameter	Flute Length	Overall Length
TiAlN	D_1	D_2	L_1	L_2
DH423145	14.5	16	65	115
DH423148	14.8	16	65	115
DH423150	15.0	16	65	115
DH423155	15.5	16	65	115
DH423158	15.8	16	65	115
DH423160	16.0	16	65	115
DH423165	16.5	18	73	123
DH423168	16.8	18	73	123
DH423170	17.0	18	73	123
DH423175	17.5	18	73	123
DH423178	17.8	18	73	123
DH423180	18.0	18	73	123
DH423185	18.5	20	79	131
DH423190	19.0	20	79	131
DH423195	19.5	20	79	131
DH423198	19.8	20	79	131
DH423200	20.0	20	79	131

▶ Other shank types are available on your request.

◎ : 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
Recommended		◎	◎	◎	○	◎	◎	○	○	◎	○	○	○		◎	○	◎	○	◎	○

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
Recommended																		○			

DREAM DRILLS - GENERAL

DH424 SERIES

CARBIDE, DREAM DRILLS GENERAL — *LONG*

- ▶ Drilling for Steel, Cast Steel, Cast Iron, Malleable Cast Iron
- ▶ Self centering and chip breaking by R-thinning
- ▶ Wave shape and negative land on the cutting edge for low thrust, stable torque and long tool life
- ▶ Optimized flute shape for strength of drilling and smooth chip evacuation



DIN 6539 | CARBIDE | 30° | h6 | h7 | 140° | TiAlN

p. A16-A17

5 × D

Unit : mm

EDP No.	Drill Diameter	Shank Diameter	Flute Length	Overall Length
TiAlN	D_1	D_2	L_1	L_2
DH424010	1.0	3	8	55
DH424011	1.1	3	12	55
DH424012	1.2	3	12	55
DH424013	1.3	3	12	55
DH424014	1.4	3	12	55
DH424015	1.5	3	16	55
DH424016	1.6	3	16	55
DH424017	1.7	3	16	55
DH424018	1.8	3	16	55
DH424019	1.9	3	16	55
DH424020	2.0	4	21	57
DH424021	2.1	4	21	57
DH424022	2.2	4	21	57
DH424023	2.3	4	21	57
DH424024	2.4	4	21	57
DH424025	2.5	4	21	57
DH424026	2.6	4	21	57
DH424027	2.7	4	21	57
DH424028	2.8	4	21	57
DH424029	2.9	4	21	57
DH424030	3.0	6	28	66
DH424031	3.1	6	28	66
DH424032	3.2	6	28	66
DH424033	3.3	6	28	66

EDP No.	Drill Diameter	Shank Diameter	Flute Length	Overall Length
TiAlN	D_1	D_2	L_1	L_2
DH424034	3.4	6	28	66
DH424035	3.5	6	28	66
DH424036	3.6	6	28	66
DH424037	3.7	6	28	66
DH424038	3.8	6	36	74
DH424039	3.9	6	36	74
DH424040	4.0	6	36	74
DH424041	4.1	6	36	74
DH424042	4.2	6	36	74
DH424043	4.3	6	36	74
DH424044	4.4	6	36	74
DH424045	4.5	6	36	74
DH424046	4.6	6	36	74
DH424047	4.7	6	36	74
DH424048	4.8	6	44	82
DH424049	4.9	6	44	82
DH424050	5.0	6	44	82
DH424051	5.1	6	44	82
DH424052	5.2	6	44	82
DH424053	5.3	6	44	82
DH424054	5.4	6	44	82
DH424055	5.5	6	44	82
DH424056	5.6	6	44	82
DH424057	5.7	6	44	82

▶ Other shank types are available on your request.

▶ 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	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		◎	◎	◎	○	◎	◎	○	○	◎	○	○	○		◎	○	◎	○	◎	○

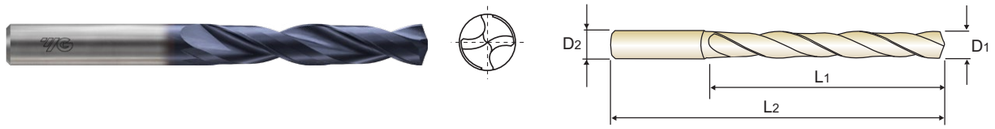
ISO	N										S							H		
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	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
Recommended																		○			

DREAM DRILLS - GENERAL

DH424 SERIES

CARBIDE, DREAM DRILLS GENERAL — *LONG*

- ▶ Drilling for Steel, Cast Steel, Cast Iron, Malleable Cast Iron
- ▶ Self centering and chip breaking by R-thinning
- ▶ Wave shape and negative land on the cutting edge for low thrust, stable torque and long tool life
- ▶ Optimized flute shape for strength of drilling and smooth chip evacuation



DIN 6539 | CARBIDE | 30° | h6 | h7 | 140° | TiAlN

p. A16-A17

5 × D

Unit : mm

EDP No.	Drill Diameter	Shank Diameter	Flute Length	Overall Length
TiAlN	D1	D2	L1	L2
DH424058	5.8	6	44	82
DH424059	5.9	6	44	82
DH424060	6.0	6	44	82
DH424061	6.1	8	53	91
DH424062	6.2	8	53	91
DH424063	6.3	8	53	91
DH424064	6.4	8	53	91
DH424065	6.5	8	53	91
DH424066	6.6	8	53	91
DH424067	6.7	8	53	91
DH424068	6.8	8	53	91
DH424069	6.9	8	53	91
DH424070	7.0	8	53	91
DH424071	7.1	8	53	91
DH424072	7.2	8	53	91
DH424073	7.3	8	53	91
DH424074	7.4	8	53	91
DH424075	7.5	8	53	91
DH424076	7.6	8	53	91
DH424077	7.7	8	53	91
DH424078	7.8	8	53	91
DH424079	7.9	8	53	91
DH424080	8.0	8	53	91
DH424081	8.1	10	61	103

EDP No.	Drill Diameter	Shank Diameter	Flute Length	Overall Length
TiAlN	D1	D2	L1	L2
DH424082	8.2	10	61	103
DH424083	8.3	10	61	103
DH424084	8.4	10	61	103
DH424085	8.5	10	61	103
DH424086	8.6	10	61	103
DH424087	8.7	10	61	103
DH424088	8.8	10	61	103
DH424089	8.9	10	61	103
DH424090	9.0	10	61	103
DH424091	9.1	10	61	103
DH424092	9.2	10	61	103
DH424093	9.3	10	61	103
DH424094	9.4	10	61	103
DH424095	9.5	10	61	103
DH424096	9.6	10	61	103
DH424097	9.7	10	61	103
DH424098	9.8	10	61	103
DH424099	9.9	10	61	103
DH424100	10.0	10	61	103
DH424101	10.1	12	71	118
DH424102	10.2	12	71	118
DH424103	10.3	12	71	118
DH424104	10.4	12	71	118
DH424105	10.5	12	71	118

▶ Other shank types are available on your request.

▶ 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	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		
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
Recommended																		○			

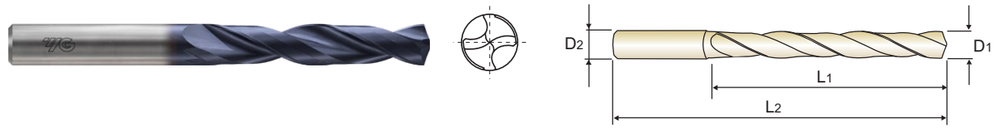
CARBIDE
HSS
DREAM DRILLS GENERAL
DREAM DRILLS SOFT
MULTI-1 DRILLS
GOLD-P DRILLS
SUPER-GP DRILLS
STRAIGHT SHANK DRILLS
MORSE TAPER SHANK DRILLS
NC-SPOTTING DRILLS
CENTER DRILLS

DREAM DRILLS - GENERAL

DH424 SERIES

CARBIDE, DREAM DRILLS GENERAL — *LONG*

- ▶ Drilling for Steel, Cast Steel, Cast Iron, Malleable Cast Iron
- ▶ Self centering and chip breaking by R-thinning
- ▶ Wave shape and negative land on the cutting edge for low thrust, stable torque and long tool life
- ▶ Optimized flute shape for strength of drilling and smooth chip evacuation



DIN 6539 | CARBIDE | 30° | h6 | h7 | 140° | TiAlN

p. A16-A17

5 × D

Unit : mm

EDP No.	Drill Diameter	Shank Diameter	Flute Length	Overall Length
TiAlN	D1	D2	L1	L2
DH424106	10.6	12	71	118
DH424107	10.7	12	71	118
DH424108	10.8	12	71	118
DH424109	10.9	12	71	118
DH424110	11.0	12	71	118
DH424111	11.1	12	71	118
DH424112	11.2	12	71	118
DH424113	11.3	12	71	118
DH424114	11.4	12	71	118
DH424115	11.5	12	71	118
DH424116	11.6	12	71	118
DH424117	11.7	12	71	118
DH424118	11.8	12	71	118
DH424119	11.9	12	71	118
DH424120	12.0	12	71	118
DH424125	12.5	14	77	124

EDP No.	Drill Diameter	Shank Diameter	Flute Length	Overall Length
TiAlN	D1	D2	L1	L2
DH424130	13.0	14	77	124
DH424135	13.5	14	77	124
DH424140	14.0	14	77	124
DH424145	14.5	16	83	133
DH424150	15.0	16	83	133
DH424155	15.5	16	83	133
DH424160	16.0	16	83	133
DH424165	16.5	18	93	143
DH424170	17.0	18	93	143
DH424175	17.5	18	93	143
DH424180	18.0	18	93	143
DH424185	18.5	20	101	153
DH424190	19.0	20	101	153
DH424195	19.5	20	101	153
DH424200	20.0	20	101	153

▶ Other shank types are available on your request.

◎ : 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
Recommended		◎	◎	◎	○	◎	◎	○	○	◎	○	○	○		◎	○	◎	○	◎	○

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
Recommended																		○			

DREAM DRILLS - GENERAL

DH421 SERIES

CARBIDE, DREAM DRILLS GENERAL with COOLANT HOLES *EXTRA LONG*

- ▶ Drilling for Steel, Cast Steel, Cast Iron, Malleable Cast Iron
- ▶ Self centering and chip breaking by R-thinning
- ▶ Wave shape and negative land on the cutting edge for low thrust, stable torque and long tool life
- ▶ Optimized flute shape for strength of drilling and smooth chip evacuation



DIN 6537 | CARBIDE | 30° | h6 | m7 | 140° | 20 bar | TiAlN

p. A18-A19

8 × D

Unit : mm

EDP No.	Drill Diameter	Shank Diameter	Flute Length	Overall Length
TiAlN	D_1	D_2	L_1	L_2
DH421030	3.0	6	34	72
DH421031	3.1	6	34	72
DH421032	3.2	6	34	72
DH421033	3.3	6	34	72
DH421034	3.4	6	34	72
DH421035	3.5	6	34	72
DH421036	3.6	6	34	72
DH421037	3.7	6	34	72
DH421038	3.8	6	43	81
DH421039	3.9	6	43	81
DH421040	4.0	6	43	81
DH421041	4.1	6	43	81
DH421042	4.2	6	43	81
DH421043	4.3	6	43	81
DH421044	4.4	6	43	81
DH421045	4.5	6	43	81
DH421046	4.6	6	43	81
DH421047	4.7	6	43	81
DH421048	4.8	6	57	95
DH421049	4.9	6	57	95
DH421050	5.0	6	57	95
DH421051	5.1	6	57	95
DH421052	5.2	6	57	95
DH421053	5.3	6	57	95

EDP No.	Drill Diameter	Shank Diameter	Flute Length	Overall Length
TiAlN	D_1	D_2	L_1	L_2
DH421054	5.4	6	57	95
DH421055	5.5	6	57	95
DH421056	5.6	6	57	95
DH421057	5.7	6	57	95
DH421058	5.8	6	57	95
DH421059	5.9	6	57	95
DH421060	6.0	6	57	95
DH421061	6.1	8	76	114
DH421062	6.2	8	76	114
DH421063	6.3	8	76	114
DH421064	6.4	8	76	114
DH421065	6.5	8	76	114
DH421066	6.6	8	76	114
DH421067	6.7	8	76	114
DH421068	6.8	8	76	114
DH421069	6.9	8	76	114
DH421070	7.0	8	76	114
DH421071	7.1	8	76	114
DH421072	7.2	8	76	114
DH421073	7.3	8	76	114
DH421074	7.4	8	76	114
DH421075	7.5	8	76	114
DH421076	7.6	8	76	114
DH421077	7.7	8	76	114

▶ Other shank types are available on your request.

▶ 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	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		◎	◎	◎	○	◎	◎	○	○	◎	○	○	○		◎	○	◎	○	◎	○

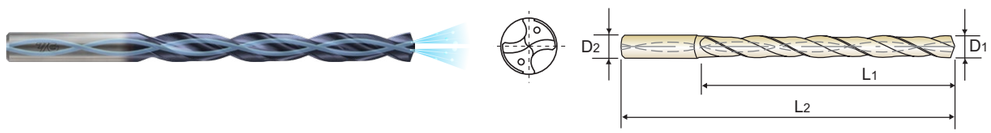
ISO	N										S							H		
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	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
Recommended																		○			

DREAM DRILLS - GENERAL

DH421 SERIES

CARBIDE, DREAM DRILLS GENERAL with COOLANT HOLES *EXTRA LONG*

- ▶ Drilling for Steel, Cast Steel, Cast Iron, Malleable Cast Iron
- ▶ Self centering and chip breaking by R-thinning
- ▶ Wave shape and negative land on the cutting edge for low thrust, stable torque and long tool life
- ▶ Optimized flute shape for strength of drilling and smooth chip evacuation



DIN 6537 | CARBIDE | 30° | h6 | m7 | 140° | 20 bar | TiAlN

p. A18-A19

8 × D

Unit : mm

EDP No.	Drill Diameter	Shank Diameter	Flute Length	Overall Length
TiAlN	D_1	D_2	L_1	L_2
DH421078	7.8	8	76	114
DH421079	7.9	8	76	114
DH421080	8.0	8	76	114
DH421081	8.1	10	95	142
DH421082	8.2	10	95	142
DH421083	8.3	10	95	142
DH421084	8.4	10	95	142
DH421085	8.5	10	95	142
DH421086	8.6	10	95	142
DH421087	8.7	10	95	142
DH421088	8.8	10	95	142
DH421089	8.9	10	95	142
DH421090	9.0	10	95	142
DH421091	9.1	10	95	142
DH421092	9.2	10	95	142
DH421093	9.3	10	95	142
DH421094	9.4	10	95	142
DH421095	9.5	10	95	142
DH421096	9.6	10	95	142
DH421097	9.7	10	95	142
DH421098	9.8	10	95	142
DH421099	9.9	10	95	142
DH421100	10.0	10	95	142
DH421101	10.1	12	114	162

EDP No.	Drill Diameter	Shank Diameter	Flute Length	Overall Length
TiAlN	D_1	D_2	L_1	L_2
DH421102	10.2	12	114	162
DH421103	10.3	12	114	162
DH421104	10.4	12	114	162
DH421105	10.5	12	114	162
DH421106	10.6	12	114	162
DH421107	10.7	12	114	162
DH421108	10.8	12	114	162
DH421109	10.9	12	114	162
DH421110	11.0	12	114	162
DH421111	11.1	12	114	162
DH421112	11.2	12	114	162
DH421113	11.3	12	114	162
DH421114	11.4	12	114	162
DH421115	11.5	12	114	162
DH421116	11.6	12	114	162
DH421117	11.7	12	114	162
DH421118	11.8	12	114	162
DH421119	11.9	12	114	162
DH421120	12.0	12	114	162
DH421125	12.5	14	133	178
DH421130	13.0	14	133	178
DH421135	13.5	14	133	178
DH421140	14.0	14	133	178

▶ Other shank types are available on your request.

◎ : 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
Recommended		◎	◎	◎	○	◎	◎	○	○	◎	○	○	○		◎	○	◎	○	◎	○

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
Recommended																		○			

CARBIDE
HSS
DREAM DRILLS GENERAL
DREAM DRILLS SOFT
MULTI-1 DRILLS
GOLD-P DRILLS
SUPER-GP DRILLS
STRAIGHT SHANK DRILLS
MORSE TAPER SHANK DRILLS
NC-SPOTTING DRILLS
CENTER DRILLS

DREAM DRILLS - GENERAL

RECOMMENDED CUTTING CONDITIONS

DH423, DH424 SERIES without COOLANT HOLES

RPM = rev./min.
FEED = mm/rev.

ISO	VDI 3323	Material Description	Vc (m/min)	Parameter	Drill Diameter(mm) 1.0	2.0	Vc (m/min)	Parameter	Drill Diameter(mm) 3.0	4.0	5.0
P	2	Non-alloy steel	70	RPM	22280	11140	100	RPM	10610	7960	6370
				FEED	0.03-0.05	0.05-0.07		FEED	0.06-0.12	0.08-0.14	0.14-0.20
	3		70	RPM	22280	11140	100	RPM	10610	7960	6370
				FEED	0.03-0.05	0.05-0.07		FEED	0.06-0.12	0.08-0.14	0.14-0.20
	4		70	RPM	22280	11140	100	RPM	10610	7960	6370
				FEED	0.03-0.05	0.05-0.07		FEED	0.04-0.10	0.07-0.13	0.10-0.16
	5		60	RPM	19100	9550	80	RPM	8490	6370	5090
				FEED	0.03-0.05	0.05-0.07		FEED	0.04-0.10	0.07-0.13	0.10-0.16
	6	Low alloy steel	70	RPM	22280	11140	100	RPM	10610	7960	6370
				FEED	0.03-0.05	0.05-0.07		FEED	0.06-0.12	0.08-0.14	0.14-0.20
	7		60	RPM	19100	9550	80	RPM	8490	6370	5090
				FEED	0.03-0.05	0.05-0.07		FEED	0.06-0.12	0.08-0.14	0.10-0.20
	8		60	RPM	19100	9550	80	RPM	8490	6370	5090
				FEED	0.02-0.04	0.03-0.05		FEED	0.04-0.10	0.07-0.13	0.10-0.16
	9		30	RPM	9550	4770	40	RPM	4240	3180	2550
				FEED	0.02-0.04	0.03-0.05		FEED	0.03-0.08	0.05-0.11	0.08-0.14
	10	High alloyed steel, and tool steel	50	RPM	15920	7960	70	RPM	7430	5570	4460
				FEED	0.03-0.05	0.05-0.07		FEED	0.04-0.10	0.07-0.13	0.10-0.16
	11		30	RPM	9550	4770	40	RPM	4240	3180	2550
				FEED	0.02-0.04	0.03-0.05		FEED	0.03-0.08	0.05-0.11	0.08-0.14
M	12	Stainless steel	50	RPM	15920	7960	70	RPM	7430	5570	4460
				FEED	0.03-0.05	0.05-0.07		FEED	0.06-0.12	0.08-0.14	0.14-0.20
	13		35	RPM	11140	5570	45	RPM	4770	3580	2860
				FEED	0.02-0.04	0.03-0.05		FEED	0.04-0.10	0.07-0.13	0.10-0.16
K	15	Grey cast iron	70	RPM	22280	11140	100	RPM	10610	7960	6370
				FEED	0.04-0.06	0.04-0.06		FEED	0.08-0.14	0.12-0.18	0.15-0.22
	16		65	RPM	20690	10350	80	RPM	8490	6370	5090
				FEED	0.04-0.06	0.04-0.06		FEED	0.06-0.12	0.08-0.14	0.14-0.20
	17	Nodular cast iron	70	RPM	22280	11140	100	RPM	10610	7960	6370
				FEED	0.04-0.06	0.04-0.06		FEED	0.08-0.14	0.12-0.18	0.15-0.22
	18		50	RPM	15920	7960	70	RPM	7430	5570	4460
				FEED	0.04-0.06	0.04-0.06		FEED	0.06-0.12	0.08-0.14	0.14-0.20
	19	Malleable cast iron	60	RPM	19100	9550	80	RPM	8490	6370	5090
				FEED	0.04-0.06	0.04-0.06		FEED	0.08-0.14	0.12-0.18	0.15-0.22
	20		50	RPM	15920	7960	70	RPM	7430	5570	4460
				FEED	0.03-0.05	0.05-0.07		FEED	0.06-0.12	0.08-0.14	0.14-0.20
H	55	Hardened steel	20	RPM	6370	3180	25	RPM	2650	1990	1590
				FEED	0.01-0.02	0.01-0.03		FEED	0.01-0.03	0.01-0.04	0.02-0.05

▶ Recommend to reduce the feed rate as following

Feed 100% : DH423(3×D)
Feed 85% : DH424(5×D)

DREAM DRILLS - GENERAL
RECOMMENDED CUTTING CONDITIONS

RPM = rev./min.
FEED = mm/rev.

VDI 3323	Parameter	Drill Diameter(mm) 6.0	8.0	10.0	12.0	14.0	16.0	18.0	20.0
2	RPM	5310	3980	3180	2650	2270	1990	1770	1590
	FEED	0.16-0.22	0.18-0.24	0.19-0.27	0.21-0.29	0.23-0.31	0.25-0.33	0.28-0.38	0.30-0.40
3	RPM	5310	3980	3180	2650	2270	1990	1770	1590
	FEED	0.16-0.22	0.18-0.24	0.19-0.27	0.21-0.29	0.23-0.31	0.25-0.33	0.28-0.38	0.30-0.40
4	RPM	5310	3980	3180	2650	2270	1990	1770	1590
	FEED	0.12-0.18	0.14-0.2	0.15-0.23	0.17-0.25	0.18-0.26	0.19-0.27	0.20-0.30	0.22-0.32
5	RPM	4240	3180	2550	2120	1820	1590	1410	1270
	FEED	0.12-0.18	0.14-0.2	0.15-0.23	0.17-0.25	0.18-0.26	0.19-0.27	0.20-0.30	0.22-0.32
6	RPM	5310	3980	3180	2650	2270	1990	1770	1590
	FEED	0.16-0.22	0.18-0.24	0.19-0.27	0.21-0.29	0.23-0.31	0.25-0.33	0.28-0.38	0.30-0.40
7	RPM	4240	3180	2550	2120	1820	1590	1410	1270
	FEED	0.12-0.24	0.16-0.28	0.19-0.27	0.21-0.29	0.23-0.31	0.25-0.33	0.28-0.38	0.30-0.40
8	RPM	4240	3180	2550	2120	1820	1590	1410	1270
	FEED	0.12-0.18	0.14-0.2	0.15-0.23	0.17-0.25	0.18-0.26	0.19-0.27	0.20-0.30	0.22-0.32
9	RPM	2120	1590	1270	1060	910	800	710	640
	FEED	0.10-0.16	0.12-0.18	0.13-0.19	0.14-0.20	0.15-0.21	0.16-0.22	0.17-0.25	0.18-0.28
10	RPM	3710	2790	2230	1860	1590	1390	1240	1110
	FEED	0.12-0.18	0.14-0.20	0.15-0.23	0.17-0.25	0.18-0.26	0.19-0.27	0.20-0.30	0.22-0.32
11	RPM	2120	1590	1270	1060	910	800	710	640
	FEED	0.10-0.16	0.12-0.18	0.13-0.19	0.14-0.20	0.15-0.21	0.16-0.22	0.17-0.25	0.18-0.28
12	RPM	3710	2790	2230	1860	1590	1390	1240	1110
	FEED	0.16-0.22	0.18-0.24	0.19-0.27	0.21-0.29	0.23-0.31	0.25-0.33	0.28-0.38	0.30-0.40
13	RPM	2390	1790	1430	1190	1020	900	800	720
	FEED	0.12-0.18	0.14-0.20	0.15-0.23	0.17-0.25	0.18-0.26	0.19-0.27	0.20-0.30	0.22-0.32
15	RPM	5310	3980	3180	2650	2270	1990	1770	1590
	FEED	0.20-0.26	0.22-0.28	0.25-0.33	0.27-0.35	0.29-0.37	0.31-0.39	0.32-0.42	0.34-0.44
16	RPM	4240	3180	2550	2120	1820	1590	1410	1270
	FEED	0.16-0.22	0.18-0.24	0.19-0.27	0.21-0.29	0.23-0.31	0.25-0.33	0.28-0.38	0.30-0.40
17	RPM	5310	3980	3180	2650	2270	1990	1770	1590
	FEED	0.20-0.26	0.22-0.28	0.25-0.33	0.27-0.35	0.29-0.37	0.31-0.39	0.32-0.42	0.34-0.44
18	RPM	3710	2790	2230	1860	1590	1390	1240	1110
	FEED	0.16-0.22	0.18-0.24	0.19-0.27	0.21-0.29	0.23-0.31	0.25-0.33	0.28-0.38	0.30-0.40
19	RPM	4240	3180	2550	2120	1820	1590	1410	1270
	FEED	0.20-0.26	0.22-0.28	0.25-0.33	0.27-0.35	0.29-0.37	0.31-0.39	0.32-0.42	0.34-0.44
20	RPM	3710	2790	2230	1860	1590	1390	1240	1110
	FEED	0.16-0.22	0.18-0.24	0.19-0.27	0.21-0.29	0.23-0.31	0.25-0.33	0.28-0.38	0.30-0.40
55	RPM	1,330	990	800	660	570	500	440	400
	FEED	0.03-0.06	0.03-0.06	0.04-0.07	0.04-0.08	0.05-0.09	0.05-0.09	0.05-0.10	0.05-0.10

CARBIDE
HSS
DREAM DRILLS GENERAL
DREAM DRILLS SOFT
MULTI-1 DRILLS
GOLD-P DRILLS
SUPER-GP DRILLS
STRAIGHT SHANK DRILLS
MORSE TAPER SHANK DRILLS
NC-SPOTTING DRILLS
CENTER DRILLS

DREAM DRILLS - GENERAL

RECOMMENDED CUTTING CONDITIONS

DH421 SERIES with COOLANT HOLES

RPM = rev./min.
FEED = mm/rev.

ISO	VDI 3323	Material Description	Vc (m/min)	Parameter	Drill Diameter(mm) 1.0	2.0	Vc (m/min)	Parameter	Drill Diameter(mm) 3.0	4.0	5.0
P	2	Non-alloy steel	80	RPM	25460	12730	110	RPM	11670	8750	7000
				FEED	0.03-0.05	0.05-0.07		FEED	0.06-0.12	0.08-0.14	0.14-0.20
	3		80	RPM	25460	12730	110	RPM	11670	8750	7000
				FEED	0.03-0.05	0.05-0.07		FEED	0.06-0.12	0.08-0.14	0.14-0.20
	4		80	RPM	25460	12730	110	RPM	11670	8750	7000
				FEED	0.03-0.05	0.05-0.07		FEED	0.04-0.10	0.07-0.13	0.10-0.16
	5		70	RPM	22280	11140	90	RPM	9550	7160	5730
				FEED	0.03-0.05	0.05-0.07		FEED	0.04-0.10	0.07-0.13	0.10-0.16
	6	Low alloy steel	80	RPM	25460	12730	110	RPM	11670	8750	7000
				FEED	0.03-0.05	0.05-0.07		FEED	0.06-0.12	0.08-0.14	0.14-0.20
	7		70	RPM	22280	11140	90	RPM	9550	7160	5730
				FEED	0.03-0.05	0.05-0.07		FEED	0.06-0.12	0.08-0.14	0.10-0.20
	8		70	RPM	22280	11140	90	RPM	9550	7160	5730
				FEED	0.02-0.04	0.03-0.05		FEED	0.04-0.10	0.07-0.13	0.10-0.16
	9		40	RPM	12730	6370	50	RPM	5310	3980	3180
				FEED	0.02-0.04	0.03-0.05		FEED	0.03-0.08	0.05-0.11	0.08-0.14
	10	High alloyed steel, and tool steel	60	RPM	19100	9550	80	RPM	8490	6370	5090
				FEED	0.03-0.05	0.05-0.07		FEED	0.04-0.10	0.07-0.13	0.10-0.16
	11		40	RPM	12730	6370	45	RPM	4770	3580	2860
				FEED	0.02-0.04	0.03-0.05		FEED	0.03-0.08	0.05-0.11	0.08-0.14
M	12	Stainless steel	60	RPM	19100	9550	80	RPM	8490	6370	5090
				FEED	0.03-0.05	0.05-0.07		FEED	0.06-0.12	0.08-0.14	0.14-0.20
	13		45	RPM	14320	7160	55	RPM	5840	4380	3500
				FEED	0.02-0.04	0.03-0.05		FEED	0.04-0.10	0.07-0.13	0.10-0.16
K	15	Grey cast iron	80	RPM	25460	12730	110	RPM	11670	8750	7,000
				FEED	0.04-0.06	0.04-0.06		FEED	0.08-0.14	0.12-0.18	0.15-0.22
	16		75	RPM	23870	11940	95	RPM	10080	7560	6050
				FEED	0.04-0.06	0.04-0.06		FEED	0.06-0.12	0.08-0.14	0.14-0.20
	17	Nodular cast iron	90	RPM	28650	14320	120	RPM	12730	9550	7640
				FEED	0.04-0.06	0.04-0.06		FEED	0.08-0.14	0.12-0.18	0.15-0.22
	18		60	RPM	19100	9550	80	RPM	8490	6370	5090
				FEED	0.04-0.06	0.04-0.06		FEED	0.06-0.12	0.08-0.14	0.14-0.20
	19	Malleable cast iron	70	RPM	22280	11140	90	RPM	9550	7160	5730
				FEED	0.04-0.06	0.04-0.06		FEED	0.08-0.14	0.12-0.18	0.15-0.22
	20		60	RPM	19100	9550	80	RPM	8490	6370	5090
				FEED	0.03-0.05	0.05-0.07		FEED	0.06-0.12	0.08-0.14	0.14-0.20
H	55	Hardened steel	25	RPM	7960	3980	30	RPM	3180	2390	1910
				FEED	0.01-0.02	0.01-0.03		FEED	0.01-0.03	0.01-0.04	0.02-0.05

▶ Recommend to reduce the feed rate as following

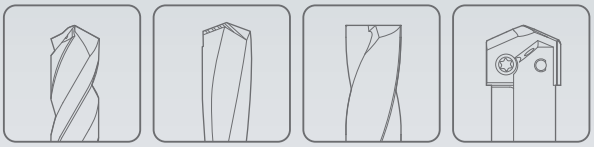
Feed 75% : DH421(8×D)

DREAM DRILLS - GENERAL
RECOMMENDED CUTTING CONDITIONS

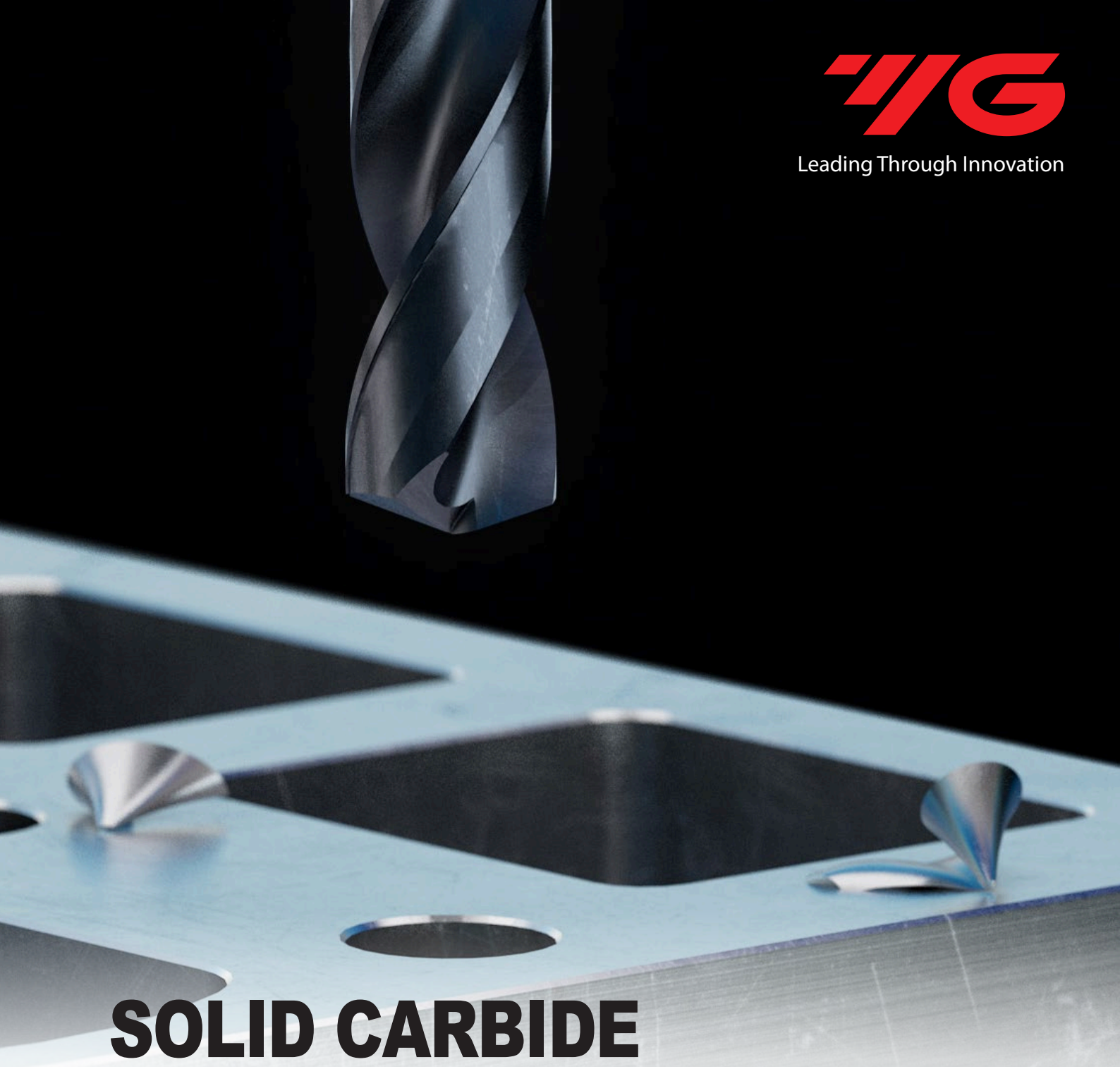
RPM = rev./min.
FEED = mm/rev.

VDI 3323	Parameter	Drill Diameter(mm) 6.0	8.0	10.0	12.0	14.0	16.0	18.0	20.0
2	RPM	5840	4380	3500	2920	2500	2190	1950	1750
	FEED	0.16-0.22	0.18-0.24	0.19-0.27	0.21-0.29	0.23-0.31	0.25-0.33	0.28-0.38	0.30-0.40
3	RPM	5840	4380	3500	2920	2500	2190	1950	1750
	FEED	0.16-0.22	0.18-0.24	0.19-0.27	0.21-0.29	0.23-0.31	0.25-0.33	0.28-0.38	0.30-0.40
4	RPM	5840	4380	3500	2920	2500	2190	1950	1750
	FEED	0.12-0.18	0.14-0.20	0.15-0.23	0.17-0.25	0.18-0.26	0.19-0.27	0.20-0.30	0.22-0.32
5	RPM	4770	3580	2860	2390	2050	1790	1590	1430
	FEED	0.12-0.18	0.14-0.20	0.15-0.23	0.17-0.25	0.18-0.26	0.19-0.27	0.20-0.30	0.22-0.32
6	RPM	5840	4380	3500	2920	2500	2190	1950	1750
	FEED	0.16-0.22	0.18-0.24	0.19-0.27	0.21-0.29	0.23-0.31	0.25-0.33	0.28-0.38	0.30-0.40
7	RPM	4770	3580	2860	2390	2050	1790	1590	1430
	FEED	0.12-0.24	0.16-0.28	0.19-0.27	0.21-0.29	0.23-0.31	0.25-0.33	0.28-0.38	0.30-0.40
8	RPM	4770	3580	2860	2390	2050	1790	1590	1430
	FEED	0.12-0.18	0.14-0.20	0.15-0.23	0.17-0.25	0.18-0.26	0.19-0.27	0.20-0.30	0.22-0.32
9	RPM	2650	1990	1590	1330	1140	990	880	800
	FEED	0.10-0.16	0.12-0.18	0.13-0.19	0.14-0.20	0.15-0.21	0.16-0.22	0.17-0.25	0.18-0.28
10	RPM	4240	3180	2550	2120	1820	1590	1410	1270
	FEED	0.12-0.18	0.14-0.20	0.15-0.23	0.17-0.25	0.18-0.26	0.19-0.27	0.20-0.30	0.22-0.32
11	RPM	2390	1790	1430	1190	1020	900	800	720
	FEED	0.10-0.16	0.12-0.18	0.13-0.19	0.14-0.20	0.15-0.21	0.16-0.22	0.17-0.25	0.18-0.28
12	RPM	4240	3180	2550	2120	1820	1590	1410	1270
	FEED	0.16-0.22	0.18-0.24	0.19-0.27	0.21-0.29	0.23-0.31	0.25-0.33	0.28-0.38	0.30-0.40
13	RPM	2920	2190	1750	1460	1250	1090	970	880
	FEED	0.12-0.18	0.14-0.20	0.15-0.23	0.17-0.25	0.18-0.26	0.19-0.27	0.20-0.30	0.22-0.32
15	RPM	5840	4380	3500	2920	2500	2190	1950	1750
	FEED	0.20-0.26	0.22-0.28	0.25-0.33	0.27-0.35	0.29-0.37	0.31-0.39	0.32-0.42	0.34-0.44
16	RPM	5040	3780	3020	2520	2160	1890	1680	1510
	FEED	0.16-0.22	0.18-0.24	0.19-0.27	0.21-0.29	0.23-0.31	0.25-0.33	0.28-0.38	0.30-0.40
17	RPM	6370	4770	3820	3180	2730	2390	2120	1910
	FEED	0.20-0.26	0.22-0.28	0.25-0.33	0.27-0.35	0.29-0.37	0.31-0.39	0.32-0.42	0.34-0.44
18	RPM	4240	3180	2550	2120	1820	1590	1410	1270
	FEED	0.16-0.22	0.18-0.24	0.19-0.27	0.21-0.29	0.23-0.31	0.25-0.33	0.28-0.38	0.30-0.40
19	RPM	4770	3580	2860	2390	2050	1790	1590	1430
	FEED	0.20-0.26	0.22-0.28	0.25-0.33	0.27-0.35	0.29-0.37	0.31-0.39	0.32-0.42	0.34-0.44
20	RPM	4240	3180	2550	2120	1820	1590	1410	1270
	FEED	0.16-0.22	0.18-0.24	0.19-0.27	0.21-0.29	0.23-0.31	0.25-0.33	0.28-0.38	0.30-0.40
55	RPM	1590	1190	950	800	680	600	530	480
	FEED	0.03-0.06	0.03-0.06	0.04-0.07	0.04-0.08	0.05-0.09	0.05-0.09	0.05-0.10	0.05-0.10

Global Cutting Tool Leader **YG-1**



HOLEMAKING



YG

Leading Through Innovation

SOLID CARBIDE

DREAM DRILLS -SOFT

- For Steels, up to Medium Hardness

SELECTION GUIDE

HOLEMAKING TOOLS

SERIES	DPPA01	DPPA02
DRILLING DEPTH	-	-
LENGTH	REGULAR	LONG
SIZE MIN	D1.0	D1.0
SIZE MAX	D20.0	D20.0
PAGE	A23	A26
SURFACE TREATMENT	X-Coating	

SOLID CARBIDE DREAM DRILLS SOFT

For Steels, up to Medium Hardness





Please visit globalyg1.com/mat for material search

◎ : Excellent ○ : Good

Recommended cutting conditions : p. A29

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		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		Ni or Co Based	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	Hardened steel		Hardened	550	55		
	39			Hardened	630	60		
	40	Chilled Cast Iron		Cast	400	42		
	41	Hardened Cast Iron		Hardened	550	55		

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NC-SPOTTING DRILLS
CENTER DRILLS

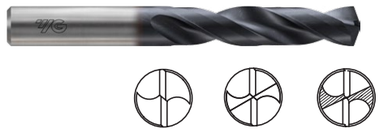
DREAM DRILLS -SOFT

DPPA01 SERIES

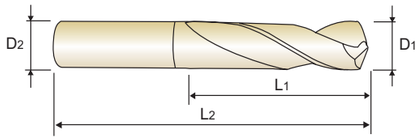
CARBIDE, DREAM DRILLS - SOFT

REGULAR

- ▶ Drilling for Non-alloy Steel, Low Alloy Steel and Cast Iron.
- ▶ Lip straight shape cutting edge will allow low thrust, strong rigidity and stable torque.
- ▶ Unique radius thinning for self-centering and chip breaking
- ▶ Negative land on the cutting edge for reliable tool life



up to 1.5mm ø1.6~ø1.9 over 1.9mm



CARBIDE | 30° | h6 | h7 | 140° | TiAlN

p. A29-A30

Unit : mm

EDP No.	Drill Diameter	Shank Diameter	Flute Length	Overall Length
X-Coating	D1	D2	L1	L2
DPPA01010	1.0	3	8	38
DPPA01011	1.1	3	9	42
DPPA01012	1.2	3	10	42
DPPA01013	1.3	3	10	42
DPPA01014	1.4	3	11	42
DPPA01015	1.5	3	11	42
DPPA01016	1.6	3	12	42
DPPA01017	1.7	3	12	42
DPPA01018	1.8	3	13	42
DPPA01019	1.9	3	13	42
DPPA01020	2.0	3	17	50
DPPA01021	2.1	3	17	50
DPPA01022	2.2	3	17	50
DPPA01023	2.3	3	17	50
DPPA01024	2.4	3	17	50
DPPA01025	2.5	3	17	50
DPPA01026	2.6	3	17	50
DPPA01027	2.7	3	17	50
DPPA01028	2.8	3	17	50
DPPA01029	2.9	3	17	50
DPPA01030	3.0	4	20	55
DPPA01031	3.1	4	20	55

EDP No.	Drill Diameter	Shank Diameter	Flute Length	Overall Length
X-Coating	D1	D2	L1	L2
DPPA01032	3.2	4	20	55
DPPA01033	3.3	4	20	55
DPPA01034	3.4	4	20	55
DPPA01035	3.5	4	20	55
DPPA01036	3.6	4	25	55
DPPA01037	3.7	4	25	55
DPPA01038	3.8	4	25	55
DPPA01039	3.9	4	25	55
DPPA01040	4.0	4	25	55
DPPA01041	4.1	4	25	55
DPPA01042	4.2	5	32	62
DPPA01043	4.3	5	32	62
DPPA01044	4.4	5	32	62
DPPA01045	4.5	5	32	62
DPPA01046	4.6	5	32	62
DPPA01047	4.7	5	32	62
DPPA01048	4.8	5	32	62
DPPA01049	4.9	5	32	62
DPPA01050	5.0	5	32	62
DPPA01051	5.1	5	32	62
DPPA01052	5.2	6	36	66
DPPA01053	5.3	6	36	66

▶ Other shank types are available on your request.

▶ 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	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			
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
Recommended																					

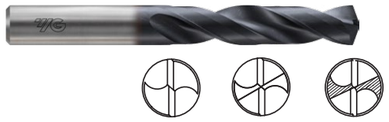
DREAM DRILLS -SOFT

DPPA01 SERIES

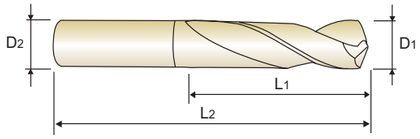
CARBIDE, DREAM DRILLS - SOFT

REGULAR

- Drilling for Non-alloy Steel, Low Alloy Steel and Cast Iron.
- Lip straight shape cutting edge will allow low thrust, strong rigidity and stable torque.
- Unique radius thinning for self-centering and chip breaking
- Negative land on the cutting edge for reliable tool life



up to 1.5mm ø1.6~ø1.9 over 1.9mm



CARBIDE | 30° | h6 | h7 | 140° | TiAlN

p. A29-A30

Unit : mm

EDP No.	Drill Diameter	Shank Diameter	Flute Length	Overall Length
X-Coating	D1	D2	L1	L2
DPPA01054	5.4	6	36	66
DPPA01055	5.5	6	36	66
DPPA01056	5.6	6	36	66
DPPA01057	5.7	6	36	66
DPPA01058	5.8	6	36	66
DPPA01059	5.9	6	36	66
DPPA01060	6.0	6	36	66
DPPA01061	6.1	6	36	66
DPPA01062	6.2	7	42	74
DPPA01063	6.3	7	42	74
DPPA01064	6.4	7	42	74
DPPA01065	6.5	7	42	74
DPPA01066	6.6	7	42	74
DPPA01067	6.7	7	42	74
DPPA01068	6.8	7	42	74
DPPA01069	6.9	7	42	74
DPPA01070	7.0	7	42	74
DPPA01071	7.1	7	42	74
DPPA01072	7.2	8	46	79
DPPA01073	7.3	8	46	79
DPPA01074	7.4	8	46	79
DPPA01075	7.5	8	46	79

EDP No.	Drill Diameter	Shank Diameter	Flute Length	Overall Length
X-Coating	D1	D2	L1	L2
DPPA01076	7.6	8	46	79
DPPA01077	7.7	8	46	79
DPPA01078	7.8	8	46	79
DPPA01079	7.9	8	46	79
DPPA01080	8.0	8	46	79
DPPA01081	8.1	8	46	79
DPPA01082	8.2	9	50	84
DPPA01083	8.3	9	50	84
DPPA01084	8.4	9	50	84
DPPA01085	8.5	9	50	84
DPPA01086	8.6	9	50	84
DPPA01087	8.7	9	50	84
DPPA01088	8.8	9	50	84
DPPA01089	8.9	9	50	84
DPPA01090	9.0	9	50	84
DPPA01091	9.1	9	50	84
DPPA01092	9.2	10	53	89
DPPA01093	9.3	10	53	89
DPPA01094	9.4	10	53	89
DPPA01095	9.5	10	53	89
DPPA01096	9.6	10	53	89
DPPA01097	9.7	10	53	89

▶ Other shank types are available on your request.

▶ 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	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			
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
Recommended																					

DREAM DRILLS -SOFT

DPPA01 SERIES

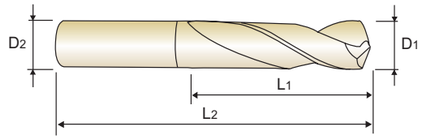
CARBIDE, DREAM DRILLS - SOFT

REGULAR

- Drilling for Non-alloy Steel, Low Alloy Steel and Cast Iron.
- Lip straight shape cutting edge will allow low thrust, strong rigidity and stable torque.
- Unique radius thinning for self-centering and chip breaking
- Negative land on the cutting edge for reliable tool life



up to 1.5mm ø1.6~ø1.9 over 1.9mm



CARBIDE | 30° | h6 | h7 | 140° | TiAlN

p. A29-A30

Unit : mm

EDP No.	Drill Diameter	Shank Diameter	Flute Length	Overall Length
X-Coating	D1	D2	L1	L2
DPPA01098	9.8	10	53	89
DPPA01099	9.9	10	53	89
DPPA01100	10.0	10	53	89
DPPA01101	10.1	10	53	89
DPPA01102	10.2	11	55	95
DPPA01103	10.3	11	55	95
DPPA01104	10.4	11	55	95
DPPA01105	10.5	11	55	95
DPPA01106	10.6	11	55	95
DPPA01107	10.7	11	55	95
DPPA01108	10.8	11	55	95
DPPA01109	10.9	11	55	95
DPPA01110	11.0	11	55	95
DPPA01111	11.1	11	55	95
DPPA01112	11.2	12	62	102
DPPA01113	11.3	12	62	102
DPPA01114	11.4	12	62	102
DPPA01115	11.5	12	62	102
DPPA01116	11.6	12	62	102
DPPA01117	11.7	12	62	102

EDP No.	Drill Diameter	Shank Diameter	Flute Length	Overall Length
X-Coating	D1	D2	L1	L2
DPPA01118	11.8	12	62	102
DPPA01119	11.9	12	62	102
DPPA01120	12.0	12	62	102
DPPA01125	12.5	13	62	102
DPPA01130	13.0	13	62	102
DPPA01135	13.5	14	64	107
DPPA01140	14.0	14	64	107
DPPA01145	14.5	15	67	111
DPPA01150	15.0	15	67	111
DPPA01155	15.5	16	69	115
DPPA01160	16.0	16	69	115
DPPA01165	16.5	17	71	119
DPPA01170	17.0	17	71	119
DPPA01175	17.5	18	74	123
DPPA01180	18.0	18	74	123
DPPA01185	18.5	19	76	127
DPPA01190	19.0	19	76	127
DPPA01195	19.5	20	80	131
DPPA01200	20.0	20	80	131

▶ Other shank types are available on your request.

◎ : 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										
Recommended		◎	○			◎	○			○		○	○		◎	○	◎	○	◎	○										

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
Recommended																					

DREAM DRILLS -SOFT

DPPA02 SERIES

CARBIDE, DREAM DRILLS - SOFT — *LONG*

- Drilling for Non-alloy Steel, Low Alloy Steel and Cast Iron.
- Lip straight shape cutting edge will allow low thrust, strong rigidity and stable torque.
- Unique radius thinning for self-centering and chip breaking
- Negative land on the cutting edge for reliable tool life



CARBIDE | 30° | h6 | h7 | 140° | TiAlN p. A29-A30

Unit : mm

EDP No.	Drill Diameter	Shank Diameter	Flute Length	Overall Length
X-Coating	D1	D2	L1	L2
DPPA02010	1.0	3	12	60
DPPA02011	1.1	3	12	60
DPPA02012	1.2	3	12	60
DPPA02013	1.3	3	15	60
DPPA02014	1.4	3	15	60
DPPA02015	1.5	3	15	60
DPPA02016	1.6	3	20	60
DPPA02017	1.7	3	20	60
DPPA02018	1.8	3	20	60
DPPA02019	1.9	3	20	60
DPPA02020	2.0	3	25	66
DPPA02021	2.1	3	25	66
DPPA02022	2.2	3	25	66
DPPA02023	2.3	3	25	66
DPPA02024	2.4	3	30	66
DPPA02025	2.5	3	30	66
DPPA02026	2.6	3	30	66
DPPA02027	2.7	3	30	66
DPPA02028	2.8	3	30	66
DPPA02029	2.9	3	30	66
DPPA02030	3.0	4	45	80
DPPA02031	3.1	4	45	80
DPPA02032	3.2	4	45	80
DPPA02033	3.3	4	45	80
DPPA02034	3.4	4	45	80
DPPA02035	3.5	4	45	80
DPPA02036	3.6	4	45	80

EDP No.	Drill Diameter	Shank Diameter	Flute Length	Overall Length
X-Coating	D1	D2	L1	L2
DPPA02037	3.7	4	45	80
DPPA02038	3.8	4	45	80
DPPA02039	3.9	4	45	80
DPPA02040	4.0	4	45	80
DPPA02041	4.1	4	45	80
DPPA02042	4.2	5	45	80
DPPA02043	4.3	5	45	80
DPPA02044	4.4	5	45	80
DPPA02045	4.5	5	45	80
DPPA02046	4.6	5	45	80
DPPA02047	4.7	5	45	80
DPPA02048	4.8	5	45	80
DPPA02049	4.9	5	45	80
DPPA02050	5.0	5	45	80
DPPA02051	5.1	5	45	80
DPPA02052	5.2	6	50	83
DPPA02053	5.3	6	50	83
DPPA02054	5.4	6	50	83
DPPA02055	5.5	6	50	83
DPPA02056	5.6	6	50	83
DPPA02057	5.7	6	50	83
DPPA02058	5.8	6	50	83
DPPA02059	5.9	6	50	83
DPPA02060	6.0	6	50	83
DPPA02061	6.1	6	50	83
DPPA02062	6.2	7	53	85
DPPA02063	6.3	7	53	85

▶ Other shank types are available on your request.

▶ NEXT PAGE

◎ : Excellent ○ : Good

ISO	P																			
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
Recommended		◎	○			◎	○			○		○	○		◎	○	◎	○	◎	○

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
Recommended																					

DREAM DRILLS -SOFT
DPPA02 SERIES
CARBIDE, DREAM DRILLS - SOFT — LONG
▶ Drilling for Non-alloy Steel, Low Alloy Steel and Cast Iron.
▶ Lip straight shape cutting edge will allow low thrust, strong rigidity and stable torque.
▶ Unique radius thinning for self-centering and chip breaking
▶ Negative land on the cutting edge for reliable tool life



CARBIDE | 30° | h6 | h7 | 140° | TiAlN p. A29-A30

Unit : mm

EDP No.	Drill Diameter	Shank Diameter	Flute Length	Overall Length
X-Coating	D1	D2	L1	L2
DPPA02064	6.4	7	53	85
DPPA02065	6.5	7	53	85
DPPA02066	6.6	7	53	85
DPPA02067	6.7	7	53	85
DPPA02068	6.8	7	53	85
DPPA02069	6.9	7	53	85
DPPA02070	7.0	7	53	85
DPPA02071	7.1	7	53	85
DPPA02072	7.2	8	58	90
DPPA02073	7.3	8	58	90
DPPA02074	7.4	8	58	90
DPPA02075	7.5	8	58	90
DPPA02076	7.6	8	58	90
DPPA02077	7.7	8	58	90
DPPA02078	7.8	8	58	90
DPPA02079	7.9	8	58	90
DPPA02080	8.0	8	58	90
DPPA02081	8.1	8	58	90
DPPA02082	8.2	9	64	98
DPPA02083	8.3	9	64	98
DPPA02084	8.4	9	64	98
DPPA02085	8.5	9	64	98
DPPA02086	8.6	9	64	98
DPPA02087	8.7	9	64	98
DPPA02088	8.8	9	64	98
DPPA02089	8.9	9	64	98
DPPA02090	9.0	9	64	98

EDP No.	Drill Diameter	Shank Diameter	Flute Length	Overall Length
X-Coating	D1	D2	L1	L2
DPPA02091	9.1	9	64	98
DPPA02092	9.2	10	68	105
DPPA02093	9.3	10	68	105
DPPA02094	9.4	10	68	105
DPPA02095	9.5	10	68	105
DPPA02096	9.6	10	68	105
DPPA02097	9.7	10	68	105
DPPA02098	9.8	10	68	105
DPPA02099	9.9	10	68	105
DPPA02100	10.0	10	68	105
DPPA02101	10.1	10	68	105
DPPA02102	10.2	11	73	110
DPPA02103	10.3	11	73	110
DPPA02104	10.4	11	73	110
DPPA02105	10.5	11	73	110
DPPA02106	10.6	11	73	110
DPPA02107	10.7	11	73	110
DPPA02108	10.8	11	73	110
DPPA02109	10.9	11	73	110
DPPA02110	11.0	11	73	110
DPPA02111	11.1	11	73	110
DPPA02112	11.2	12	80	120
DPPA02113	11.3	12	80	120
DPPA02114	11.4	12	80	120
DPPA02115	11.5	12	80	120
DPPA02116	11.6	12	80	120
DPPA02117	11.7	12	80	120

▶ Other shank types are available on your request.

▶ NEXT PAGE

◎ : Excellent ○ : Good

ISO	P																			
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
Recommended		◎	○			◎	○			○		○	○		◎	○	◎	○	◎	○

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
Recommended																					

CARBIDE
HSS
DREAM DRILLS GENERAL
DREAM DRILLS SOFT
MULTI-1 DRILLS
GOLD-P DRILLS
SUPER-GP DRILLS
STRAIGHT SHANK DRILLS
MORSE TAPER SHANK DRILLS
NC-SPOTTING DRILLS
CENTER DRILLS

DREAM DRILLS -SOFT

DPPA02 SERIES

CARBIDE, DREAM DRILLS - SOFT

LONG

- Drilling for Non-alloy Steel, Low Alloy Steel and Cast Iron.
- Lip straight shape cutting edge will allow low thrust, strong rigidity and stable torque.
- Unique radius thinning for self-centering and chip breaking
- Negative land on the cutting edge for reliable tool life



CARBIDE | 30° | h6 | h7 | 140° | TiAlN | p. A29-A30

Unit : mm

EDP No.	Drill Diameter	Shank Diameter	Flute Length	Overall Length
X-Coating	D1	D2	L1	L2
DPPA02118	11.8	12	80	120
DPPA02119	11.9	12	80	120
DPPA02120	12.0	12	80	120
DPPA02125	12.5	13	90	137
DPPA02130	13.0	13	90	137
DPPA02135	13.5	14	96	147
DPPA02140	14.0	14	96	147
DPPA02145	14.5	15	100	153
DPPA02150	15.0	15	100	153
DPPA02155	15.5	16	112	160

EDP No.	Drill Diameter	Shank Diameter	Flute Length	Overall Length
X-Coating	D1	D2	L1	L2
DPPA02160	16.0	16	112	160
DPPA02165	16.5	17	112	160
DPPA02170	17.0	17	112	160
DPPA02175	17.5	18	112	160
DPPA02180	18.0	18	112	160
DPPA02185	18.5	19	112	160
DPPA02190	19.0	19	112	160
DPPA02195	19.5	20	112	160
DPPA02200	20.0	20	112	160

▶ Other shank types are available on your request.

◎ : 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
Recommended		◎	○			◎	○			○		○	○		◎	○	◎	○	◎	○

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
Recommended																					

DREAM DRILLS -SOFT

RECOMMENDED CUTTING CONDITIONS

DPPA01, DPPA02 SERIES without COOLANT HOLES

RPM = rev./min.
FEED = mm/rev.

ISO	VDI 3323	Material Description	Vc (m/min)	Parameter	Drill Diameter (mm) 1.0	2.0	Vc (m/min)	Parameter	Drill Diameter (mm) 3.0	4.0	5.0
P	2	Non-alloy steel	60	RPM	19100	9550	80	RPM	8490	6370	5090
				FEED	0.02-0.04	0.04-0.06		FEED	0.04-0.10	0.06-0.12	0.12-0.18
	3		60	RPM	19100	9550	80	RPM	8490	4770	3820
				FEED	0.02-0.04	0.04-0.06		FEED	0.04-0.10	0.06-0.12	0.12-0.18
	6	Low alloy steel	60	RPM	19100	9550	80	RPM	8490	6370	5090
				FEED	0.02-0.04	0.04-0.06		FEED	0.04-0.10	0.06-0.12	0.12-0.18
	7		40	RPM	12730	6370	60	RPM	6370	4770	3820
				FEED	0.02-0.04	0.04-0.06		FEED	0.04-0.10	0.06-0.12	0.12-0.18
	10	High alloyed steel, and tool steel	35	RPM	11140	5570	55	RPM	5840	4380	3500
				FEED	0.02-0.04	0.04-0.06		FEED	0.04-0.10	0.06-0.12	0.12-0.18
M	12	Stainless steel	30	RPM	9550	4770	45	RPM	4770	3580	2860
				FEED	0.02-0.04	0.02-0.04		FEED	0.03-0.05	0.05-0.09	0.07-0.11
	13		20	RPM	6370	3180	35	RPM	3710	2790	2230
				FEED	0.02-0.04	0.02-0.04		FEED	0.03-0.05	0.05-0.09	0.07-0.11
K	15	Grey cast iron	60	RPM	19100	9550	80	RPM	8490	6370	5090
				FEED	0.03-0.05	0.05-0.07		FEED	0.06-0.12	0.08-0.14	0.14-0.20
	16		40	RPM	12730	6370	60	RPM	6370	4770	3820
				FEED	0.02-0.04	0.04-0.06		FEED	0.04-0.10	0.06-0.12	0.12-0.18
	17	Nodular cast iron	60	RPM	19100	9550	80	RPM	8490	6370	5090
				FEED	0.03-0.05	0.05-0.07		FEED	0.06-0.12	0.08-0.14	0.14-0.20
	18		35	RPM	11140	5570	55	RPM	5840	4380	3500
				FEED	0.02-0.04	0.04-0.06		FEED	0.04-0.10	0.06-0.12	0.12-0.18
	19	Malleable cast iron	40	RPM	12730	6370	60	RPM	6370	4770	3820
				FEED	0.03-0.05	0.05-0.07		FEED	0.06-0.12	0.08-0.14	0.14-0.20
	20		35	RPM	11140	5570	55	RPM	5840	4380	3500
				FEED	0.02-0.04	0.04-0.06		FEED	0.04-0.10	0.06-0.12	0.12-0.18

DREAM DRILLS -SOFT

RECOMMENDED CUTTING CONDITIONS

RPM = rev./min.
FEED = mm/rev.

ISO	VDI 3323	Material Descrip	Vc (m/min)	Parameter	Drill Diameter (mm)							
					6.0	8.0	10.0	12.0	14.0	16.0	18.0	20.0
P	2	Non-alloy ste	80	RPM	4240	3180	2550	2120	1820	1590	1410	1270
				FEED	0.14-0.20	0.16-0.22	0.18-0.24	0.20-0.26	0.22-0.28	0.24-0.30	0.26-0.36	0.28-0.38
	3		80	RPM	3180	2390	1910	1590	1360	1190	1060	950
				FEED	0.14-0.20	0.16-0.22	0.18-0.24	0.20-0.26	0.22-0.28	0.24-0.30	0.26-0.36	0.28-0.38
	6	Low alloy ste	80	RPM	4240	3180	2550	2120	1820	1590	1410	1270
				FEED	0.14-0.20	0.16-0.22	0.18-0.24	0.20-0.26	0.22-0.28	0.24-0.30	0.26-0.36	0.28-0.38
	7		60	RPM	3180	2390	1910	1590	1360	1190	1060	950
				FEED	0.14-0.20	0.16-0.22	0.18-0.24	0.20-0.26	0.22-0.28	0.24-0.30	0.26-0.36	0.28-0.38
	10	High alloyed st and tool ste	55	RPM	2920	2190	1750	1460	1250	1090	970	880
				FEED	0.14-0.20	0.16-0.22	0.18-0.24	0.20-0.26	0.22-0.28	0.24-0.30	0.26-0.36	0.28-0.38
M	12	Stainless ste	45	RPM	2390	1790	1430	1190	1020	900	800	720
				FEED	0.08-0.12	0.09-0.13	0.10-0.15	0.11-0.16	0.12-0.17	0.13-0.18	0.14-0.19	0.15-0.20
	13		35	RPM	1860	1390	1110	930	800	700	620	560
				FEED	0.08-0.12	0.09-0.13	0.10-0.15	0.11-0.16	0.12-0.17	0.13-0.18	0.14-0.19	0.15-0.20
K	15	Grey cast iro	80	RPM	4240	3180	2550	2120	1820	1590	1410	1270
				FEED	0.16-0.22	0.18-0.24	0.20-0.26	0.22-0.28	0.24-0.30	0.26-0.32	0.28-0.38	0.30-0.40
	16		60	RPM	3180	2390	1910	1590	1360	1190	1060	950
				FEED	0.14-0.20	0.16-0.22	0.18-0.24	0.20-0.26	0.22-0.28	0.24-0.30	0.26-0.36	0.28-0.38
	17	Nodular cast i	80	RPM	4240	3180	2550	2120	1820	1590	1410	1270
				FEED	0.16-0.22	0.18-0.24	0.20-0.26	0.22-0.28	0.24-0.30	0.26-0.32	0.28-0.38	0.30-0.40
	18		55	RPM	2920	2190	1750	1460	1250	1090	970	880
				FEED	0.14-0.20	0.16-0.22	0.18-0.24	0.20-0.26	0.22-0.28	0.24-0.30	0.26-0.36	0.28-0.38
	19	Malleable cast	60	RPM	3180	2390	1910	1590	1360	1190	1060	950
				FEED	0.16-0.22	0.18-0.24	0.20-0.26	0.22-0.28	0.24-0.30	0.26-0.32	0.28-0.38	0.30-0.40
	20		55	RPM	2920	2190	1750	1460	1250	1090	970	880
				FEED	0.14-0.20	0.16-0.22	0.18-0.24	0.20-0.26	0.22-0.28	0.24-0.30	0.26-0.36	0.28-0.38



Leading Through Innovation

HSS-PM

MULTI-1 DRILLS

- For Wide Range of Applications Particularly Stainless Steels and Titanium

SELECTION GUIDE

HOLEMAKING TOOLS

SERIES	CDRA03	CDRA04
TOOL MATERIAL	HSS-PM	
LENGTH	STUB	JOBBER
SIZE MIN	D1.0	D2.0
SIZE MAX	D13.0	D13.0
PAGE	**A33**	**A37**
SURFACE TREATMENT	TiAlN	

HSS-PM MULTI-1 DRILLS

For Wide Range of Applications Particularly Stainless Steels and Titanium



Please visit globalyg1.com/mat for material search

◎ : Excellent ○ : Good

Recommended cutting conditions : p. A40

ISO	VDI 3323	Material Description	Composition / Structure / Heat Treatment		HB	HRc	CDRA03	CDRA04
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		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		Ni or Co Based	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	Hardened steel		Hardened	550	55		
	39			Hardened	630	60		
	40	Chilled Cast Iron		Cast	400	42		
	41	Hardened Cast Iron		Hardened	550	55		

MULTI-1 DRILLS

CDRA03 SERIES

HSS-PM, MULTI-1 DRILLS

STUB

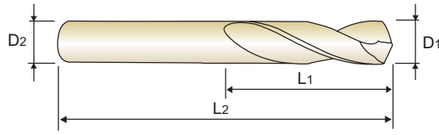
▶ **Application** : Structural steels, Carbon steels, Alloy steels, Pre-hardened steels, Mold steels, Stainless steels, Hardened steels(HRc30~45), Cast iron, Aluminum alloys, Nonferrous alloys, Titanium.

▶ **Advantage** : Point shape to maximize self-centering.
Flute design for the best chip evacuation.
Premium powder materials with excellent toughness.





up to 1.4mm over 1.4mm



HSS PM | 30° | h6 | h7 | 118° | 135° | TiAlN

up to 1.9mm over 1.9mm

p. A40

Unit : mm

EDP No.	Drill Diameter	Shank Diameter	Flute Length	Overall Length
TiAlN	D1	D2	L1	L2
CDRA03010	1.00	3	6	38
CDRA03910	1.05	3	6	38
CDRA03011	1.10	3	7	39
CDRA03911	1.15	3	7	39
CDRA03012	1.20	3	8	40
CDRA03912	1.25	3	8	40
CDRA03013	1.30	3	8	40
CDRA03913	1.35	3	9	41
CDRA03014	1.40	3	9	41
CDRA03914	1.45	3	9	41
CDRA03015	1.50	3	9	41
CDRA03915	1.55	3	10	42
CDRA03016	1.60	3	10	42
CDRA03916	1.65	3	10	42
CDRA03017	1.70	3	10	42
CDRA03917	1.75	3	11	43
CDRA03018	1.80	3	11	43
CDRA03918	1.85	3	11	43
CDRA03019	1.90	3	11	43
CDRA03919	1.95	3	12	44
CDRA03020	2.00	3	12	44
CDRA03920	2.05	3	12	44
CDRA03021	2.10	3	12	44
CDRA03921	2.15	3	13	45

EDP No.	Drill Diameter	Shank Diameter	Flute Length	Overall Length
TiAlN	D1	D2	L1	L2
CDRA03022	2.20	3	13	45
CDRA03922	2.25	3	13	45
CDRA03023	2.30	3	13	45
CDRA03923	2.35	3	13	45
CDRA03024	2.40	3	14	46
CDRA03924	2.45	3	14	46
CDRA03025	2.50	3	14	46
CDRA03925	2.55	3	14	46
CDRA03026	2.60	3	14	46
CDRA03926	2.65	3	14	46
CDRA03027	2.70	3	16	48
CDRA03927	2.75	3	16	48
CDRA03028	2.80	3	16	48
CDRA03928	2.85	3	16	48
CDRA03029	2.90	3	16	48
CDRA03929	2.95	3	16	48
CDRA03030	3.00	3	16	48
CDRA03930	3.05	4	18	50
CDRA03031	3.10	4	18	50
CDRA03931	3.15	4	18	50
CDRA03032	3.20	4	18	50
CDRA03932	3.25	4	18	50
CDRA03033	3.30	4	18	50
CDRA03933	3.35	4	18	50

▶ 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	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		
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
Recommended	◎	◎	○	○												○					

MULTI-1 DRILLS

CDRA03 SERIES

HSS-PM, MULTI-1 DRILLS

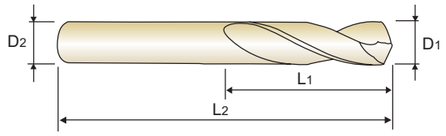
STUB

▶ **Application** : Structural steels, Carbon steels, Alloy steels, Pre-hardened steels, Mold steels, Stainless steels, Hardened steels(HRc30~45), Cast iron, Aluminum alloys, Nonferrous alloys, Titanium.

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Flute design for the best chip evacuation.
Premium powder materials with excellent toughness.







HSS PM | 30° | h6 | h7 | 118° | 135° | TiAlN

up to 1.9mm over 1.9mm

p. A40

Unit : mm

EDP No.	Drill Diameter	Shank Diameter	Flute Length	Overall Length
TiAlN	D1	D2	L1	L2
CDRA03034	3.40	4	20	52
CDRA03934	3.45	4	20	52
CDRA03035	3.50	4	20	52
CDRA03935	3.55	4	20	52
CDRA03036	3.60	4	20	52
CDRA03936	3.65	4	20	52
CDRA03037	3.70	4	20	52
CDRA03937	3.75	4	20	52
CDRA03038	3.80	4	22	54
CDRA03938	3.85	4	22	54
CDRA03039	3.90	4	22	54
CDRA03939	3.95	4	22	54
CDRA03040	4.00	4	22	54
CDRA03940	4.05	6	22	66
CDRA03041	4.10	6	22	66
CDRA03941	4.15	6	22	66
CDRA03042	4.20	6	22	66
CDRA03942	4.25	6	22	66
CDRA03043	4.30	6	24	68
CDRA03943	4.35	6	24	68
CDRA03044	4.40	6	24	68
CDRA03944	4.45	6	24	68
CDRA03045	4.50	6	24	68
CDRA03945	4.55	6	24	68

EDP No.	Drill Diameter	Shank Diameter	Flute Length	Overall Length
TiAlN	D1	D2	L1	L2
CDRA03046	4.60	6	24	68
CDRA03946	4.65	6	24	68
CDRA03047	4.70	6	24	68
CDRA03947	4.75	6	24	68
CDRA03048	4.80	6	26	70
CDRA03948	4.85	6	26	70
CDRA03049	4.90	6	26	70
CDRA03949	4.95	6	26	70
CDRA03050	5.00	6	26	70
CDRA03950	5.05	6	26	70
CDRA03051	5.10	6	26	70
CDRA03951	5.15	6	26	70
CDRA03052	5.20	6	26	70
CDRA03952	5.25	6	26	70
CDRA03053	5.30	6	26	70
CDRA03953	5.35	6	28	72
CDRA03054	5.40	6	28	72
CDRA03954	5.45	6	28	72
CDRA03055	5.50	6	28	72
CDRA03955	5.55	6	28	72
CDRA03056	5.60	6	28	72
CDRA03956	5.65	6	28	72
CDRA03057	5.70	6	28	72
CDRA03957	5.75	6	28	72

▶ 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	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		
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
Recommended	◎	◎	○	○												○					

CARBIDE
HSS
DREAM DRILLS GENERAL
DREAM DRILLS SOFT
MULTI-1 DRILLS
GOLD-P DRILLS
SUPER-GP DRILLS
STRAIGHT SHANK DRILLS
MORSE TAPER SHANK DRILLS
NC-SPOTTING DRILLS
CENTER DRILLS

MULTI-1 DRILLS

CDRA03 SERIES

HSS-PM, MULTI-1 DRILLS

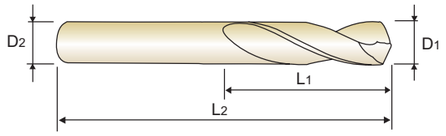
STUB

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HSS PM | 30° | h6 | h7 | 118° | 135° | TiAlN

up to 1.9mm over 1.9mm

p. A40

Unit : mm

EDP No.	Drill Diameter	Shank Diameter	Flute Length	Overall Length
TiAlN	D1	D2	L1	L2
CDRA03058	5.80	6	28	72
CDRA03958	5.85	6	28	72
CDRA03059	5.90	6	28	72
CDRA03959	5.95	6	28	72
CDRA03060	6.00	6	28	72
CDRA03061	6.10	8	31	75
CDRA03062	6.20	8	31	75
CDRA03063	6.30	8	31	75
CDRA03064	6.40	8	31	75
CDRA03065	6.50	8	31	75
CDRA03066	6.60	8	31	75
CDRA03067	6.70	8	31	75
CDRA03068	6.80	8	34	78
CDRA03069	6.90	8	34	78
CDRA03070	7.00	8	34	78
CDRA03071	7.10	8	34	78
CDRA03072	7.20	8	34	78
CDRA03073	7.30	8	34	78
CDRA03074	7.40	8	34	78
CDRA03075	7.50	8	34	78
CDRA03076	7.60	8	37	81
CDRA03077	7.70	8	37	81
CDRA03078	7.80	8	37	81
CDRA03079	7.90	8	37	81

EDP No.	Drill Diameter	Shank Diameter	Flute Length	Overall Length
TiAlN	D1	D2	L1	L2
CDRA03080	8.00	8	37	81
CDRA03081	8.10	10	37	87
CDRA03082	8.20	10	37	87
CDRA03083	8.30	10	37	87
CDRA03084	8.40	10	37	87
CDRA03085	8.50	10	37	87
CDRA03086	8.60	10	40	90
CDRA03087	8.70	10	40	90
CDRA03088	8.80	10	40	90
CDRA03089	8.90	10	40	90
CDRA03090	9.00	10	40	90
CDRA03091	9.10	10	40	90
CDRA03092	9.20	10	40	90
CDRA03093	9.30	10	40	90
CDRA03094	9.40	10	40	90
CDRA03095	9.50	10	40	90
CDRA03096	9.60	10	43	93
CDRA03097	9.70	10	43	93
CDRA03098	9.80	10	43	93
CDRA03099	9.90	10	43	93
CDRA03100	10.00	10	43	93
CDRA03101	10.10	12	43	100
CDRA03102	10.20	12	43	100
CDRA03103	10.30	12	43	100

▶ 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	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		
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
Recommended	◎	◎	○	○												○					

MULTI-1 DRILLS

CDRA03 SERIES

HSS-PM, MULTI-1 DRILLS

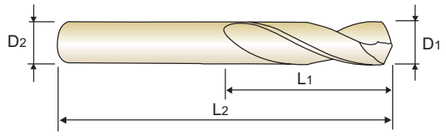
STUB

▶ **Application** : Structural steels, Carbon steels, Alloy steels, Pre-hardened steels, Mold steels, Stainless steels, Hardened steels(HRc30~45), Cast iron, Aluminum alloys, Nonferrous alloys, Titanium.

▶ **Advantage** : Point shape to maximize self-centering.
Flute design for the best chip evacuation.
Premium powder materials with excellent toughness.







HSS PM | 30° | h6 | h7 | 118° | 135° | TiAlN

up to 1.9mm over 1.9mm

p. A40

Unit : mm

EDP No.	Drill Diameter	Shank Diameter	Flute Length	Overall Length
TiAlN	D_1	D_2	L_1	L_2
CDRA03104	10.40	12	43	100
CDRA03105	10.50	12	43	100
CDRA03106	10.60	12	43	100
CDRA03107	10.70	12	47	104
CDRA03108	10.80	12	47	104
CDRA03109	10.90	12	47	104
CDRA03110	11.00	12	47	104
CDRA03111	11.10	12	47	104
CDRA03112	11.20	12	47	104
CDRA03113	11.30	12	47	104
CDRA03114	11.40	12	47	104
CDRA03115	11.50	12	47	104
CDRA03116	11.60	12	47	104
CDRA03117	11.70	12	47	104

EDP No.	Drill Diameter	Shank Diameter	Flute Length	Overall Length
TiAlN	D_1	D_2	L_1	L_2
CDRA03118	11.80	12	47	104
CDRA03119	11.90	12	51	108
CDRA03120	12.00	12	51	108
CDRA03121	12.10	12	51	108
CDRA03122	12.20	12	51	108
CDRA03123	12.30	12	51	108
CDRA03124	12.40	12	51	108
CDRA03125	12.50	12	51	108
CDRA03126	12.60	12	51	108
CDRA03127	12.70	12	51	108
CDRA03128	12.80	12	51	108
CDRA03129	12.90	12	51	108
CDRA03130	13.00	12	51	108

◎ : 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
Recommended	◎	◎	○			◎	○					○		◎	○					

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
Recommended	◎	◎	○	○												○					

MULTI-1 DRILLS

CDRA04 SERIES

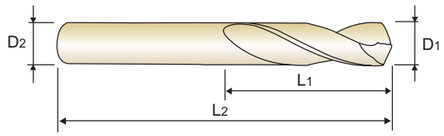
HSS-PM, MULTI-1 DRILLS

JOBBER

▶ **Application** : Structural steels, Carbon steels, Alloy steels, Pre-hardened steels, Mold steels, Stainless steels, Hardened steels(HRc30~45), Cast iron, Aluminum alloys, Nonferrous alloys, Titanium.

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Flute design for the best chip evacuation.
Premium powder materials with excellent toughness.





HSS PM | 30° | h6 | h7 | 135° | TiAlN

p. A40

Unit : mm

EDP No.	Drill Diameter	Shank Diameter	Flute Length	Overall Length
TiAlN	D_1	D_2	L_1	L_2
CDRA04020	2.0	3	24	56
CDRA04021	2.1	3	24	56
CDRA04022	2.2	3	25	56
CDRA04023	2.3	3	25	56
CDRA04024	2.4	3	30	61
CDRA04025	2.5	3	30	61
CDRA04026	2.6	3	30	61
CDRA04027	2.7	3	33	64
CDRA04028	2.8	3	33	64
CDRA04029	2.9	3	33	64
CDRA04030	3.0	3	33	64
CDRA04031	3.1	4	36	68
CDRA04032	3.2	4	36	68
CDRA04033	3.3	4	36	68
CDRA04034	3.4	4	39	71
CDRA04035	3.5	4	39	71
CDRA04036	3.6	4	39	71
CDRA04037	3.7	4	39	71
CDRA04038	3.8	4	43	75
CDRA04039	3.9	4	43	75
CDRA04040	4.0	4	43	75
CDRA04041	4.1	6	43	85
CDRA04042	4.2	6	43	85
CDRA04043	4.3	6	47	89

EDP No.	Drill Diameter	Shank Diameter	Flute Length	Overall Length
TiAlN	D_1	D_2	L_1	L_2
CDRA04044	4.4	6	47	89
CDRA04045	4.5	6	47	89
CDRA04046	4.6	6	47	89
CDRA04047	4.7	6	47	89
CDRA04048	4.8	6	52	94
CDRA04049	4.9	6	52	94
CDRA04050	5.0	6	52	94
CDRA04051	5.1	6	52	94
CDRA04052	5.2	6	52	94
CDRA04053	5.3	6	52	94
CDRA04054	5.4	6	57	99
CDRA04055	5.5	6	57	99
CDRA04056	5.6	6	57	99
CDRA04057	5.7	6	57	99
CDRA04058	5.8	6	57	99
CDRA04059	5.9	6	57	99
CDRA04060	6.0	6	57	99
CDRA04061	6.1	8	63	107
CDRA04062	6.2	8	63	107
CDRA04063	6.3	8	63	107
CDRA04064	6.4	8	63	107
CDRA04065	6.5	8	63	107
CDRA04066	6.6	8	63	107
CDRA04067	6.7	8	63	107

▶ 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	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		
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
Recommended	◎	◎	○	○												○					

MULTI-1 DRILLS

CDRA04 SERIES

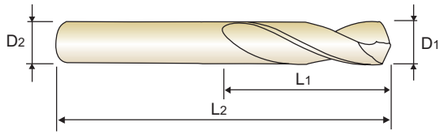
HSS-PM, MULTI-1 DRILLS

JOBBER

▶ **Application** : Structural steels, Carbon steels, Alloy steels, Pre-hardened steels, Mold steels, Stainless steels, Hardened steels(HRc30~45), Cast iron, Aluminum alloys, Nonferrous alloys, Titanium.

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Flute design for the best chip evacuation.
Premium powder materials with excellent toughness.





HSS PM | 30° | h6 | h7 | 135° | TiAlN

p. A40

Unit : mm

EDP No.	Drill Diameter	Shank Diameter	Flute Length	Overall Length
TiAlN	D_1	D_2	L_1	L_2
CDRA04068	6.8	8	69	113
CDRA04069	6.9	8	69	113
CDRA04070	7.0	8	69	113
CDRA04071	7.1	8	69	113
CDRA04072	7.2	8	69	113
CDRA04073	7.3	8	69	113
CDRA04074	7.4	8	69	113
CDRA04075	7.5	8	69	113
CDRA04076	7.6	8	75	119
CDRA04077	7.7	8	75	119
CDRA04078	7.8	8	75	119
CDRA04079	7.9	8	75	119
CDRA04080	8.0	8	75	119
CDRA04081	8.1	10	75	125
CDRA04082	8.2	10	75	125
CDRA04083	8.3	10	75	125
CDRA04084	8.4	10	75	125
CDRA04085	8.5	10	75	125
CDRA04086	8.6	10	81	131
CDRA04087	8.7	10	81	131
CDRA04088	8.8	10	81	131
CDRA04089	8.9	10	81	131
CDRA04090	9.0	10	81	131
CDRA04091	9.1	10	81	131

EDP No.	Drill Diameter	Shank Diameter	Flute Length	Overall Length
TiAlN	D_1	D_2	L_1	L_2
CDRA04092	9.2	10	81	131
CDRA04093	9.3	10	81	131
CDRA04094	9.4	10	81	131
CDRA04095	9.5	10	81	131
CDRA04096	9.6	10	87	137
CDRA04097	9.7	10	87	137
CDRA04098	9.8	10	87	137
CDRA04099	9.9	10	87	137
CDRA04100	10.0	10	87	137
CDRA04101	10.1	12	87	144
CDRA04102	10.2	12	87	144
CDRA04103	10.3	12	87	144
CDRA04104	10.4	12	87	144
CDRA04105	10.5	12	87	144
CDRA04106	10.6	12	87	144
CDRA04107	10.7	12	94	151
CDRA04108	10.8	12	94	151
CDRA04109	10.9	12	94	151
CDRA04110	11.0	12	94	151
CDRA04111	11.1	12	94	151
CDRA04112	11.2	12	94	151
CDRA04113	11.3	12	94	151
CDRA04114	11.4	12	94	151
CDRA04115	11.5	12	94	151

▶ 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	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		
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
Recommended	◎	◎	○	○												○					

CARBIDE
HSS
DREAM DRILLS GENERAL
DREAM DRILLS SOFT
MULTI-1 DRILLS
GOLD-P DRILLS
SUPER-GP DRILLS
STRAIGHT SHANK DRILLS
MORSE TAPER SHANK DRILLS
NC-SPOTTING DRILLS
CENTER DRILLS

MULTI-1 DRILLS

CDRA04 SERIES

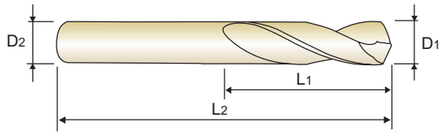
HSS-PM, MULTI-1 DRILLS

JOBBER

▶ **Application** : Structural steels, Carbon steels, Alloy steels, Pre-hardened steels, Mold steels, Stainless steels, Hardened steels(HRc30~45), Cast iron, Aluminum alloys, Nonferrous alloys, Titanium.

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Premium powder materials with excellent toughness.





HSS PM | 30° | h6 | h7 | 135° | TiAlN

p. A40

Unit : mm

EDP No.	Drill Diameter	Shank Diameter	Flute Length	Overall Length
TiAlN	D_1	D_2	L_1	L_2
CDRA04116	11.6	12	94	151
CDRA04117	11.7	12	94	151
CDRA04118	11.8	12	94	151
CDRA04119	11.9	12	101	158
CDRA04120	12.0	12	101	158
CDRA04121	12.1	12	101	158
CDRA04122	12.2	12	101	158
CDRA04123	12.3	12	101	158

EDP No.	Drill Diameter	Shank Diameter	Flute Length	Overall Length
TiAlN	D_1	D_2	L_1	L_2
CDRA04124	12.4	12	101	158
CDRA04125	12.5	12	101	158
CDRA04126	12.6	12	101	158
CDRA04127	12.7	12	101	158
CDRA04128	12.8	12	101	158
CDRA04129	12.9	12	101	158
CDRA04130	13.0	12	101	158

◎ : 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
Recommended	◎	◎	○			◎	○					○		◎	○					

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
Recommended	◎	◎	○	○												○					

MULTI-1 DRILLS

RECOMMENDED CUTTING CONDITIONS

CDRA03, CDRA04 SERIES MULTI-1 DRILLS

RPM = rev./min.
FEED = mm/rev.

ISO	VDI 3323	Material Description	Vc (m/min)	Parameter	Drill Diameter (mm) 1.0	Vc (m/min)	Parameter	Drill Diameter (mm) 2.0	3.0	4.0	5.0
P	1	Non-alloy steel	30	RPM	9550	40	RPM	6370	4240	3180	2550
				FEED	0.01~0.03		FEED	0.03~0.06	0.08~0.12	0.09~0.15	0.12~0.18
	2		28	RPM	8910	35	RPM	5570	3710	2790	2230
				FEED	0.01~0.03		FEED	0.03~0.06	0.08~0.12	0.09~0.15	0.12~0.18
	3		28	RPM	8910	35	RPM	5570	3710	2790	2230
				FEED	0.01~0.03		FEED	0.03~0.06	0.08~0.12	0.09~0.15	0.12~0.18
	6	Low alloy steel	28	RPM	8910	35	RPM	5570	3710	2790	2230
				FEED	0.01~0.03		FEED	0.03~0.06	0.08~0.12	0.09~0.15	0.12~0.18
	7		23	RPM	7320	30	RPM	4770	3180	2390	1910
				FEED	0.01~0.03		FEED	0.03~0.05	0.06~0.10	0.07~0.13	0.10~0.16
	8		20	RPM	6370	25	RPM	3980	2650	1990	1590
				FEED	0.01-0.02		FEED	0.02-0.05	0.03-0.07	0.04-0.10	0.06-0.12
	9		15	RPM	4770	20	RPM	3180	2120	1590	1270
				FEED	0.01-0.02		FEED	0.02-0.05	0.03-0.07	0.04-0.10	0.06-0.12
M	12	Stainless steel	15	RPM	4770	20	RPM	3180	2120	1590	1270
				FEED	0.01~0.03		FEED	0.03-0.07	0.05-0.09	0.06-0.12	0.09-0.15
	14		13	RPM	4140	15	RPM	2390	1590	1190	950
				FEED	0.01-0.02		FEED	0.02-0.05	0.03-0.07	0.04-0.10	0.06-0.12
K	15	Grey cast iron	30	RPM	9550	40	RPM	6370	4240	3180	2550
				FEED	0.02~0.04		FEED	0.04~0.10	0.07~0.13	0.09~0.15	0.12~0.18
N	21	Aluminum-wrought alloy	68	RPM	21650	90	RPM	14320	9550	7160	5730
				FEED	0.09~0.13		FEED	0.13~0.17	0.23~0.27	0.27~0.33	0.33~0.39
	22		68	RPM	21650	90	RPM	14320	9550	7160	5730
				FEED	0.09~0.13		FEED	0.13~0.17	0.23~0.27	0.27~0.33	0.33~0.39
	23	Aluminum-cast, alloyed	60	RPM	19100	80	RPM	12730	8490	6370	5090
				FEED	0.09~0.13		FEED	0.13~0.17	0.23~0.27	0.27~0.33	0.33~0.39
	24		55	RPM	17510	70	RPM	11140	7430	5570	4460
				FEED	0.06~0.10		FEED	0.10~0.14	0.15~0.19	0.20~0.26	0.24~0.30
S	36	Titanium Alloys	5	RPM	1590	5	RPM	800	530	400	320
				FEED	0.01~0.02		FEED	0.02~0.05	0.03~0.07	0.04~0.08	0.06~0.12

ISO	VDI 3323	Material Description	Vc (m/min)	Parameter	Drill Diameter (mm) 6.0	8.0	10.0	12.0	13.0
P	1	Non-alloy steel	40	RPM	2120	1590	1270	1060	980
				FEED	0.14~0.20	0.18~0.24	0.18~0.28	0.20~0.30	0.20~0.30
	2		35	RPM	1860	1390	1110	930	860
				FEED	0.14~0.20	0.18~0.24	0.18~0.28	0.20~0.30	0.20~0.30
	3		35	RPM	1860	1390	1110	930	860
				FEED	0.14~0.20	0.18~0.24	0.18~0.28	0.20~0.30	0.20~0.30
	6	Low alloy steel	35	RPM	1860	1390	1110	930	860
				FEED	0.14~0.20	0.18~0.24	0.18~0.28	0.20~0.30	0.20~0.30
	7		30	RPM	1590	1190	950	800	730
				FEED	0.12~0.18	0.14~0.20	0.14~0.24	0.16~0.26	0.16~0.26
	8		25	RPM	1330	990	800	660	610
				FEED	0.07-0.13	0.10-0.20	0.12-0.22	0.14~0.24	0.14~0.24
	9		20	RPM	1060	800	640	530	490
				FEED	0.07-0.13	0.10-0.20	0.12-0.22	0.14~0.24	0.14~0.24
M	12	Stainless steel	20	RPM	1060	800	640	530	490
				FEED	0.12-0.18	0.18-0.24	0.20-0.30	0.26-0.36	0.26-0.36
	14		15	RPM	800	600	480	400	370
				FEED	0.07-0.13	0.10-0.20	0.12-0.22	0.14~0.24	0.14~0.24
K	15	Grey cast iron	40	RPM	2120	1590	1270	1060	980
				FEED	0.13~0.19	0.18~0.24	0.20~0.30	0.22~0.32	0.22~0.32
N	21	Aluminum-wrought alloy	90	RPM	4770	3580	2860	2390	2200
				FEED	0.40~0.46	0.45~0.51	0.51~0.61	0.63~0.73	0.63~0.73
	22		90	RPM	4770	3580	2860	2390	2200
				FEED	0.40~0.46	0.45~0.51	0.51~0.61	0.63~0.73	0.63~0.73
	23	Aluminum-cast, alloyed	80	RPM	4240	3180	2550	2120	1960
				FEED	0.40~0.46	0.45~0.51	0.51~0.61	0.63~0.73	0.63~0.73
	24		70	RPM	3710	2790	2230	1860	1710
				FEED	0.28~0.34	0.30~0.36	0.34~0.44	0.36~0.46	0.36~0.46
S	36	Titanium Alloys	5	RPM	270	200	160	130	120
				FEED	0.07~0.13	0.09~0.15	0.12~0.22	0.14~0.24	0.14~0.24

Leading Through Innovation



HSS & HSSCo8

GOLD-P DRILLS

- Same Performance as Full TiN-coated Drills

SELECTION GUIDE

HOLEMAKING TOOLS

SERIES	D1GP123
STANDARD	JIS
LENGTH	REGULAR
SIZE MIN	D1.0
SIZE MAX	D13.0
PAGE	A43
SURFACE TREATMENT	TiN

HSS & HSSCo8
GOLD-P DRILLS

Same Performance as Full TiN-coated Drills



Please visit globalyg1.com/mat for material search

◎ : Excellent ○ : Good

Recommended cutting conditions : p. A46

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		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		Ni or Co Based	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	Hardened steel		Hardened	550	55	
	39			Hardened	630	60	
	40	Chilled Cast Iron		Cast	400	42	
	41	Hardened Cast Iron		Hardened	550	55	

GOLD-P DRILLS

D1GP123 SERIES

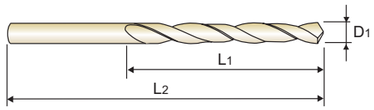
HSS, STRAIGHT SHANK DRILLS GOLD-P COATED

REGULAR

▶**Flute Geometry** : Right hand helix
▶**Point Angle** : 118°
Under 1.6mm : Normal point
1.6mm & over : Split point
▶**Surface Treatment** : TiN-tip coating
▶**Application** : Drilling in Steels, Cast Steels Alloyed and Non-Alloyed, Stainless Steels, Aluminum and Titanium







JIS HSS 20~30° h8 118° TiN p. A46

Unit : mm

EDP No.	Drill Diameter D1	Flute Length L1	Overall Length L2
D1GP123010	1.0	18	40
D1GP123012	1.2	20	42
D1GP123013	1.3	22	45
D1GP123014	1.4	23	48
D1GP123015	1.5	23	48
D1GP123016	1.6	25	50
D1GP123017	1.7	25	50
D1GP123018	1.8	28	52
D1GP123019	1.9	28	52
D1GP123020	2.0	29	55
D1GP123021	2.1	29	55
D1GP123022	2.2	33	58
D1GP123023	2.3	33	58
D1GP123024	2.4	35	61
D1GP123025	2.5	35	61
D1GP123026	2.6	37	64
D1GP123027	2.7	37	64
D1GP123028	2.8	39	67
D1GP123029	2.9	42	71
D1GP123030	3.0	42	71
D1GP123031	3.1	42	71
D1GP123032	3.2	42	71
D1GP123033	3.3	45	73
D1GP123034	3.4	45	73
D1GP123035	3.5	45	73
D1GP123036	3.6	48	76

EDP No.	Drill Diameter D1	Flute Length L1	Overall Length L2
D1GP123037	3.7	48	76
D1GP123038	3.8	48	76
D1GP123039	3.9	51	79
D1GP123040	4.0	54	83
D1GP123041	4.1	54	83
D1GP123042	4.2	54	83
D1GP123043	4.3	54	83
D1GP123044	4.4	56	86
D1GP123045	4.5	56	86
D1GP123046	4.6	56	86
D1GP123047	4.7	59	89
D1GP123048	4.8	59	89
D1GP123049	4.9	62	92
D1GP123050	5.0	62	92
D1GP123051	5.1	62	92
D1GP123052	5.2	64	95
D1GP123053	5.3	64	95
D1GP123054	5.4	64	95
D1GP123055	5.5	64	95
D1GP123056	5.6	67	98
D1GP123057	5.7	67	98
D1GP123058	5.8	67	98
D1GP123059	5.9	67	98
D1GP123060	6.0	70	102
D1GP123061	6.1	70	102
D1GP123062	6.2	70	102

▶ 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	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	◎	◎	◎	○		◎	○	○		○		◎	○	○	○	○	○		○	

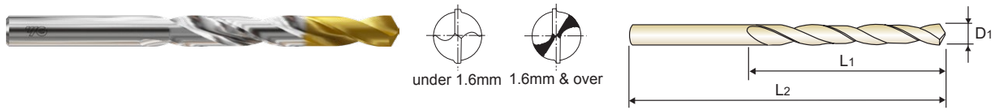
ISO	N										S						H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys				Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	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
Recommended	○	○	○						○							○					

GOLD-P DRILLS

D1GP123 SERIES

HSS, STRAIGHT SHANK DRILLS GOLD-P COATED *REGULAR*

▶**Flute Geometry** : Right hand helix
▶**Point Angle** : 118°
Under 1.6mm : Normal point
1.6mm & over : Split point
▶**Surface Treatment** : TiN-tip coating
▶**Application** : Drilling in Steels, Cast Steels Alloyed and Non-Alloyed, Stainless Steels, Aluminum and Titanium



JIS | HSS | 20~30° | h8 | 118° | TiN p. A46

Unit : mm

EDP No.	Drill Diameter D1	Flute Length L1	Overall Length L2
D1GP123063	6.3	70	102
D1GP123064	6.4	73	105
D1GP123065	6.5	73	105
D1GP123066	6.6	73	105
D1GP123067	6.7	73	105
D1GP123068	6.8	73	105
D1GP123069	6.9	73	105
D1GP123070	7.0	73	105
D1GP123071	7.1	75	108
D1GP123072	7.2	75	108
D1GP123073	7.3	75	108
D1GP123074	7.4	78	111
D1GP123075	7.5	78	111
D1GP123076	7.6	78	111
D1GP123077	7.7	81	114
D1GP123078	7.8	81	114
D1GP123079	7.9	81	114
D1GP123080	8.0	81	114
D1GP123081	8.1	84	117
D1GP123082	8.2	84	117
D1GP123083	8.3	84	117
D1GP123084	8.4	87	121
D1GP123085	8.5	87	121
D1GP123086	8.6	87	121
D1GP123087	8.7	87	121
D1GP123088	8.8	89	124

EDP No.	Drill Diameter D1	Flute Length L1	Overall Length L2
D1GP123089	8.9	89	124
D1GP123090	9.0	89	124
D1GP123091	9.1	89	124
D1GP123092	9.2	92	127
D1GP123093	9.3	92	127
D1GP123094	9.4	92	127
D1GP123095	9.5	92	127
D1GP123096	9.6	95	130
D1GP123097	9.7	95	130
D1GP123098	9.8	95	130
D1GP123099	9.9	95	130
D1GP123100	10.0	95	130
D1GP123101	10.1	98	133
D1GP123102	10.2	98	133
D1GP123103	10.3	98	133
D1GP123104	10.4	98	133
D1GP123105	10.5	100	137
D1GP123106	10.6	100	137
D1GP123107	10.7	100	137
D1GP123108	10.8	103	140
D1GP123109	10.9	103	140
D1GP123110	11.0	103	140
D1GP123111	11.1	103	140
D1GP123112	11.2	106	143
D1GP123113	11.3	106	143
D1GP123114	11.4	106	143

▶ 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	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		
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
Recommended	○	○	○						○							○					

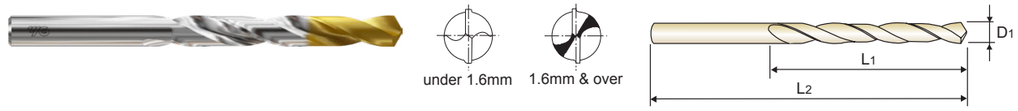
CARBIDE
HSS
DREAM DRILLS GENERAL
DREAM DRILLS SOFT
MULTI-1 DRILLS
GOLD-P DRILLS
SUPER-GP DRILLS
STRAIGHT SHANK DRILLS
MORSE TAPER SHANK DRILLS
NC-SPOTTING DRILLS
CENTER DRILLS

GOLD-P DRILLS

D1GP123 SERIES

HSS, STRAIGHT SHANK DRILLS GOLD-P COATED *REGULAR*

▶**Flute Geometry** : Right hand helix
▶**Point Angle** : 118°
Under 1.6mm : Normal point
1.6mm & over : Split point
▶**Surface Treatment** : TiN-tip coating
▶**Application** : Drilling in Steels, Cast Steels Alloyed and Non-Alloyed, Stainless Steels, Aluminum and Titanium



JIS | HSS | 20~30° | h8 | 118° | TiN p. A46

Unit : mm

EDP No.	Drill Diameter D1	Flute Length L1	Overall Length L2
D1GP123115	11.5	106	143
D1GP123116	11.6	109	146
D1GP123117	11.7	109	146
D1GP123118	11.8	109	146
D1GP123119	11.9	109	146
D1GP123120	12.0	111	149
D1GP123121	12.1	111	149
D1GP123122	12.2	111	149

EDP No.	Drill Diameter D1	Flute Length L1	Overall Length L2
D1GP123123	12.3	111	149
D1GP123124	12.4	114	152
D1GP123125	12.5	114	152
D1GP123126	12.6	114	152
D1GP123127	12.7	114	152
D1GP123128	12.8	114	152
D1GP123129	12.9	114	152
D1GP123130	13.0	114	152

◎ : 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
Recommended	◎	◎	◎	○		◎	○	○		○		◎	○	○	○	○	○		○	

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
Recommended	○	○	○						○							○					

GOLD-P DRILLS

RECOMMENDED CUTTING CONDITIONS

D1GP123 SERIES HSS & HSSCo8 GOLD-P DRILLS

RPM = rev./min.
FEED = mm/rev.

ISO	VDI 3323	Material Description	Vc (m/min)	Parameter	Drill Diameter (mm) 1.0	Vc (m/min)	Parameter	Drill Diameter (mm) 2.0	3.0	4.0	6.0	8.0	10.0	13.0
P	1	Non-alloy steel	28	RPM	8910	40	RPM	6370	4240	3180	2120	1590	1270	980
				FEED	0.01-0.03		FEED	0.04-0.08	0.06-0.10	0.08-0.12	0.12-0.16	0.12-0.18	0.16-0.22	0.18-0.24
	2		25	RPM	7960	35	RPM	5570	3710	2790	1860	1390	1110	860
				FEED	0.01-0.03		FEED	0.04-0.08	0.06-0.10	0.08-0.12	0.12-0.16	0.12-0.18	0.16-0.22	0.18-0.24
	3		20	RPM	6370	30	RPM	4770	3180	2390	1590	1190	950	730
				FEED	0.01-0.03		FEED	0.04-0.08	0.06-0.10	0.08-0.12	0.12-0.16	0.12-0.18	0.16-0.22	0.18-0.24
	4		15	RPM	4770	20	RPM	3180	2120	1590	1060	800	640	490
				FEED	0.01-0.02		FEED	0.02-0.05	0.02-0.06	0.04-0.08	0.04-0.10	0.06-0.12	0.08-0.14	0.12-0.18
	6	Low alloy steel	25	RPM	7960	35	RPM	5570	3710	2790	1860	1390	1110	860
				FEED	0.01-0.03		FEED	0.04-0.08	0.06-0.10	0.08-0.12	0.12-0.16	0.12-0.18	0.16-0.22	0.18-0.24
	7		20	RPM	6370	30	RPM	4770	3180	2390	1590	1190	950	730
				FEED	0.01-0.03		FEED	0.04-0.08	0.06-0.10	0.08-0.12	0.12-0.16	0.12-0.18	0.16-0.22	0.18-0.24
	8		20	RPM	6370	30	RPM	4770	3180	2390	1590	1190	950	730
				FEED	0.01-0.02		FEED	0.02-0.05	0.02-0.06	0.04-0.08	0.04-0.10	0.06-0.12	0.08-0.14	0.12-0.18
	10	High alloyed steel, and tool steel	15	RPM	4770	20	RPM	3180	2120	1590	1060	800	640	490
				FEED	0.01-0.03		FEED	0.04-0.08	0.06-0.10	0.08-0.12	0.12-0.16	0.12-0.18	0.16-0.22	0.18-0.24
M	12	Stainless steel	18	RPM	5730	25	RPM	3980	2650	1990	1330	990	800	610
				FEED	0.01-0.03		FEED	0.04-0.08	0.06-0.10	0.08-0.12	0.12-0.16	0.12-0.18	0.16-0.22	0.18-0.24
	13		15	RPM	4770	20	RPM	3180	2120	1590	1060	800	640	490
				FEED	0.01-0.03		FEED	0.04-0.08	0.06-0.10	0.08-0.12	0.12-0.16	0.12-0.18	0.16-0.22	0.18-0.24
	14		10	RPM	3180	15	RPM	2390	1590	1190	800	600	480	370
				FEED	0.01-0.02		FEED	0.02-0.05	0.02-0.06	0.04-0.08	0.04-0.10	0.06-0.12	0.08-0.14	0.12-0.18
K	15	Grey cast iron	28	RPM	8910	40	RPM	6370	4240	3180	2120	1590	1270	980
				FEED	0.01-0.03		FEED	0.04-0.08	0.06-0.10	0.08-0.12	0.12-0.16	0.12-0.18	0.16-0.22	0.18-0.24
	16		25	RPM	7960	35	RPM	5570	3710	2790	1860	1390	1110	860
				FEED	0.01-0.02		FEED	0.02-0.05	0.02-0.06	0.04-0.08	0.04-0.10	0.06-0.12	0.08-0.14	0.12-0.18
	17	Nodular cast iron	28	RPM	8910	40	RPM	6370	4240	3180	2120	1590	1270	980
				FEED	0.01-0.03		FEED	0.04-0.08	0.06-0.10	0.08-0.12	0.12-0.16	0.12-0.18	0.16-0.22	0.18-0.24
	18		20	RPM	6370	30	RPM	4770	3180	2390	1590	1190	950	730
				FEED	0.01-0.02		FEED	0.02-0.05	0.02-0.06	0.04-0.08	0.04-0.10	0.06-0.12	0.08-0.14	0.12-0.18
	19	Malleable cast iron	25	RPM	7960	35	RPM	5570	3710	2790	1860	1390	1110	860
				FEED	0.01-0.03		FEED	0.04-0.08	0.06-0.10	0.08-0.12	0.12-0.16	0.12-0.18	0.16-0.22	0.18-0.24
	20		20	RPM	6370	30	RPM	4770	3180	2390	1590	1190	950	730
				FEED	0.01-0.02		FEED	0.02-0.05	0.02-0.06	0.04-0.08	0.04-0.10	0.06-0.12	0.08-0.14	0.12-0.18
N	21	Aluminum-wrought alloy	45	RPM	14320	65	RPM	10350	6900	5170	3450	2590	2070	1590
				FEED	0.02-0.05		FEED	0.05-0.09	0.07-0.11	0.12-0.16	0.12-0.18	0.14-0.20	0.16-0.22	0.22-0.28
	22		45	RPM	14320	65	RPM	10350	6900	5170	3450	2590	2070	1590
				FEED	0.02-0.05		FEED	0.05-0.09	0.07-0.11	0.12-0.16	0.12-0.18	0.14-0.20	0.16-0.22	0.22-0.28
	23	Aluminum-cast, alloyed	35	RPM	11140	50	RPM	7960	5310	3980	2650	1990	1590	1220
				FEED	0.02-0.05		FEED	0.05-0.09	0.07-0.11	0.12-0.16	0.12-0.18	0.14-0.20	0.16-0.22	0.22-0.28
	29	Non Metallic Materials	20	RPM	6370	30	RPM	4770	3180	2390	1590	1190	950	730
				FEED	0.01-0.03		FEED	0.04-0.08	0.06-0.10	0.08-0.12	0.12-0.16	0.12-0.18	0.16-0.22	0.18-0.24
S	36	Titanium Alloys	15	RPM	4770	20	RPM	3180	2120	1590	1060	800	640	490
				FEED	0.01-0.02		FEED	0.02-0.05	0.02-0.06	0.04-0.08	0.05-0.09	0.06-0.10	0.07-0.13	0.08-0.14



Leading Through Innovation

SUPER HSS

SUPER-GP DRILLS

- All Applications Regardless of Machining Conditions; Good or Poor

SELECTION GUIDE

SERIES	DSH101
STANDARD	JIS
LENGTH	REGULAR
SIZE MIN	D2.0
SIZE MAX	D13.0
PAGE	A49
SURFACE TREATMENT	Steam Tempered

HOLEMAKING TOOLS

SUPER HSS
SUPER-GP DRILLS

All Applications Regardless of Machining Conditions; Good or Poor



Please visit globalyg1.com/mat for material search

◎ : Excellent ○ : Good

Recommended cutting conditions : p. A51

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		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		Ni or Co Based	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	Hardened steel		Hardened	550	55	
	39			Hardened	630	60	
	40	Chilled Cast Iron		Cast	400	42	
	41	Hardened Cast Iron		Hardened	550	55	

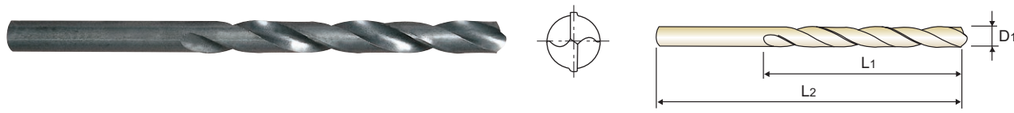
SUPER-GP DRILLS

DSH101 SERIES

SUPER HSS, SUPER-GP DRILLS

REGULAR

▶ Surface treatment: Steam Tempered (Black Oxide Finish)
▶ Excellent tool performance in steels, cast iron, alloy steels and malleable cast iron.
▶ Special HSS improves toughness, wear resistance as well as extends dramatically the tool life.
▶ All applications regardless of machine condition: Good or Poor.



JIS | SUPER HSS | 30° | h8 | 118° | Steam Tempered | p. A51

Unit : mm

EDP No.	Drill Diameter D1	Flute Length L1	Overall Length L2
*DSH101020	2.0	29	55
*DSH101021	2.1	29	55
*DSH101022	2.2	33	58
*DSH101023	2.3	33	58
*DSH101024	2.4	35	61
*DSH101025	2.5	35	61
*DSH101026	2.6	37	64
*DSH101027	2.7	37	64
*DSH101028	2.8	39	67
*DSH101029	2.9	42	71
*DSH101030	3.0	42	71
*DSH101031	3.1	42	71
*DSH101032	3.2	42	71
*DSH101033	3.3	45	73
*DSH101034	3.4	45	73
*DSH101035	3.5	45	73
*DSH101036	3.6	48	76
*DSH101037	3.7	48	76
*DSH101038	3.8	48	76
*DSH101039	3.9	51	79
*DSH101040	4.0	54	83
*DSH101041	4.1	54	83
*DSH101042	4.2	54	83
*DSH101043	4.3	54	83
*DSH101044	4.4	56	86
*DSH101045	4.5	56	86
*DSH101046	4.6	56	86
*DSH101047	4.7	59	89

EDP No.	Drill Diameter D1	Flute Length L1	Overall Length L2
*DSH101048	4.8	59	89
*DSH101049	4.9	62	92
*DSH101050	5.0	62	92
*DSH101051	5.1	62	92
*DSH101052	5.2	64	95
*DSH101053	5.3	64	95
*DSH101054	5.4	64	95
*DSH101055	5.5	64	95
*DSH101056	5.6	67	98
*DSH101057	5.7	67	98
*DSH101058	5.8	67	98
*DSH101059	5.9	67	98
*DSH101060	6.0	70	102
*DSH101061	6.1	70	102
*DSH101062	6.2	70	102
*DSH101063	6.3	70	102
*DSH101064	6.4	73	105
*DSH101065	6.5	73	105
*DSH101066	6.6	73	105
*DSH101067	6.7	73	105
*DSH101068	6.8	73	105
*DSH101069	6.9	73	105
*DSH101070	7.0	73	105
*DSH101071	7.1	75	108
*DSH101072	7.2	75	108
*DSH101073	7.3	75	108
*DSH101074	7.4	78	111
*DSH101075	7.5	78	111

*10pcs per package
** 5pcs per package

▶ 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	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			
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
Recommended	○	○	○						○							○					

SUPER-GP DRILLS

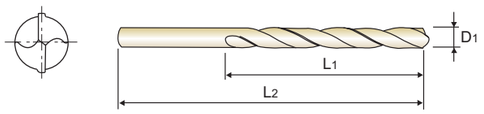
DSH101 SERIES

SUPER HSS, SUPER-GP DRILLS

REGULAR

- ▶ Surface treatment: Steam Tempered (Black Oxide Finish)
- ▶ Excellent tool performance in steels, cast iron, alloy steels and malleable cast iron.
- ▶ Special HSS improves toughness, wear resistance as well as extends dramatically the tool life.
- ▶ All applications regardless of machine condition: Good or Poor.





JIS | SUPER HSS | 30° | h8 | 118° | Steam Tempered

p. A51

Unit : mm

EDP No.	Drill Diameter D1	Flute Length L1	Overall Length L2
*DSH101076	7.6	78	111
*DSH101077	7.7	81	114
*DSH101078	7.8	81	114
*DSH101079	7.9	81	114
*DSH101080	8.0	81	114
*DSH101081	8.1	84	117
*DSH101082	8.2	84	117
*DSH101083	8.3	84	117
**DSH101084	8.4	87	121
**DSH101085	8.5	87	121
**DSH101086	8.6	87	121
**DSH101087	8.7	87	121
**DSH101088	8.8	89	124
**DSH101089	8.9	89	124
**DSH101090	9.0	89	124
**DSH101091	9.1	89	124
**DSH101092	9.2	92	127
**DSH101093	9.3	92	127
**DSH101094	9.4	92	127
**DSH101095	9.5	92	127
**DSH101096	9.6	95	130
**DSH101097	9.7	95	130
**DSH101098	9.8	95	130
**DSH101099	9.9	95	130
**DSH101100	10.0	95	130
**DSH101101	10.1	98	133
**DSH101102	10.2	98	133
**DSH101103	10.3	98	133

EDP No.	Drill Diameter D1	Flute Length L1	Overall Length L2
**DSH101104	10.4	98	133
**DSH101105	10.5	100	137
**DSH101106	10.6	100	137
**DSH101107	10.7	100	137
**DSH101108	10.8	103	140
**DSH101109	10.9	103	140
**DSH101110	11.0	103	140
**DSH101111	11.1	103	140
**DSH101112	11.2	106	143
**DSH101113	11.3	106	143
**DSH101114	11.4	106	143
**DSH101115	11.5	106	143
**DSH101116	11.6	109	146
**DSH101117	11.7	109	146
**DSH101118	11.8	109	146
**DSH101119	11.9	109	146
**DSH101120	12.0	111	149
**DSH101121	12.1	111	149
**DSH101122	12.2	111	149
**DSH101123	12.3	111	149
**DSH101124	12.4	114	152
**DSH101125	12.5	114	152
**DSH101126	12.6	114	152
**DSH101127	12.7	114	152
**DSH101128	12.8	114	152
**DSH101129	12.9	114	152
**DSH101130	13.0	114	152

*10pcs per package
** 5pcs per package

◎ : 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
Recommended	◎	◎	◎	○		◎	○	○		○		○	○	○	○	○	○		○	

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㎫	1050㎫	550	630	400	550
Recommended	○	○	○						○							○					

SUPER-GP DRILLS

RECOMMENDED CUTTING CONDITIONS

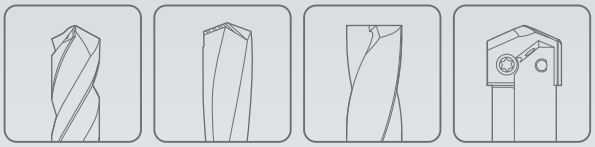
DSH101 SERIES SUPER HSS, SUPER-GP DRILLS

RPM = rev./min.
FEED = mm/rev.

ISO	VDI 3323	Material Description	Vc (m/min)	Parameter	Drill Diameter (mm) 2.0	3.0	4.0	6.0	8.0	10.0	13.0
P	1	Non-alloy steel	30	RPM	4770	3180	2390	1590	1190	950	730
				FEED	0.02-0.04	0.03-0.05	0.04-0.06	0.05-0.08	0.10-0.13	0.11-0.15	0.11-0.17
	2		25	RPM	3980	2650	1990	1330	990	800	610
				FEED	0.02-0.04	0.03-0.05	0.04-0.06	0.05-0.08	0.10-0.13	0.11-0.15	0.11-0.17
	3		20	RPM	3180	2120	1590	1060	800	640	490
				FEED	0.02-0.04	0.03-0.05	0.04-0.06	0.05-0.08	0.10-0.13	0.11-0.15	0.11-0.17
	4		20	RPM	3180	2120	1590	1060	800	640	490
				FEED	0.01-0.02	0.01-0.03	0.02-0.04	0.02-0.05	0.03-0.06	0.03-0.06	0.04-0.10
	6	Low alloy steel	25	RPM	3980	2650	1990	1330	990	800	610
				FEED	0.02-0.04	0.03-0.05	0.04-0.06	0.05-0.08	0.10-0.13	0.11-0.15	0.11-0.17
	7		20	RPM	3180	2120	1590	1060	800	640	490
				FEED	0.02-0.04	0.03-0.05	0.04-0.06	0.05-0.08	0.10-0.13	0.11-0.15	0.11-0.17
	8		20	RPM	3180	2120	1590	1060	800	640	490
				FEED	0.01-0.02	0.01-0.03	0.02-0.04	0.02-0.05	0.03-0.06	0.03-0.06	0.04-0.10
	10	High alloyed steel, and tool steel	15	RPM	2390	1590	1190	800	600	480	370
				FEED	0.02-0.04	0.03-0.05	0.04-0.06	0.05-0.08	0.10-0.13	0.11-0.15	0.11-0.17
M	12	Stainless steel	20	RPM	3180	2120	1590	1060	800	640	490
				FEED	0.02-0.04	0.03-0.05	0.04-0.06	0.05-0.08	0.10-0.13	0.11-0.15	0.11-0.17
	13		15	RPM	2390	1590	1190	800	600	480	370
				FEED	0.02-0.04	0.03-0.05	0.04-0.06	0.05-0.08	0.10-0.13	0.11-0.15	0.11-0.17
	14		10	RPM	1590	1060	800	530	400	320	240
				FEED	0.01-0.02	0.01-0.03	0.02-0.04	0.02-0.05	0.03-0.06	0.03-0.06	0.04-0.10
K	15	Grey cast iron	30	RPM	4770	3180	2390	1590	1190	950	730
				FEED	0.02-0.04	0.03-0.05	0.04-0.06	0.05-0.08	0.10-0.13	0.11-0.15	0.11-0.17
	16		25	RPM	3980	2650	1990	1330	990	800	610
				FEED	0.01-0.02	0.01-0.03	0.02-0.04	0.02-0.05	0.03-0.06	0.03-0.06	0.04-0.10
	17	Nodular cast iron	30	RPM	4770	3180	2390	1590	1190	950	730
				FEED	0.02-0.04	0.03-0.05	0.04-0.06	0.05-0.08	0.10-0.13	0.11-0.15	0.11-0.17
	19	Malleable cast iron	25	RPM	3980	2650	1990	1330	990	800	610
				FEED	0.02-0.04	0.03-0.05	0.04-0.06	0.05-0.08	0.10-0.13	0.11-0.15	0.11-0.17
N	21	Aluminum-wrought alloy	55	RPM	8750	5840	4380	2920	2190	1750	1350
				FEED	0.03-0.06	0.05-0.09	0.07-0.11	0.12-0.16	0.12-0.18	0.14-0.20	0.16-0.22
	22		55	RPM	8750	5840	4380	2920	2190	1750	1350
				FEED	0.03-0.06	0.05-0.09	0.07-0.11	0.12-0.16	0.12-0.18	0.14-0.20	0.16-0.22
	23	Aluminum-cast, alloyed	40	RPM	6370	4240	3180	2120	1590	1270	980
				FEED	0.03-0.06	0.05-0.09	0.07-0.11	0.12-0.16	0.12-0.18	0.14-0.20	0.16-0.22
	29	Non Metallic Materials	20	RPM	3180	2120	1590	1060	800	640	490
				FEED	0.02-0.04	0.03-0.05	0.04-0.06	0.05-0.08	0.10-0.13	0.11-0.15	0.11-0.17
S	36	Titanium Alloys	10	RPM	1590	1060	800	530	400	320	240
				FEED	0.01-0.03	0.02-0.04	0.03-0.05	0.04-0.07	0.05-0.08	0.05-0.09	0.06-0.10

CARBIDE
HSS
DREAM DRILLS GENERAL
DREAM DRILLS SOFT
MULTI-1 DRILLS
GOLD-P DRILLS
SUPER-GP DRILLS
STRAIGHT SHANK DRILLS
MORSE TAPER SHANK DRILLS
NC-SPOTTING DRILLS
CENTER DRILLS

Global Cutting Tool Leader **YG-1**



HOLEMAKING

Leading Through Innovation





HSS

STRAIGHT SHANK DRILLS

- For General Purpose (Soft &Tough Materials)

SELECTION GUIDE

HOLEMAKING TOOLS

SERIES	D1101	D1102
STANDARD	JIS	-
LENGTH	REGULAR	LONG
SIZE MIN	D0.2	D2.0
SIZE MAX	D13.0	D13.0
PAGE	A55	A57
SURFACE TREATMENT	Steam Homo	

HSS & HSSCo8
STRAIGHT SHANK DRILLS

For General Purpose (Soft &Tough Materials)



Please visit globalyg1.com/mat for material search

◎ : Excellent ○ : Good

Recommended cutting conditions : p. A63

ISO	VDI 3323	Material Description	Composition / Structure / Heat Treatment		HB	HRc	D1101	D1102
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		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		Ni or Co Based	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	Hardened steel		Hardened	550	55		
	39			Hardened	630	60		
	40	Chilled Cast Iron		Cast	400	42		
	41	Hardened Cast Iron		Hardened	550	55		

STRAIGHT SHANK DRILLS

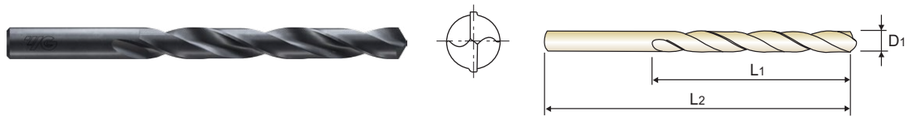
D1101 SERIES

HSS, STRAIGHT SHANK TWIST DRILLS

REGULAR

▶ **Surface treatment** : Steam Homo (Black Oxide Finish)
Bright Finish under 2mm

▶ **Application** : Drilling in steel, cast steel alloyed and non-alloyed, grey cast iron, malleable cast iron



HSS | 20~30° | h8 | 118° | Steam Tempered

p. A63-A64

Unit : mm

EDP No	Drill Diameter D1	Flute Length L1	Overall Length L2
* D1101002	0.2	3	19
* D1101003	0.3	3.5	20
* D1101004	0.4	5.5	24
* D1101005	0.5	7.5	27
* D1101006	0.6	8.5	30
* D1101007	0.7	10	32
* D1101008	0.8	11	34
* D1101009	0.9	13	36
* D1101010	1.0	18	40
* D1101011	1.1	20	42
* D1101012	1.2	20	42
* D1101013	1.3	22	45
* D1101014	1.4	23	48
* D1101015	1.5	23	48
* D1101016	1.6	25	50
* D1101017	1.7	25	50
* D1101018	1.8	28	52
* D1101019	1.9	28	52
D1101020	2.0	29	55
D1101021	2.1	29	55
D1101022	2.2	33	58
D1101023	2.3	33	58
D1101024	2.4	35	61
D1101025	2.5	35	61
D1101026	2.6	37	64
D1101027	2.7	37	64
D1101028	2.8	39	67
D1101029	2.9	42	71
D1101030	3.0	42	71
D1101031	3.1	42	71
D1101032	3.2	42	71
D1101033	3.3	45	73

EDP No	Drill Diameter D1	Flute Length L1	Overall Length L2
D1101034	3.4	45	73
D1101035	3.5	45	73
D1101036	3.6	48	76
D1101037	3.7	48	76
D1101038	3.8	48	76
D1101039	3.9	51	79
D1101040	4.0	54	83
D1101041	4.1	54	83
D1101042	4.2	54	83
D1101043	4.3	54	83
D1101044	4.4	56	86
D1101045	4.5	56	86
D1101046	4.6	56	86
D1101047	4.7	59	89
D1101048	4.8	59	89
D1101049	4.9	62	92
D1101050	5.0	62	92
D1101051	5.1	62	92
D1101052	5.2	64	95
D1101053	5.3	64	95
D1101054	5.4	64	95
D1101055	5.5	64	95
D1101056	5.6	67	98
D1101057	5.7	67	98
D1101058	5.8	67	98
D1101059	5.9	67	98
D1101060	6.0	70	102
D1101061	6.1	70	102
D1101062	6.2	70	102
D1101063	6.3	70	102
D1101064	6.4	73	105
D1101065	6.5	73	105

* Bright Finish

▶ 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	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			
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
Recommended	○	○	○						○							○					

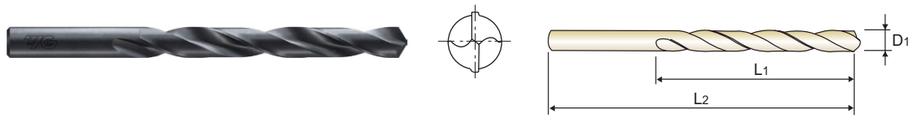
STRAIGHT SHANK DRILLS

D1101 SERIES

HSS, STRAIGHT SHANK TWIST DRILLS

REGULAR

▶ **Surface treatment** : Steam Homo (Black Oxide Finish)
▶ **Application** : Drilling in steel, cast steel alloyed and non-alloyed, grey cast iron, malleable cast iron



HSS | 20~30° | h8 | 118° | Steam Tempered

p. A63-A64

Unit : mm

EDP No	Drill Diameter D1	Flute Length L1	Overall Length L2
D1101066	6.6	73	105
D1101067	6.7	73	105
D1101068	6.8	73	105
D1101069	6.9	73	105
D1101070	7.0	73	105
D1101071	7.1	75	108
D1101072	7.2	75	108
D1101073	7.3	75	108
D1101074	7.4	78	111
D1101075	7.5	78	111
D1101076	7.6	78	111
D1101077	7.7	81	114
D1101078	7.8	81	114
D1101079	7.9	81	114
D1101080	8.0	81	114
D1101081	8.1	84	117
D1101082	8.2	84	117
D1101083	8.3	84	117
D1101084	8.4	87	121
D1101085	8.5	87	121
D1101086	8.6	87	121
D1101087	8.7	87	121
D1101088	8.8	89	124
D1101089	8.9	89	124
D1101090	9.0	89	124
D1101091	9.1	89	124
D1101092	9.2	92	127
D1101093	9.3	92	127
D1101094	9.4	92	127
D1101095	9.5	92	127
D1101096	9.6	95	130
D1101097	9.7	95	130
D1101098	9.8	95	130
D1101099	9.9	95	130
D1101100	10.0	95	130
D1101101	10.1	98	133
D1101102	10.2	98	133
D1101103	10.3	98	133
D1101104	10.4	98	133
D1101105	10.5	100	137
D1101106	10.6	100	137
D1101107	10.7	100	137
D1101108	10.8	103	140
D1101109	10.9	103	140
D1101110	11.0	103	140
D1101111	11.1	103	140
D1101112	11.2	106	143
D1101113	11.3	106	143
D1101114	11.4	106	143
D1101115	11.5	106	143
D1101116	11.6	109	146
D1101117	11.7	109	146
D1101118	11.8	109	146
D1101119	11.9	109	146
D1101120	12.0	111	149
D1101121	12.1	111	149
D1101122	12.2	111	149
D1101123	12.3	111	149
D1101124	12.4	114	152
D1101125	12.5	114	152
D1101126	12.6	114	152
D1101127	12.7	114	152
D1101128	12.8	114	152
D1101129	12.9	114	152
D1101130	13.0	114	152

◎ : Excellent ○ : Good

ISO	P																			
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
Recommended	◎	◎	◎	○		◎	○	○		○		○	○	○	○	○	○		○	

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
Recommended	○	○	○						○							○					

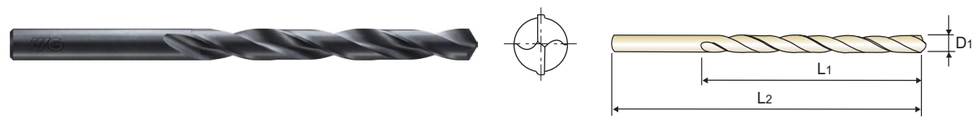
STRAIGHT SHANK DRILLS

D1102 SERIES

HSS, STRAIGHT SHANK DRILLS

LONG

▶ **Surface treatment**: Steam Homo (Black Oxide Finish)
▶ **Application** : Designed for drilling deep holes or deeply located holes. Drills in steel, cast steel alloyed and non-alloyed, grey cast iron, malleable cast iron



HSS | 20~30° | h8 | 118° | Steam Tempered

p. A63-A64

Unit : mm

EDP No	Drill Diameter D1	Flute Length L1	Overall Length L2
D1102220	2.0	75	100
D1102221	2.1	75	100
D1102222	2.2	75	100
D1102223	2.3	75	100
D1102224	2.4	75	100
D1102225	2.5	75	100
D1102226	2.6	75	100
D1102227	2.7	75	100
D1102228	2.8	75	100
D1102229	2.9	75	100
D1102230	3.0	75	100
D1102231	3.1	75	100
D1102232	3.2	75	100
D1102233	3.3	75	100
D1102234	3.4	75	100
D1102235	3.5	75	100
D1102236	3.6	75	100
D1102237	3.7	75	100
D1102238	3.8	75	100
D1102239	3.9	75	100
D1102240	4.0	75	100
D1102241	4.1	75	100
D1102242	4.2	75	100
D1102243	4.3	75	100
D1102244	4.4	75	100
D1102245	4.5	75	100
D1102246	4.6	75	100
D1102247	4.7	75	100
D1102248	4.8	75	100
D1102250	5.0	75	100
D1102251	5.1	75	100
D1102252	5.2	75	100
D1102253	5.3	75	100
D1102254	5.4	75	100
D1102255	5.5	75	100
D1102320	2.0	100	150
D1102321	2.1	100	150
D1102322	2.2	100	150
D1102323	2.3	100	150
D1102324	2.4	100	150
D1102325	2.5	100	150
D1102326	2.6	100	150
D1102327	2.7	100	150
D1102328	2.8	100	150
D1102329	2.9	100	150
D1102330	3.0	100	150
D1102331	3.1	100	150
D1102332	3.2	100	150
D1102333	3.3	100	150
D1102334	3.4	100	150
D1102335	3.5	100	150
D1102336	3.6	100	150
D1102337	3.7	100	150
D1102338	3.8	100	150
D1102339	3.9	100	150
D1102340	4.0	100	150
D1102341	4.1	100	150
D1102342	4.2	100	150

▶ NEXT PAGE

◎ : Excellent ○ : Good

ISO	P																			
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
Recommended	◎	◎	◎	○		◎	○	○		○		○	○	○	○	○	○		○	

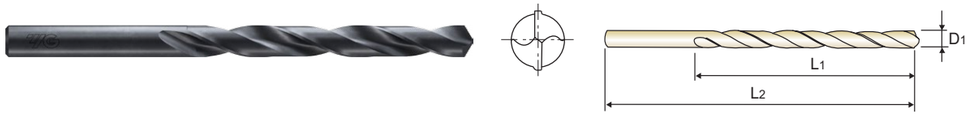
ISO	N										S							H		
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	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
Recommended	○	○	○						○							○					

STRAIGHT SHANK DRILLS

D1102 SERIES

HSS, STRAIGHT SHANK DRILLS — *LONG*

▶**Surface treatment**: Steam Homo (Black Oxide Finish)
▶**Application** : Designed for drilling deep holes or deeply located holes. Drills in steel, cast steel alloyed and non-alloyed, grey cast iron, malleable cast iron



HSS | 20~30° | h8 | 118° | Steam Tempered | p. A63-A64

Unit : mm

EDP No	Drill Diameter D1	Flute Length L1	Overall Length L2
D1102343	4.3	100	150
D1102344	4.4	100	150
D1102345	4.5	100	150
D1102346	4.6	100	150
D1102347	4.7	100	150
D1102348	4.8	100	150
D1102349	4.9	100	150
D1102350	5.0	100	150
D1102351	5.1	100	150
D1102352	5.2	100	150
D1102353	5.3	100	150
D1102354	5.4	100	150
D1102355	5.5	100	150
D1102356	5.6	100	150
D1102357	5.7	100	150
D1102358	5.8	100	150
D1102359	5.9	100	150
D1102360	6.0	100	150
D1102361	6.1	100	150
D1102362	6.2	100	150
D1102363	6.3	100	150
D1102364	6.4	100	150
D1102365	6.5	100	150
D1102366	6.6	100	150
D1102367	6.7	100	150
D1102368	6.8	100	150
D1102369	6.9	100	150
D1102370	7.0	100	150
D1102371	7.1	100	150

EDP No	Drill Diameter D1	Flute Length L1	Overall Length L2
D1102372	7.2	100	150
D1102373	7.3	100	150
D1102374	7.4	100	150
D1102375	7.5	100	150
D1102376	7.6	100	150
D1102377	7.7	100	150
D1102378	7.8	100	150
D1102379	7.9	100	150
D1102380	8.0	100	150
D1102381	8.1	100	150
D1102382	8.2	100	150
D1102383	8.3	100	150
D1102384	8.4	100	150
D1102385	8.5	100	150
D1102386	8.6	100	150
D1102387	8.7	100	150
D1102388	8.8	100	150
D1102389	8.9	100	150
D1102390	9.0	100	150
D1102392	9.2	100	150
D1102393	9.3	100	150
D1102394	9.4	100	150
D1102395	9.5	100	150
D1102396	9.6	100	150
D1102397	9.7	100	150
D1102398	9.8	100	150
D1102600	10.0	100	150
D1102602	10.2	100	150
D1102604	10.4	100	150

▶ 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	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		
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
Recommended	○	○	○						○							○					

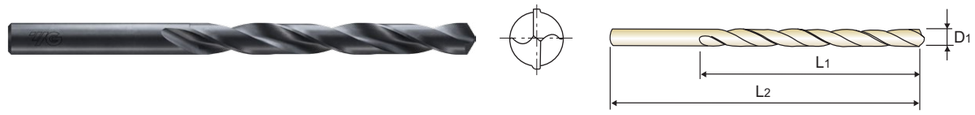
CARBIDE
HSS
DREAM DRILLS GENERAL
DREAM DRILLS SOFT
MULTI-1 DRILLS
GOLD-P DRILLS
SUPER-GP DRILLS
STRAIGHT SHANK DRILLS
MORSE TAPER SHANK DRILLS
NC-SPOTTING DRILLS
CENTER DRILLS

STRAIGHT SHANK DRILLS

D1102 SERIES

HSS, STRAIGHT SHANK DRILLS — *LONG*

▶**Surface treatment**: Steam Homo (Black Oxide Finish)
▶**Application** : Designed for drilling deep holes or deeply located holes. Drills in steel, cast steel alloyed and non-alloyed, grey cast iron, malleable cast iron



HSS | 20~30° | h8 | 118° | Steam Tempered | p. A63-A64

Unit : mm

EDP No	Drill Diameter D1	Flute Length L1	Overall Length L2
D1102605	10.5	100	150
D1102606	10.6	100	150
D1102608	10.8	100	150
D1102610	11.0	100	150
* D1102420	2.0	150	200
* D1102422	2.2	150	200
* D1102424	2.4	150	200
* D1102425	2.5	150	200
* D1102427	2.7	150	200
* D1102428	2.8	150	200
* D1102429	2.9	150	200
* D1102430	3.0	150	200
* D1102432	3.2	150	200
* D1102434	3.4	150	200
* D1102435	3.5	150	200
* D1102436	3.6	150	200
* D1102437	3.7	150	200
* D1102438	3.8	150	200
* D1102439	3.9	150	200
D1102440	4.0	150	200
D1102441	4.1	150	200
D1102442	4.2	150	200
D1102443	4.3	150	200
D1102444	4.4	150	200
D1102445	4.5	150	200
D1102446	4.6	150	200
D1102447	4.7	150	200
D1102448	4.8	150	200
D1102449	4.9	150	200

EDP No	Drill Diameter D1	Flute Length L1	Overall Length L2
D1102450	5.0	150	200
D1102451	5.1	150	200
D1102452	5.2	150	200
D1102453	5.3	150	200
D1102454	5.4	150	200
D1102455	5.5	150	200
D1102456	5.6	150	200
D1102457	5.7	150	200
D1102458	5.8	150	200
D1102459	5.9	150	200
D1102460	6.0	150	200
D1102461	6.1	150	200
D1102462	6.2	150	200
D1102463	6.3	150	200
D1102464	6.4	150	200
D1102465	6.5	150	200
D1102466	6.6	150	200
D1102467	6.7	150	200
D1102468	6.8	150	200
D1102469	6.9	150	200
D1102470	7.0	150	200
D1102471	7.1	150	200
D1102472	7.2	150	200
D1102473	7.3	150	200
D1102474	7.4	150	200
D1102475	7.5	150	200
D1102476	7.6	150	200
D1102477	7.7	150	200
D1102478	7.8	150	200

* Bright Finish

▶ 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	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	◎	◎	◎	○		◎	○	○		○		○	○	○	○	○	○		○		

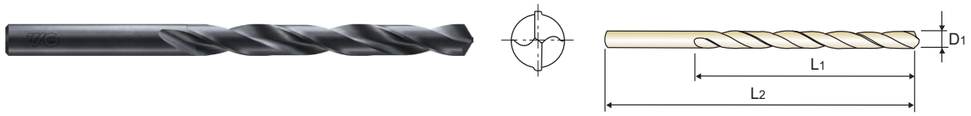
ISO	N										S							H		
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	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
Recommended	○	○	○						○							○					

STRAIGHT SHANK DRILLS

D1102 SERIES

HSS, STRAIGHT SHANK DRILLS — *LONG*

▶**Surface treatment**: Steam Homo (Black Oxide Finish)
▶**Application** : Designed for drilling deep holes or deeply located holes. Drills in steel, cast steel alloyed and non-alloyed, grey cast iron, malleable cast iron



HSS | 20~30° | h8 | 118° | Steam Tempered p. A63-A64

Unit : mm

EDP No	Drill Diameter D1	Flute Length L1	Overall Length L2
D1102479	7.9	150	200
D1102480	8.0	150	200
D1102481	8.1	150	200
D1102482	8.2	150	200
D1102483	8.3	150	200
D1102484	8.4	150	200
D1102485	8.5	150	200
D1102486	8.6	150	200
D1102487	8.7	150	200
D1102488	8.8	150	200
D1102489	8.9	150	200
D1102490	9.0	150	200
D1102491	9.1	150	200
D1102492	9.2	150	200
D1102493	9.3	150	200
D1102494	9.4	150	200
D1102495	9.5	150	200
D1102496	9.6	150	200
D1102497	9.7	150	200
D1102498	9.8	150	200
D1102499	9.9	150	200
D1102700	10.0	150	200
D1102702	10.2	150	200
D1102704	10.4	150	200
D1102705	10.5	150	200
D1102706	10.6	150	200
D1102707	10.7	150	200
D1102708	10.8	150	200
D1102710	11.0	150	200
D1102712	11.2	150	200
D1102714	11.4	150	200

EDP No	Drill Diameter D1	Flute Length L1	Overall Length L2
D1102715	11.5	150	200
D1102716	11.6	150	200
D1102718	11.8	150	200
D1102720	12.0	150	200
D1102722	12.2	150	200
D1102724	12.4	150	200
D1102725	12.5	150	200
D1102726	12.6	150	200
D1102728	12.8	150	200
D1102730	13.0	150	200
D1102536	3.6	200	250
D1102540	4.0	200	250
D1102544	4.4	200	250
D1102545	4.5	200	250
D1102546	4.6	200	250
D1102548	4.8	200	250
D1102550	5.0	200	250
D1102551	5.1	200	250
D1102552	5.2	200	250
D1102553	5.3	200	250
D1102554	5.4	200	250
D1102555	5.5	200	250
D1102556	5.6	200	250
D1102558	5.8	200	250
D1102560	6.0	200	250
D1102561	6.1	200	250
D1102562	6.2	200	250
D1102563	6.3	200	250
D1102564	6.4	200	250
D1102565	6.5	200	250
D1102566	6.6	200	250

▶ 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	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		
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
Recommended	○	○	○						○							○					

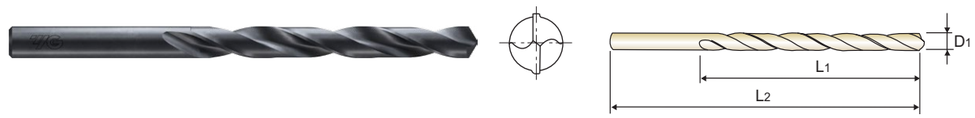
CARBIDE
HSS
DREAM DRILLS GENERAL
DREAM DRILLS SOFT
MULTI-1 DRILLS
GOLD-P DRILLS
SUPER-GP DRILLS
STRAIGHT SHANK DRILLS
MORSE TAPER SHANK DRILLS
NC-SPOTTING DRILLS
CENTER DRILLS

STRAIGHT SHANK DRILLS

D1102 SERIES

HSS, STRAIGHT SHANK DRILLS — *LONG*

▶**Surface treatment**: Steam Homo (Black Oxide Finish)
▶**Application** : Designed for drilling deep holes or deeply located holes. Drills in steel, cast steel alloyed and non-alloyed, grey cast iron, malleable cast iron



HSS | 20~30° | h8 | 118° | Steam Tempered p. A63-A64

Unit : mm

EDP No	Drill Diameter D1	Flute Length L1	Overall Length L2
D1102567	6.7	200	250
D1102568	6.8	200	250
D1102569	6.9	200	250
D1102570	7.0	200	250
D1102571	7.1	200	250
D1102572	7.2	200	250
D1102573	7.3	200	250
D1102574	7.4	200	250
D1102575	7.5	200	250
D1102576	7.6	200	250
D1102577	7.7	200	250
D1102578	7.8	200	250
D1102579	7.9	200	250
D1102580	8.0	200	250
D1102581	8.1	200	250
D1102582	8.2	200	250
D1102583	8.3	200	250
D1102584	8.4	200	250
D1102585	8.5	200	250
D1102586	8.6	200	250
D1102587	8.7	200	250
D1102588	8.8	200	250
D1102589	8.9	200	250
D1102590	9.0	200	250
D1102591	9.1	200	250
D1102592	9.2	200	250
D1102593	9.3	200	250
D1102594	9.4	200	250
D1102595	9.5	200	250
D1102596	9.6	200	250
D1102597	9.7	200	250

EDP No	Drill Diameter D1	Flute Length L1	Overall Length L2
D1102598	9.8	200	250
D1102599	9.9	200	250
D1102800	10.0	200	250
D1102801	10.1	200	250
D1102802	10.2	200	250
D1102803	10.3	200	250
D1102804	10.4	200	250
D1102805	10.5	200	250
D1102806	10.6	200	250
D1102807	10.7	200	250
D1102808	10.8	200	250
D1102809	10.9	200	250
D1102810	11.0	200	250
D1102811	11.1	200	250
D1102812	11.2	200	250
D1102813	11.3	200	250
D1102814	11.4	200	250
D1102815	11.5	200	250
D1102816	11.6	200	250
D1102817	11.7	200	250
D1102818	11.8	200	250
D1102819	11.9	200	250
D1102820	12.0	200	250
D1102821	12.1	200	250
D1102822	12.2	200	250
D1102823	12.3	200	250
D1102824	12.4	200	250
D1102825	12.5	200	250
D1102826	12.6	200	250
D1102827	12.7	200	250
D1102828	12.8	200	250

▶ 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	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	◎	◎	◎	○		◎	○	○		○		○	○	○	○	○	○		○	

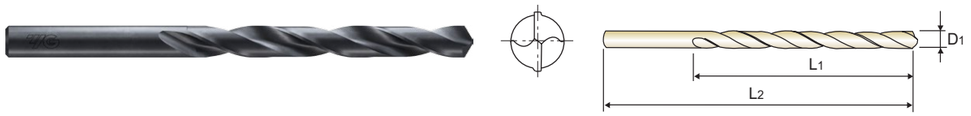
ISO	N										S							H		
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	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
Recommended	○	○	○						○							○					

STRAIGHT SHANK DRILLS

D1102 SERIES

HSS, STRAIGHT SHANK DRILLS — *LONG*

▶**Surface treatment**: Steam Homo (Black Oxide Finish)
▶**Application** : Designed for drilling deep holes or deeply located holes. Drills in steel, cast steel alloyed and non-alloyed, grey cast iron, malleable cast iron



HSS | 20~30° | h8 | 118° | Steam Tempered

p. A63-A64

Unit : mm

EDP No	Drill Diameter D1	Flute Length L1	Overall Length L2
D1102829	12.9	200	250
D1102830	13.0	200	250
D1102650	5.0	200	300
D1102654	5.4	200	300
D1102655	5.5	200	300
D1102656	5.6	200	300
D1102660	6.0	200	300
D1102662	6.2	200	300
D1102664	6.4	200	300
D1102665	6.5	200	300
D1102666	6.6	200	300
D1102670	7.0	200	300
D1102672	7.2	200	300
D1102674	7.4	200	300
D1102675	7.5	200	300
D1102676	7.6	200	300
D1102678	7.8	200	300
D1102680	8.0	200	300
D1102682	8.2	200	300
D1102684	8.4	200	300
D1102685	8.5	200	300
D1102686	8.6	200	300
D1102687	8.7	200	300
D1102688	8.8	200	300
D1102690	9.0	200	300
D1102692	9.2	200	300
D1102694	9.4	200	300
D1102695	9.5	200	300
D1102696	9.6	200	300
D1102698	9.8	200	300
D1102900	10.0	200	300
D1102901	10.1	200	300

EDP No	Drill Diameter D1	Flute Length L1	Overall Length L2
D1102902	10.2	200	300
D1102903	10.3	200	300
D1102904	10.4	200	300
D1102905	10.5	200	300
D1102906	10.6	200	300
D1102907	10.7	200	300
D1102908	10.8	200	300
D1102909	10.9	200	300
D1102910	11.0	200	300
D1102911	11.1	200	300
D1102912	11.2	200	300
D1102913	11.3	200	300
D1102914	11.4	200	300
D1102915	11.5	200	300
D1102916	11.6	200	300
D1102917	11.7	200	300
D1102918	11.8	200	300
D1102919	11.9	200	300
D1102920	12.0	200	300
D1102921	12.1	200	300
D1102922	12.2	200	300
D1102923	12.3	200	300
D1102924	12.4	200	300
D1102925	12.5	200	300
D1102926	12.6	200	300
D1102927	12.7	200	300
D1102928	12.8	200	300
D1102929	12.9	200	300
D1102930	13.0	200	300
D1102A20	12.0	250	350
D1102A30	13.0	250	350

◎ : 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
Recommended	◎	◎	◎	○		◎	○	○		○		○	○	○	○	○	○		○	

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
Recommended	○	○	○						○							○					

STRAIGHT SHANK DRILLS

RECOMMENDED CUTTING CONDITIONS

D1101, D1102 SERIES — **HSS & HSSCo8 STRAIGHT SHANK DRILLS**

RPM = rev./min.
FEED = mm/rev.

ISO	VDI 3323	Material Description	Vc (m/min)	Parameter	Drill Diameter (mm) 1.0	Vc (m/min)	Parameter	Drill Diameter (mm) 2.0	3.0	4.0	6.0	8.0	10.0
P	1	Non-alloy steel	25	RPM	7960	30	RPM	4770	3180	2390	1590	1190	950
				FEED	0.01-0.03		FEED	0.02-0.04	0.03-0.05	0.04-0.06	0.05-0.08	0.10-0.13	0.11-0.15
	2		20	RPM	6370	25	RPM	3980	2650	1990	1330	990	800
				FEED	0.01-0.03		FEED	0.02-0.04	0.03-0.05	0.04-0.06	0.05-0.08	0.10-0.13	0.11-0.15
	3		15	RPM	4770	20	RPM	3180	2120	1590	1060	800	640
				FEED	0.01-0.03		FEED	0.02-0.04	0.03-0.05	0.04-0.06	0.05-0.08	0.10-0.13	0.11-0.15
	4		15	RPM	4770	20	RPM	3180	2120	1590	1060	800	640
				FEED	0.01-0.02		FEED	0.01-0.02	0.01-0.03	0.02-0.04	0.02-0.05	0.03-0.06	0.03-0.06
	6	Low alloy steel	20	RPM	6370	25	RPM	3980	2650	1990	1330	990	800
				FEED	0.01-0.03		FEED	0.02-0.04	0.03-0.05	0.04-0.06	0.05-0.08	0.10-0.13	0.11-0.15
	7		15	RPM	4770	20	RPM	3180	2120	1590	1060	800	640
				FEED	0.01-0.03		FEED	0.02-0.04	0.03-0.05	0.04-0.06	0.05-0.08	0.10-0.13	0.11-0.15
	8		15	RPM	4770	20	RPM	3180	2120	1590	1060	800	640
				FEED	0.01-0.02		FEED	0.01-0.02	0.01-0.03	0.02-0.04	0.02-0.05	0.03-0.06	0.03-0.06
	10	High alloyed steel, and tool steel	10	RPM	3180	15	RPM	2390	1590	1190	800	600	480
				FEED	0.01-0.03		FEED	0.02-0.04	0.03-0.05	0.04-0.06	0.05-0.08	0.10-0.13	0.11-0.15
M	12	Stainless steel	15	RPM	4770	20	RPM	3180	2120	1590	1060	800	640
				FEED	0.01-0.03		FEED	0.02-0.04	0.03-0.05	0.04-0.06	0.05-0.08	0.10-0.13	0.11-0.15
	13		10	RPM	3180	15	RPM	2390	1590	1190	800	600	480
				FEED	0.01-0.03		FEED	0.02-0.04	0.03-0.05	0.04-0.06	0.05-0.08	0.10-0.13	0.11-0.15
	14		8	RPM	2550	10	RPM	1590	1060	800	530	400	320
				FEED	0.01-0.02		FEED	0.01-0.02	0.01-0.03	0.02-0.04	0.02-0.05	0.03-0.06	0.03-0.06
K	15	Grey cast iron	25	RPM	7960	30	RPM	4770	3180	2390	1590	1190	950
				FEED	0.01-0.03		FEED	0.02-0.04	0.03-0.05	0.04-0.06	0.05-0.08	0.10-0.13	0.11-0.15
	16		20	RPM	6370	25	RPM	3980	2650	1990	1330	990	800
				FEED	0.01-0.02		FEED	0.01-0.02	0.01-0.03	0.02-0.04	0.02-0.05	0.03-0.06	0.03-0.06
	17	Nodular cast iron	25	RPM	7960	30	RPM	4770	3180	2390	1590	1190	950
				FEED	0.01-0.03		FEED	0.02-0.04	0.03-0.05	0.04-0.06	0.05-0.08	0.10-0.13	0.11-0.15
	19	Malleable cast iron	20	RPM	6370	25	RPM	3980	2650	1990	1330	990	800
				FEED	0.01-0.03		FEED	0.02-0.04	0.03-0.05	0.04-0.06	0.05-0.08	0.10-0.13	0.11-0.15
N	21	Aluminum-wrought alloy	45	RPM	14320	55	RPM	8750	5840	4380	2920	2190	1750
				FEED	0.02-0.04		FEED	0.03-0.06	0.05-0.09	0.07-0.11	0.12-0.16	0.12-0.18	0.14-0.20
	22		45	RPM	14320	55	RPM	8750	5840	4380	2920	2190	1750
				FEED	0.02-0.04		FEED	0.03-0.06	0.05-0.09	0.07-0.11	0.12-0.16	0.12-0.18	0.14-0.20
	23	Aluminum-cast, alloyed	30	RPM	9550	40	RPM	6370	4240	3180	2120	1590	1270
				FEED	0.02-0.04		FEED	0.03-0.06	0.05-0.09	0.07-0.11	0.12-0.16	0.12-0.18	0.14-0.20
	29	Non Metallic Materials	15	RPM	4770	20	RPM	3180	2120	1590	1060	800	640
				FEED	0.01-0.03		FEED	0.02-0.04	0.03-0.05	0.04-0.06	0.05-0.08	0.10-0.13	0.11-0.15
S	36	Titanium Alloys	7	RPM	2230	10	RPM	1590	1060	800	530	400	320
				FEED	0.01-0.03		FEED	0.01-0.03	0.02-0.04	0.03-0.05	0.04-0.07	0.05-0.08	0.05-0.09

▶ NEXT PAGE

STRAIGHT SHANK DRILLS

RECOMMENDED CUTTING CONDITIONS

D1101, D1102 SERIES — HSS & HSSCo8 STRAIGHT SHANK DRILLS

RPM = rev./min.
FEED = mm/rev.

ISO	VDI	Material Description	Vc (m/min)	Parameter	Drill Diameter (mm)				
					13.0	16.0	18.0	20.0	30.0
P	1	Non-alloy steel	30	RPM	730	600	530	480	320
				FEED	0.11-0.17	0.12-0.18	0.14-0.20	0.19-0.25	0.22-0.28
	2		25	RPM	610	500	440	400	270
				FEED	0.11-0.17	0.12-0.18	0.14-0.20	0.19-0.25	0.22-0.28
	3		20	RPM	490	400	350	320	210
				FEED	0.11-0.17	0.12-0.18	0.14-0.20	0.19-0.25	0.22-0.28
	4		20	RPM	490	400	350	320	210
				FEED	0.04-0.10	0.06-0.12	0.08-0.14	0.10-0.16	0.12-0.18
	6	Low alloy steel	25	RPM	610	500	440	400	270
				FEED	0.11-0.17	0.12-0.18	0.14-0.20	0.19-0.25	0.22-0.28
	7		20	RPM	490	400	350	320	210
				FEED	0.11-0.17	0.12-0.18	0.14-0.20	0.19-0.25	0.22-0.28
	8		20	RPM	490	400	350	320	210
				FEED	0.04-0.10	0.06-0.12	0.08-0.14	0.10-0.16	0.12-0.18
	10	High alloyed steel, and tool steel	15	RPM	370	300	270	240	160
				FEED	0.11-0.17	0.12-0.18	0.14-0.20	0.19-0.25	0.22-0.28
M	12	Stainless steel	20	RPM	490	400	350	320	210
				FEED	0.11-0.17	0.12-0.18	0.14-0.20	0.19-0.25	0.22-0.28
	13		15	RPM	370	300	270	240	160
				FEED	0.11-0.17	0.12-0.18	0.14-0.20	0.19-0.25	0.22-0.28
	14		10	RPM	240	200	180	160	110
				FEED	0.04-0.10	0.06-0.12	0.08-0.14	0.10-0.16	0.12-0.18
K	15	Grey cast iron	30	RPM	730	600	530	480	320
				FEED	0.11-0.17	0.12-0.18	0.14-0.20	0.19-0.25	0.22-0.28
	16		25	RPM	610	500	440	400	270
				FEED	0.04-0.10	0.06-0.12	0.08-0.14	0.10-0.16	0.12-0.18
	17	Nodular cast iron	30	RPM	730	600	530	480	320
				FEED	0.11-0.17	0.12-0.18	0.14-0.20	0.19-0.25	0.22-0.28
	19	Malleable cast iron	25	RPM	610	500	440	400	270
				FEED	0.11-0.17	0.12-0.18	0.14-0.20	0.19-0.25	0.22-0.28
N	21	Aluminum-wrought alloy	55	RPM	1350	1090	970	880	580
				FEED	0.16-0.22	0.18-0.24	0.20-0.28	0.20-0.30	0.28-0.38
	22		55	RPM	1350	1090	970	880	580
				FEED	0.16-0.22	0.18-0.24	0.20-0.28	0.20-0.30	0.28-0.38
	23	Aluminum-cast, alloyed	40	RPM	980	800	710	640	420
				FEED	0.16-0.22	0.18-0.24	0.20-0.28	0.20-0.30	0.28-0.38
	29	Non Metallic Materials	20	RPM	490	400	350	320	210
				FEED	0.11-0.17	0.12-0.18	0.14-0.20	0.19-0.25	0.22-0.28
S	36	Titanium Alloys	10	RPM	240	200	180	160	110
				FEED	0.06-0.10	0.05-0.11	0.06-0.12	0.09-0.13	0.12-0.18

Leading Through Innovation



HSS

MORSE TAPER SHANK DRILLS

- Morse Taper Shank Drills for Wide Applications

SELECTION GUIDE

SERIES	D1201
STANDARD	KS
LENGTH	REGULAR
SIZE MIN	D13.0
SIZE MAX	D60.0
PAGE	A67
SURFACE TREATMENT	Steam Tempered

HOLEMAKING TOOLS

HSS, HSS-E & HSSCo8
MORSE TAPER SHANK DRILLS

Morse Taper Shank Drills for Wide Applications



Please visit globalyg1.com/mat for material search

◎ : Excellent ○ : Good

Recommended cutting conditions : p. A69

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		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		Ni or Co Based	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	Hardened steel		Hardened	550	55	
	39			Hardened	630	60	
	40	Chilled Cast Iron		Cast	400	42	
	41	Hardened Cast Iron		Hardened	550	55	

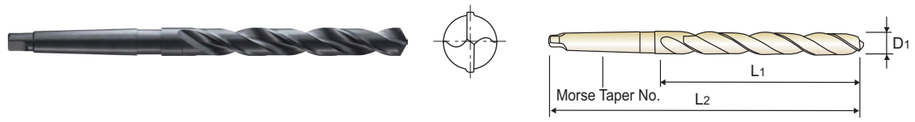
MORSE TAPER SHANK DRILLS

D1201 SERIES

HSS, MORSE TAPER SHANK DRILLS

REGULAR

▶**Surface treatment** : Steam Homo (Black Oxide Finish)
▶**Application** : Drilling into steel, cast steel alloyed and non-alloyed, grey cast iron, melleable cast iron



HSS | N 30° | 1 ~ 5 | h8 | 118° | Steam Tempered | p. A69

Unit : mm

EDP No	Drill Diameter D1	Flute Length L1	Overall Length L2	No.of Morse Taper
D1201130	13.0	115	198	1
D1201132	13.2	118	202	1
D1201135	13.5	118	202	1
D1201138	13.8	122	205	1
D1201140	14.0	122	205	1
D1201145	14.5	122	222	2
D1201150	15.0	125	225	2
D1201155	15.5	128	228	2
D1201160	16.0	130	230	2
D1201165	16.5	132	232	2
D1201170	17.0	135	235	2
D1201175	17.5	140	240	2
D1201180	18.0	140	240	2
D1201185	18.5	145	245	2
D1201190	19.0	145	245	2
D1201195	19.5	150	250	2
D1201200	20.0	150	250	2
D1201205	20.5	155	255	2
D1201210	21.0	155	255	2
D1201215	21.5	160	260	2
D1201220	22.0	160	260	2
D1201225	22.5	165	265	2
D1201230	23.0	165	265	2
D1201235	23.5	165	285	3
D1201240	24.0	165	285	3
D1201245	24.5	165	285	3

EDP No	Drill Diameter D1	Flute Length L1	Overall Length L2	No.of Morse Taper
D1201250	25.0	165	285	3
D1201255	25.5	165	285	3
D1201260	26.0	165	285	3
D1201265	26.5	170	290	3
D1201270	27.0	170	290	3
D1201275	27.5	175	295	3
D1201280	28.0	175	295	3
D1201285	28.5	180	300	3
D1201290	29.0	180	300	3
D1201295	29.5	185	305	3
D1201300	30.0	185	305	3
D1201305	30.5	190	310	3
D1201310	31.0	190	310	3
D1201315	31.5	195	315	3
D1201320	32.0	195	315	3
D1201330	33.0	200	345	4
D1201340	34.0	205	350	4
D1201350	35.0	205	350	4
D1201360	36.0	210	355	4
D1201370	37.0	210	355	4
D1201380	38.0	215	360	4
D1201390	39.0	215	360	4
D1201400	40.0	220	365	4
D1201410	41.0	220	365	4
D1201420	42.0	225	370	4
D1201430	43.0	225	370	4

▶ 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	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	◎	◎	◎	○		◎	○	○		○		◎	○		○	○	○	○	○	○

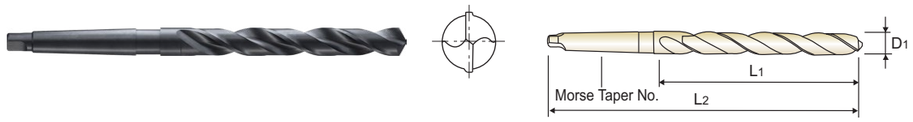
ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	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
Recommended	○	○	○						○							○					

MORSE TAPER SHANK DRILLS

D1201 SERIES

HSS, MORSE TAPER SHANK DRILLS — *REGULAR*

▶ **Surface treatment** : Steam Homo (Black Oxide Finish)
▶ **Application** : Drilling into steel, cast steel alloyed and non-alloyed, grey cast iron, melleable cast iron



HSS | N 30° | 1~5 | h8 | 118° | Steam Tempered | p. A69

Unit : mm

EDP No	Drill Diameter D1	Flute Length L1	Overall Length L2	No.of Morse Taper
D1201440	44.0	230	375	4
D1201450	45.0	230	375	4
D1201460	46.0	235	380	4
D1201470	47.0	235	380	4
D1201480	48.0	240	385	4
D1201490	49.0	240	385	4
D1201500	50.0	245	390	4
D1201510	51.0	245	425	5
D1201520	52.0	250	430	5
D1201530	53.0	250	430	5
D1201540	54.0	255	435	5

EDP No	Drill Diameter D1	Flute Length L1	Overall Length L2	No.of Morse Taper
D1201550	55.0	255	435	5
D1201560	56.0	260	440	5
D1201570	57.0	260	440	5
D1201580	58.0	265	445	5
D1201590	59.0	265	445	5
D1201600	60.0	270	450	5

◎ : 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
Recommended	◎	◎	◎	○		◎	○	○		○		◎	○		○	○	○	○	○	○

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
Recommended	○	○	○						○							○					

MORSE TAPER SHANK DRILLS

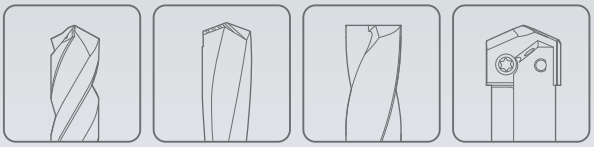
RECOMMENDED CUTTING CONDITIONS

D1201 SERIES **HSS & HSSCo8, MORSE TAPER SHANK DRILLS**

RPM = rev./min.
FEED = mm/rev.

ISO	VDI 3323	Material Description	Vc (m/min)	Parameter	Drill Diameter (mm) 13.0	16.0	18.0	20.0	30.0	40.0	50.0	60.0
P	1	Non-alloy steel	30	RPM	730	600	530	480	320	240	190	160
				FEED	0.11-0.17	0.12-0.18	0.14-0.20	0.19-0.25	0.22-0.28	0.24-0.30	0.28-0.34	0.36-0.40
	2		25	RPM	610	500	440	400	270	200	160	130
				FEED	0.11-0.17	0.12-0.18	0.14-0.20	0.19-0.25	0.22-0.28	0.24-0.30	0.28-0.34	0.36-0.40
	3		20	RPM	490	400	350	320	210	160	130	110
				FEED	0.11-0.17	0.12-0.18	0.14-0.20	0.19-0.25	0.22-0.28	0.24-0.30	0.28-0.34	0.36-0.40
	4		15	RPM	370	300	270	240	160	120	100	80
				FEED	0.04-0.10	0.06-0.12	0.08-0.14	0.10-0.16	0.12-0.18	0.14-0.20	0.16-0.22	0.18-0.24
	6	Low alloy steel	25	RPM	610	500	440	400	270	200	160	130
				FEED	0.11-0.17	0.12-0.18	0.14-0.20	0.19-0.25	0.22-0.28	0.24-0.30	0.28-0.34	0.36-0.40
	7		20	RPM	490	400	350	320	210	160	130	110
				FEED	0.11-0.17	0.12-0.18	0.14-0.20	0.19-0.25	0.22-0.28	0.24-0.30	0.28-0.34	0.36-0.40
	8		15	RPM	370	300	270	240	160	120	100	80
				FEED	0.04-0.10	0.06-0.12	0.08-0.14	0.10-0.16	0.12-0.18	0.14-0.20	0.16-0.22	0.18-0.24
	10	High alloyed steel, and tool steel	15	RPM	370	300	270	240	160	120	100	80
				FEED	0.11-0.17	0.12-0.18	0.14-0.20	0.19-0.25	0.22-0.28	0.24-0.30	0.28-0.34	0.36-0.40
M	12	Stainless steel	20	RPM	490	400	350	320	210	160	130	110
				FEED	0.11-0.17	0.12-0.18	0.14-0.20	0.19-0.25	0.22-0.28	0.24-0.30	0.28-0.34	0.36-0.40
	13		15	RPM	370	300	270	240	160	120	100	80
				FEED	0.11-0.17	0.12-0.18	0.14-0.20	0.19-0.25	0.22-0.28	0.24-0.30	0.28-0.34	0.36-0.40
K	15	Grey cast iron	30	RPM	730	600	530	480	320	240	190	160
				FEED	0.11-0.17	0.12-0.18	0.14-0.20	0.19-0.25	0.22-0.28	0.24-0.30	0.28-0.34	0.36-0.40
	16		25	RPM	610	500	440	400	270	200	160	130
				FEED	0.04-0.10	0.06-0.12	0.08-0.14	0.10-0.16	0.12-0.18	0.14-0.20	0.16-0.22	0.18-0.24
	17	Nodular cast iron	30	RPM	730	600	530	480	320	240	190	160
				FEED	0.11-0.17	0.12-0.18	0.14-0.20	0.19-0.25	0.22-0.28	0.24-0.30	0.28-0.34	0.36-0.40
	18		20	RPM	490	400	350	320	210	160	130	110
				FEED	0.04-0.10	0.06-0.12	0.08-0.14	0.10-0.16	0.12-0.18	0.14-0.20	0.16-0.22	0.18-0.24
	19	Malleable cast iron	25	RPM	610	500	440	400	270	200	160	130
				FEED	0.11-0.17	0.12-0.18	0.14-0.20	0.19-0.25	0.22-0.28	0.24-0.30	0.28-0.34	0.36-0.40
	20		20	RPM	490	400	350	320	210	160	130	110
				FEED	0.04-0.10	0.06-0.12	0.08-0.14	0.10-0.16	0.12-0.18	0.14-0.20	0.16-0.22	0.18-0.24
N	21	Aluminum-wrought alloy	55	RPM	1350	1090	970	880	580	440	350	290
				FEED	0.16-0.22	0.18-0.24	0.20-0.28	0.20-0.30	0.28-0.38	0.32-0.42	0.36-0.46	0.40-0.50
	22		55	RPM	1350	1090	970	880	580	440	350	290
				FEED	0.16-0.22	0.18-0.24	0.20-0.28	0.20-0.30	0.28-0.38	0.32-0.42	0.36-0.46	0.40-0.50
	23	Aluminum-cast, alloyed	40	RPM	980	800	710	640	420	320	250	210
				FEED	0.16-0.22	0.18-0.24	0.20-0.28	0.20-0.30	0.28-0.38	0.32-0.42	0.36-0.46	0.40-0.50
	29	Non Metallic Materials	20	RPM	490	400	350	320	210	160	130	110
				FEED	0.11-0.17	0.12-0.18	0.14-0.20	0.19-0.25	0.22-0.28	0.24-0.30	0.28-0.34	0.36-0.40
S	36	Titanium Alloys	10	RPM	240	200	180	160	110	80	60	50
				FEED	0.06-0.10	0.05-0.11	0.06-0.12	0.09-0.13	0.12-0.18	0.14-0.20	0.16-0.22	0.18-0.24

Global Cutting Tool Leader **YG-1**



HOLEMAKING

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HSSCo8

NC-SPOTTING DRILLS

- For Centering and Chamfering of Holes

SELECTION GUIDE

HOLEMAKING TOOLS

SERIES	D2306
POINT ANGLE	90°
SIZE MIN	D2.0
SIZE MAX	D20.0
PAGE	A73
SURFACE TREATMENT	Bright

HSSCo8
NC-SPOTTING DRILLS

For Centering and Chamfering of Holes



Please visit globalyg1.com/mat for material search

◎ : Excellent ○ : Good

Recommended cutting conditions : p. A74

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		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		Ni or Co Based	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	Hardened steel		Hardened	550	55	
	39			Hardened	630	60	
	40	Chilled Cast Iron		Cast	400	42	
	41	Hardened Cast Iron		Hardened	550	55	

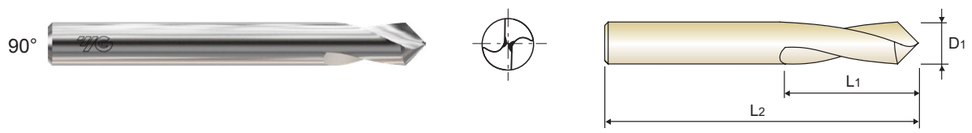
CARBIDE
HSS
DREAM DRILLS GENERAL
DREAM DRILLS SOFT
MULTI-1 DRILLS
GOLD-P DRILLS
SUPER-GP DRILLS
STRAIGHT SHANK DRILLS
MORSE TAPER SHANK DRILLS
NC-SPOTTING DRILLS
CENTER DRILLS

NC-SPOTTING DRILLS

90° D2306 SERIES

HSSCo8, NC-SPOTTING DRILLS 90°

▶**Surface treatment** : Bright Finish
▶ **Application**: For more precise centering work on NC/CNC Machines.
The large diameter of the tool permits chamfering work after centering continuously.



NC | HSS Co8 | h6 | h6 | 90° | Bright p. A74

Unit : mm

EDP No.	Drill Diameter D1	Flute Length L1	Overall Length L2
D2306020	2.0	8	40
D2306030	3.0	12	46
D2306040	4.0	12	55
D2306050	5.0	15	60
D2306060	6.0	20	66
D2306080	8.0	25	79

EDP No.	Drill Diameter D1	Flute Length L1	Overall Length L2
D2306100	10.0	25	89
D2306120	12.0	30	102
D2306140	14.0	35	115
D2306160	16.0	35	115
D2306180	18.0	40	130
D2306200	20.0	40	131

▶ TiN, TiCN and TiAlN are available on your request.

◎ : 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
Recommended	◎	◎	◎			◎	○					○			◎	○	○		○	

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
Recommended	○	○	○																		

NC-SPOTTING DRILLS

RECOMMENDED CUTTING CONDITIONS

D2306 SERIES HSSCo8, NC-SPOTTING DRILLS

RPM = rev./min.
FEED = mm/rev.

ISO	VDI 3323	Material Description	Vc (m/min)	Parameter	Drill Diameter (mm)								
					2.0	3.0	4.0	6.0	8.0	10.0	12.0	16.0	20.0
P	1	Non-alloy steel	25	RPM	3980	2650	1990	1330	990	800	660	500	400
				FEED	0.02-0.04	0.04-0.06	0.05-0.08	0.07-0.10	0.08-0.12	0.09-0.14	0.11-0.17	0.13-0.19	0.15-0.21
	2		25	RPM	3980	2650	1990	1330	990	800	660	500	400
				FEED	0.02-0.04	0.04-0.06	0.05-0.08	0.07-0.10	0.08-0.12	0.09-0.14	0.11-0.17	0.13-0.19	0.15-0.21
	3		15	RPM	2390	1590	1190	800	600	480	400	300	240
				FEED	0.01-0.03	0.03-0.05	0.04-0.07	0.05-0.08	0.07-0.10	0.08-0.12	0.09-0.14	0.11-0.17	0.13-0.19
	6	Low alloy steel	20	RPM	3180	2120	1590	1060	800	640	530	400	320
				FEED	0.02-0.04	0.04-0.06	0.05-0.08	0.07-0.10	0.08-0.12	0.09-0.14	0.11-0.17	0.13-0.19	0.15-0.21
	7		15	RPM	2390	1590	1190	800	600	480	400	300	240
				FEED	0.01-0.03	0.03-0.05	0.04-0.07	0.05-0.08	0.07-0.10	0.08-0.12	0.09-0.14	0.11-0.17	0.13-0.19
M	12	Stainless steel	15	RPM	2390	1590	1190	800	600	480	400	300	240
				FEED	0.02-0.04	0.04-0.06	0.05-0.08	0.07-0.10	0.08-0.12	0.09-0.14	0.11-0.17	0.13-0.19	0.15-0.21
K	15	Grey cast iron	30	RPM	4770	3180	2390	1590	1190	950	800	600	480
				FEED	0.03-0.05	0.05-0.07	0.06-0.09	0.08-0.11	0.10-0.13	0.12-0.16	0.15-0.2	0.18-0.24	0.22-0.28
	16		25	RPM	3980	2650	1990	1330	990	800	660	500	400
				FEED	0.01-0.03	0.03-0.05	0.04-0.07	0.05-0.08	0.07-0.10	0.08-0.12	0.09-0.14	0.11-0.17	0.13-0.19
	17	Nodular cast iron	30	RPM	4770	3180	2390	1590	1190	950	800	600	480
				FEED	0.03-0.05	0.05-0.07	0.06-0.09	0.08-0.11	0.10-0.13	0.12-0.16	0.15-0.2	0.18-0.24	0.22-0.28
	19	Malleable cast iron	20	RPM	3180	2120	1590	1060	800	640	530	400	320
				FEED	0.03-0.05	0.05-0.07	0.06-0.09	0.08-0.11	0.10-0.13	0.12-0.16	0.15-0.2	0.18-0.24	0.22-0.28
N	21	Aluminum-wrought alloy	65	RPM	10350	6900	5170	3450	2590	2070	1720	1290	1030
				FEED	0.04-0.06	0.06-0.09	0.08-0.11	0.10-0.13	0.12-0.15	0.15-0.19	0.18-0.23	0.21-0.27	0.25-0.31
	22		60	RPM	9550	6370	4770	3180	2390	1910	1590	1190	950
				FEED	0.04-0.06	0.06-0.09	0.08-0.11	0.10-0.13	0.12-0.15	0.15-0.19	0.18-0.23	0.21-0.27	0.25-0.31
	23	Aluminum-cast, alloyed	50	RPM	7960	5310	3980	2650	1990	1590	1330	990	800
				FEED	0.04-0.06	0.06-0.09	0.08-0.11	0.10-0.13	0.12-0.15	0.15-0.19	0.18-0.23	0.21-0.27	0.25-0.31



Leading Through Innovation

HSS-E

CENTER DRILLS

- General Purpose

SELECTION GUIDE

HOLEMAKING TOOLS

SERIES	DV301
DRILLING DEPTH	-
LENGTH	-
SIZE MIN	D1.0
SIZE MAX	D6.0
PAGE	**A77**
SURFACE TREATMENT	Bright

HSS-E CENTER DRILLS

General Purpose



Please visit globalyg1.com/mat for material search

◎ : Excellent ○ : Good

Recommended cutting conditions : p. A78

ISO 公制	VDI 3323	Material Description 材料描述	Composition / Structure / Heat Treatment 成分 / 组织 / 热处理		HB 布氏硬度	HRc 硬度	
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		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		Ni or Co Based	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	Hardened steel		Hardened	550	55	
	39			Hardened	630	60	
	40	Chilled Cast Iron		Cast	400	42	
	41	Hardened Cast Iron		Hardened	550	55	

CARBIDE
HSS
DREAM DRILLS GENERAL
DREAM DRILLS SOFT
MULTI-1 DRILLS
GOLD-P DRILLS
SUPER-GP DRILLS
STRAIGHT SHANK DRILLS
MORSE TAPER SHANK DRILLS
NC-SPOTTING DRILLS
CENTER DRILLS

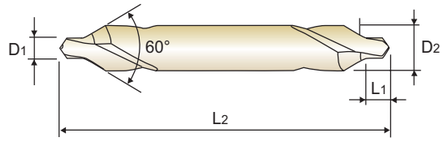
YG CENTER DRILLS

DV301 SERIES

HSS-E, CENTER DRILLS

▶ **Application** : Center Drills suitable for center drilling and chamfering in general materials.
Excellent performance with High Vanadium HSS-E and YG-1's unique design technology.





HSS-E | h8 | k12 | Bright | 120°

p. A78

FORM A (60°)

Unit : mm

EDP No	Drill Diameter	Shank Diameter	Pilot Length	Overall Length
	D1	D2	L1	L2
DV301010	1.0	4.0	1.0	35
DV301015	1.5	5.0	1.5	40
DV301020	2.0	6.0	2.0	45
DV301025	2.5	7.7	2.5	50
DV301904	2.5	8.0	2.5	50
DV301030	3.0	7.7	3.0	55
DV301901	3.0	8.0	3.0	55
DV301040	4.0	10.0	4.5	65
DV301050	5.0	11.0	5.5	78
DV301060	6.0	12.0	7.0	95

◎ : 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
Recommended	◎	◎	○			◎	○					○			◎	○	○		○	

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
Recommended																					

CENTER DRILLS

RECOMMENDED CUTTING CONDITIONS

DV301 SERIES HSS-E, CENTER DRILLS

RPM = rev./min.
FEED = mm/rev.

ISO	VDI 3323	Material Description	Vc (m/min)	Parameter	Drill Diameter (mm) 0.5	Vc (m/min)	Parameter	Drill Diameter (mm) 1.0	Drill Diameter (mm) 2.0
P	1	Non-alloy steel	30	RPM	19100	40	RPM	12730	6370
				FEED	0.01-0.03		FEED	0.02-0.04	0.03-0.06
	2		25	RPM	15920	35	RPM	9550	4770
				FEED	0.01-0.03		FEED	0.02-0.04	0.03-0.06
	3		20	RPM	12730	25	RPM	7960	3980
				FEED	0.005-0.02		FEED	0.01-0.03	0.01-0.035
	6	Low alloy steel	25	RPM	15920	30	RPM	9550	4770
				FEED	0.01-0.03		FEED	0.02-0.04	0.03-0.06
	7		15	RPM	9550	20	RPM	6370	3180
				FEED	0.005-0.02		FEED	0.01-0.03	0.01-0.035
M	12	Stainless steel	8	RPM	5090	10	RPM	3180	1590
				FEED	0.005-0.02		FEED	0.01-0.03	0.01-0.035
K	15	Grey cast iron	30	RPM	19100	40	RPM	12730	6370
				FEED	0.01-0.03		FEED	0.02-0.04	0.03-0.06
	16		25	RPM	15920	30	RPM	9550	4770
				FEED	0.005-0.02		FEED	0.01-0.03	0.01-0.035
	17	Nodular cast iron	30	RPM	19100	40	RPM	12730	6370
				FEED	0.01-0.03		FEED	0.02-0.04	0.03-0.06
	19	Malleable cast iron	20	RPM	12730	25	RPM	7960	3980
				FEED	0.01-0.03		FEED	0.02-0.04	0.03-0.06

ISO	VDI 3323	Material Description	Vc (m/min)	Parameter	Drill Diameter (mm) 3.0	4.0	5.0	6.0	8.0	10.0
P	1	Non-alloy steel	40	RPM	4240	3180	2550	2120	1590	1270
				FEED	0.04-0.08	0.05-0.09	0.06-0.10	0.07-0.12	0.09-0.15	0.12-0.18
	2		35	RPM	3180	2390	1910	1590	1190	950
				FEED	0.04-0.08	0.05-0.09	0.06-0.10	0.07-0.12	0.09-0.15	0.12-0.18
	3		25	RPM	2650	1990	1590	1330	990	800
				FEED	0.015-0.05	0.02-0.06	0.03-0.07	0.04-0.08	0.06-0.12	0.08-0.14
	6	Low alloy steel	30	RPM	3180	2390	1910	1590	1190	950
				FEED	0.04-0.08	0.05-0.09	0.06-0.10	0.07-0.12	0.09-0.15	0.12-0.18
	7		20	RPM	2120	1590	1270	1060	800	640
				FEED	0.015-0.05	0.02-0.06	0.03-0.07	0.04-0.08	0.06-0.12	0.08-0.14
M	12	Stainless steel	10	RPM	1060	800	640	530	400	320
				FEED	0.015-0.05	0.02-0.06	0.03-0.07	0.04-0.08	0.06-0.12	0.08-0.14
K	15	Grey cast iron	40	RPM	4240	3180	2550	2120	1590	1270
				FEED	0.04-0.08	0.05-0.09	0.06-0.10	0.07-0.12	0.09-0.15	0.12-0.18
	16		30	RPM	3180	2390	1910	1590	1190	950
				FEED	0.015-0.05	0.02-0.06	0.03-0.07	0.04-0.08	0.06-0.12	0.08-0.14
	17	Nodular cast iron	40	RPM	4240	3180	2550	2120	1590	1270
				FEED	0.04-0.08	0.05-0.09	0.06-0.10	0.07-0.12	0.09-0.15	0.12-0.18
	19	Malleable cast iron	25	RPM	2650	1990	1590	1330	990	800
				FEED	0.04-0.08	0.05-0.09	0.06-0.10	0.07-0.12	0.06-0.12	0.12-0.18

YG CUTTING TOOLS

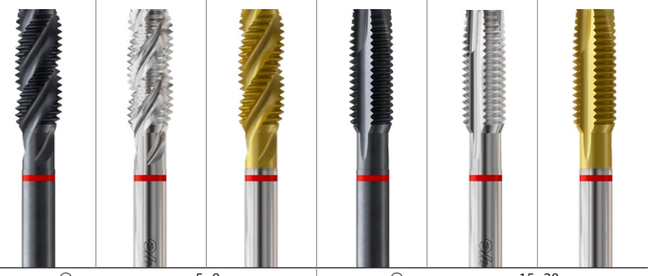
THREADING TOOLS

HSS-E COMBO TAPS
HSS & HSS-E YG TAP GENERAL
HSS-E YG TAP FORMING

YG-1 CO., LTD.

SELECTION GUIDE

THREADING TOOLS

	COMBO TAPS					
HOLE TYPE	Max. 2.5xD Blind Hole			Max. 3.0xD Through Hole		
TOOL MATERIAL	HSS-E					
CHAMFER LEAD ACC. TO DIN2197	2.5P	2.5P	2.5P	5.0P	5.0P	5.0P
FLUTE TYPE	Spiral Flute	Spiral Flute	Spiral Flute	Spiral Point	Spiral Point	Spiral Point
SPIRAL FLUTE ANGLE	R40	R40	R40	R40	R40	R40
SERIES NO. 系列号 (page 页数) JIS Type	I	I	I	I	I	I
M/MF	T1809 (p. B9)	T2809 (p. B9)	T3809 (p. B9)	T1829 (p. B16)	T2829 (p. B16)	T3829 (p. B16)
UNC/F		T2839 (p. B14)			T2849 (p. B20)	
W						
M-LH W-LH						
PIPE TAPS						
SURFACE TREATMENT	HOMO	Bright	TiN	HOMO	Bright	TiN
MODEL						

Please visit globalyg1.com/mat for material search

◎ : Excellent ○ : Good

ISO	VDI 3323	Material Description	HB	HRc					
P	1	Non-alloy steel	125		○	5~8	○	15~20	
	2		190	13	◎	7~12	◎	10~15	
	3		250	25	◎	7~12	◎	10~15	
	4		270	28	◎	7~12	◎	10~15	
	5		300	32	◎	7~12	◎	10~15	
	6	Low alloy steel	180	10	◎	7~12	◎	10~15	
	7		275	29	◎	7~12	◎	10~15	
	8		300	32	○	5~8	○	8~10	
	9		350	38					
	10	High alloyed steel, and tool steel	200	15	○	6~9	○	7~10	
	11		325	35					
M	12	Stainless steel	200	15	◎	5~8	◎	8~13	
	13		240	23	◎	5~8	◎	8~13	
	14		180	10	◎	5~8	◎	8~13	
K	15	Grey cast iron	180	10	○	7~12	◎	10~15	
	16		260	26	○	7~12	◎	10~15	
	17	Nodular cast iron	160	3	○	7~12	◎	10~20	
	18		250	25	○	7~12	◎	10~20	
	19	Malleable cast iron	130				○	10~15	
	20		230	21			○	10~15	
N	21	Aluminum-wrought alloy	60		◎	10~20	◎	15~25	
	22		100		◎	10~20	◎	15~25	
	23	Aluminum-cast, alloyed	75		◎	10~15	◎	15~20	
	24		90		◎	10~15	◎	15~20	
	25		130		○	10~15	○	15~20	
	26	Copper and Copper Alloys (Bronze / Brass)	110		◎	6~11	◎	7~12	
	27		90		◎	6~20	◎	10~25	
	28		100						
	29	Non Metallic Materials							
	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					

	YG TAP GENERAL			YG TAP FORMING
	Max. 2.0xD Blind/Through Hole	Max. 2.5xD Blind Hole	Max. 3.0xD Through Hole	Max. 3.0xD Blind / Th rough Hole
	HSS	HSS-E	HSS-E	HSS-E
	1.5P/5.0P/9.0P	2.5P	5.0P	2.0P/4.0P
	Straight Flute	Spiral Flute	Spiral Point	with Oil Groove
	-	R40	-	-
	HT	I	I	I
	T7099 (p. B26)	T1121 (p. B30)	T1022 (p. B34)	T2751 (p. B41)
	Bright	Steam Homo	Steam Homo	Bright
	HAND TAP			
	○ 8~13	◎ 8~13	◎ 15~25	◎ 8~13
	○ 7~12	◎ 7~12	◎ 10~15	○ 7~10
	○ 7~12	○ 7~12	○ 10~15	○ 7~10
	○ 7~12	○ 7~12	○ 10~15	
	○ 7~12			
	○ 7~12	○ 7~12	○ 10~15	○ 5~8
	○ 7~12	○ 7~12	○ 10~15	
	○ 6~9	○ 6~9	○ 7~10	
		○ 5~8	○ 8~13	◎ 5~10
		○ 5~8	○ 8~13	◎ 5~10
				◎ 5~10
	○ 10~15	○ 8~13	○ 10~15	
	○ 10~15		○ 10~15	
	○ 7~12	○ 7~12	○ 10~20	
	○ 7~12		○ 10~20	
	○ 10~20	○ 10~20	○ 15~25	◎ 10~20
	○ 10~20	○ 10~20	○ 15~25	◎ 10~20
	○ 10~15	○ 10~15	○ 15~20	◎ 10~15
				○ 10~15
	○ 6~9	○ 6~11	○ 7~12	◎ 7~12
	○ 6~15	○ 6~20	○ 10~25	◎ 7~12

CUTTING SPEED TABLE

CUTTING SPEED TABLE SCHNITTGESCHWINDIGKEITSTABELLE
Cutting Speeds m/min. into revolutions per minute

TOOL RPM (rev/min.)																
Tool Dia.	Cutting Speed (m/min.)															
	1	2	3	4	5	6	8	10	12	15	20	25	30	40	50	60
1	318	637	955	1274	1592	1910	2548	3185	3822	4777	6396	7962	9554	12739	15924	19108
2	159	318	478	637	796	955	1274	1592	1911	2388	3185	3981	4777	6369	7962	9554
3	106	212	318	425	531	637	849	1062	1274	1592	2123	2654	3185	4246	5308	6369
4	80	159	239	318	398	478	637	796	955	1194	1592	1990	2389	3185	3981	4777
5	64	127	191	255	318	382	510	637	764	955	1274	1592	1911	2548	3185	3822
6	53	106	159	212	265	318	425	531	637	796	1062	1327	1592	2123	2653	3185
8	40	80	119	159	199	239	318	398	478	597	796	955	1194	1592	1990	2388
10	31	64	96	127	159	191	255	318	382	478	637	796	955	1274	1592	1911
12	26	53	80	106	133	159	212	265	318	398	531	663	796	1062	1327	1592
14	23	45	68	91	114	136	182	227	273	341	455	569	682	910	1137	1365
16	20	40	60	80	100	119	159	199	239	299	398	498	597	796	995	1194
18	18	35	53	71	88	106	142	177	212	265	354	442	531	708	885	1062
20	16	32	48	64	80	96	127	159	191	239	318	398	478	637	796	955
25	13	25	38	51	64	76	102	127	153	191	255	318	382	510	637	764
30	11	21	32	42	53	64	85	106	127	159	212	265	318	425	531	637
35	9	18	27	36	45	55	73	91	109	136	182	227	273	364	455	546
40	8	16	24	32	40	48	64	80	96	119	159	199	239	118	398	478

RPM = rev/min.
V = m/min.
D = Dia.(mm)

$$V = \frac{RPM \cdot \pi \cdot D}{1000}$$

$$RPM = \frac{1000 \cdot V}{\pi \cdot D}$$

SURFACE TREATMENT AND COATING

The applied High Speed Steels holds a grant of good wear resistance and toughness. Therefore YG-1 normally delivers taps with bright and unfinished surface. For certain materials, various surface treatments provide higher advantage in machining.

STEAM TEMPERED - VAP

Steam Tempered is a Fe3O4-oxyd-coating which reduces friction between the tool and workpiece, also preventing cold welding.

NITRIDING - NI

Recommend surface treatment for machining materials that affect wear abrasion, such as grey cast iron, alu-alloys with high Si-percentages (more than 10%).

Below are the various surface treatments for excellent finish surfaces suitable for many applications. The surface treatments are produced and developed within the company.

X-COATING

YG-1's High Performance Coating for high heat and wear resistance

TiN-COATING

TiN-coating yields a hardness of approx. 2,300 HV and also a heat resistant up to approx. 600°C. The current coating is an excellent all-round coating for normal applications.
(Colour : Golden Coefficient of friction against steel : 0.4)

TiCN-COATING

TiCN takes place of TiN when the conditions require the coating to have a different hardness and toughness. The TiCN brings advantages for machining very difficult steels or cutting interrupted bores. The TiCN-coating has a hardness of approx. 3,000 HV, but is heat resistance only holds up to approx. 400°C, meaning that the TiCN needs an excellent cooling system for a long service life. (Colour : Blue-Grey Coefficient of friction against steel : 0.4)

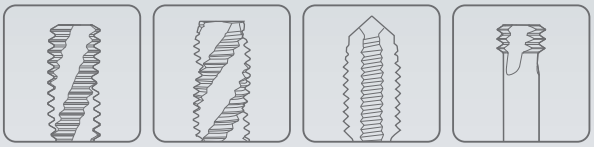
TiAlN-COATING

A special coating for machining abrasive materials such as grey cast iron, alu-alloys with silicon, fiber reinforced plastics, etc., or machining at high temperatures with insufficient cooling, or at high speeds ≥ 600m/min. TiAlN has a hardness of approx. 3,000 HV and is heat resistant up to approx. 800°C. (Colour : Violet-Grey Coefficient of friction against steel : 0.4)

HARDSLICK-COATING

Hardslick combines the advantages of an extremely hard, thermally stable TiAlN-coating with the sliding and lubricating properties of an outer WC/C(Tungsten carbide/carbon)-coating in a novel way. The Hardslick coating has a hardness of approx. 3,000 HVand is temperature-resistant up to approx. 800°C. (Colour : Violet-Grey Coefficient of friction against steel : 0.2)

Global Cutting Tool Leader **YG-1**



THREADING

YG

Leading Through Innovation



HSS-E

COMBO TAPS

- For Multi Purpose Tapping

SELECTION GUIDE

THREADING TOOLS

HSS-E COMBO TAPS

For Multi Purpose Tapping

HOLE TYPE		Max. 2.5xD Blind Hole			Max. 3.0xD Through Hole		
TOOL MATERIAL		HSS-E					
CHAMFER LEAD ACC. TO DIN2197		2.5P	2.5P	2.5P	5.0P	5.0P	5.0P
FLUTE TYPE		Spiral Flute	Spiral Flute	Spiral Flute	Spiral Point	Spiral Point	Spiral Point
SPIRAL FLUTE ANGLE		R40	R40	R40	R40	R40	R40
SERIES NO. (page)	JIS Type	I	I	I	I	I	I
	M/MF	T1809 (p. B9)	T2809 (p. B9)	T3809 (p. B9)	T1829 (p. B16)	T2829 (p. B16)	T3829 (p. B16)
	UNC/F		T2839 (p. B14)			T2849 (p. B20)	
	W						
	M-LH W-LH						
	PIPE TAPS						
SURFACE TREATMENT		HOMO	Bright	TiN	HOMO	Bright	TiN
MODEL							

Please visit globalyg1.com/mat for material search

◎ : Excellent ○ : Good

ISO	VDI 3323	Material Description	Composition / Structure / Heat Treatment		HB	HRc				
P	1	Non-alloy steel	About 0.15% C	Annealed	125		○	5~8	○	15~20
	2		About 0.45% C	Annealed	190	13	◎	7~12	◎	10~15
	3		About 0.45% C	Quenched & Tempered	250	25	◎	7~12	◎	10~15
	4		About 0.75% C	Annealed	270	28	◎	7~12	◎	10~15
	5		About 0.75% C	Quenched & Tempered	300	32	◎	7~12	◎	10~15
	6	Low alloy steel		Annealed	180	10	◎	7~12	◎	10~15
	7			Quenched & Tempered	275	29	◎	7~12	◎	10~15
	8			Quenched & Tempered	300	32	○	5~8	○	8~10
	9			Quenched & Tempered	350	38				
	10	High alloyed steel, and tool steel		Annealed	200	15	○	6~9	○	7~10
	11			Quenched & Tempered	325	35				
M	12	Stainless steel	Ferritic / Martensitic	Annealed	200	15	◎	5~8	◎	8~13
	13		Martensitic	Quenched & Tempered	240	23	◎	5~8	◎	8~13
	14		Austenitic		180	10	◎	5~8	◎	8~13
K	15	Grey cast iron	Pearlitic / ferritic		180	10	○	7~12	◎	10~15
	16		Pearlitic (Martensitic)		260	26	○	7~12	◎	10~15
	17	Nodular cast iron	Ferritic		160	3	○	7~12	◎	10~20
	18		Pearlitic		250	25	○	7~12	◎	10~20
	19	Malleable cast iron	Ferritic		130				○	10~15
	20		Pearlitic		230	21			○	10~15
N	21	Aluminum-wrought alloy	Not Curable		60		◎	10~20	◎	15~25
	22		Curable	Hardened	100		◎	10~20	◎	15~25
	23	Aluminum-cast, alloyed	≤ 12% Si, Not Curable		75		◎	10~15	◎	15~20
	24		≤ 12% Si, Curable	Hardened	90		◎	10~15	◎	15~20
	25		> 12% Si, Not Curable		130		○	10~15	○	15~20
	26	Copper and Copper Alloys (Bronze / Brass)	Cutting Alloys, PB>1%		110		◎	6~11	◎	7~12
	27		CuZn, CuSnZn (Brass)		90		◎	6~20	◎	10~25
	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		Ni or Co Based	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	Hardened steel		Hardened	550	55				
	39			Hardened	630	60				
	40	Chilled Cast Iron		Cast	400	42				
	41	Hardened Cast Iron		Hardened	550	55				

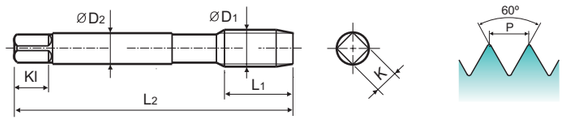
COMBO TAPS

HOMO T1809 SERIES
Bright T2809 SERIES
TiN T3809 SERIES

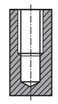
M I-SP SPIRAL FLUTE TAPS for Multi Purpose

▶ For using multi-purpose and correct thread profiles & long tool life due to special tap geometry.





Hole type
2.5×D



Material groups **MU** | HSS-E | I | YH | 60° | 2.5P | R40 | HOMO Bright TiN | p. B8

Tap Limits: p.B230

Unit : mm

SIZE ØD1	Pitch P	EDP No. HOMO	Bright	TiN	Limit	Overall Length L2	Thread Length L1	Shank Diameter ØD2	Square Size K	Square Length Kl	No. of Flute
M1	x 0.25	T1809011	T2809011	T3809011	YH1	30.0	5.5	3.0	2.5	5.0	2
M1.1	x 0.25	T1809031	T2809031	T3809031	YH1	32.0	5.5	3.0	2.5	5.0	2
M1.2	x 0.25	T1809051	T2809051	T3809051	YH1	32.0	5.5	3.0	2.5	5.0	2
M1.4	x 0.3	T1809071	T2809071	T3809071	YH1	34.0	8.0	3.0	2.5	5.0	2
M1.6	x 0.35	T1809091	T2809091	T3809091	YH1	36.0	8.0	3.0	2.5	5.0	2
M1.7	x 0.35	T1809K51	T2809K51	T3809K51	YH1	36.0	8.0	3.0	2.5	5.0	2
M1.8	x 0.35	T1809111	T2809111	T3809111	YH1	36.0	8.0	3.0	2.5	5.0	2
M2	x 0.4	T1809131	T2809131	T3809131	YH1	40.0	9.5	3.0	2.5	5.0	2
M2.2	x 0.45	T1809151	T2809151	T3809151	YH1	42.0	9.5	3.0	2.5	5.0	2
M2.3	x 0.4	T1809191	T2809191	T3809191	YH1	42.0	9.5	3.0	2.5	5.0	2
M2.5	x 0.45	T1809171	T2809171	T3809171	YH1	44.0	9.5	3.0	2.5	5.0	2
M2.5	x 0.35	T1809181	T2809181	T3809181	YH1	44.0	9.5	3.0	2.5	5.0	2
M2.6	x 0.45	T1809491	T2809491	T3809491	YH1	44.0	9.5	3.0	2.5	5.0	2
M2.6	x 0.35	T1809K71	T2809K71	T3809K71	YH1	44.0	9.5	3.0	2.5	5.0	2
M3	x 0.5	T1809202-C	T2809202-C	T3809202-C	YH2	46.0	11.0	4.0	3.2	6.0	3
M3	x 0.35	T1809211-C	T2809211-C	T3809211-C	YH1	46.0	11.0	4.0	3.2	6.0	3
M3.5	x 0.6	T1809222-C	T2809222-C	T3809222-C	YH2	48.0	13.0	4.0	3.2	6.0	3
M3.5	x 0.35	T1809231-C	T2809231-C	T3809231-C	YH1	48.0	13.0	4.0	3.2	6.0	3
M4	x 0.7	T1809242-C	T2809242-C	T3809242-C	YH2	52.0	13.0	5.0	4.0	7.0	3
M4	x 0.5	T1809251-C	T2809251-C	T3809251-C	YH1	52.0	13.0	5.0	4.0	7.0	3
M4.5	x 0.75	T1809262-C	T2809262-C	T3809262-C	YH2	55.0	13.0	5.0	4.0	7.0	3
M4.5	x 0.5	T1809271-C	T2809271-C	T3809271-C	YH1	55.0	13.0	5.0	4.0	7.0	3
M5	x 0.8	T1809282-C	T2809282-C	T3809282-C	YH2	60.0	16.0	5.5	4.5	7.0	3
M5	x 0.5	T1809292-C	T2809292-C	T3809292-C	YH2	60.0	16.0	5.5	4.5	7.0	3
M5.5	x 0.5	T1809301-C	T2809301-C	T3809301-C	YH1	60.0	16.0	5.5	4.5	7.0	3

* The other coating(TiCN or TiAlN) is available on your request

▶ 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	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			
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
Recommended	◎	◎	◎	◎	○	◎	◎														

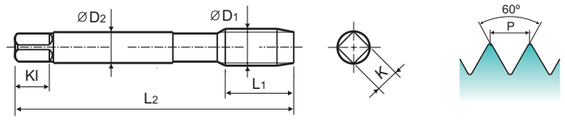
COMBO TAPS

HOMO T1809 SERIES
Bright T2809 SERIES
TiN T3809 SERIES

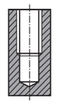
M I-SP SPIRAL FLUTE TAPS for Multi Purpose

▶ For using multi-purpose and correct thread profiles & long tool life due to special tap geometry.





Hole type
2.5×D



Material groups **MU** | HSS-E | I | YH | 60° | 2.5P | R40 | HOMO Bright TiN | p. B8

Tap Limits: p.B230

Unit : mm

SIZE ØD1	Pitch P	EDP No. HOMO	Bright	TiN	Limit	Overall Length L2	Thread Length L1	Shank Diameter ØD2	Square Size K	Square Length Kl	No. of Flute
M6	1.0	T1809312-C	T2809312-C	T3809312-C	YH2	62.0	19.0	6.0	4.5	7.0	3
M6	0.75	T1809322-C	T2809322-C	T3809322-C	YH2	62.0	19.0	6.0	4.5	7.0	3
M6	0.5	T1809332-C	T2809332-C	T3809332-C	YH2	62.0	19.0	6.0	4.5	7.0	3
M7	1.0	T1809342-C	T2809342-C	T3809342-C	YH2	65.0	19.0	6.2	5.0	8.0	3
M7	0.75	T1809352-C	T2809352-C	T3809352-C	YH2	65.0	19.0	6.2	5.0	8.0	3
M8	1.25	T1809362-C	T2809362-C	T3809362-C	YH2	70.0	22.0	6.2	5.0	8.0	3
M8	1.0	T1809372-C	T2809372-C	T3809372-C	YH2	70.0	22.0	6.2	5.0	8.0	3
M8	0.75	T1809382-C	T2809382-C	T3809382-C	YH2	70.0	22.0	6.2	5.0	8.0	3
M9	1.25	T1809392-C	T2809392-C	T3809392-C	YH2	72.0	22.0	7.0	5.5	8.0	3
M9	1.0	T1809402-C	T2809402-C	T3809402-C	YH2	72.0	22.0	7.0	5.5	8.0	3
M9	0.75	T1809412-C	T2809412-C	T3809412-C	YH2	72.0	22.0	7.0	5.5	8.0	3
M10	1.5	T1809422-C	T2809422-C	T3809422-C	YH2	75.0	24.0	7.0	5.5	8.0	3
M10	1.25	T1809432-C	T2809432-C	T3809432-C	YH2	75.0	24.0	7.0	5.5	8.0	3
M10	1.0	T1809442-C	T2809442-C	T3809442-C	YH2	75.0	24.0	7.0	5.5	8.0	3
M10	0.75	T1809452-C	T2809452-C	T3809452-C	YH2	75.0	24.0	7.0	5.5	8.0	3
M11	1.5	T1809462-C	T2809462-C	T3809462-C	YH2	80.0	25.0	8.0	6.0	9.0	3
M11	1.0	T1809472-C	T2809472-C	T3809472-C	YH2	80.0	25.0	8.0	6.0	9.0	3
M11	0.75	T1809482-C	T2809482-C	T3809482-C	YH2	80.0	25.0	8.0	6.0	9.0	3
M12	1.75	T1809502-C	T2809502-C	T3809502-C	YH2	82.0	29.0	8.5	6.5	9.0	3
M12	1.5	T1809512-C	T2809512-C	T3809512-C	YH2	82.0	29.0	8.5	6.5	9.0	3
M12	1.25	T1809522-C	T2809522-C	T3809522-C	YH2	82.0	29.0	8.5	6.5	9.0	3
M12	1.0	T1809532-C	T2809532-C	T3809532-C	YH2	82.0	29.0	8.5	6.5	9.0	3
M14	2.0	T1809542	T2809542	T3809542	YH2	88.0	30.0	10.5	8.0	11.0	3
M14	1.5	T1809552	T2809552	T3809552	YH2	88.0	30.0	10.5	8.0	11.0	3
M14	1.25	T1809562	T2809562	T3809562	YH2	88.0	30.0	10.5	8.0	11.0	3

* The other coating(TiCN or TiAlN) is available on your request

▶ NEXT PAGE

◎ : Excellent ○ : Good

ISO	P																			
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
Recommended	○	◎	◎	◎	◎	◎	◎	○		○		◎	◎	◎	○	○	○	○		

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
Recommended	◎	◎	◎	◎	○	◎	◎														

CARBIDE
HSS
COMBO TAPS
YG TAP GENERAL
YG TAP FORMING

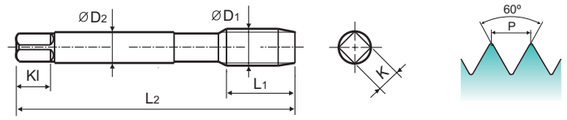
COMBO TAPS

HOMO T1809 SERIES
Bright T2809 SERIES
TiN T3809 SERIES

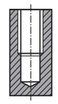
M I-SP SPIRAL FLUTE TAPS for Multi Purpose

▶ For using multi-purpose and correct thread profiles & long tool life due to special tap geometry.





Hole type
2.5×D



Material groups **MU** | HSS-E | I | YH | 60° | 2.5P | R40 | HOMO Bright TiN | p. B8

Tap Limits: p.B230

Unit : mm

SIZE ØD1	Pitch P	EDP No. HOMO	Bright	TiN	Limit	Overall Length L2	Thread Length L1	Shank Diameter ØD2	Square Size K	Square Length Kl	No. of Flute
M14	1.0	T1809572	T2809572	T3809572	YH2	88.0	30.0	10.5	8.0	11.0	3
M15	1.5	T1809582	T2809582	T3809582	YH2	90.0	30.0	10.5	8.0	11.0	3
M15	1.0	T1809592	T2809592	T3809592	YH2	90.0	30.0	10.5	8.0	11.0	3
M16	2.0	T1809602	T2809602	T3809602	YH2	95.0	32.0	12.5	10.0	13.0	3
M16	1.5	T1809612	T2809612	T3809612	YH2	95.0	32.0	12.5	10.0	13.0	3
M16	1.0	T1809622	T2809622	T3809622	YH2	95.0	32.0	12.5	10.0	13.0	3
M18	2.5	T1809653	T2809653	T3809653	YH3	100.0	37.0	14.0	11.0	14.0	4
M18	2.0	T1809663	T2809663	T3809663	YH3	100.0	37.0	14.0	11.0	14.0	4
M18	1.5	T1809672	T2809672	T3809672	YH2	100.0	37.0	14.0	11.0	14.0	4
M18	1.0	T1809682	T2809682	T3809682	YH2	100.0	37.0	14.0	11.0	14.0	4
M20	2.5	T1809703	T2809703	T3809703	YH3	105.0	37.0	15.0	12.0	15.0	4
M20	2.0	T1809713	T2809713	T3809713	YH3	105.0	37.0	15.0	12.0	15.0	4
M20	1.5	T1809723	T2809723	T3809723	YH3	105.0	37.0	15.0	12.0	15.0	4
M20	1.0	T1809732	T2809732	T3809732	YH2	105.0	37.0	15.0	12.0	15.0	4
M22	2.5	T1809743	T2809743	T3809743	YH3	115.0	38.0	17.0	13.0	16.0	4
M22	2.0	T1809753	T2809753	T3809753	YH3	115.0	38.0	17.0	13.0	16.0	4
M22	1.5	T1809763	T2809763	T3809763	YH3	115.0	38.0	17.0	13.0	16.0	4
M22	1.0	T1809772	T2809772	T3809772	YH2	115.0	38.0	17.0	13.0	16.0	4
M24	3.0	T1809783	T2809783	T3809783	YH3	120.0	45.0	19.0	15.0	18.0	4
M24	2.0	T1809793	T2809793	T3809793	YH3	120.0	45.0	19.0	15.0	18.0	4
M24	1.5	T1809803	T2809803	T3809803	YH3	120.0	45.0	19.0	15.0	18.0	4
M24	1.0	T1809812	T2809812	T3809812	YH2	120.0	45.0	19.0	15.0	18.0	4
M25	2.0	T1809823	T2809823	T3809823	YH3	125.0	45.0	19.0	15.0	18.0	4
M25	1.5	T1809833	T2809833	T3809833	YH3	125.0	45.0	19.0	15.0	18.0	4
M26	2.0	T1809N43	T2809N43	T3809N43	YH3	125.0	45.0	20.0	15.0	18.0	4

* The other coating(TiCN or TiAlN) is available on your request

▶ NEXT PAGE

◎ : Excellent ○ : Good

ISO	P																			
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
Recommended	○	◎	◎	◎	◎	◎	◎	○		○		◎	◎	◎	○	○	○	○		

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
Recommended	◎	◎	◎	◎	○	◎	◎														

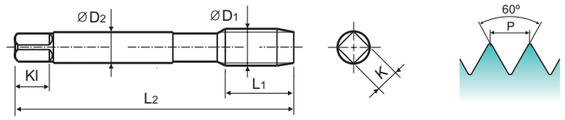
COMBO TAPS

HOMO **T1809** SERIES
Bright **T2809** SERIES
TiN **T3809** SERIES

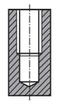
M I-SP SPIRAL FLUTE TAPS for Multi Purpose

▶ For using multi-purpose and correct thread profiles & long tool life due to special tap geometry.





Hole type
2.5×D



Material groups **MU** | HSS-E | I | YH | 60° | 2.5P | R40 | HOMO Bright TiN | p. B8

Tap Limits: p.B230

Unit : mm

SIZE ØD1	Pitch P	EDP No. HOMO	Bright	TiN	Limit	Overall Length L2	Thread Length L1	Shank Diameter ØD2	Square Size K	Square Length Kl	No. of Flute
M26	1.5	T1809853	T2809853	T3809853	YH3	125.0	45.0	20.0	15.0	18.0	4
M26	1.0	T1809N52	T2809N52	T3809N52	YH2	125.0	45.0	20.0	15.0	18.0	4
M27	3.0	T1809863	T2809863	T3809863	YH3	130.0	45.0	20.0	15.0	18.0	4
M27	2.0	T1809873	T2809873	T3809873	YH3	130.0	45.0	20.0	15.0	18.0	4
M27	1.5	T1809883	T2809883	T3809883	YH3	130.0	45.0	20.0	15.0	18.0	4
M28	2.0	T1809903	T2809903	T3809903	YH3	130.0	45.0	21.0	17.0	20.0	4
M28	1.5	T1809913	T2809913	T3809913	YH3	130.0	45.0	21.0	17.0	20.0	4
M30	3.5	T1809944	T2809944	T3809944	YH4	135.0	48.0	23.0	17.0	20.0	4
M30	3.0	T1809953	T2809953	T3809953	YH3	135.0	48.0	23.0	17.0	20.0	4
M30	2.0	T1809963	T2809963	T3809963	YH3	135.0	48.0	23.0	17.0	20.0	4
M30	1.5	T1809973	T2809973	T3809973	YH3	135.0	48.0	23.0	17.0	20.0	4
M30	1.0	T1809982	T2809982	T3809982	YH2	135.0	48.0	23.0	17.0	20.0	4
M33	3.5	T1809A44	T2809A44	T3809A44	YH4	145.0	51.0	25.0	19.0	22.0	4
M33	3.0	T1809A53	T2809A53	T3809A53	YH3	145.0	51.0	25.0	19.0	22.0	4
M33	2.0	T1809A63	T2809A63	T3809A63	YH3	145.0	45.0	25.0	19.0	22.0	4
M33	1.5	T1809A73	T2809A73	T3809A73	YH3	145.0	45.0	25.0	19.0	22.0	4
M36	4.0	T1809B34	T2809B34	T3809B34	YH4	155.0	57.0	28.0	21.0	24.0	4
M36	3.0	T1809B43	T2809B43	T3809B43	YH3	155.0	57.0	28.0	21.0	24.0	4
M36	2.0	T1809B53	T2809B53	T3809B53	YH3	155.0	45.0	28.0	21.0	24.0	4
M36	1.5	T1809B63	T2809B63	T3809B63	YH3	155.0	45.0	28.0	21.0	24.0	4
M38	1.5	T1809B83	T2809B83	T3809B83	YH3	165.0	45.0	28.0	21.0	24.0	4
M39	4.0	T1809C04	T2809C04	T3809C04	YH4	165.0	60.0	30.0	23.0	26.0	4
M39	2.0	T1809C23	T2809C23	T3809C23	YH3	165.0	45.0	30.0	23.0	26.0	4
M39	1.5	T1809C33	T2809C33	T3809C33	YH3	165.0	45.0	30.0	23.0	26.0	4
M40	3.0	T1809C44	T2809C44	T3809C44	YH4	165.0	60.0	30.0	23.0	26.0	4

* The other coating(TiCN or TiAlN) is available on your request

▶ 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	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													
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										
Recommended	◎	◎	◎	◎	○	◎	◎																									

CARBIDE
HSS
COMBO TAPS
YG TAP GENERAL
YG TAP FORMING

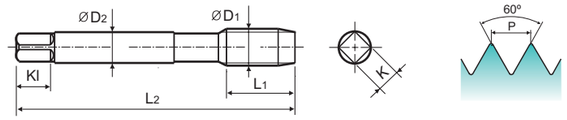
COMBO TAPS

HOMO **T1809** SERIES
Bright **T2809** SERIES
TiN **T3809** SERIES

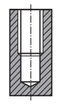
M I-SP SPIRAL FLUTE TAPS for Multi Purpose

▶ For using multi-purpose and correct thread profiles & long tool life due to special tap geometry.





Hole type
2.5×D



Material groups **MU** | HSS-E | I | YH | 60° | 2.5P | R40 | HOMO Bright TiN | p. B8

Tap Limits: p.B230

Unit : mm

SIZE ØD1	Pitch P	EDP No. HOMO	Bright	TiN	Limit	Overall Length L2	Thread Length L1	Shank Diameter ØD2	Square Size K	Square Length Kl	No. of Flute
M40	2.0	T1809C53	T2809C53	T3809C53	YH3	165.0	45.0	30.0	23.0	26.0	4
M40	1.5	T1809C63	T2809C63	T3809C63	YH3	165.0	45.0	30.0	23.0	26.0	4
M42	4.5	T1809C84	T2809C84	T3809C84	YH4	175.0	60.0	32.0	26.0	30.0	4
M42	3.0	T1809D04	T2809D04	T3809D04	YH4	175.0	60.0	32.0	26.0	30.0	4
M42	2.0	T1809D13	T2809D13	T3809D13	YH3	175.0	45.0	32.0	26.0	30.0	4
M42	1.5	T1809D23	T2809D23	T3809D23	YH3	175.0	45.0	32.0	26.0	30.0	4
M45	4.5	T1809D54	T2809D54	T3809D54	YH4	180.0	67.0	35.0	26.0	30.0	4
M45	1.5	T1809D93	T2809D93	T3809D93	YH3	180.0	45.0	35.0	26.0	30.0	4
M48	5.0	T1809E24	T2809E24	T3809E24	YH4	185.0	67.0	38.0	29.0	32.0	4
M48	3.0	T1809E54	T2809E54	T3809E54	YH4	185.0	67.0	38.0	29.0	32.0	4
M48	1.5	T1809E73	T2809E73	T3809E73	YH3	185.0	45.0	38.0	29.0	32.0	4
M50	5.0	T1809O34	T2809O34	T3809O34	YH4	195.0	70.0	40.0	32.0	35.0	4
M52	5.0	T1809F34	T2809F34	T3809F34	YH4	195.0	70.0	42.0	32.0	35.0	4
M64	6.0	T1809I75	T2809I75	T3809I75	YH5	225.0	79.0	48.0	38.0	42.0	4

* The other coating(TiCN or TiAlN) is available on your request

◎ : 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												
Recommended	○	◎	◎	◎	◎	◎	◎	○		○		◎	◎	◎	○	○	○	○														
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										
Recommended	◎	◎	◎	◎	○	◎	◎																									

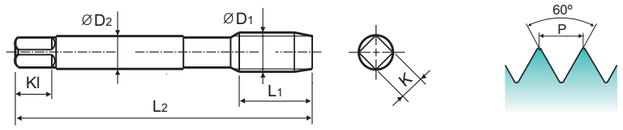
COMBO TAPS

Bright **T2839** SERIES

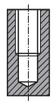
UNC/F I-SP SPIRAL FLUTE TAPS for Multi Purpose

▶ For using multi-purpose and correct thread profiles & long tool life due to special tap geometry.





Hole type
2.5×D



Material groups **MU** | HSS-E | I | YH | 60° | 2.5P | R40 | Bright



p. B8

Tap Limits: p.B230

Unit : mm

SIZE	Pitch	EDP No.	Limit	Overall Length	Thread Length	Shank Diameter	Square Size	Square Length	No. of Flute
ØD1	P	Bright		L2	L1	ØD2	K	Kl	
#2	- 56UNC	**T2839081**	YH1	42.0	9.5	3.0	2.5	5.0	2
#2	- 64UNF	**T2839101**	YH1	42.0	9.5	3.0	2.5	5.0	2
#3	- 48UNC	**T2839121**	YH1	44.0	9.5	3.0	2.5	5.0	2
#3	- 56UNF	**T2839141**	YH1	44.0	9.5	3.0	2.5	5.0	2
#4	- 40UNC	**T2839161**	YH1	44.0	9.5	3.0	2.5	5.0	3
#4	- 48UNF	**T2839181**	YH1	44.0	9.5	3.0	2.5	5.0	3
#5	- 40UNC	**T2839201-C**	YH1	46.0	11.0	4.0	3.2	6.0	3
#5	- 44UNF	**T2839221-C**	YH1	46.0	11.0	4.0	3.2	6.0	3
#6	- 32UNC	**T2839242-C**	YH2	48.0	13.0	4.0	3.2	6.0	3
#6	- 40UNF	**T2839261-C**	YH1	48.0	13.0	4.0	3.2	6.0	3
#8	- 32UNC	**T2839282-C**	YH2	52.0	13.0	5.0	4.0	7.0	3
#8	- 36UNF	**T2839302-C**	YH2	52.0	13.0	5.0	4.0	7.0	3
#10	- 24UNC	**T2839322-C**	YH2	60.0	16.0	5.5	4.5	7.0	3
#10	- 32UNF	**T2839342-C**	YH2	60.0	16.0	5.5	4.5	7.0	3
#12	- 24UNC	**T2839362-C**	YH2	60.0	16.0	5.5	4.5	7.0	3
#12	- 28UNF	**T2839382-C**	YH2	60.0	16.0	5.5	4.5	7.0	3
1/4	- 20UNC	**T2839402-C**	YH2	62.0	19.0	6.0	4.5	7.0	3
1/4	- 28UNF	**T2839422-C**	YH2	62.0	19.0	6.0	4.5	7.0	3
5/16	- 18UNC	**T2839442-C**	YH2	70.0	22.0	6.1	5.0	8.0	3
5/16	- 24UNF	**T2839462-C**	YH2	70.0	22.0	6.1	5.0	8.0	3
3/8	- 16UNC	**T2839482-C**	YH2	75.0	24.0	7.0	5.5	8.0	3
3/8	- 24UNF	**T2839502-C**	YH2	75.0	24.0	7.0	5.5	8.0	3
7/16	- 14UNC	**T2839523-C**	YH3	80.0	25.0	8.0	6.0	9.0	3
7/16	- 20UNF	**T2839542-C**	YH2	80.0	25.0	8.0	6.0	9.0	3

* The other coating(TiCN or TiAlN) is available on your request

▶ 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	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		
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
Recommended	◎	◎	◎	◎	○	◎	◎														

CARBIDE
HSS
COMBO TAPS
YG TAP GENERAL
YG TAP FORMING

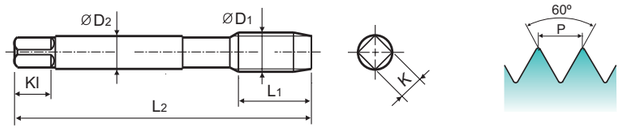
COMBO TAPS

Bright **T2839** SERIES

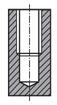
UNC/F I-SP SPIRAL FLUTE TAPS for Multi Purpose

▶ For using multi-purpose and correct thread profiles & long tool life due to special tap geometry.





Hole type
2.5×D



Material groups **MU** | HSS-E | I | YH | 60° | 2.5P | R40 | Bright



p. B8

Tap Limits: p.B230

Unit : mm

SIZE	Pitch	EDP No.	Limit	Overall Length	Thread Length	Shank Diameter	Square Size	Square Length	No. of Flute
ØD1	P	Bright		L2	L1	ØD2	K	Kl	
1/2	- 13UNC	**T2839563-C**	YH3	85.0	29.0	9.0	7.0	10.0	3
1/2	- 20UNF	**T2839582-C**	YH2	85.0	29.0	9.0	7.0	10.0	3
9/16	- 12UNC	**T2839603**	YH3	90.0	30.0	10.5	8.0	11.0	3
9/16	- 18UNF	**T2839622**	YH2	90.0	30.0	10.5	8.0	11.0	3
5/8	- 11UNC	**T2839643**	YH3	95.0	32.0	12.0	9.0	12.0	3
5/8	- 18UNF	**T2839662**	YH2	95.0	32.0	12.0	9.0	12.0	3
3/4	- 10UNC	**T2839703**	YH3	105.0	37.0	14.0	11.0	14.0	4
3/4	- 16UNF	**T2839723**	YH3	105.0	37.0	14.0	11.0	14.0	4
7/8	- 9UNC	**T2839743**	YH3	115.0	38.0	17.0	13.0	16.0	4
7/8	- 14UNF	**T2839763**	YH3	115.0	38.0	17.0	13.0	16.0	4
1"	- 8UNC	**T2839783**	YH3	125.0	45.0	20.0	15.0	18.0	4
1"	- 12UNF	**T2839803**	YH3	125.0	45.0	20.0	15.0	18.0	4

* The other coating(TiCN or TiAlN) is available on your request

◎ : 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
Recommended	○	◎	◎	◎	◎	◎	◎	○		○		◎	◎	◎	○	○	○	○		

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
Recommended	◎	◎	◎	◎	○	◎	◎														

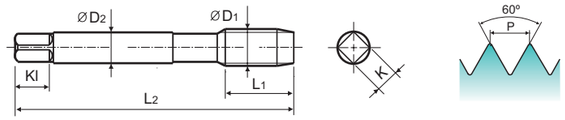
COMBO TAPS

HOMO T1829 SERIES
Bright T2829 SERIES
TiN T3829 SERIES

M I-GP SPIRAL POINT TAPS for Multi Purpose

▶ For using multi-purpose and correct thread profiles & long tool life due to special tap geometry.





Hole type
3.0×D



Material groups MU | HSS-E | I | YH | 60° | 5.0P | HOMO Bright TiN

p. B8 p. B8

Tap Limits: p.B230

Unit : mm

SIZE ØD1	Pitch P	EDP No. HOMO	Bright	TiN	Limit	Overall Length L2	Thread Length L1	Shank Diameter ØD2	Square Size K	Square Length Kl	No. of Flute
M1	x 0.25	T1829011	T2829011	T2829011	YH1	30.0	5.5	3.0	2.5	5.0	2
M1.1	x 0.25	T1829031	T2829031	T2829031	YH1	32.0	5.5	3.0	2.5	5.0	2
M1.2	x 0.25	T1829051	T2829051	T2829051	YH1	32.0	5.5	3.0	2.5	5.0	2
M1.4	x 0.3	T1829071	T2829071	T2829071	YH1	34.0	8.0	3.0	2.5	5.0	2
M1.6	x 0.35	T1829091	T2829091	T2829091	YH1	36.0	8.0	3.0	2.5	5.0	2
M1.7	x 0.35	T1829K51	T2829K51	T2829K51	YH1	36.0	8.0	3.0	2.5	5.0	2
M1.8	x 0.35	T1829112	T2829112	T2829112	YH2	36.0	8.0	3.0	2.5	5.0	2
M2	x 0.4	T1829132	T2829132	T2829132	YH2	40.0	9.5	3.0	2.5	5.0	2
M2.2	x 0.45	T1829152	T2829152	T2829152	YH2	42.0	9.5	3.0	2.5	5.0	2
M2.3	x 0.4	T1829192	T2829192	T2829192	YH2	42.0	9.5	3.0	2.5	5.0	2
M2.5	x 0.45	T1829172	T2829172	T2829172	YH2	44.0	9.5	3.0	2.5	5.0	2
M2.6	x 0.45	T1829492	T2829492	T2829492	YH2	44.0	9.5	3.0	2.5	5.0	2
M3	x 0.5	T1829202-C	T2829202-C	T2829202-C	YH2	46.0	11.0	4.0	3.2	6.0	3
M3	x 0.35	T1829212-C	T2829212-C	T2829212-C	YH2	46.0	11.0	4.0	3.2	6.0	3
M3.5	x 0.6	T1829222-C	T2829222-C	T2829222-C	YH2	48.0	13.0	4.0	3.2	6.0	3
M3.5	x 0.35	T1829232-C	T2829232-C	T2829232-C	YH2	48.0	13.0	4.0	3.2	6.0	3
M4	x 0.7	T1829242-C	T2829242-C	T2829242-C	YH2	52.0	13.0	5.0	4.0	7.0	3
M4	x 0.5	T1829252-C	T2829252-C	T2829252-C	YH2	52.0	13.0	5.0	4.0	7.0	3
M4.5	x 0.75	T1829262-C	T2829262-C	T2829262-C	YH2	55.0	13.0	5.0	4.0	7.0	3
M4.5	x 0.5	T1829272-C	T2829272-C	T2829272-C	YH2	55.0	13.0	5.0	4.0	7.0	3
M5	x 0.8	T1829282-C	T2829282-C	T2829282-C	YH2	60.0	16.0	5.5	4.5	7.0	3
M5	x 0.5	T1829292-C	T2829292-C	T2829292-C	YH2	60.0	16.0	5.5	4.5	7.0	3
M5.5	x 0.5	T1829302-C	T2829302-C	T2829302-C	YH2	60.0	16.0	5.5	4.5	7.0	3
M6	x 1.0	T1829312-C	T2829312-C	T2829312-C	YH2	62.0	19.0	6.0	4.5	7.0	3

* The other Coating(TiCN or TiAlN) is available on your request.

▶ 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	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		
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
Recommended	◎	◎	◎	◎	○	◎	◎														

CARBIDE
HSS
COMBO TAPS
YG TAP GENERAL
YG TAP FORMING

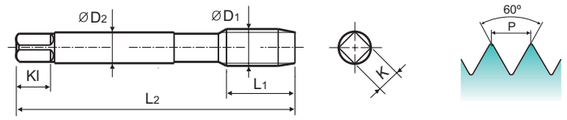
COMBO TAPS

HOMO T1829 SERIES
Bright T2829 SERIES
TiN T3829 SERIES

M I-GP SPIRAL POINT TAPS for Multi Purpose

▶ For using multi-purpose and correct thread profiles & long tool life due to special tap geometry.





Hole type
3.0×D



Material groups MU | HSS-E | I | YH | 60° | 5.0P | HOMO Bright TiN

p. B8 p. B8

Tap Limits: p.B230

Unit : mm

SIZE ØD1	Pitch P	EDP No. HOMO	Bright	TiN	Limit	Overall Length L2	Thread Length L1	Shank Diameter ØD2	Square Size K	Square Length Kl	No. of Flute
M6	x 0.75	T1829322-C	T2829322-C	T3829322-C	YH2	62.0	19.0	6.0	4.5	7.0	3
M6	x 0.5	T1829332-C	T2829332-C	T3829332-C	YH2	62.0	19.0	6.0	4.5	7.0	3
M7	x 1.0	T1829342-C	T2829342-C	T3829342-C	YH2	65.0	19.0	6.2	5.0	8.0	3
M7	x 0.75	T1829352-C	T2829352-C	T3829352-C	YH2	65.0	19.0	6.2	5.0	8.0	3
M8	x 1.25	T1829363-C	T2829363-C	T3829363-C	YH3	70.0	22.0	6.2	5.0	8.0	3
M8	x 1.0	T1829373-C	T2829373-C	T3829373-C	YH3	70.0	22.0	6.2	5.0	8.0	3
M8	x 0.75	T1829383-C	T2829383-C	T3829383-C	YH3	70.0	22.0	6.2	5.0	8.0	3
M9	x 1.25	T1829393-C	T2829393-C	T3829393-C	YH3	72.0	22.0	7.0	5.5	8.0	3
M9	x 1.0	T1829403-C	T2829403-C	T3829403-C	YH3	72.0	22.0	7.0	5.5	8.0	3
M9	x 0.75	T1829413-C	T2829413-C	T3829413-C	YH3	72.0	22.0	7.0	5.5	8.0	3
M10	x 1.5	T1829423-C	T2829423-C	T3829423-C	YH3	75.0	24.0	7.0	5.5	8.0	3
M10	x 1.25	T1829433-C	T2829433-C	T3829433-C	YH3	75.0	24.0	7.0	5.5	8.0	3
M10	x 1.0	T1829443-C	T2829443-C	T3829443-C	YH3	75.0	24.0	7.0	5.5	8.0	3
M11	x 1.5	T1829463-C	T2829463-C	T3829463-C	YH3	80.0	25.0	8.0	6.0	9.0	3
M11	x 1.0	T1829473-C	T2829473-C	T3829473-C	YH3	80.0	25.0	8.0	6.0	9.0	3
M11	x 0.75	T1829483-C	T2829483-C	T3829483-C	YH3	80.0	25.0	8.0	6.0	9.0	3
M12	x 1.75	T1829504-C	T2829504-C	T3829504-C	YH4	82.0	29.0	8.5	6.5	9.0	3
M12	x 1.5	T1829513-C	T2829513-C	T3829513-C	YH3	82.0	29.0	8.5	6.5	9.0	3
M12	x 1.25	T1829523-C	T2829523-C	T3829523-C	YH3	82.0	29.0	8.5	6.5	9.0	3
M12	x 1.0	T1829533-C	T2829533-C	T3829533-C	YH3	82.0	29.0	8.5	6.5	9.0	3
M14	x 2.0	T1829544	T2829544	T3829544	YH4	88.0	30.0	10.5	8.0	11.0	3
M14	x 1.5	T1829553	T2829553	T3829553	YH3	88.0	30.0	10.5	8.0	11.0	3
M14	x 1.25	T1829563	T2829563	T3829563	YH3	88.0	30.0	10.5	8.0	11.0	3
M14	x 1.0	T1829573	T2829573	T3829573	YH3	88.0	30.0	10.5	8.0	11.0	3

* The other Coating(TiCN or TiAlN) is available on your request.

▶ 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	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		
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
Recommended	◎	◎	◎	◎	○	◎	◎														

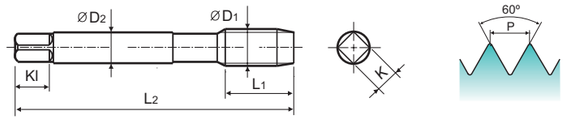
COMBO TAPS

HOMO T1829 SERIES
Bright T2829 SERIES
TiN T3829 SERIES

M I-GP SPIRAL POINT TAPS for Multi Purpose

▶ For using multi-purpose and correct thread profiles & long tool life due to special tap geometry.





Hole type
3.0×D



Material groups MU | HSS-E | I | YH | 60° | 5.0P | HOMO Bright TiN

p. B8 p. B8

Tap Limits: p.B230

Unit : mm

SIZE ØD1	Pitch P	EDP No. HOMO	Bright	TiN	Limit	Overall Length L2	Thread Length L1	Shank Diameter ØD2	Square Size K	Square Length Kl	No. of Flute
M15	x 1.5	T1829583	T2829583	T3829583	YH3	90.0	30.0	10.5	8.0	11.0	3
M15	x 1.0	T1829593	T2829593	T3829593	YH3	90.0	30.0	10.5	8.0	11.0	3
M16	x 2.0	T1829604	T2829604	T3829604	YH4	95.0	32.0	12.5	10.0	13.0	3
M16	x 1.5	T1829613	T2829613	T3829613	YH3	95.0	32.0	12.5	10.0	13.0	3
M16	x 1.0	T1829623	T2829623	T3829623	YH3	95.0	32.0	12.5	10.0	13.0	3
M18	x 2.5	T1829654	T2829654	T3829654	YH4	100.0	37.0	14.0	11.0	14.0	3
M18	x 2.0	T1829664	T2829664	T3829664	YH4	100.0	37.0	14.0	11.0	14.0	3
M18	x 1.5	T1829674	T2829674	T3829674	YH4	100.0	37.0	14.0	11.0	14.0	3
M18	x 1.0	T1829683	T2829683	T3829683	YH3	100.0	37.0	14.0	11.0	14.0	3
M20	x 2.5	T1829704	T2829704	T3829704	YH4	105.0	37.0	15.0	12.0	15.0	3
M20	x 2.0	T1829714	T2829714	T3829714	YH4	105.0	37.0	15.0	12.0	15.0	3
M20	x 1.5	T1829724	T2829724	T3829724	YH4	105.0	37.0	15.0	12.0	15.0	3
M20	x 1.0	T1829733	T2829733	T3829733	YH3	105.0	37.0	15.0	12.0	15.0	3
M22	x 2.5	T1829744	T2829744	T3829744	YH4	115.0	38.0	17.0	13.0	16.0	3
M22	x 2.0	T1829754	T2829754	T3829754	YH4	115.0	38.0	17.0	13.0	16.0	3
M22	x 1.5	T1829764	T2829764	T3829764	YH4	115.0	38.0	17.0	13.0	16.0	3
M22	x 1.0	T1829773	T2829773	T3829773	YH3	115.0	38.0	17.0	13.0	16.0	3
M24	x 3.0	T1829784	T2829784	T3829784	YH4	120.0	45.0	19.0	15.0	18.0	3
M24	x 2.0	T1829794	T2829794	T3829794	YH4	120.0	45.0	19.0	15.0	18.0	3
M24	x 1.5	T1829804	T2829804	T3829804	YH4	120.0	45.0	19.0	15.0	18.0	3
M24	x 1.0	T1829813	T2829813	T3829813	YH3	120.0	45.0	19.0	15.0	18.0	3
M25	x 2.0	T1829824	T2829824	T3829824	YH4	125.0	45.0	19.0	15.0	18.0	3
M25	x 1.5	T1829834	T2829834	T3829834	YH4	125.0	45.0	19.0	15.0	18.0	3
M26	x 2.0	T1829N44	T2829N44	T3829N44	YH4	125.0	45.0	20.0	15.0	18.0	4

* The other Coating(TiCN or TiAlN) is available on your request.

▶ 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	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		
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
Recommended	◎	◎	◎	◎	○	◎	◎														

CARBIDE
HSS
COMBO TAPS
YG TAP GENERAL
YG TAP FORMING

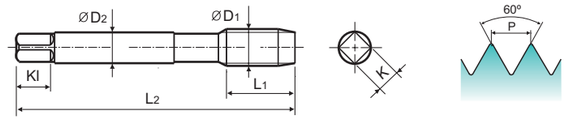
COMBO TAPS

HOMO T1829 SERIES
Bright T2829 SERIES
TiN T3829 SERIES

M I-GP SPIRAL POINT TAPS for Multi Purpose

▶ For using multi-purpose and correct thread profiles & long tool life due to special tap geometry.





Hole type
3.0×D



Material groups MU | HSS-E | I | YH | 60° | 5.0P | HOMO Bright TiN

p. B8 p. B8

Tap Limits: p.B230

Unit : mm

SIZE ØD1	Pitch P	EDP No. HOMO	Bright	TiN	Limit	Overall Length L2	Thread Length L1	Shank Diameter ØD2	Square Size K	Square Length Kl	No. of Flute
M26	x 1.5	T1829854	T2829854	T3829854	YH4	125.0	45.0	20.0	15.0	18.0	4
M26	x 1.0	T1829N53	T2829N53	T3829N53	YH3	125.0	45.0	20.0	15.0	18.0	4
M27	x 3.0	T1829864	T2829864	T3829864	YH4	130.0	45.0	20.0	15.0	18.0	4
M27	x 2.0	T1829874	T2829874	T3829874	YH4	130.0	45.0	20.0	15.0	18.0	4
M27	x 1.5	T1829884	T2829884	T3829884	YH4	130.0	45.0	20.0	15.0	18.0	4
M28	x 2.0	T1829904	T2829904	T3829904	YH4	130.0	45.0	21.0	17.0	20.0	4
M28	x 1.5	T1829914	T2829914	T3829914	YH4	130.0	45.0	21.0	17.0	20.0	4
M30	x 3.5	T1829945	T2829945	T3829945	YH5	135.0	48.0	23.0	17.0	20.0	4
M30	x 3.0	T1829954	T2829954	T3829954	YH4	135.0	48.0	23.0	17.0	20.0	4
M30	x 2.0	T1829964	T2829964	T3829964	YH4	135.0	48.0	23.0	17.0	20.0	4
M30	x 1.5	T1829974	T2829974	T3829974	YH4	135.0	48.0	23.0	17.0	20.0	4
M30	x 1.0	T1829982	T2829982	T3829982	YH2	135.0	48.0	23.0	17.0	20.0	4
M33	x 3.5	T1829A45	T2829A45	T3829A45	YH5	145.0	51.0	25.0	19.0	22.0	4
M33	x 3.0	T1829A54	T2829A54	T3829A54	YH4	145.0	51.0	25.0	19.0	22.0	4
M33	x 2.0	T1829A63	T2829A63	T3829A63	YH3	145.0	45.0	25.0	19.0	22.0	4
M33	x 1.5	T1829A74	T2829A74	T3829A74	YH4	145.0	45.0	25.0	19.0	22.0	4
M36	x 4.0	T1829B35	T2829B35	T3829B35	YH5	155.0	57.0	28.0	21.0	24.0	4
M36	x 3.0	T1829B44	T2829B44	T3829B44	YH4	155.0	57.0	28.0	21.0	24.0	4
M36	x 2.0	T1829B53	T2829B53	T3829B53	YH3	155.0	45.0	28.0	21.0	24.0	4
M36	x 1.5	T1829B64	T2829B64	T3829B64	YH4	155.0	45.0	28.0	21.0	24.0	4

* The other Coating(TiCN or TiAlN) is available on your request.

◎ : 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
Recommended	○	◎	◎	◎	◎	◎	◎	○		○		◎	◎	◎	◎	◎	◎	◎	○	○

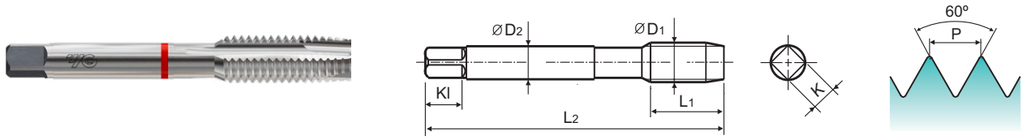
ISO	N										S							H		
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	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
Recommended	◎	◎	◎	◎	○	◎	◎														

COMBO TAPS

Bright **T2849** SERIES

UNC/F I-GP SPIRAL POINT TAPS for Multi Purpose

▶ For using multi-purpose and correct thread profiles & long tool life due to special tap geometry.



Hole type
3.0×D

Material groups **MU** | HSS-E | I | YH | 60° | 5.0P | Bright | p. B8

Tap Limits: p.B230

Unit(単位) : mm

SIZE	Pitch	EDP No.	Limit	Overall Length	Thread Length	Shank Diameter	Square Size	Square Length	No. of Flute
ØD1	P	Bright		L2	L1	ØD2	K	Kl	
#2	- 56UNC	**T2849081**	YH1	42.0	9.5	3.0	2.5	5.0	2
#2	- 64UNF	**T2849101**	YH1	42.0	9.5	3.0	2.5	5.0	2
#3	- 48UNC	**T2849121**	YH1	44.0	9.5	3.0	2.5	5.0	2
#3	- 56UNF	**T2849141**	YH1	44.0	9.5	3.0	2.5	5.0	2
#4	- 40UNC	**T2849162**	YH2	44.0	9.5	3.0	2.5	5.0	2
#4	- 48UNF	**T2849182**	YH2	44.0	9.5	3.0	2.5	5.0	2
#5	- 40UNC	**T2849202-C**	YH2	46.0	11.0	4.0	3.2	6.0	3
#5	- 44UNF	**T2849222-C**	YH2	46.0	11.0	4.0	3.2	6.0	3
#6	- 32UNC	**T2849242-C**	YH2	48.0	13.0	4.0	3.2	6.0	3
#6	- 40UNF	**T2849262-C**	YH2	48.0	13.0	4.0	3.2	6.0	3
#8	- 32UNC	**T2849282-C**	YH2	52.0	13.0	5.0	4.0	7.0	3
#8	- 36UNF	**T2849302-C**	YH2	52.0	13.0	5.0	4.0	7.0	3
#10	- 24UNC	**T2849322-C**	YH2	60.0	16.0	5.5	4.5	7.0	3
#10	- 32UNF	**T2849342-C**	YH2	60.0	16.0	5.5	4.5	7.0	3
#12	- 24UNC	**T2849362-C**	YH2	60.0	16.0	5.5	4.5	7.0	3
#12	- 28UNF	**T2849382-C**	YH2	60.0	16.0	5.5	4.5	7.0	3
1/4	- 20UNC	**T2849402-C**	YH2	62.0	19.0	6.0	4.5	7.0	3
1/4	- 28UNF	**T2849422-C**	YH2	62.0	19.0	6.0	4.5	7.0	3
5/16	- 18UNC	**T2849442-C**	YH2	70.0	22.0	6.1	5.0	8.0	3
5/16	- 24UNF	**T2849462-C**	YH2	70.0	22.0	6.1	5.0	8.0	3
3/8	- 16UNC	**T2849483-C**	YH3	75.0	24.0	7.0	5.5	8.0	3
3/8	- 24UNF	**T2849502-C**	YH2	75.0	24.0	7.0	5.5	8.0	3
7/16	- 14UNC	**T2849523-C**	YH3	80.0	25.0	8.0	6.0	9.0	3
7/16	- 20UNF	**T2849543-C**	YH3	80.0	25.0	8.0	6.0	9.0	3
1/2	- 13UNC	**T2849563-C**	YH3	85.0	29.0	9.0	7.0	10.0	3
1/2	- 20UNF	**T2849582-C**	YH2	85.0	29.0	9.0	7.0	10.0	3

* The other coating(TiCN or TiAlN) is available on your request

▶ 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	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		
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
Recommended	◎	◎	◎	◎	○	◎	◎														

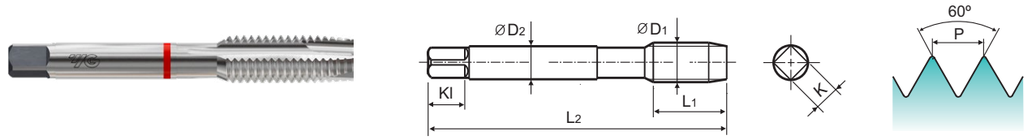
CARBIDE
HSS
COMBO TAPS
YG TAP GENERAL
YG TAP FORMING

COMBO TAPS

Bright **T2849** SERIES

UNC/F I-GP SPIRAL POINT TAPS for Multi Purpose

▶ For using multi-purpose and correct thread profiles & long tool life due to special tap geometry.



Hole type
3.0×D

Material groups **MU** | HSS-E | I | YH | 60° | 5.0P | Bright | p. B8

Tap Limits: p.B230

Unit(単位) : mm

SIZE	Pitch	EDP No.	Limit	Overall Length	Thread Length	Shank Diameter	Square Size	Square Length	No. of Flute
ØD1	P	Bright		L2	L1	ØD2	K	Kl	
9/16	- 12UNC	**T2849603**	YH3	90.0	30.0	10.5	8.0	11.0	3
9/16	- 18UNF	**T2849622**	YH2	90.0	30.0	10.5	8.0	11.0	3
5/8	- 11UNC	**T2849643**	YH3	95.0	32.0	12.0	9.0	12.0	3
5/8	- 18UNF	**T2849663**	YH3	95.0	32.0	12.0	9.0	12.0	3
3/4	- 10UNC	**T2849703**	YH3	105.0	37.0	14.0	11.0	14.0	3
3/4	- 16UNF	**T2849723**	YH3	105.0	37.0	14.0	11.0	14.0	3
7/8	- 9UNC	**T2849744**	YH4	115.0	38.0	17.0	13.0	16.0	3
7/8	- 14UNF	**T2849763**	YH3	115.0	38.0	17.0	13.0	16.0	3
1"	- 8UNC	**T2849784**	YH4	125.0	45.0	20.0	15.0	18.0	3
1"	- 12UNF	**T2849803**	YH3	125.0	45.0	20.0	15.0	18.0	3

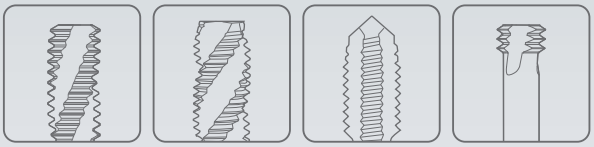
* The other coating(TiCN or TiAlN) is available on your request

◎ : 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
Recommended	○	◎	◎	◎	◎	◎	◎	○		○		◎	◎	◎	◎	◎	◎	◎	○	○

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
Recommended	◎	◎	◎	◎	○	◎	◎														

Global Cutting Tool Leader **YG-1**



THREADING



Leading Through Innovation

HSS-E & HSS

YG TAP GENERAL

- Suitable for Tapping Blind / Through Holes due to Flute Geometry and Excellent Chip Evacuation

SELECTION GUIDE

THREADING TOOLS

HSS-E & HSS
YG TAP GENERAL

Suitable for Tapping Blind / Through Holes
due to Flute Geometry and Excellent Chip Evacuation

HOLE TYPE		Max. 2.0xD Blind/Through Hole	Max. 2.5xD Blind Hole	Max. 3.0xD Through Hole
TOOL MATERIAL		HSS	HSS-E	HSS-E
CHAMFER LEAD ACC. TO DIN2197		1.5P/5.0P/9.0P	2.5P	5.0P
FLUTE TYPE		Straight Flute	Spiral Flute	Spiral Point
SPIRAL FLUTE ANGLE		-	R40	-
SERIES (page)	JIS Type	HT	I	I
	M/MF	T7099 (p. B26)	T1121 (p. B30)	T1022 (p. B34)
	UNC/F			
	W			
	M-LH W-LH			
	PIPE TAPS			
SURFACE TREATMENT		Bright	Steam Homo	Steam Homo
MODEL		HAND TAP		





Please visit globalyg1.com/mat for material search

◎ : Excellent ○ : Good

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

CARBIDE
HSS
COMBO TAPS
YG TAP GENERAL
YG TAP FORMING

YG TAP GENERAL

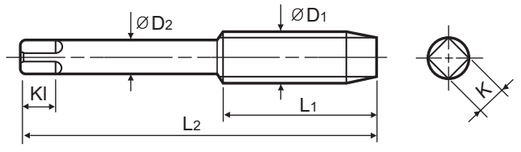
T7099 SERIES

M I-SP HAND TAPS(SET of 3 PIECES)

► This tap is a serial hand tap in set, Taper, Plug and Bottoming.

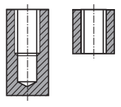


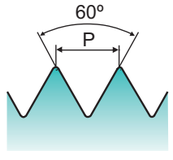
up to M6 : Male Center



Hole type

2.0×D





Material groups **GS** | HSS | HT | JIS II | 60° | 1.5P/5.0P/9.0P | Bright

p. B24

Unit : mm

SIZE		Pitch	EDP No.	Limit	Overall Length	Thread Length	Shank Diameter	Square Size	Square Length	No. of Flute
ØD1		P			L2	L1	ØD2	K	Kl	
M2	×	0.4	T7099139	JIS II	40	15	3	2.5	5	3
M2.2	×	0.45	T7099159	JIS II	42	15	3	2.5	5	3
M2.3	×	0.4	T7099199	JIS II	42	15	3	2.5	5	3
M2.5	×	0.45	T7099179	JIS II	44	16	3	2.5	5	3
M2.6	×	0.45	T7099499	JIS II	44	16	3	2.5	5	3
M3	×	0.5	T7099209	JIS II	46	18	4	3.2	6	3
M3	×	0.35	T7099219	JIS II	46	18	4	3.2	6	3
M3.5	×	0.6	T7099229	JIS II	48	18	4	3.2	6	3
M3.5	×	0.35	T7099239	JIS II	48	18	4	3.2	6	3
M4	×	0.7	T7099249	JIS II	52	20	5	4	7	4
M4	×	0.5	T7099259	JIS II	52	20	5	4	7	4
M4.5	×	0.75	T7099269	JIS II	55	20	5	4	7	4
M4.5	×	0.5	T7099279	JIS II	55	20	5	4	7	4
M5	×	0.8	T7099289	JIS II	60	22	5.5	4.5	7	4
M5	×	0.5	T7099299	JIS II	60	22	5.5	4.5	7	4
M5.5	×	0.5	T7099309	JIS II	60	22	5.5	4.5	7	4
M6	×	1	T7099319	JIS II	62	24	6	4.5	7	4
M6	×	0.75	T7099329	JIS II	62	24	6	4.5	7	4
M6	×	0.5	T7099339	JIS II	62	22	6	4.5	7	4
M7	×	1	T7099349	JIS II	65	26	6.2	5	8	4
M7	×	0.75	T7099359	JIS II	65	26	6.2	5	8	4
M8	×	1.25	T7099369	JIS II	70	30	6.2	5	8	4

▶ 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	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		
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
Recommended	○	○	○			○	○														

CARBIDE
HSS
COMBO TAPS
YG TAP GENERAL
YG TAP FORMING

YG TAP GENERAL

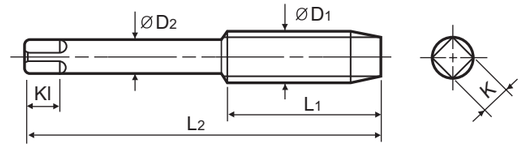
T7099 SERIES

M I-SP HAND TAPS(SET of 3 PIECES)

► This tap is a serial hand tap in set, Taper, Plug and Bottoming.

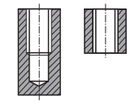


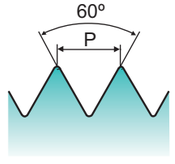
up to M6 : Male Center



Hole type

2.0×D





Material groups GS | HSS | HT | JIS II | 60° | 1.5P/5.0P/9.0P | Bright

p. B24

Unit : mm

SIZE		Pitch	EDP No.	Limit	Overall Length	Thread Length	Shank Diameter	Square Size	Square Length	No. of Flute
ØD1		P			L2	L1	ØD2	K	Kl	
M8	×	1	T7099379	JIS II	70	30	6.2	5	8	4
M8	×	0.75	T7099389	JIS II	65	26	6.2	5	8	4
M9	×	1.25	T7099399	JIS II	72	30	7	5.5	8	4
M9	×	1	T7099409	JIS II	70	30	7	5.5	8	4
M9	×	0.75	T7099419	JIS II	65	26	7	5.5	8	4
M10	×	1.5	T7099429	JIS II	75	32	7	5.5	8	4
M10	×	1.25	T7099439	JIS II	75	32	7	5.5	8	4
M10	×	1	T7099449	JIS II	70	30	7	5.5	8	4
M10	×	0.75	T7099459	JIS II	65	26	7	5.5	8	4
M11	×	1.5	T7099469	JIS II	80	38	8	6	9	4
M11	×	1	T7099479	JIS II	70	30	8	6	9	4
M11	×	0.75	T7099489	JIS II	65	26	8	6	9	4
M12	×	1.75	T7099509	JIS II	82	38	8.5	6.5	9	4
M12	×	1.5	T7099519	JIS II	82	38	8.5	6.5	9	4
M12	×	1.25	T7099529	JIS II	80	38	8.5	6.5	9	4
M12	×	1	T7099539	JIS II	70	30	8.5	6.5	9	4
M14	×	2	T7099549	JIS II	88	42	10.5	8	11	4
M14	×	1.5	T7099559	JIS II	88	42	10.5	8	11	4
M14	×	1.25	T7099569	JIS II	80	38	10.5	8	11	4
M14	×	1	T7099579	JIS II	70	30	10.5	8	11	4
M15	×	1.5	T7099589	JIS II	90	42	10.5	8	11	4
M15	×	1	T7099599	JIS II	70	30	10.5	8	11	4

▶ 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	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		
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
Recommended	○	○	○			○	○														

YG TAP GENERAL

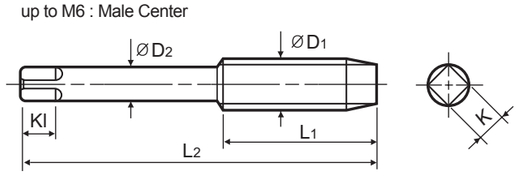
T7099 SERIES

M I-SP HAND TAPS(SET of 3 PIECES)

► This tap is a serial hand tap in set, Taper, Plug and Bottoming.

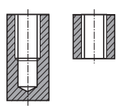


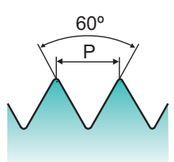
up to M6 : Male Center



Hole type

2.0×D





Material groups GS | HSS | HT | JIS II | 60° | 1.5P/5.0P/9.0P | Bright

p. B24

Unit : mm

SIZE		Pitch	EDP No.	Limit	Overall Length	Thread Length	Shank Diameter	Square Size	Square Length	No. of Flute
ØD1		P			L2	L1	ØD2	K	Kl	
M16	×	2	T7099609	JIS II	95	45	12.5	10	13	4
M16	×	1.5	T7099619	JIS II	95	45	12.5	10	13	4
M16	×	1	T7099629	JIS II	75	30	12.5	10	13	4
M18	×	2.5	T7099659	JIS II	100	48	14	11	14	4
M18	×	2	T7099669	JIS II	95	45	14	11	14	4
M18	×	1.5	T7099679	JIS II	95	45	14	11	14	4
M18	×	1	T7099689	JIS II	80	30	14	11	14	4
M20	×	2.5	T7099709	JIS II	105	50	15	12	15	4
M20	×	2	T7099719	JIS II	95	45	15	12	15	4
M20	×	1.5	T7099729	JIS II	95	45	15	12	15	4
M20	×	1	T7099739	JIS II	80	30	15	12	15	4
M22	×	2.5	T7099749	JIS II	115	55	17	13	16	4
M22	×	2	T7099759	JIS II	95	45	17	13	16	4
M22	×	1.5	T7099769	JIS II	95	45	17	13	16	4
M22	×	1	T7099779	JIS II	85	30	17	13	16	4
M24	×	3	T7099789	JIS II	120	58	19	15	18	4
M24	×	2	T7099799	JIS II	95	45	19	15	18	4
M24	×	1.5	T7099809	JIS II	95	45	19	15	18	4
M24	×	1	T7099819	JIS II	90	30	19	15	18	4
M25	×	2	T7099829	JIS II	95	45	19	15	18	4
M25	×	1.5	T7099839	JIS II	95	45	19	15	18	4
M26	×	2	T7099N49	JIS II	95	45	20	15	18	4

▶ 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	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		
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
Recommended	○	○	○			○	○														

YG TAP GENERAL

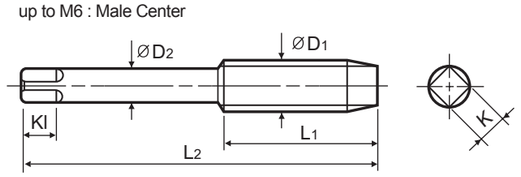
T7099 SERIES

M I-SP HAND TAPS(SET of 3 PIECES)

► This tap is a serial hand tap in set, Taper, Plus and Bottoming.

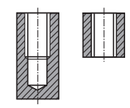


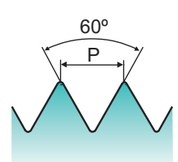
up to M6 : Male Center



Hole type

2.0×D





Material groups GS | HSS | HT | JIS II | 60° | 1.5P/5.0P/9.0P | Bright

p. B24

Unit : mm

SIZE		Pitch	EDP No.	Limit	Overall Length	Thread Length	Shank Diameter	Square Size	Square Length	No. of Flute
ØD1		P			L2	L1	ØD2	K	Kl	
M26	×	1.5	T7099859	JIS II	95	45	20	15	18	4
M26	×	1	T7099N59	JIS II	95	30	20	15	18	4
M27	×	3	T7099869	JIS II	130	62	20	15	18	4
M27	×	2	T7099879	JIS II	95	45	20	15	18	4
M27	×	1.5	T7099889	JIS II	95	45	20	15	18	4
M28	×	2	T7099909	JIS II	105	45	21	17	20	4
M28	×	1.5	T7099919	JIS II	105	45	21	17	20	4
M30	×	3.5	T7099949	JIS II	135	65	23	17	20	4
M30	×	3	T7099959	JIS II	130	65	23	17	20	4
M30	×	2	T7099969	JIS II	105	45	23	17	20	4
M30	×	1.5	T7099979	JIS II	105	45	23	17	20	4
M30	×	1	T7099989	JIS II	105	30	23	17	20	4
M33	×	3.5	T7099A49	JIS II	145	70	25	19	22	4
M33	×	3	T7099A59	JIS II	145	70	25	19	22	4
M33	×	2	T7099A69	JIS II	110	45	25	19	22	4
M33	×	1.5	T7099A79	JIS II	110	45	25	19	22	4
M36	×	4	T7099B39	JIS II	155	75	28	21	24	4
M36	×	3	T7099B49	JIS II	155	75	28	21	24	4
M36	×	2	T7099B59	JIS II	110	45	28	21	24	4
M36	×	1.5	T7099B69	JIS II	110	45	28	21	24	4

◎ : 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
Recommended	○	○	○	○	○	○	○			○					○	○	○	○		

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
Recommended	○	○	○			○	○														

YG TAP GENERAL

T1121 SERIES

M I-SP SPIRAL FLUTE TAPS for GENERAL PURPOSE

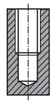
► Suitable for tapping Blind holes in Carbon Steels and Alloy Steels, where chips are produced in a continuous coil state.

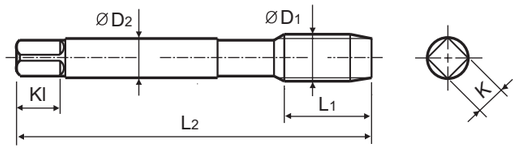


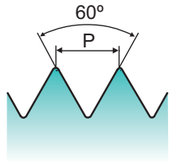
up to M7 : Male Center

Hole type

2.5×D







Material groups **GS** | HSS-E | I | YH | 60° | 2.5P | R40 | Homo

p. B24

Tap Limits: p.B230

Unit : mm

SIZE		Pitch		EDP No.	Limit	Overall Length	Thread Length	Shank Diameter	Square Size	Square Length	No. of Flute
ØD1		P				L2	L1	ØD2	K	Kl	
M2	×	0.4		T1121131	YH1	40	9.5	3	2.5	5	2
M2.2	×	0.45		T1121151	YH1	42	9.5	3	2.5	5	2
M2.3	×	0.4		T1121191	YH1	42	9.5	3	2.5	5	2
M2.5	×	0.45		T1121171	YH1	44	9.5	3	2.5	5	2
M2.6	×	0.45		T1121491	YH1	44	9.5	3	2.5	5	2
M3	×	0.5		T1121202	YH2	46	11	4	3.2	6	3
M3	×	0.35		T1121211	YH1	46	9.5	4	3.2	6	3
M3.5	×	0.6		T1121222	YH2	48	13	4	3.2	6	3
M3.5	×	0.35		T1121231	YH1	48	9.5	4	3.2	6	3
M4	×	0.7		T1121242	YH2	52	13	5	4	7	3
M4	×	0.5		T1121251	YH1	52	13	5	4	7	3
M4.5	×	0.75		T1121262	YH2	55	13	5	4	7	3
M4.5	×	0.5		T1121271	YH1	55	13	5	4	7	3
M5	×	0.8		T1121282	YH2	60	16	5.5	4.5	7	3
M5	×	0.5		T1121291	YH1	60	16	5.5	4.5	7	3
M5.5	×	0.5		T1121301	YH1	55	13	5.5	4.5	7	3
M6	×	1		T1121312	YH2	62	19	6	4.5	7	3
M6	×	0.75		T1121322	YH2	62	19	6	4.5	7	3
M6	×	0.5		T1121331	YH1	55	13	6	4.5	7	3
M7	×	1		T1121342	YH2	65	19	6.2	5	8	3
M7	×	0.75		T1121352	YH2	65	19	6.2	5	8	3
M8	×	1.25		T1121362	YH2	70	22	6.2	5	8	3

▶ 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	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		
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
Recommended	○	○	○			○	○														

CARBIDE
HSS
COMBO TAPS
YG TAP GENERAL
YG TAP FORMING

YG TAP GENERAL

T1121 SERIES

M I-SP SPIRAL FLUTE TAPS for GENERAL PURPOSE

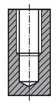
► Suitable for tapping Blind holes in Carbon Steels and Alloy Steels, where chips are produced in a continuous coil state.

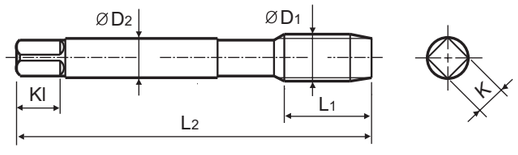


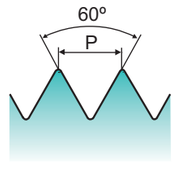
up to M7 : Male Center

Hole type

2.5×D







Material groups GS | HSS-E | I | YH | 60° | 2.5P | R40 | Homo

p. B24

Tap Limits: p.B230

Unit : mm

SIZE		Pitch		EDP No.	Limit	Overall Length	Thread Length	Shank Diameter	Square Size	Square Length	No. of Flute
ØD1		P				L2	L1	ØD2	K	Kl	
M8	×	1		T1121372	YH2	70	22	6.2	5	8	3
M8	×	0.75		T1121382	YH2	70	22	6.2	5	8	3
M9	×	1.25		T1121392	YH2	72	22	7	5.5	8	3
M9	×	1		T1121402	YH2	72	22	7	5.5	8	3
M9	×	0.75		T1121412	YH2	72	22	7	5.5	8	3
M10	×	1.5		T1121422	YH2	75	24	7	5.5	8	3
M10	×	1.25		T1121432	YH2	75	24	7	5.5	8	3
M10	×	1		T1121442	YH2	75	24	7	5.5	8	3
M10	×	0.75		T1121452	YH2	75	24	7	5.5	8	3
M11	×	1.5		T1121462	YH2	80	25	8	6	9	3
M11	×	1		T1121472	YH2	80	25	8	6	9	3
M11	×	0.75		T1121482	YH2	80	25	8	6	9	3
M12	×	1.75		T1121502	YH2	82	29	8.5	6.5	9	3
M12	×	1.5		T1121512	YH2	82	29	8.5	6.5	9	3
M12	×	1.25		T1121522	YH2	82	29	8.5	6.5	9	3
M12	×	1		T1121532	YH2	82	29	8.5	6.5	9	3
M14	×	2		T1121542	YH2	88	30	10.5	8	11	3
M14	×	1.5		T1121552	YH2	88	30	10.5	8	11	3
M14	×	1.25		T1121562	YH2	88	30	10.5	8	11	3
M14	×	1		T1121572	YH2	88	30	10.5	8	11	3
M15	×	1.5		T1121582	YH2	90	30	10.5	8	11	3
M15	×	1		T1121592	YH2	90	30	10.5	8	11	3

▶ 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	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		
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
Recommended	○	○	○			○	○														

YG TAP GENERAL

T1121 SERIES

M I-SP SPIRAL FLUTE TAPS for GENERAL PURPOSE

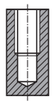
► Suitable for tapping Blind holes in Carbon Steels and Alloy Steels, where chips are produced in a continuous coil state.

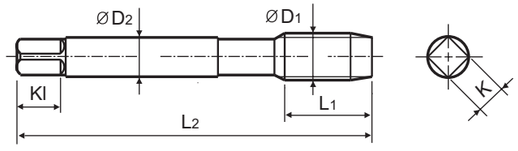


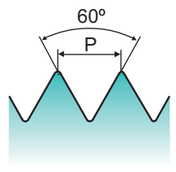
up to M7 : Male Center

Hole type

2.5×D







Material groups **GS** | HSS-E | I | YH | 60° | 2.5P | R40 | Homo

p. B24

Tap Limits: p.B230

Unit : mm

SIZE		Pitch		EDP No.	Limit	Overall Length	Thread Length	Shank Diameter	Square Size	Square Length	No. of Flute
ØD1		P				L2	L1	ØD2	K	Kl	
M16	×	2		T1121602	YH2	95	32	12.5	10	13	3
M16	×	1.5		T1121612	YH2	95	32	12.5	10	13	3
M16	×	1		T1121622	YH2	95	32	12.5	10	13	3
M18	×	2.5		T1121653	YH3	100	37	14	11	14	4
M18	×	2		T1121663	YH3	100	37	14	11	14	4
M18	×	1.5		T1121672	YH2	100	37	14	11	14	4
M18	×	1		T1121682	YH2	100	37	14	11	14	4
M20	×	2.5		T1121703	YH3	105	37	15	12	15	4
M20	×	2		T1121713	YH3	105	37	15	12	15	4
M20	×	1.5		T1121723	YH3	105	37	15	12	15	4
M20	×	1		T1121732	YH2	95	30	15	12	15	4
M22	×	2.5		T1121743	YH3	115	38	17	13	16	4
M22	×	2		T1121753	YH3	115	38	17	13	16	4
M22	×	1.5		T1121763	YH3	115	38	17	13	16	4
M22	×	1		T1121772	YH2	95	30	17	13	16	4
M24	×	3		T1121783	YH3	120	45	19	15	18	4
M24	×	2		T1121793	YH3	120	45	19	15	18	4
M24	×	1.5		T1121803	YH3	120	45	19	15	18	4
M24	×	1		T1121812	YH2	95	30	19	15	18	4
M25	×	2		T1121823	YH3	125	45	19	15	18	4
M25	×	1.5		T1121833	YH3	125	45	19	15	18	4
M26	×	2		T1121N43	YH3	125	45	20	15	18	4

▶ 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	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		
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
Recommended	○	○	○			○	○														

YG TAP GENERAL

T1121 SERIES

M I-SP SPIRAL FLUTE TAPS for GENERAL PURPOSE

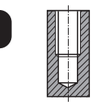
► Suitable for tapping Blind holes in Carbon Steels and Alloy Steels, where chips are produced in a continuous coil state.

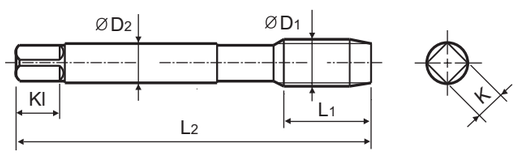


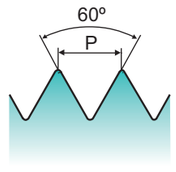
up to M7 : Male Center

Hole type

2.5×D







Material groups GS | HSS-E | I | YH | 60° | 2.5P | R40 | Homo

p. B24

Tap Limits: p.B230

Unit : mm

SIZE		Pitch		EDP No.	Limit	Overall Length	Thread Length	Shank Diameter	Square Size	Square Length	No. of Flute
ØD1		P				L2	L1	ØD2	K	Kl	
M26	×	1.5		T1121853	YH3	125	45	20	15	18	4
M26	×	1		T1121N52	YH2	95	30	20	15	18	4
M27	×	3		T1121863	YH3	130	45	20	15	18	4
M27	×	2		T1121873	YH3	130	45	20	15	18	4
M27	×	1.5		T1121883	YH3	130	45	20	15	18	4
M28	×	2		T1121903	YH3	130	45	21	17	20	4
M28	×	1.5		T1121913	YH3	130	45	21	17	20	4
M30	×	3.5		T1121944	YH4	135	48	23	17	20	4
M30	×	3		T1121953	YH3	135	48	23	17	20	4
M30	×	2		T1121963	YH3	135	45	23	17	20	4
M30	×	1.5		T1121973	YH3	135	45	23	17	20	4
M30	×	1		T1121982	YH2	105	30	23	17	20	4
M33	×	3.5		T1121A44	YH4	145	51	25	19	22	4
M33	×	3		T1121A53	YH3	145	51	25	19	22	4
M33	×	2		T1121A63	YH3	145	45	25	19	22	4
M33	×	1.5		T1121A73	YH3	145	45	25	19	22	4
M36	×	4		T1121B34	YH4	155	57	28	21	24	4
M36	×	3		T1121B43	YH3	155	57	28	21	24	4
M36	×	2		T1121B53	YH3	155	45	28	21	24	4
M36	×	1.5		T1121B63	YH3	155	45	28	21	24	4

◎ : 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
Recommended	◎	◎	○	○		○	○			○		○	○		○		○			

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
Recommended	○	○	○			○	○														

YG TAP GENERAL

T1022 SERIES

M I-GP SPIRAL POINT TAPS for GENERAL PURPOSE

► Suitable for tapping Through holes in Carbon Steels and Alloy Steels, where chips are produced in a continuous coil state.

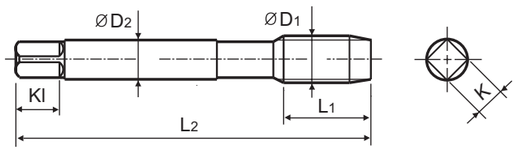


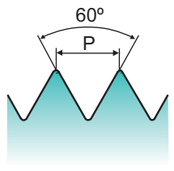
up to M8 : Male Center

Hole type



3.0×D





Material groups **GS** | HSS-E | I | YH | 60° | 5.0P | Homo

p. B24

Tap Limits: p.B230

Unit : mm

SIZE		Pitch		EDP No.	Limit	Overall Length	Thread Length	Shank Diameter	Square Size	Square Length	No. of Flute
ØD1		P				L2	L1	ØD2	K	Kl	
M2	×	0.4		T1022132	YH2	40	9.5	3	2.5	5	2
M2.2	×	0.45		T1022152	YH2	42	9.5	3	2.5	5	2
M2.3	×	0.4		T1022192	YH2	42	9.5	3	2.5	5	2
M2.5	×	0.45		T1022172	YH2	44	9.5	3	2.5	5	2
M2.6	×	0.45		T1022492	YH2	44	9.5	3	2.5	5	2
M3	×	0.5		T1022202	YH2	46	11	4	3.2	6	3
M3	×	0.35		T1022212	YH2	46	9.5	4	3.2	6	3
M3.5	×	0.6		T1022222	YH2	48	13	4	3.2	6	3
M3.5	×	0.35		T1022232	YH2	48	9.5	4	3.2	6	3
M4	×	0.7		T1022242	YH2	52	13	5	4	7	3
M4	×	0.5		T1022252	YH2	52	13	5	4	7	3
M4.5	×	0.75		T1022262	YH2	55	13	5	4	7	3
M4.5	×	0.5		T1022272	YH2	55	13	5	4	7	3
M5	×	0.8		T1022282	YH2	60	16	5.5	4.5	7	3
M5	×	0.5		T1022292	YH2	60	16	5.5	4.5	7	3
M5.5	×	0.5		T1022302	YH2	55	13	5.5	4.5	7	3
M6	×	1		T1022312	YH2	62	19	6	4.5	7	3
M6	×	0.75		T1022322	YH2	62	19	6	4.5	7	3
M6	×	0.5		T1022332	YH2	62	19	6	4.5	7	3
M7	×	1		T1022342	YH2	65	19	6.2	5	8	3
M7	×	0.75		T1022352	YH2	65	19	6.2	5	8	3
M8	×	1.25		T1022363	YH3	70	22	6.2	5	8	3

▶ 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	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		
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
Recommended	○	○	○			○	○														

CARBIDE
HSS
COMBO TAPS
YG TAP GENERAL
YG TAP FORMING

YG TAP GENERAL

T1022 SERIES

M I-GP SPIRAL POINT TAPS for GENERAL PURPOSE

► Suitable for tapping Through holes in Carbon Steels and Alloy Steels, where chips are produced in a continuous coil state.

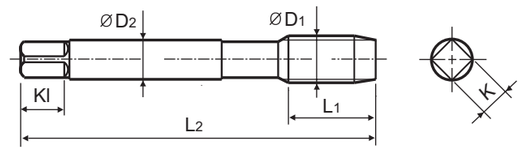


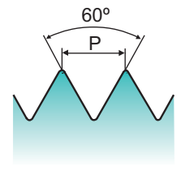
up to M8 : Male Center

Hole type



3.0×D





Material groups GS | HSS-E | I | YH | 60° | 5.0P | Homo

p. B24

Tap Limits: p.B230

Unit : mm

SIZE		Pitch		EDP No.	Limit	Overall Length	Thread Length	Shank Diameter	Square Size	Square Length	No. of Flute
ØD1		P				L2	L1	ØD2	K	Kl	
M8	×	1		T1022373	YH3	70	22	6.2	5	8	3
M8	×	0.75		T1022383	YH3	70	22	6.2	5	8	3
M9	×	1.25		T1022393	YH3	72	22	7	5.5	8	3
M9	×	1		T1022403	YH3	72	22	7	5.5	8	3
M9	×	0.75		T1022413	YH3	72	22	7	5.5	8	3
M10	×	1.5		T1022423	YH3	75	24	7	5.5	8	3
M10	×	1.25		T1022433	YH3	75	24	7	5.5	8	3
M10	×	1		T1022443	YH3	75	24	7	5.5	8	3
M10	×	0.75		T1022453	YH3	75	24	7	5.5	8	3
M11	×	1.5		T1022463	YH3	80	25	8	6	9	3
M11	×	1		T1022473	YH3	80	25	8	6	9	3
M11	×	0.75		T1022483	YH3	80	25	8	6	9	3
M12	×	1.75		T1022504	YH4	82	29	8.5	6.5	9	3
M12	×	1.5		T1022513	YH3	82	29	8.5	6.5	9	3
M12	×	1.25		T1022523	YH3	82	29	8.5	6.5	9	3
M12	×	1		T1022533	YH3	82	29	8.5	6.5	9	3
M14	×	2		T1022544	YH4	88	30	10.5	8	11	3
M14	×	1.5		T1022553	YH3	88	30	10.5	8	11	3
M14	×	1.25		T1022563	YH3	88	30	10.5	8	11	3
M14	×	1		T1022573	YH3	88	30	10.5	8	11	3
M15	×	1.5		T1022583	YH3	90	30	10.5	8	11	3
M15	×	1		T1022593	YH3	90	30	10.5	8	11	3

▶ 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	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		
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
Recommended	○	○	○			○	○														

YG TAP GENERAL

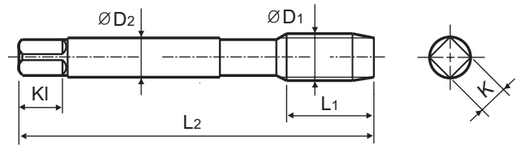
T1022 SERIES

M I-GP SPIRAL POINT TAPS for GENERAL PURPOSE

► Suitable for tapping Through holes in Carbon Steels and Alloy Steels, where chips are produced in a continuous coil state.

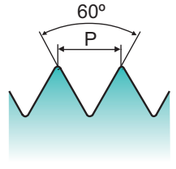


up to M8 : Male Center



Hole type

3.0×D



Material groups **GS** | HSS-E | I | YH | 60° | 5.0P | Homo

p. B24

Tap Limits: p.B230

Unit : mm

SIZE		Pitch	EDP No.	Limit	Overall Length	Thread Length	Shank Diameter	Square Size	Square Length	No. of Flute
ØD1		P			L2	L1	ØD2	K	Kl	
M16	×	2	T1022604	YH4	95	32	12.5	10	13	3
M16	×	1.5	T1022613	YH3	95	32	12.5	10	13	3
M16	×	1	T1022623	YH3	95	32	12.5	10	13	3
M18	×	2.5	T1022654	YH4	100	37	14	11	14	3
M18	×	2	T1022664	YH4	100	37	14	11	14	3
M18	×	1.5	T1022674	YH4	100	37	14	11	14	3
M18	×	1	T1022683	YH3	95	30	14	11	14	3
M20	×	2.5	T1022704	YH4	105	37	15	12	15	3
M20	×	2	T1022714	YH4	105	37	15	12	15	3
M20	×	1.5	T1022724	YH4	105	37	15	12	15	3
M20	×	1	T1022733	YH3	95	30	15	12	15	3
M22	×	2.5	T1022744	YH4	115	38	17	13	16	3
M22	×	2	T1022754	YH4	115	38	17	13	16	3
M22	×	1.5	T1022764	YH4	115	38	17	13	16	3
M22	×	1	T1022773	YH3	95	30	17	13	16	3
M24	×	3	T1022784	YH4	120	45	19	15	18	3
M24	×	2	T1022794	YH4	120	45	19	15	18	3
M24	×	1.5	T1022804	YH4	120	45	19	15	18	3
M24	×	1	T1022813	YH3	95	30	19	15	18	3
M25	×	2	T1022824	YH4	125	45	19	15	18	3
M25	×	1.5	T1022834	YH4	125	45	19	15	18	3
M26	×	2	T1022N44	YH4	125	45	20	15	18	4

▶ 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	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		
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
Recommended	○	○	○			○	○														

CARBIDE
HSS
COMBO TAPS
YG TAP GENERAL
YG TAP FORMING

YG TAP GENERAL

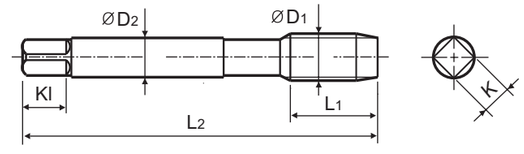
T1022 SERIES

M I-GP SPIRAL POINT TAPS for GENERAL PURPOSE

► Suitable for tapping Through holes in Carbon Steels and Alloy Steels, where chips are produced in a continuous coil state.

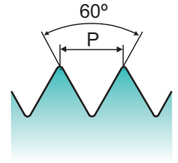


up to M8 : Male Center



Hole type

3.0×D



Material groups GS | HSS-E | I | YH | 60° | 5.0P | Homo

p. B24

Tap Limits: p.B230

Unit : mm

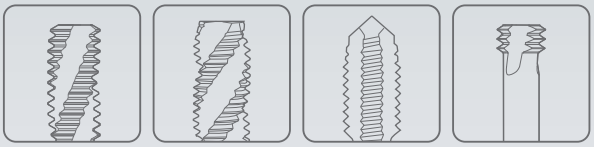
SIZE		Pitch	EDP No.	Limit	Overall Length	Thread Length	Shank Diameter	Square Size	Square Length	No. of Flute
ØD1		P			L2	L1	ØD2	K	Kl	
M26	×	1.5	T1022854	YH4	125	45	20	15	18	4
M26	×	1	T1022N53	YH3	95	30	20	15	18	4
M27	×	3	T1022864	YH4	130	45	20	15	18	4
M27	×	2	T1022874	YH4	130	45	20	15	18	4
M27	×	1.5	T1022884	YH4	130	45	20	15	18	4
M28	×	2	T1022904	YH4	130	45	21	17	20	4
M28	×	1.5	T1022914	YH4	130	45	21	17	20	4
M30	×	3.5	T1022945	YH5	135	48	23	17	20	4
M30	×	3	T1022954	YH4	135	48	23	17	20	4
M30	×	2	T1022964	YH4	135	45	23	17	20	4
M30	×	1.5	T1022974	YH4	135	45	23	17	20	4
M30	×	1	T1022982	YH2	105	30	23	17	20	4
M33	×	3.5	T1022A45	YH5	145	51	25	19	22	4
M33	×	3	T1022A54	YH4	145	51	25	19	22	4
M33	×	2	T1022A63	YH3	145	45	25	19	22	4
M33	×	1.5	T1022A74	YH4	145	45	25	19	22	4
M36	×	4	T1022B35	YH5	155	57	28	21	24	4
M36	×	3	T1022B44	YH4	155	57	28	21	24	4
M36	×	2	T1022B53	YH3	155	45	28	21	24	4
M36	×	1.5	T1022B64	YH4	155	45	28	21	24	4

◎ : 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
Recommended	◎	◎	○	○		○	○			○		○	○		○	○	○	○		

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
Recommended	○	○	○			○	○														

Global Cutting Tool Leader **YG-1**



THREADING



Leading Through Innovation

HSS-E

YG TAP FORMING

- Tapping by Forming Soft Materials

SELECTION GUIDE

THREADING TOOLS

HSS-E
YG TAP FORMING

Tapping by Forming Soft Materials

HOLE TYPE		Max. 3.0xD Blind / Th rough Hole
TOOL MATERIAL		HSS-E
CHAMFER LEAD ACC. TO DIN2197		2.0P
FLUTE TYPE		with Oil Groove
SPIRAL FLUTE ANGLE		-
SERIES NO. (page)	JIS Type	I
	M/MF	T2751 (p. B41)
	UNC/F	
	W	
	M-LH W-LH	
	PIPE TAPS	
SURFACE TREATMENT		Bright
MODEL		

Please visit globalyg1.com/mat for material search

◎ : Excellent ○ : Good

ISO	VDI 3323	Material Description	Composition / Structure / Heat Treatment		HB	HRc		
P	1	Non-alloy steel	About 0.15% C	Annealed	125		◎	8~13
	2		About 0.45% C	Annealed	190	13	○	7~10
	3		About 0.45% C	Quenched & Tempered	250	25	○	7~10
	4		About 0.75% C	Annealed	270	28		
	5		About 0.75% C	Quenched & Tempered	300	32		
	6	Low alloy steel		Annealed	180	10	○	5~8
	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	◎	5~10
	13		Martensitic	Quenched & Tempered	240	23	◎	5~10
	14		Austenitic		180	10	◎	5~10
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		◎	10~20
	22		Curable	Hardened	100		◎	10~20
	23	Aluminum-cast, alloyed	≤ 12% Si, Not Curable		75		◎	10~15
	24		≤ 12% Si, Curable	Hardened	90		○	10~15
	25		> 12% Si, Not Curable		130			
	26	Copper and Copper Alloys (Bronze / Brass)	Cutting Alloys, PB>1%		110		◎	7~12
	27		CuZn, CuSnZn (Brass)		90		◎	7~12
	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		Ni or Co Based	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	Hardened steel		Hardened	550	55		
	39			Hardened	630	60		
	40	Chilled Cast Iron		Cast	400	42		
	41	Hardened Cast Iron		Hardened	550	55		

YG TAP FORMING

2.0P **T2751** SERIES

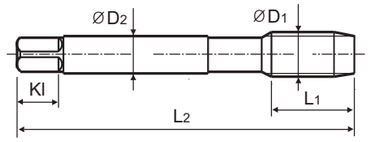
M FLUTELESS TAPS with OIL GROOVE for NON-FERROUS METALS

► Suitable for tapping in Aluminum, Magnesium, Zinc, Copper as well as Non-Ferrous metal alloys.

2.0P



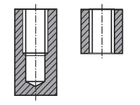
up to M7 : Male Center

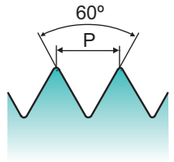




Hole type

3.0×D





Material groups **GV** | HSS-E | I | GH | 60° | 2.0P | Bright | p. B40

Unit : mm

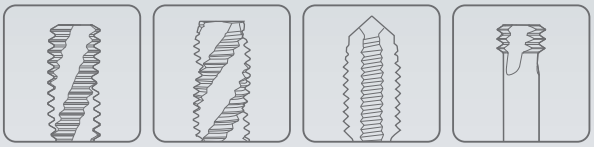
SIZE		Pitch	EDP No.	Limit	Overall Length	Thread Length	Shank Diameter	Square Size	Square Length	No. of Lobe
ØD1		P	2.0P		L2	L1	ØD2	K	Kl	
M2	×	0.4	T2751134	GH4	40	9	3	2.5	5	
M2.3	×	0.4	T2751194	GH4	42	10	3	2.5	5	
M2.5	×	0.45	T2751174	GH4	44	11	3	2.5	5	
M2.6	×	0.45	T2751494	GH4	44	11	3	2.5	5	
M3	×	0.5	T2751205	GH5	46	9	4	3.2	6	
M3.5	×	0.6	T2751225	GH5	48	9	4	3.2	6	
M4	×	0.7	T2751246	GH6	52	10	5	4	7	
M5	×	0.8	T2751286	GH6	60	11	5.5	4.5	7	
M6	×	1.0	T2751317	GH7	62	12	6	4.5	7	
M7	×	1.0	T2751347	GH7	65	13	6.2	5	8	
M8	×	1.25	T2751367	GH7	70	22	6.2	5	8	
M8	×	1.0	T2751377	GH7	70	22	6.2	5	8	
M10	×	1.5	T2751427	GH7	75	24	7	5.5	8	
M10	×	1.25	T2751437	GH7	75	24	7	5.5	8	
M10	×	1.0	T2751447	GH7	75	24	7	5.5	8	
M12	×	1.75	T2751508	GH8	82	29	8.5	6.5	9	
M12	×	1.5	T2751517	GH7	82	29	8.5	6.5	9	
M12	×	1.25	T2751527	GH7	82	29	8.5	6.5	9	
M12	×	1.0	T2751537	GH7	82	29	8.5	6.5	9	
M14	×	2.0	T2751540	GH10	88	30	10.5	8	11	
M14	×	1.5	T2751559	GH9	88	30	10.5	8	11	
M16	×	2.0	T2751600	GH10	95	32	12.5	10	13	
M16	×	1.5	T2751619	GH9	95	32	12.5	10	13	
M18	×	2.5	T275165A	GH11	100	37	14	11	14	
M18	×	1.5	T2751670	GH10	100	37	14	11	14	
M20	×	2.5	T275170A	GH11	105	37	15	12	15	
M20	×	1.5	T2751720	GH10	105	37	15	12	15	

◎ : 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
Recommended	◎	○	○			○						◎	◎	◎						

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
Recommended	◎	◎	◎	○		◎	◎														

Global Cutting Tool Leader **YG-1**



THREADING

YG CUTTING TOOLS

MILLING TOOLS

i-Xmill END MILLS

X1-EH END MILLS

4G Mill SOLID CARBIDE END MILLS

X-POWER PRO SOLID CARBIDE END MILLS

TitaNox-POWER SOLID CARBIDE END MILLS

V7 PLUS SOLID CARBIDE END MILLS

ALU-CUT SOLID CARBIDE & HSS-PM END MILLS

K-2 Plus SOLID CARBIDE END MILLS

GENERAL CARBIDE END MILLS

YG-1 CO., LTD.

SELECTION GUIDE

YG MILLING TOOLS

	i-Xmill							
SERIES	XMB110A	XMB120C	XMB260T	XMR110A	XMR120C	XMR260T	ZBC	ZRC
FLUTE	2	2	2	2	2	2	-	-
HELIX ANGLE	-	-	-	-	-	-	-	-
CUTTING EDGE SHAPE	BALL NOSE	BALL NOSE	BALL NOSE	CORNER RADIUS	CORNER RADIUS	CORNER RADIUS	BALL NOSE	CORNER RADIUS
SIZE MIN	R4.0	R4.0	R4.0	D8.0	D8.0	D8.0	-	-
SIZE MAX	R16.5	R16.5	R16.5	D33.0	D33.0	D33.0	-	-
PAGE	C10			C11			C16	C17
LENGTH							STRAIGHT NECK	STRAIGHT NECK
SURFACE TREATMENT	AlTiN	XC-Coating	Z-Coating	AlTiN	XC-Coating	Z-Coating	Carbide	Carbide
	GENERAL PURPOSE	PRE-HARDENED STEELS	HIGH HARDENED STEELS	GENERAL PURPOSE STAINLESS STEELS	PRE-HARDENED STEELS	HIGH HARDENED STEELS		







Please visit globalyg1.com/mat for material search

◎ : Excellent
○ : Good

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

	X1-EH					4G Mills						
	HPI90	HPI91	HPI92	HPI89	HPI88	SEMD98	SEM846	SEM846	SEMD99	SEME61	SEME01	SEME64
	2	2	2	2	2	2	2	2	2	2	4	4
	30°	30°	30°	35°	35°	30°	30°	30°	30°	30°	27°/30° (MULTIPLE HELIX)	27°/30° (MULTIPLE HELIX)
	BALL NOSE	BALL NOSE	BALL NOSE	CORNER RADIUS	SQUARE	BALL NOSE	BALL NOSE	BALL NOSE	CORNER RADIUS	CORNER RADIUS	CORNER RADIUS	CORNER RADIUS
	R0.05	R0.05	R0.05	D0.2	D0.1	R0.05	R0.05	R0.25	D0.2	D0.2	D1.0	D1.0
	R10.0	R3.0	R6.0	D3.0	D6.0	R12.5	R6.0	R1.0	D20.0	D20.0	D20.0	D20.0
	C23	C24	C34	C43	C50	C82	C88	C98	C101	C109	C128	C135
	-	RIB PROCESSING	TAPER NECK	RIB PROCESSING	RIB PROCESSING	-	EXTENDED NECK	EXTENDED NECK (6mm Shank)	-	EXTENDED NECK	-	EXTENDED NECK
	C-Coating	C-Coating	C-Coating	C-Coating	C-Coating	Y-Coating	Y-Coating	Y-Coating	Y-Coating	Y-Coating	Y-Coating	Y-Coating



						○	○	○	○	○	○	○	1
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						◎	◎	◎	◎	◎	◎	◎	4
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						○	○	○	○	○	○	○	6 P
						◎	◎	◎	◎	◎	◎	◎	7
○	○	○	○	○	◎	◎	◎	◎	◎	◎	◎	◎	8
○	○	○	○	○	◎	◎	◎	◎	◎	◎	◎	◎	9
						○	○	○	○	○	○	○	10
○	○	○	○	○	◎	◎	◎	◎	◎	◎	◎	◎	11
													12
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						○	○	○	○	○	○	○	15
						○	○	○	○	○	○	○	16
						○	○	○	○	○	○	○	17
						○	○	○	○	○	○	○	18 K
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						○	○	○	○	○	○	○	20
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◎	◎	◎	◎	◎									39
○	○	○	○	○	◎	◎	◎	◎	◎	◎	◎	◎	40 H
◎	◎	◎	◎	◎	○	○	○	○	○	○	○	○	41

SELECTION GUIDE

MILLING TOOLS

	4G Mills									
SERIES	SEME35	SEME35	SEME35	SEME70	SEM845	SEME36	SEME71	SEME72	SEME73	SEME75
FLUTE	2	2	2	2	2	4	4	4	4	6
HELIX ANGLE	30°	30°	30°	30°	30°	27°/30° (MULTIPLE HELIX)	35°/38° (MULTIPLE HELIX)	30°	30°	45°
CUTTING EDGE SHAPE	SQUARE	SQUARE	SQUARE	SQUARE	SQUARE	SQUARE	SQUARE	SQUARE	SQUARE	SQUARE
SIZE MIN	D0.1	D0.1	D0.1	D1.0	D0.1	D0.8	D1.0	D1.0	D1.0	D6.0
SIZE MAX	D25.0	D4.0	D3.0	D25.0	D12.0	D25.0	D20.0	D25.0	D12.0	D20.0
PAGE	C150	C153	C154	C155	C161	C170	C172	C176	C182	C187
LENGTH	-	4mm Shank	3mm Shank	LONG LENGTH	EXTENDED NECK	-	Sharp Corner Removal	LONG LENGTH	EXTENDED NECK	-
SURFACE TREATMENT	Y-Coating	Y-Coating	Y-Coating	Y-Coating	Y-Coating	Y-Coating	Y-Coating	Y-Coating	Y-Coating	Y-Coating

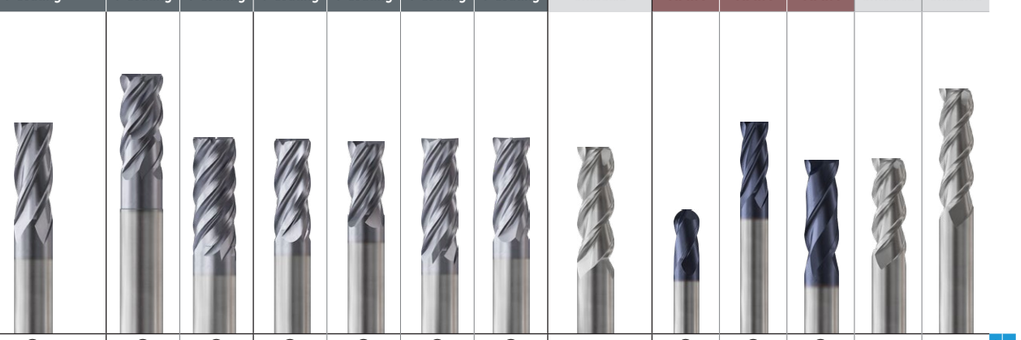


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◎ : Excellent
○ : Good

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	Low alloy steel	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	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	TitaNox-Power		V7 Plus				ALU-CUT	K-2 Plus				
SERIES	GMH35	GMG40	GMG30	GMH65	GMF66	GMH67	GMH68	E5D70	EMC56	EMC62	EMC52	E5C72	E5C74
FLUTE	4	4	5	4	4	4	4	3	4	4	2	2	3
HELIX ANGLE	30°	43°/45°	43°/44°/45°	35°/37° (MULTIPLE HELIX)	35°/37° (MULTIPLE HELIX)	35°/37° (MULTIPLE HELIX)	35°/37° (MULTIPLE HELIX)	45°	30°	30°	35°	45°	45°
CUTTING EDGE SHAPE	SQUARE	CORNER RADIUS	CORNER RADIUS	CORNER RADIUS	SQUARE	SQUARE	SQUARE	SQUARE	BALL NOSE	CORNER RADIUS	SQUARE	SQUARE	SQUARE
SIZE MIN	D1.0	D6.0	D6.0	D1.0	D3.0	D1.0	D1.0	D1.0	R0.1	D3.0	D1.0	D1.0	D2.0
SIZE MAX	D20.0	D25.0	D25.0	D25.0	D20.0	D20.0	D20.0	D20.0	R10.0	D12.0	D20.0	D20.0	D20.0
PAGE	C259	C263	C265	C274	C276	C277	C278	C283	C294	C295	C297	C298	C299
LENGTH	SHORT LENGTH	LONG LENGTH DOUBLE CORE	LONG LENGTH	LONG LENGTH	SHORT LENGTH	LONG LENGTH	LONG LENGTH	-	SHORT LENGTH	-	SHORT LENGTH	SHORT LENGTH	LONG LENGTH
SURFACE TREATMENT	Y-Coating	Y-Coating	Y-Coating	Y-Coating	Y-Coating	Y-Coating	Y-Coating	Uncoated	TiAlN	TiAlN	TiAlN	Uncoated	Uncoated



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○	○	○	◎	◎	◎	◎		◎		◎			10	
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	◎	◎	○	○	○	○							36	
	◎	◎	○	○	○	○							37	
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◎									○	○	○			40
○														41

CARBIDE
HSS
i-Xmill END MILLS
X-1EH END MILLS
4G MILL END MILLS
X-POWER PRO END MILLS
TitaNox-POWER END MILLS
V7 PLUS END MILLS
ALU-CUT END MILLS
K-2 END MILLS
GENERAL CARBIDE END MILLS

SELECTION GUIDE

YG MILLING TOOLS

	K-2 Plus			GENERAL HSS END MILLS		
SERIES	EMC54	EMC55	EMC69	E2401	E2412	E2760
FLUTE	4	4	4-6	2	4	4-6
HELIX ANGLE	35°	35°	45°	30°	30°	30°
CUTTING EDGE SHAPE	SQUARE	SQUARE	ROUGHING	SQUARE	SQUARE	SQUARE
SIZE MIN	D1.0	D2.0	D6.0	D1.0	D1.0	D6.0
SIZE MAX	D20.0	D20.0	D20.0	D50.0	D50.0	D50.0
PAGE	C301	C302	C303	C313	C316	C319
LENGTH	SHORT LENGTH	LONG LENGTH	FINE	REGULAR LENGTH	REGULAR LENGTH CENTER CUT	SHORT LENGTH ROUGHING-COARSE
SURFACE TREATMENT	TiAlN	TiAlN	X-Coating	Uncoated	Uncoated	Uncoated
				HSSCo8	HSSCo8	HSSCo8
						

Please visit 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	Low alloy steel	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	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						

YG

Leading Through Innovation



CARBIDE INSERT & HOLDER

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

YG MILLING TOOLS

CARBIDE INSERT & HOLDER i-Xmill END MILLS

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

Please visit globalyg1.com/mat for material search

◎ : Excellent ○ : Good

Recommended cutting conditions : p.C19

SERIES	XMB110A	XMB120C	XMB260T	XMR110A	XMR120C	XMR260T	ZBC	ZRC
FLUTE	2	2	2	2	2	2	-	-
HELIX ANGLE	-	-	-	-	-	-	-	-
CUTTING EDGE SHAPE	BALL NOSE	BALL NOSE	BALL NOSE	CORNER RADIUS	CORNER RADIUS	CORNER RADIUS	BALL NOSE	CORNER RADIUS
SIZE MIN	R4.0	R4.0	R4.0	D8.0	D8.0	D8.0	-	-
SIZE MAX	R16.5	R16.5	R16.5	D33.0	D33.0	D33.0	-	-
PAGE	C10			C11			C16	C17
	-	-	-	-	-	-	STRAIGHT NECK	STRAIGHT NECK
	AlTiN	XC-Coating	Z-Coating	AlTiN	XC-Coating	Z-Coating	Carbide	Carbide
	GENERAL PURPOSE	PRE-HARDENED STEELS	HIGH HARDENED STEELS	GENERAL PURPOSE STAINLESS STEELS	PRE-HARDENED STEELS	HIGH HARDENED STEELS		





| ISO | VDI 3323 | Material Description | Composition / Structure / Heat Treatment 成分 / 组织 / 热处理 | | HB | HRc | | |

i-Xmill END MILLS

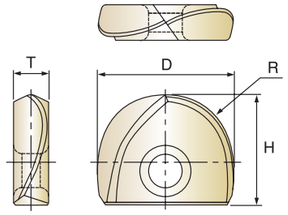
XMB110A SERIES
XMB120C SERIES
XMB260T SERIES

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)

▶Special Geometry and Coating for Excellent Performance





Cutting conditions : p.C19

Unit : mm

EDP No.			Radius of Ball Nose	Mill Diameter	Height	Thickness
AlTiN	XC-Coating	Z-Coating				
For General Purpose	For Pre-Hardened Steels	For High Hardened Steels	R	D	H	T
XMB110A080	XMB120C080	XMB260T080	R4.0	8.0	8.0	2.4
XMB110A100	XMB120C100	XMB260T100	R5.0	10.0	9.5	2.7
XMB110A110	XMB120C110	XMB260T110	R5.5	11.0	10.0	2.7
XMB110A120	XMB120C120	XMB260T120	R6.0	12.0	11.0	3.2
XMB110A130	XMB120C130	XMB260T130	R6.5	13.0	11.5	3.2
XMB110A160	XMB120C160	XMB260T160	R8.0	16.0	13.0	4.2
XMB110A170	XMB120C170	XMB260T170	R8.5	17.0	13.5	4.2
XMB110A200	XMB120C200	XMB260T200	R10.0	20.0	16.0	5.2
XMB110A210	XMB120C210	XMB260T210	R10.5	21.0	16.5	5.2
XMB110A250	XMB120C250	XMB260T250	R12.5	25.0	19.5	6.2
XMB110A260	XMB120C260	XMB260T260	R13.0	26.0	20.0	6.2
XMB110A300	XMB120C300	XMB260T300	R15.0	30.0	23.5	7.2
XMB110A320	XMB120C320	XMB260T320	R16.0	32.0	24.5	7.2
XMB110A330	XMB120C330	XMB260T330	R16.5	33.0	25.0	7.2

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

◎ : 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
XMB110A	◎	◎	◎	◎	◎	◎	◎	◎												
XMB120C									◎	○	◎				◎	◎	◎	◎	◎	◎
XMB260T																				

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
XMB110A																					
XMB120C																		○			
XMB260T																		◎	◎	○	◎

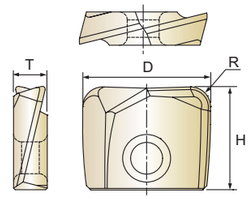
i-Xmill END MILLS

XMR110A SERIES
XMR120C SERIES
XMR260T SERIES

i-Xmill CORNER RADIUS INSERT

▶ The optimum geometry of the tool to achieve 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.





Cutting conditions : p.C20

Unit : mm

EDP No.			Corner Radius	Mill Diameter	Height	Thickness
AlTiN	XC-Coating	Z-Coating				
For General Purpose & Stainless Steels	For Pre-Hardened Steels	For High Hardened Steels	R	D	H	T
XMR110A080 03	XMR120C080 03	XMR260T080 03	R0.3	8.0	8.0	2.4
XMR110A080 05	XMR120C080 05	XMR260T080 05	R0.5	8.0	8.0	2.4
XMR110A080 10	XMR120C080 10	XMR260T080 10	R1.0	8.0	8.0	2.4
XMR110A080 20	XMR120C080 20	XMR260T080 20	R2.0	8.0	8.0	2.4
XMR110A100 03	XMR120C100 03	XMR260T100 03	R0.3	10.0	9.5	2.7
XMR110A100 05	XMR120C100 05	XMR260T100 05	R0.5	10.0	9.5	2.7
XMR110A100 10	XMR120C100 10	XMR260T100 10	R1.0	10.0	9.5	2.7
XMR110A100 15	XMR120C100 15	XMR260T100 15	R1.5	10.0	9.5	2.7
XMR110A100 20	XMR120C100 20	XMR260T100 20	R2.0	10.0	9.5	2.7
XMR110A100 30	XMR120C100 30	XMR260T100 30	R3.0	10.0	9.5	2.7
XMR110A110 03	XMR120C110 03	XMR260T110 03	R0.3	11.0	9.5	2.7
XMR110A110 05	XMR120C110 05	XMR260T110 05	R0.5	11.0	9.5	2.7
XMR110A110 10	XMR120C110 10	XMR260T110 10	R1.0	11.0	9.5	2.7
XMR110A110 15	XMR120C110 15	XMR260T110 15	R1.5	11.0	9.5	2.7
XMR110A110 20	XMR120C110 20	XMR260T110 20	R2.0	11.0	9.5	2.7
XMR110A110 30	XMR120C110 30	XMR260T110 30	R3.0	11.0	9.5	2.7

▶ The corner radius tolerance is ±0.015mm and the set-up accuracy is ±0.02mm.

▶ 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	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
XMR110A	◎	◎	◎	◎	◎	◎	◎	◎				◎	◎	◎						
XMR120C									◎	○	◎				◎	◎	◎	◎	◎	◎
XMR260T																				

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
XMR110A																					
XMR120C																		○			
XMR260T																		◎	◎	○	◎

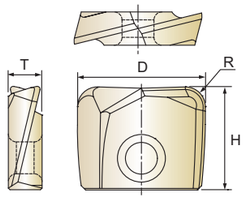
i-Xmill END MILLS

XMR110A SERIES
XMR120C SERIES
XMR260T SERIES

i-Xmill CORNER RADIUS INSERT

- ▶ The optimum geometry of the tool to achieve better reliability and less vibration and cutting load.
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- ▶ Special coating makes high hardness with high thermal stability against oxidation.





Cutting conditions : p.C20

Unit : mm

EDP No.			Corner Radius	Mill Diameter	Height	Thickness
AlTiN	XC-Coating	Z-Coating				
For General Purpose & Stainless Steels	For Pre-Hardened Steels	For High Hardened Steels	R	D	H	T
XMR110A120 03	XMR120C120 03	XMR260T120 03	R0.3	12.0	11.0	3.2
XMR110A120 05	XMR120C120 05	XMR260T120 05	R0.5	12.0	11.0	3.2
XMR110A120 10	XMR120C120 10	XMR260T120 10	R1.0	12.0	11.0	3.2
XMR110A120 15	XMR120C120 15	XMR260T120 15	R1.5	12.0	11.0	3.2
XMR110A120 20	XMR120C120 20	XMR260T120 20	R2.0	12.0	11.0	3.2
XMR110A120 30	XMR120C120 30	XMR260T120 30	R3.0	12.0	11.0	3.2
XMR110A130 03	XMR120C130 03	XMR260T130 03	R0.3	13.0	11.2	3.2
XMR110A130 05	XMR120C130 05	XMR260T130 05	R0.5	13.0	11.2	3.2
XMR110A130 10	XMR120C130 10	XMR260T130 10	R1.0	13.0	11.2	3.2
XMR110A130 15	XMR120C130 15	XMR260T130 15	R1.5	13.0	11.2	3.2
XMR110A130 20	XMR120C130 20	XMR260T130 20	R2.0	13.0	11.2	3.2
XMR110A130 30	XMR120C130 30	XMR260T130 30	R3.0	13.0	11.2	3.2
XMR110A160 03	XMR120C160 03	XMR260T160 03	R0.3	16.0	13.0	4.2
XMR110A160 05	XMR120C160 05	XMR260T160 05	R0.5	16.0	13.0	4.2
XMR110A160 10	XMR120C160 10	XMR260T160 10	R1.0	16.0	13.0	4.2
XMR110A160 15	XMR120C160 15	XMR260T160 15	R1.5	16.0	13.0	4.2
XMR110A160 20	XMR120C160 20	XMR260T160 20	R2.0	16.0	13.0	4.2
XMR110A160 30	XMR120C160 30	XMR260T160 30	R3.0	16.0	13.0	4.2

▶ The corner radius tolerance is ±0.015mm and the set-up accuracy is ±0.02mm.

▶ 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	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
XMR110A	◎	◎	◎	◎	◎	◎	◎	◎		○		◎	◎	◎						
XMR120C									◎	◎	◎				◎	◎	◎	◎	◎	◎
XMR260T																				

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
XMR110A																					
XMR120C																		○			
XMR260T																		◎	◎	○	◎

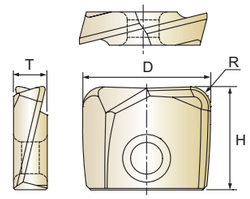
i-Xmill END MILLS

XMR110A SERIES
XMR120C SERIES
XMR260T SERIES

i-Xmill CORNER RADIUS INSERT

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Cutting conditions : p.C20

Unit : mm

EDP No.			Corner Radius	Mill Diameter	Height	Thickness
AlTiN	XC-Coating	Z-Coating				
For General Purpose & Stainless Steels	For Pre-Hardened Steels	For High Hardened Steels	R	D	H	T
XMR110A170 03	XMR120C170 03	XMR260T170 03	R0.3	17.0	13.0	4.2
XMR110A170 05	XMR120C170 05	XMR260T170 05	R0.5	17.0	13.0	4.2
XMR110A170 10	XMR120C170 10	XMR260T170 10	R1.0	17.0	13.0	4.2
XMR110A170 15	XMR120C170 15	XMR260T170 15	R1.5	17.0	13.0	4.2
XMR110A170 20	XMR120C170 20	XMR260T170 20	R2.0	17.0	13.0	4.2
XMR110A170 30	XMR120C170 30	XMR260T170 30	R3.0	17.0	13.0	4.2
XMR110A200 03	XMR120C200 03	XMR260T200 03	R0.3	20.0	16.0	5.2
XMR110A200 05	XMR120C200 05	XMR260T200 05	R0.5	20.0	16.0	5.2
XMR110A200 10	XMR120C200 10	XMR260T200 10	R1.0	20.0	16.0	5.2
XMR110A200 15	XMR120C200 15	XMR260T200 15	R1.5	20.0	16.0	5.2
XMR110A200 20	XMR120C200 20	XMR260T200 20	R2.0	20.0	16.0	5.2
XMR110A200 30	XMR120C200 30	XMR260T200 30	R3.0	20.0	16.0	5.2
XMR110A210 03	XMR120C210 03	XMR260T210 03	R0.3	21.0	16.0	5.2
XMR110A210 05	XMR120C210 05	XMR260T210 05	R0.5	21.0	16.0	5.2
XMR110A210 10	XMR120C210 10	XMR260T210 10	R1.0	21.0	16.0	5.2
XMR110A210 15	XMR120C210 15	XMR260T210 15	R1.5	21.0	16.0	5.2
XMR110A210 20	XMR120C210 20	XMR260T210 20	R2.0	21.0	16.0	5.2
XMR110A210 30	XMR120C210 30	XMR260T210 30	R3.0	21.0	16.0	5.2

▶ The corner radius tolerance is ±0.015mm and the set-up accuracy is ±0.02mm.

▶ 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	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
XMR110A	◎	◎	◎	◎	◎	◎	◎	◎				◎	◎	◎						
XMR120C									◎	○	◎				◎	◎	◎	◎	◎	◎
XMR260T																				

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
XMR110A																					
XMR120C																		○			
XMR260T																		◎	◎	○	◎

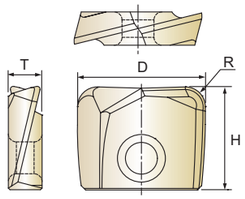
i-Xmill END MILLS

XMR110A SERIES
XMR120C SERIES
XMR260T SERIES

i-Xmill CORNER RADIUS INSERT

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Cutting conditions : p.C20

Unit : mm

EDP No.			Corner Radius	Mill Diameter	Height	Thickness
AlTiN	XC-Coating	Z-Coating				
For General Purpose & Stainless Steels	For Pre-Hardened Steels	For High Hardened Steels	R	D	H	T
XMR110A250 03	XMR120C250 03	XMR260T250 03	R0.3	25.0	19.5	6.2
XMR110A250 05	XMR120C250 05	XMR260T250 05	R0.5	25.0	19.5	6.2
XMR110A250 10	XMR120C250 10	XMR260T250 10	R1.0	25.0	19.5	6.2
XMR110A250 15	XMR120C250 15	XMR260T250 15	R1.5	25.0	19.5	6.2
XMR110A250 20	XMR120C250 20	XMR260T250 20	R2.0	25.0	19.5	6.2
XMR110A250 30	XMR120C250 30	XMR260T250 30	R3.0	25.0	19.5	6.2
XMR110A260 03	XMR120C260 03	XMR260T260 03	R0.3	26.0	19.5	6.2
XMR110A260 05	XMR120C260 05	XMR260T260 05	R0.5	26.0	19.5	6.2
XMR110A260 10	XMR120C260 10	XMR260T260 10	R1.0	26.0	19.5	6.2
XMR110A260 15	XMR120C260 15	XMR260T260 15	R1.5	26.0	19.5	6.2
XMR110A260 20	XMR120C260 20	XMR260T260 20	R2.0	26.0	19.5	6.2
XMR110A260 30	XMR120C260 30	XMR260T260 30	R3.0	26.0	19.5	6.2
XMR110A300 03	XMR120C300 03	XMR260T300 03	R0.3	30.0	23.5	7.2
XMR110A300 05	XMR120C300 05	XMR260T300 05	R0.5	30.0	23.5	7.2
XMR110A300 10	XMR120C300 10	XMR260T300 10	R1.0	30.0	23.5	7.2
XMR110A300 15	XMR120C300 15	XMR260T300 15	R1.5	30.0	23.5	7.2
XMR110A300 20	XMR120C300 20	XMR260T300 20	R2.0	30.0	23.5	7.2
XMR110A300 30	XMR120C300 30	XMR260T300 30	R3.0	30.0	23.5	7.2

▶ The corner radius tolerance is ±0.015mm and the set-up accuracy is ±0.02mm.

▶ 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	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
XMR110A	◎	◎	◎	◎	◎	◎	◎	◎		○		◎	◎	◎						
XMR120C									◎	◎	◎				◎	◎	◎	◎	◎	◎
XMR260T																				

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
XMR110A																					
XMR120C																		○			
XMR260T																		◎	◎	○	◎

CARBIDE
HSS
i-Xmill END MILLS
X-1EH END MILLS
4G MILL END MILLS
X-POWER PRO END MILLS
TitaNox-POWER END MILLS
V7 PLUS END MILLS
ALU-CUT END MILLS
K-2 END MILLS
GENERAL CARBIDE END MILLS

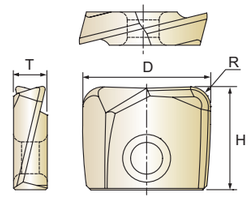
i-Xmill END MILLS

XMR110A SERIES
XMR120C SERIES
XMR260T SERIES

i-Xmill CORNER RADIUS INSERT

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Cutting conditions : p.C20

Unit : mm

EDP No.			Corner Radius	Mill Diameter	Height	Thickness
AlTiN	XC-Coating	Z-Coating				
For General Purpose & Stainless Steels	For Pre-Hardened Steels	For High Hardened Steels	R	D	H	T
XMR110A320 03	XMR120C320 03	XMR260T320 03	R0.3	32.0	23.5	7.2
XMR110A320 05	XMR120C320 05	XMR260T320 05	R0.5	32.0	23.5	7.2
XMR110A320 10	XMR120C320 10	XMR260T320 10	R1.0	32.0	23.5	7.2
XMR110A320 15	XMR120C320 15	XMR260T320 15	R1.5	32.0	23.5	7.2
XMR110A320 20	XMR120C320 20	XMR260T320 20	R2.0	32.0	23.5	7.2
XMR110A320 30	XMR120C320 30	XMR260T320 30	R3.0	32.0	23.5	7.2
XMR110A330 03	XMR120C330 03	XMR260T330 03	R0.3	33.0	23.5	7.2
XMR110A330 05	XMR120C330 05	XMR260T330 05	R0.5	33.0	23.5	7.2
XMR110A330 10	XMR120C330 10	XMR260T330 10	R1.0	33.0	23.5	7.2
XMR110A330 15	XMR120C330 15	XMR260T330 15	R1.5	33.0	23.5	7.2
XMR110A330 20	XMR120C330 20	XMR260T330 20	R2.0	33.0	23.5	7.2
XMR110A330 30	XMR120C330 30	XMR260T330 30	R3.0	33.0	23.5	7.2

▶ The corner radius tolerance is ±0.015mm and the set-up accuracy is ±0.02mm.

◎ : 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
XMR110A	◎	◎	◎	◎	◎	◎	◎	◎				◎	◎	◎						
XMR120C									◎	○	◎				◎	◎	◎	◎	◎	◎
XMR260T																				

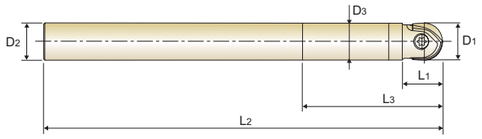
ISO	N										S							H		
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	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
XMR110A																					
XMR120C																		○			
XMR260T																		◎	◎	○	◎

i-Xmill END MILLS

ZBC SERIES

i-Xmill CARBIDE BALL HOLDER - STRAIGHT NECK





Unit : mm

EDP No.	Mill Diameter D1	Shank Diameter D2	Neck Diameter D3	Length of Cut L1	Length Below Shank L3	Overall Length L2	Length Type	Wrench No.	Screw No.
ZBC0801080	8	8	7.6	12	25	130	Regular	TWFT07	TX2508T07
ZBC0802080	8	8	7.6	12	40	130	Regular		
ZBC0803080	8	8	7.6	12	65	130	Regular		
ZBC0804080	8	8	7.6	12	60	150	Regular		
ZBC0805080	8	8	7.6	12	60	200	Long		
ZBC0806080	8	8	7.6	12	25	80	Short		
ZBC1001100	10, 11	10	9.5	15	30	140	Regular	TWFT08	TX3010T08
ZBC1002100	10, 11	10	9.5	15	50	140	Regular		
ZBC1003100	10, 11	10	9.5	15	75	140	Regular		
ZBC1004100	10, 11	10	9.5	15	60	180	Regular		
ZBC1005100	10, 11	10	9.5	15	60	200	Long		
ZBC1006100	10, 11	10	9.5	15	30	80	Short		
ZBC120001P	12, 13	12	11.4	17	40	200	Long	TWFT10	TX3512T10
ZBC1201120	12, 13	12	11.4	17	35	150	Regular		
ZBC1202120	12, 13	12	11.4	17	60	150	Regular		
ZBC1203120	12, 13	12	11.4	17	85	150	Regular		
ZBC1204120	12, 13	12	11.4	17	60	250	Long		
ZBC1205120	12, 13	12	11.4	17	35	100	Short		
ZBC160001P	16, 17	16	15.0	20	50	150	Regular	TWFT15	TX4016T15
ZBC1601160	16, 17	16	15.0	20	50	200	Long		
ZBC1602160	16, 17	16	15.0	20	80	200	Long		
ZBC1603160	16, 17	16	15.0	20	120	200	Long		
ZBC1604160	16, 17	16	15.0	20	80	250	Long		
ZBC1605160	16, 17	16	15.0	20	50	120	Short		
ZBC200002P	20, 21	20	19.0	25	60	150	Regular	● TWBT20	TX5020T20
ZBC2001200	20, 21	20	19.0	25	60	200	Regular		
ZBC2002200	20, 21	20	19.0	25	80	200	Regular		
ZBC2003200	20, 21	20	19.0	25	100	250	Long		
ZBC2004200	20, 21	20	19.0	25	150	250	Long		
ZBC2005200	20, 21	20	19.0	25	100	300	Long		
ZBC250001P	25, 26	25	24.0	30	75	150	Regular	● TWBT25	TX6025T25
ZBC2501250	25, 26	25	24.0	30	75	200	Regular		
ZBC2502250	25, 26	25	24.0	30	120	250	Regular		
ZBC2503250	25, 26	25	24.0	30	190	300	Long		
ZBC2504250	25, 26	25	24.0	30	120	350	Long		
ZBC2505250	25, 26	25	24.0	30	60	300	Long		
ZBC3001320	30, 32, 33	32	29.0	40	90	250	Regular	● TWBT30	TX8030T30
ZBC3002320	30, 32, 33	32	29.0	40	150	300	Long		
ZBC3003320	30, 32, 33	32	29.0	40	190	300	Long		
ZBC3004320	30, 32, 33	32	29.0	40	120	350	Long		
ZBC3005320	30, 32, 33	32	29.0	40	150	400	Long		

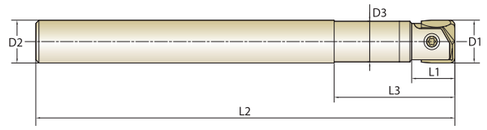
* Upon request, the broken holder is able to be regenerated
* Your carbide holder can be regenerated as YG-1 type upon request
* ● Required to use T-HANDLE (TWH600) - (p.C18)

i-Xmill END MILLS

ZRC SERIES

i-Xmill CARBIDE CORNER RADIUS HOLDER - STRAIGHT NECK





Unit : mm

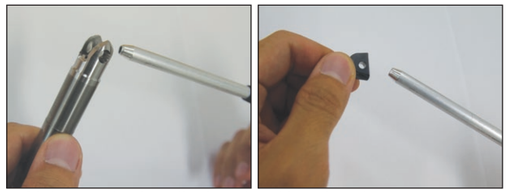
EDP No.	Mill Diameter D1	Shank Diameter D2	Neck Diameter D3	Length of Cut L1	Length Below Shank L3	Overall Length L2	Length Type	Wrench No.	Screw No.
ZRC0801080	8	8	7.6	12	25	130	Regular	TWFT07	TX2508T07
ZRC0802080	8	8	7.6	12	40	130	Regular		
ZRC0803080	8	8	7.6	12	65	130	Regular		
ZRC1001100	10	10	9.5	15	30	140	Regular	TWFT08	TX3010T08
ZRC1002100	10	10	9.5	15	50	140	Regular		
ZRC1003100	10	10	9.5	15	75	140	Regular		
ZRC1201120	12, 13	12	11.4	17	35	150	Regular	TWFT10	TX3512T10
ZRC1202120	12, 13	12	11.4	17	60	150	Regular		
ZRC1203120	12, 13	12	11.4	17	85	150	Regular		
ZRC1601160	16, 17	16	15.0	20	50	200	Long	TWFT15	TX4016T15
ZRC1602160	16, 17	16	15.0	20	80	200	Long		
ZRC1603160	16, 17	16	15.0	20	120	200	Long		
ZRC1604160	16, 17	16	15.0	20	80	250	Long		
ZRC2001200	20, 21	20	19.0	25	60	200	Regular	● TWBT20	TX5020T20
ZRC2002200	20, 21	20	19.0	25	80	200	Regular		
ZRC2003200	20, 21	20	19.0	25	100	250	Long		
ZRC2004200	20, 21	20	19.0	25	150	250	Long		
ZRC2501250	25, 26	25	24.0	30	75	200	Regular	● TWBT25	TX6025T25
ZRC2502250	25, 26	25	24.0	30	120	250	Regular		
ZRC2503250	25, 26	25	24.0	30	190	300	Long		
ZRC3001320	30,32,33	32	29.0	40	90	250	Regular	● TWBT30	TX8030T30
ZRC3002320	30,32,33	32	29.0	40	150	300	Long		
ZRC3003320	30,32,33	32	29.0	40	190	300	Long		

* ● Required to use T-HANDLE (TWH600) - (p.C18)

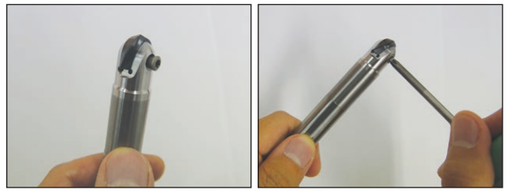
i-Xmill END MILLS

RECOMMENDED CUTTING CONDITIONS

ASSEMBLY of i-Xmill



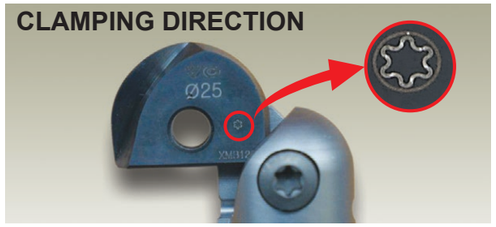
▲ Make sure to clean the insert and insert seat.



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

SIZE (ØD)	CLAMPING TORQUE [N·m]
Ø8.0	1.0
Ø10.0	1.5
Ø12.0, Ø13.0	2.5
Ø16.0, Ø17.0	3.5
Ø20.0, Ø21.0	5.0
Ø25.0, Ø26.0	6.0
Ø30.0, Ø32.0	6.5

∗ When the screw is worn out, please change the a 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.

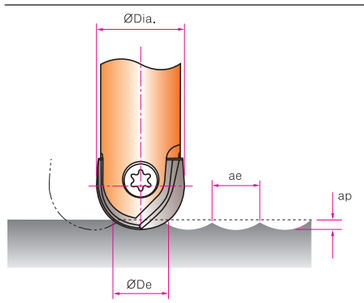


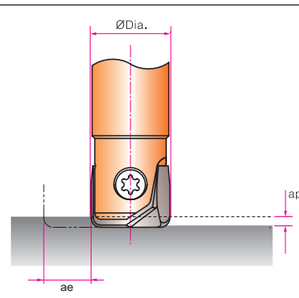
Wrench No.

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





RPM = revolution per minute (rev/min)
Vc = surface meter per minute (M/min)
Dia. = diameter of insert (mm)
Vf = feed speed (mm/min)
f = feed per revolution (mm/rev)
De = effective tool diameter (mm)
Ap = axial depth of cut (mm)
Ae = radial depth of cut (mm)

$$Vc\ [M/min] = \frac{(RPM) \cdot (\pi) \cdot (Dia.)}{1000} \qquad RPM\ [rev/min] = \frac{(Vc) \cdot (1000)}{(\pi) \cdot (Dia.)}$$

$$Vf\ [mm/min] = (RPM) \cdot (f) \qquad De\ [mm] = 2\sqrt{(ap) \cdot (Dia. - ap)}$$

CARBIDE
HSS
i-Xmill END MILLS
X-1EH END MILLS
4G MILL END MILLS
X-POWER PRO END MILLS
TitaNox-POWER END MILLS
V7 PLUS END MILLS
ALU-CUT END MILLS
K-2 END MILLS
GENERAL CARBIDE END MILLS

i-Xmill END MILLS

RECOMMENDED CUTTING CONDITIONS

XMB110A SERIES — BALL INSERTS for GENERAL PURPOSE

Vc = m/min.
Fz = mm/tooth
RPM = rev./min.
FEED = mm/min.

ISO	VDI 3323	Material Description	Parameter	Diameter (Ø) 8	10, 11	12, 13	16, 17	20, 21	25, 26	30, 32, 33
P	1-4	Non-alloy steel	Vc	160~320	160~360	160~380	160~480	160~580	160~600	160~700
			fz	0.20~0.20	0.20~0.20	0.20~0.20	0.25~0.30	0.25~0.40	0.25~0.50	0.25~0.60
			RPM	6370~12730	5090~11460	4240~10080	3180~9550	2550~9230	2040~7640	1700~7430
			FEED	2550~5090	2040~4580	1700~4030	1590~5730	1270~7380	1020~7640	850~8910
	5		Vc	120~280	120~300	120~350	120~380	120~420	120~480	120~550
			fz	0.20~0.20	0.20~0.20	0.20~0.20	0.25~0.30	0.25~0.40	0.25~0.50	0.25~0.60
			RPM	4770~11140	3820~9550	3180~9280	2390~7560	1910~6680	1530~6110	1270~5840
			FEED	1910~4460	1530~3820	1270~3710	1190~4540	950~5350	760~6110	640~7000
	6-7	Low alloy steel	Vc	160~320	160~360	160~380	160~480	160~580	160~600	160~700
			fz	0.20~0.20	0.20~0.20	0.20~0.20	0.25~0.30	0.25~0.40	0.25~0.50	0.25~0.60
			RPM	6370~12730	5090~11460	4240~10080	3180~9550	2550~9230	2040~7640	1700~7430
			FEED	2550~5090	2040~4580	1700~4030	1590~5730	1270~7380	1020~7640	850~8910
	8		Vc	120~280	120~300	120~350	120~380	120~420	120~480	120~550
			fz	0.20~0.20	0.20~0.20	0.20~0.20	0.25~0.30	0.25~0.40	0.25~0.50	0.25~0.60
			RPM	4770~11140	3820~9550	3180~9280	2390~7560	1910~6680	1530~6110	1270~5840
			FEED	1910~4460	1530~3820	1270~3710	1190~4540	950~5350	760~6110	640~7000

XMB120C SERIES — BALL INSERTS for PRE-HARDENED STEELS

ISO	VDI 3323	Material Description	Parameter	Diameter (Ø) 8	10, 11	12, 13	16, 17	20, 21	25, 26	30, 32, 33
P	9-11	Low alloy steel High alloyed steel, and tool steel	Vc	100~220	100~260	100~280	100~350	100~400	100~450	100~500
			fz	0.15~0.20	0.15~0.20	0.15~0.20	0.20~0.30	0.20~0.40	0.20~0.50	0.20~0.60
			RPM	3980~8750	3180~8280	2650~7430	1990~6960	1590~6370	1270~5730	1060~5310
			FEED	1190~3500	950~3310	800~2970	800~4180	640~5090	510~5730	420~6370
K	15-20	Grey cast iron Nodular cast iron Malleable cast iron	Vc	160~320	160~360	160~400	160~500	160~550	160~620	160~720
			fz	0.30~0.30	0.30~0.30	0.30~0.30	0.35~0.40	0.35~0.40	0.35~0.50	0.35~0.60
			RPM	6370~12730	5090~11460	4240~10610	3180~9950	2550~8750	2040~7890	1700~7640
			FEED	3820~7640	3060~6880	2550~6370	2230~7960	1780~7000	1430~7890	1190~9170
H	38	Hardened steel	Vc	80~180	80~200	80~220	80~260	80~320	80~360	80~400
			fz	0.10~0.20	0.10~0.20	0.10~0.20	0.15~0.30	0.15~0.40	0.15~0.50	0.15~0.60
			RPM	3180~7160	2550~6370	2120~5840	1590~5170	1270~5090	1020~4580	850~4240
			FEED	640~2860	510~2550	420~2330	480~3100	380~4070	310~4580	250~5090

XMB260T SERIES — BALL INSERTS for HIGH HARDENED STEELS

ISO	VDI 3323	Material Description	Parameter	Diameter (Ø) 8	10, 11	12, 13	16, 17	20, 21	25, 26	30, 32, 33
H	38-41	Hardened steel	Vc	80~180	80~200	80~220	80~260	80~320	80~360	80~400
			fz	0.10~0.15	0.10~0.15	0.10~0.15	0.15~0.25	0.15~0.25	0.15~0.25	0.15~0.30
			RPM	3180~7160	2550~6370	2120~5840	1590~5170	1270~5090	1020~4580	850~4240
			FEED	640~2150	510~1910	420~1750	480~2590	380~2550	310~2290	250~2550

i-Xmill END MILLS

RECOMMENDED CUTTING CONDITIONS

XMR110A SERIES — CORNER RADIUS INSERTS for GENERAL PURPOSE & STAINLESS STEELS

Vc = m/min.
Fz = mm/tooth
RPM = rev./min.
FEED = mm/min.

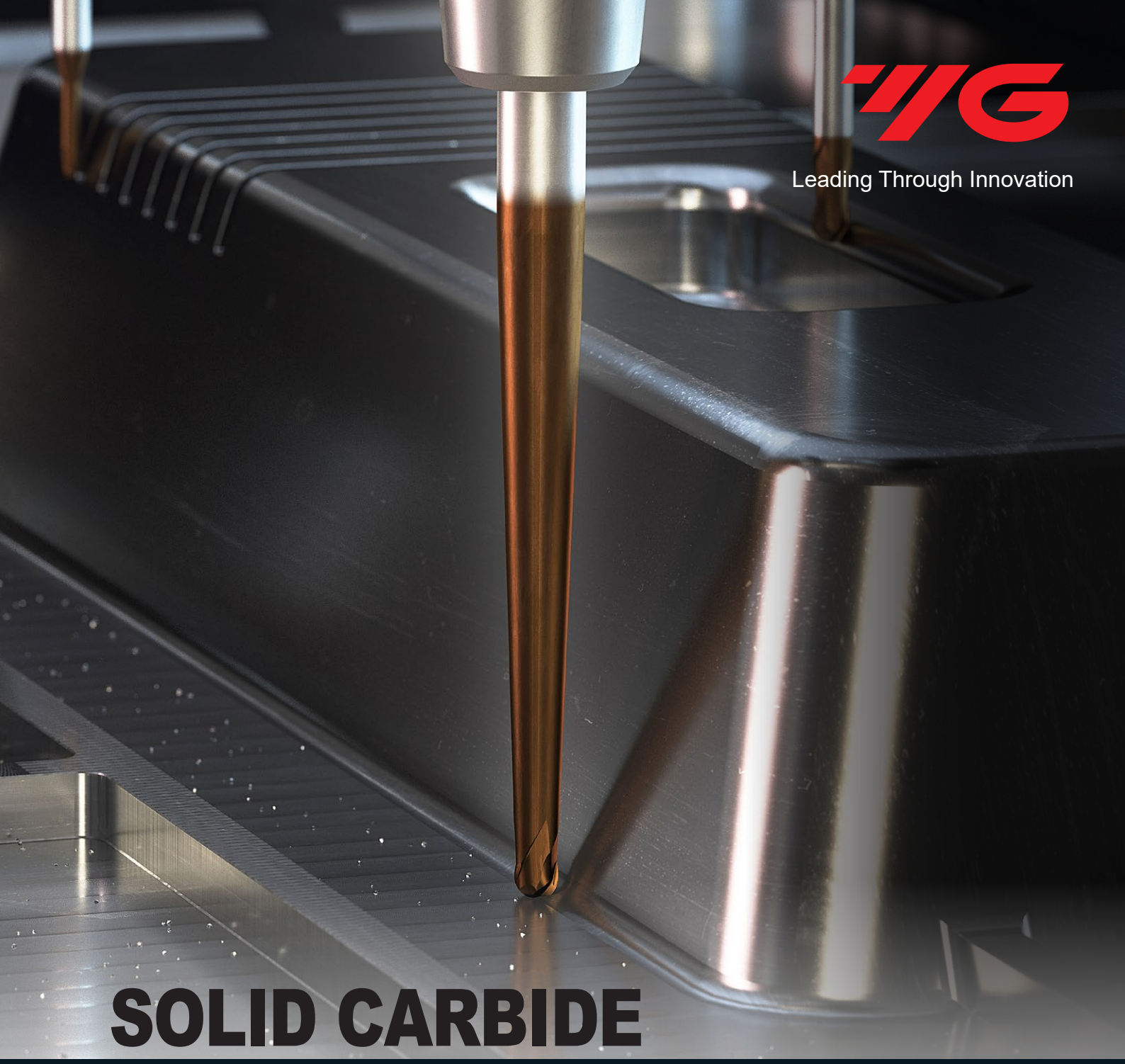
ISO	VDI 3323	Material Description	Parameter	Diameter (Ø)						
				8	10, 11	12, 13	16, 17	20, 21	25, 26	30, 32, 33
P	1-4	Non-alloy steel	Vc	160~300	160~300	160~300	160~300	160~300	160~300	160~300
			fz	0.20~0.15	0.20~0.15	0.20~0.15	0.25~0.20	0.25~0.20	0.25~0.20	0.25~0.20
			RPM	6370~11940	5090~9550	4240~7960	3180~5970	2550~4770	2040~3820	1700~3180
			FEED	2550~3580	2040~2860	1700~2390	1590~2390	1270~1910	1020~1530	850~1270
	5		Vc	120~280	120~280	120~280	120~280	120~280	120~280	120~280
			fz	0.20~0.15	0.20~0.15	0.20~0.15	0.25~0.20	0.25~0.20	0.25~0.20	0.25~0.20
			RPM	4770~11140	3820~8910	3180~7430	2390~5570	1910~4460	1530~3570	1270~2970
			FEED	1910~3340	1530~2670	1270~2230	1190~2230	950~1780	760~1430	640~1190
	6-7	Low alloy steel	Vc	160~300	160~300	160~300	160~300	160~300	160~300	160~300
			fz	0.20~0.15	0.20~0.15	0.20~0.15	0.25~0.20	0.25~0.20	0.25~0.20	0.25~0.20
			RPM	6370~11940	5090~9550	4240~7960	3180~5970	2550~4770	2040~3820	1700~3180
			FEED	2550~3580	2040~2860	1700~2390	1590~2390	1270~1910	1020~1530	850~1270
	8		Vc	120~280	120~280	120~280	120~280	120~280	120~280	120~280
			fz	0.20~0.15	0.20~0.15	0.20~0.15	0.25~0.20	0.25~0.20	0.25~0.20	0.25~0.20
			RPM	4770~11140	3820~8910	3180~7430	2390~5570	1910~4460	1530~3570	1270~2970
			FEED	1910~3340	1530~2670	1270~2230	1190~2230	950~1780	760~1430	640~1190
M	12-14	Stainless steel	Vc	90~130	90~130	90~130	90~130	90~130	90~130	90~130
			fz	0.10~0.10	0.11~0.11	0.12~0.11	0.13~0.13	0.13~0.13	0.13~0.12	0.13~0.12
			RPM	3580~5170	2860~4140	2390~3450	1790~2590	1430~2070	1150~1660	950~1380
			FEED	720~1030	630~910	550~790	450~650	360~520	290~410	240~340

XMR120C SERIES — CORNER RADIUS INSERTS for PRE-HARDENED STEELS

ISO	VDI 3323	Material Description	Parameter	Diameter (Ø)						
				8	10, 11	12, 13	16, 17	20, 21	25, 26	30, 32, 33
P	9-11	Low alloy steel High alloyed steel, and tool steel	Vc	100~280	100~280	100~280	100~280	100~280	100~280	100~280
			fz	0.12~0.06	0.13~0.06	0.13~0.06	0.15~0.08	0.15~0.08	0.15~0.08	0.15~0.08
			RPM	3980~11140	3180~8910	2650~7430	1990~5570	1590~4460	1270~3570	1060~2970
			FEED	990~1340	800~1070	690~890	600~840	480~670	380~570	320~450
K	15-20	Grey cast iron Nodular cast iron Malleable cast iron	Vc	160~380	160~380	160~380	160~380	160~380	160~380	160~380
			fz	0.30~0.20	0.30~0.20	0.30~0.20	0.35~0.30	0.35~0.30	0.35~0.30	0.35~0.30
			RPM	6370~15120	5090~12100	4240~10080	3180~7560	2550~6050	2040~4840	1700~4030
			FEED	3820~6050	3060~4840	2550~4030	2230~4540	1780~3630	1430~2900	1190~2420
H	38	Hardened steel	Vc	80~220	80~220	80~220	80~220	80~220	80~220	80~220
			fz	0.10~0.05	0.10~0.05	0.10~0.05	0.15~0.06	0.15~0.06	0.15~0.06	0.15~0.06
			RPM	3180~8750	2550~7000	2120~5840	1590~4380	1270~3500	1020~2800	850~2330
			FEED	640~880	510~700	420~580	420~530	380~420	310~340	250~280

XMR260T SERIES — CORNER RADIUS INSERTS for HIGH HARDENED STEELS

ISO	VDI 3323	Material Description	Parameter	Diameter (Ø)						
				8	10, 11	12, 13	16, 17	20, 21	25, 26	30, 32, 33
H	38-41	Hardened steel	Vc	80~220	80~220	80~220	80~220	80~220	80~220	80~220
			fz	0.10~0.05	0.10~0.05	0.10~0.05	0.15~0.06	0.15~0.06	0.15~0.06	0.15~0.06
			RPM	3180~8750	2550~7000	2120~5840	1590~4380	1270~3500	1020~2800	850~2330
			FEED	640~880	510~700	420~580	480~530	380~420	310~340	250~280



Leading Through Innovation

SOLID CARBIDE

X1-EH END MILLS

- Highly Accurate Fine-Finishing for High Hardened Steel

SELECTION GUIDE

YG MILLING TOOLS

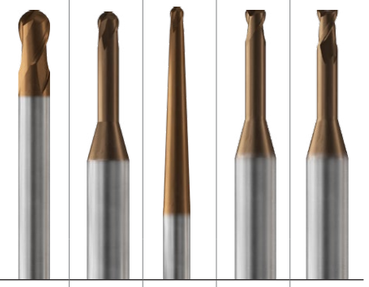
SERIES	HPI90	HPI91	HPI92	HPI89	HPI88
FLUTE	2	2	2	2	2
HELIX ANGLE	30°	30°	30°	35°	35°
CUTTING EDGE SHAPE	BALL NOSE	BALL NOSE	BALL NOSE	CORNER RADIUS	SQUARE
SIZE MIN	R0.05	R0.05	R0.05	D0.2	D0.1
SIZE MAX	R10.0	R3.0	R6.0	D3.0	D6.0
PAGE	C23	C24	C34	C43	C50
	-	RIB PROCESSING	TAPER NECK	RIB PROCESSING	RIB PROCESSING
	C-Coating	C-Coating	C-Coating	C-Coating	C-Coating

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DIE & MOLD



SOLID CARBIDE
X1-EH END MILLS

Highly Accurate Fine-Finishing for High Hardened Steel



Please visit globalyg1.com/mat for material search

◎ : Excellent ○ : Good

Recommended cutting conditions : p. C56

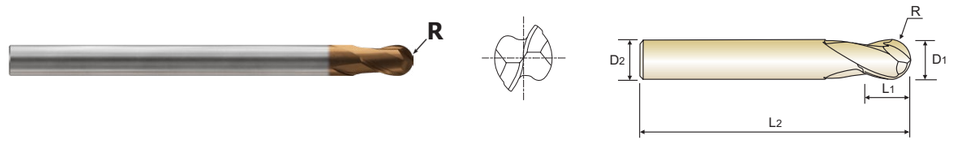
ISO	VDI 3323	Material Description	Composition / Structure / Heat Treatment		HB	HRc					
P	1	Non-alloy steel	About 0.15% C	Annealed	125						
	2		About 0.45% C	Annealed	190	13					
	3		About 0.45% C	Quenched & tempered	250	25					
	4		About 0.75% C	Annealed	270	28					
	5		About 0.75% C	Quenched & tempered	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					
	11.1			Quenched & Tempered	325	35	○	○	○	○	○
	11.2			Quenched & Tempered	409	44	○	○	○	○	○
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		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		Ni or Co Based	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	Hardened steel		Hardened	421-469	45-49	◎	◎	◎	◎	◎
	39			Hardened		66-70	◎	◎	◎	◎	◎
	40	Chilled Cast Iron		Cast	400	42	○	○	○	○	○
	41	Hardened Cast Iron		Hardened	550	55	◎	◎	◎	◎	◎

YG X1-EH END MILLS

PLAIN SHANK **HPI90 SERIES**

CARBIDE, 2 FLUTE BALL NOSE

- Improvement of tool life by applying new coating.
- Application of tight tolerances for precision machining.



CARBIDE | 2 | 30° | R +0.001 ~-0.005 | R +0.003 ~-0.007 | PLAIN | C Coating

p.C56

R0.05~R3 R4~R10

Unit : mm

EDP No.	Radius of Ball Nose R	Mill Diameter D1	Shank Diameter D2	Length of Cut L1	Overall Length L2
HPI90001	R0.05	0.1	4	0.1	50
HPI900015	R0.075	0.15	4	0.15	50
HPI90002	R0.1	0.2	4	0.2	50
HPI90003	R0.15	0.3	4	0.3	50
HPI90004	R0.2	0.4	4	0.6	50
HPI90005	R0.25	0.5	4	0.8	50
HPI90006	R0.3	0.6	4	0.9	50
HPI90008	R0.4	0.8	4	1.2	50
HPI90010	R0.5	1.0	4	1.5	50
HPI90015	R0.75	1.5	4	2.3	50
HPI90020	R1.0	2.0	4	3	60
HPI90025	R1.25	2.5	6	3.8	60
HPI90030	R1.5	3.0	6	5	60
HPI90040	R2.0	4.0	4	6	70
HPI90901	R2.0	4.0	6	6	70
HPI90050	R2.5	5.0	6	8	70
HPI90060	R3.0	6.0	6	10	80
HPI90080	R4.0	8.0	8	12	100
HPI90100	R5.0	10.0	10	15	100
HPI90120	R6.0	12.0	12	18	110
HPI90160	R8.0	16.0	16	24	140
HPI90200	R10.0	20.0	20	30	160

Size	Radius Tolerance (mm)	Mill Dia. Tolerance (mm)	Shank Dia. Tolerance
up to R3	+0.001~-0.005	0~-0.010	h4
over R3	+0.003~-0.007	0~-0.012	* Shank Dia.>ø6 : h5

◎ : 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	10	29	32	38	15	35	44	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	409	200	240	180	180	260	160	250	130	230
Recommend					○			○	○		○	○									

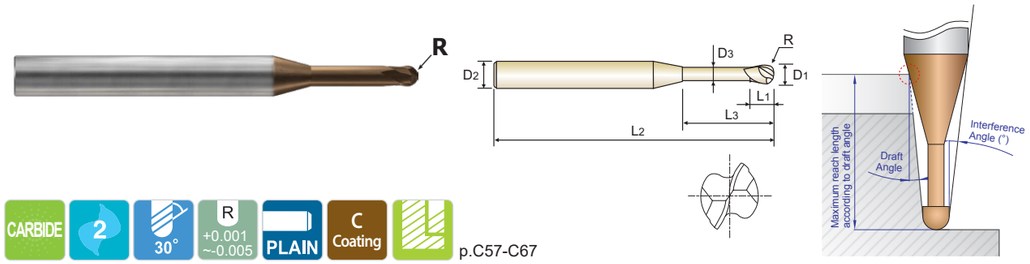
ISO	N									S							H						
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials	Heat Resistant Super Alloys					Titanium Alloys		Hardened steel					Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38.1	38.2	39.1	39.2	39.3	40	41
HRc											15	30	25	38	34			45-49	50-55	56-60	61-65	66-70	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	421-469	481-560	577-654	670-739		400	550
Recommend																		◎	◎	◎	◎	○	○	◎

X1-EH END MILLS

PLAIN SHANK **HPI91 SERIES**

CARBIDE, 2 FLUTE BALL NOSE for RIB PROCESSING

- Improvement of tool life by applying new coating.
- Application of tight tolerances for precision machining.



CARBIDE | 2 | 30° | R +0.001 ~-0.005 | PLAIN | C Coating

p.C57-C67

Unit : mm

EDP No.	Radius of Ball Nose	Mill Diameter	Shank Diameter	Length of Cut	Length Below Shank	Overall Length	Neck Diameter	Interference Angle(°)	Maximum reach lengths according to draft angle				
	R	D1	D2	L1	L3	L2	D3		0.5°	1°	1.5°	2°	3°
HPI91001	R0.05	**0.1**	4	0.07	0.2	45	0.085	14.66	0.25	0.26	0.28	0.29	0.32
HPI91901	R0.05	**0.1**	4	0.07	0.3	45	0.085	14.47	0.36	0.37	0.39	0.41	0.47
HPI91902	R0.05	**0.1**	4	0.07	0.5	45	0.085	14.11	0.57	0.60	0.63	0.66	0.75
HPI910015	R0.075	**0.15**	4	0.1	0.3	45	0.135	14.51	0.36	0.37	0.39	0.41	0.46
HPI91903	R0.075	**0.15**	4	0.1	0.5	45	0.135	14.15	0.57	0.59	0.62	0.66	0.74
HPI91904	R0.075	**0.15**	4	0.1	1	45	0.135	13.31	1.09	1.15	1.21	1.28	1.45
HPI91002	R0.1	**0.2**	4	0.15	0.3	45	0.17	14.50	0.40	0.42	0.43	0.46	0.51
HPI91905	R0.1	**0.2**	4	0.15	0.5	45	0.17	14.13	0.61	0.64	0.67	0.70	0.79
HPI91906	R0.1	**0.2**	4	0.15	0.75	45	0.17	13.70	0.87	0.92	0.96	1.02	1.15
HPI91907	R0.1	**0.2**	4	0.15	1	45	0.17	13.29	1.14	1.19	1.26	1.33	1.50
HPI91908	R0.1	**0.2**	4	0.15	1	50	0.17	13.29	1.14	1.19	1.26	1.33	1.50
HPI91909	R0.1	**0.2**	4	0.15	1.25	45	0.17	12.90	1.40	1.47	1.55	1.64	1.86
HPI91910	R0.1	**0.2**	4	0.15	1.5	45	0.17	12.53	1.66	1.75	1.84	1.95	2.21
HPI91911	R0.1	**0.2**	4	0.15	1.75	45	0.17	12.19	1.93	2.03	2.14	2.26	2.57
HPI91912	R0.1	**0.2**	4	0.15	2	45	0.17	11.86	2.19	2.30	2.43	2.58	2.92
HPI91913	R0.1	**0.2**	4	0.15	2.5	45	0.17	11.26	2.71	2.86	3.02	3.20	3.64
HPI91914	R0.1	**0.2**	4	0.15	3	45	0.17	10.71	3.24	3.41	3.61	3.82	4.35
HPI91915	R0.1	**0.2**	4	0.2	0.5	35	0.17	14.13	0.61	0.64	0.67	0.70	0.79
HPI91916	R0.1	**0.2**	4	0.2	0.5	50	0.17	14.13	0.61	0.64	0.67	0.70	0.79
HPI91917	R0.1	**0.2**	6	0.2	0.5	50	0.17	14.42	0.61	0.64	0.67	0.70	0.79
HPI91003	R0.15	**0.3**	4	0.2	0.5	45	0.27	14.20	0.61	0.63	0.66	0.69	0.77
HPI91918	R0.15	**0.3**	4	0.2	0.6	45	0.27	14.02	0.71	0.74	0.78	0.82	0.91
HPI91919	R0.15	**0.3**	4	0.2	0.75	45	0.27	13.75	0.87	0.91	0.95	1.00	1.12
HPI91920	R0.15	**0.3**	4	0.2	1	45	0.27	13.33	1.13	1.19	1.25	1.32	1.48
HPI91921	R0.15	**0.3**	4	0.2	1.25	45	0.27	12.93	1.40	1.47	1.54	1.63	1.84
HPI91922	R0.15	**0.3**	4	0.2	1.5	45	0.27	12.55	1.66	1.74	1.84	1.94	2.19

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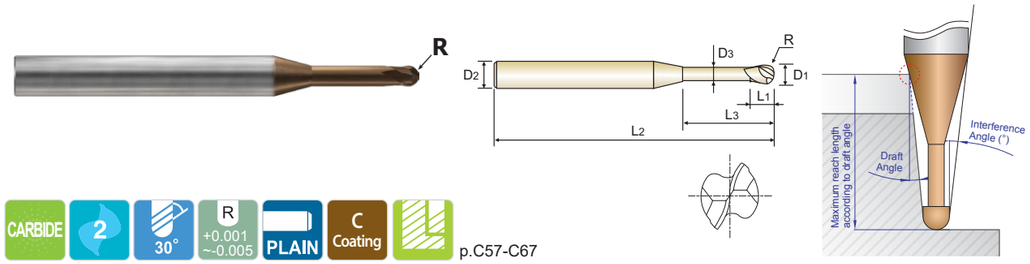
Radius Tolerance (mm)	Mill Dia. Tolerance (mm)	Shank Dia. Tolerance
+0.001~-0.005	0~-0.010	h4

◎ : 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	10	29	32	38	15	35	44		15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	409		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	39.1	39.2	39.3	40	41
HRc											15	30	25	38	34			45-49	50-55	56-60	61-65	66-70	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	421-469	481-560	577-654	670-739		400	550
Recommend																		◎	◎	◎	◎	◎	○	◎

X1-EH END MILLS
PLAIN SHANK HPI91 SERIES
CARBIDE, 2 FLUTE BALL NOSE for RIB PROCESSING
▶ Improvement of tool life by applying new coating.
▶ Application of tight tolerances for precision machining.



CARBIDE | 2 | 30° | R +0.001 ~-0.005 | PLAIN | C Coating

p.C57-C67

Unit : mm

EDP No.	Radius of Ball Nose	Mill Diameter	Shank Diameter	Length of Cut	Length Below Shank	Overall Length	Neck Diameter	Interference Angle(°)	Maximum reach lengths according to draft angle				
	R	D1	D2	L1	L3	L2	D3		0.5°	1°	1.5°	2°	3°
HPI91923	R0.15	**0.3**	4	0.2	1.75	45	0.27	12.19	1.92	2.02	2.13	2.25	2.55
HPI91924	R0.15	**0.3**	4	0.2	2	45	0.27	11.86	2.19	2.30	2.42	2.56	2.90
HPI91925	R0.15	**0.3**	4	0.2	2.25	45	0.27	11.54	2.45	2.58	2.72	2.87	3.26
HPI91926	R0.15	**0.3**	4	0.2	2.5	45	0.27	11.24	2.71	2.85	3.01	3.19	3.61
HPI91927	R0.15	**0.3**	4	0.2	3	45	0.27	10.68	3.24	3.41	3.60	3.81	4.33
HPI91928	R0.15	**0.3**	4	0.2	3.5	45	0.27	10.17	3.76	3.96	4.18	4.43	5.04
HPI91929	R0.15	**0.3**	4	0.2	4	45	0.27	9.71	4.29	4.52	4.77	5.06	5.75
HPI91930	R0.15	**0.3**	6	0.2	1.5	50	0.27	13.31	1.66	1.74	1.84	1.94	2.19
HPI91004	R0.2	**0.4**	4	0.3	0.5	45	0.37	14.28	0.61	0.63	0.65	0.68	0.75
HPI91931	R0.2	**0.4**	4	0.3	0.8	45	0.37	13.72	0.92	0.96	1.00	1.05	1.17
HPI91932	R0.2	**0.4**	4	0.3	1	45	0.37	13.37	1.13	1.18	1.24	1.30	1.46
HPI91933	R0.2	**0.4**	4	0.3	1.5	45	0.37	12.57	1.66	1.74	1.83	1.93	2.17
HPI91934	R0.2	**0.4**	4	0.3	2	45	0.37	11.86	2.18	2.29	2.41	2.55	2.88
HPI91935	R0.2	**0.4**	4	0.3	2.5	45	0.37	11.22	2.71	2.85	3.00	3.17	3.59
HPI91936	R0.2	**0.4**	4	0.3	3	45	0.37	10.65	3.24	3.40	3.59	3.80	4.31
HPI91937	R0.2	**0.4**	4	0.3	3.5	45	0.37	10.13	3.76	3.96	4.18	4.42	5.02
HPI91938	R0.2	**0.4**	4	0.3	4	45	0.37	9.66	4.29	4.51	4.76	5.04	5.73
HPI91939	R0.2	**0.4**	4	0.3	4.5	45	0.37	9.23	4.81	5.07	5.35	5.67	6.44
HPI91940	R0.2	**0.4**	4	0.3	5	45	0.37	8.84	5.34	5.62	5.94	6.29	7.15
HPI91941	R0.2	**0.4**	4	0.3	6	45	0.37	8.15	6.39	6.73	7.11	7.54	8.57
HPI91942	R0.2	**0.4**	4	0.4	1	35	0.37	13.37	1.13	1.18	1.24	1.30	1.46
HPI91943	R0.2	**0.4**	4	0.4	1	50	0.37	13.37	1.13	1.18	1.24	1.30	1.46
HPI91944	R0.2	**0.4**	6	0.3	1	50	0.37	13.91	1.13	1.18	1.24	1.30	1.46
HPI91945	R0.2	**0.4**	6	0.3	2	50	0.37	12.82	2.18	2.29	2.41	2.55	2.88
HPI91946	R0.2	**0.4**	6	0.4	1	50	0.37	13.91	1.13	1.18	1.24	1.30	1.46
HPI91005	R0.25	**0.5**	4	0.35	1	45	0.45	13.35	1.19	1.24	1.30	1.36	1.52

▶ NEXT PAGE

Radius Tolerance (mm)	Mill Dia. Tolerance (mm)	Shank Dia. Tolerance
+0.001~-0.005	0~-0.010	h4

◎ : 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	10	29	32	38	15	35	44		15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	409		200	240	180	180	260	160	250	130	230
Recommend					○			○	○		○	○										

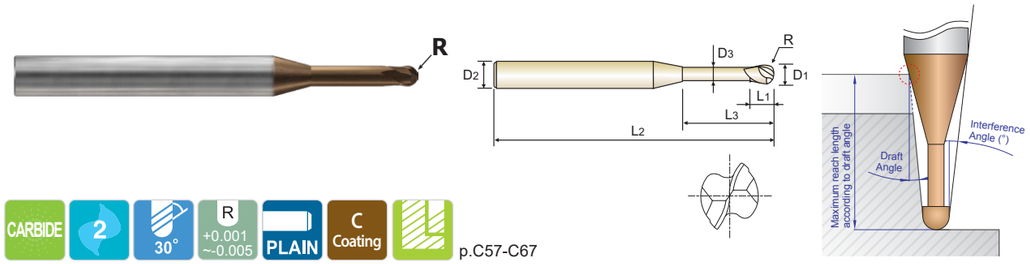
ISO	N									S							H					
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel				Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38.1	38.2	39.1	39.2	39.3	40	41
HRc											15	30	25	38	34			45-49	50-55	56-60	61-65	66-70	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	421-469	481-560	577-654	670-739		400	550
Recommend																		◎	◎	◎	◎	◎	○	◎

X1-EH END MILLS

PLAIN SHANK **HPI91 SERIES**

CARBIDE, 2 FLUTE BALL NOSE for RIB PROCESSING

- Improvement of tool life by applying new coating.
- Application of tight tolerances for precision machining.



CARBIDE | 2 | 30° | R +0.001 ~-0.005 | PLAIN | C Coating

p.C57-C67

Unit : mm

EDP No.	Radius of Ball Nose	Mill Diameter	Shank Diameter	Length of Cut	Length Below Shank	Overall Length	Neck Diameter	Interference Angle(°)	Maximum reach lengths according to draft angle				
	R	D1	D2	L1	L3	L2	D3		0.5°	1°	1.5°	2°	3°
HPI91947	R0.25	**0.5**	4	0.35	1.5	45	0.45	12.53	1.71	1.79	1.88	1.99	2.23
HPI91948	R0.25	**0.5**	4	0.35	2	45	0.45	11.80	2.24	2.35	2.47	2.61	2.94
HPI91949	R0.25	**0.5**	4	0.35	2.5	45	0.45	11.16	2.77	2.90	3.06	3.23	3.65
HPI91950	R0.25	**0.5**	4	0.35	3	45	0.45	10.57	3.29	3.46	3.65	3.86	4.36
HPI91951	R0.25	**0.5**	4	0.35	3.5	45	0.45	10.05	3.82	4.01	4.23	4.48	5.08
HPI91952	R0.25	**0.5**	4	0.35	4	45	0.45	9.57	4.34	4.57	4.82	5.10	5.79
HPI91953	R0.25	**0.5**	4	0.35	4.5	45	0.45	9.14	4.87	5.12	5.41	5.73	6.50
HPI91954	R0.25	**0.5**	4	0.35	5	45	0.45	8.75	5.40	5.68	5.99	6.35	7.21
HPI91955	R0.25	**0.5**	4	0.35	5.5	45	0.45	8.38	5.92	6.23	6.58	6.97	7.92
HPI91956	R0.25	**0.5**	4	0.35	6	45	0.45	8.05	6.45	6.79	7.17	7.60	8.63
HPI91957	R0.25	**0.5**	4	0.35	8	45	0.45	6.94	8.55	9.01	9.52	10.09	11.43
HPI91958	R0.25	**0.5**	4	0.35	10	45	0.45	6.10	10.66	11.23	11.87	12.58	13.76
HPI91959	R0.25	**0.5**	4	0.5	1.25	50	0.45	12.93	1.45	1.52	1.59	1.67	1.87
HPI91960	R0.25	**0.5**	6	0.5	1.25	50	0.45	13.61	1.45	1.52	1.59	1.67	1.87
HPI91006	R0.3	**0.6**	4	0.45	1	45	0.55	13.40	1.19	1.23	1.29	1.35	1.50
HPI91961	R0.3	**0.6**	4	0.45	1.5	45	0.55	12.55	1.71	1.79	1.88	1.97	2.21
HPI91962	R0.3	**0.6**	4	0.45	2	45	0.55	11.80	2.24	2.34	2.46	2.60	2.92
HPI91963	R0.3	**0.6**	4	0.45	2.5	45	0.55	11.13	2.76	2.90	3.05	3.22	3.63
HPI91964	R0.3	**0.6**	4	0.45	3	45	0.55	10.54	3.29	3.45	3.64	3.84	4.34
HPI91965	R0.3	**0.6**	4	0.45	3.5	45	0.55	10.00	3.82	4.01	4.22	4.47	5.06
HPI91966	R0.3	**0.6**	4	0.45	4	45	0.55	9.52	4.34	4.56	4.81	5.09	5.77
HPI91967	R0.3	**0.6**	4	0.45	4.5	45	0.55	9.08	4.87	5.12	5.40	5.71	6.48
HPI91968	R0.3	**0.6**	4	0.45	5	45	0.55	8.68	5.39	5.67	5.99	6.34	7.19
HPI91969	R0.3	**0.6**	4	0.45	5.5	45	0.55	8.31	5.92	6.23	6.57	6.96	7.90
HPI91970	R0.3	**0.6**	4	0.45	6	45	0.55	7.97	6.45	6.78	7.16	7.58	8.61
HPI91971	R0.3	**0.6**	4	0.45	7	45	0.55	7.37	7.50	7.89	8.34	8.83	10.04

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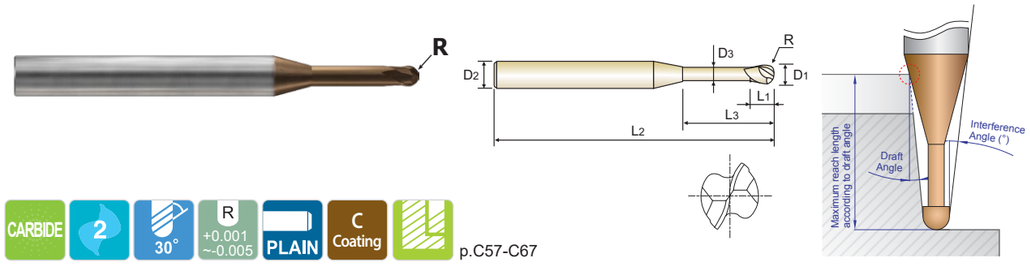
Radius Tolerance (mm)	Mill Dia. Tolerance (mm)	Shank Dia. Tolerance
+0.001~-0.005	0~-0.010	h4

◎ : 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	10	29	32	38	15	35	44		15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	409		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	39.1	39.2	39.3	40	41
HRc											15	30	25	38	34			45-49	50-55	56-60	61-65	66-70	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	421-469	481-560	577-654	670-739		400	550
Recommend																		◎	◎	◎	◎	◎	○	◎

X1-EH END MILLS
PLAIN SHANK HPI91 SERIES
CARBIDE, 2 FLUTE BALL NOSE for RIB PROCESSING
▶ Improvement of tool life by applying new coating.
▶ Application of tight tolerances for precision machining.



CARBIDE | 2 | 30° | R +0.001 ~-0.005 | PLAIN | C Coating

p.C57-C67

Unit : mm

EDP No.	Radius of Ball Nose	Mill Diameter	Shank Diameter	Length of Cut	Length Below Shank	Overall Length	Neck Diameter	Interference Angle(°)	Maximum reach lengths according to draft angle				
	R	D1	D2	L1	L3	L2	D3		0.5°	1°	1.5°	2°	3°
HPI91972	R0.3	**0.6**	4	0.45	8	45	0.55	6.86	8.55	9.00	9.51	10.08	11.36
HPI91973	R0.3	**0.6**	4	0.45	9	45	0.55	6.41	9.60	10.11	10.68	11.33	12.53
HPI91974	R0.3	**0.6**	4	0.45	10	45	0.55	6.01	10.65	11.22	11.86	12.57	13.70
HPI91975	R0.3	**0.6**	4	0.45	12	45	0.55	5.35	12.76	13.44	14.21	15.07	16.03
HPI91976	R0.3	**0.6**	4	0.6	1.5	35	0.55	12.55	1.71	1.79	1.88	1.97	2.21
HPI91977	R0.3	**0.6**	4	0.6	1.5	50	0.55	12.55	1.71	1.79	1.88	1.97	2.21
HPI91978	R0.3	**0.6**	6	0.45	2	50	0.55	12.81	2.24	2.34	2.46	2.60	2.92
HPI91979	R0.3	**0.6**	6	0.45	3	50	0.55	11.85	3.29	3.45	3.64	3.84	4.34
HPI91980	R0.3	**0.6**	6	0.45	4	50	0.55	11.02	4.34	4.56	4.81	5.09	5.77
HPI91981	R0.3	**0.6**	6	0.6	1.5	50	0.55	13.36	1.71	1.79	1.88	1.97	2.21
HPI91007	R0.35	**0.7**	4	0.5	2	45	0.65	11.80	2.24	2.34	2.45	2.58	2.90
HPI91982	R0.35	**0.7**	4	0.5	4	45	0.65	9.46	4.34	4.56	4.80	5.08	5.75
HPI91983	R0.35	**0.7**	4	0.5	6	45	0.65	7.89	6.44	6.78	7.15	7.57	8.59
HPI91984	R0.35	**0.7**	4	0.5	8	45	0.65	6.77	8.55	9.00	9.50	10.07	11.29
HPI91008	R0.4	**0.8**	4	0.6	2	45	0.75	11.79	2.23	2.33	2.45	2.57	2.88
HPI91985	R0.4	**0.8**	4	0.6	3	45	0.75	10.46	3.28	3.44	3.62	3.82	4.30
HPI91986	R0.4	**0.8**	4	0.6	4	45	0.75	9.40	4.34	4.55	4.79	5.07	5.72
HPI91987	R0.4	**0.8**	4	0.6	5	45	0.75	8.53	5.39	5.66	5.97	6.31	7.15
HPI91988	R0.4	**0.8**	4	0.6	6	45	0.75	7.81	6.44	6.77	7.14	7.56	8.57
HPI91989	R0.4	**0.8**	4	0.6	7	45	0.75	7.20	7.49	7.88	8.32	8.81	9.99
HPI91990	R0.4	**0.8**	4	0.6	8	45	0.75	6.68	8.54	8.99	9.49	10.05	11.23
HPI91991	R0.4	**0.8**	4	0.6	10	45	0.75	5.83	10.65	11.21	11.84	12.55	13.56
HPI91992	R0.4	**0.8**	4	0.6	12	45	0.75	5.18	12.75	13.43	14.19	15.04	15.90
HPI91993	R0.4	**0.8**	4	0.8	2	35	0.75	11.79	2.23	2.33	2.45	2.57	2.88
HPI91994	R0.4	**0.8**	4	0.8	2	50	0.75	11.79	2.23	2.33	2.45	2.57	2.88
HPI91995	R0.4	**0.8**	6	0.6	2	50	0.75	12.85	2.23	2.33	2.45	2.57	2.88

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Radius Tolerance (mm)	Mill Dia. Tolerance (mm)	Shank Dia. Tolerance
+0.001~-0.005	0~-0.010	h4

◎ : 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	10	29	32	38	15	35	44		15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	409		200	240	180	180	260	160	250	130	230
Recommend					○			○	○		○	○										

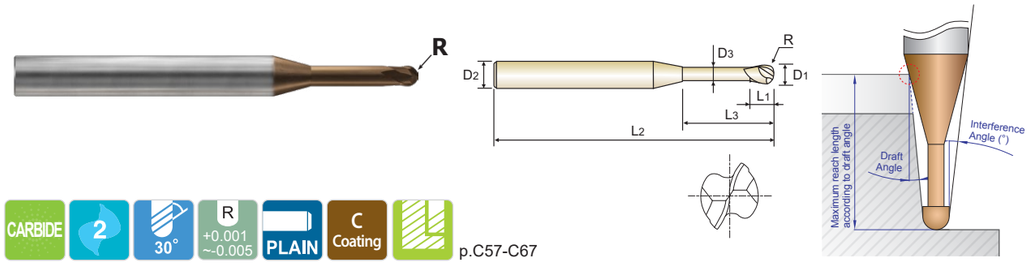
ISO	N									S							H					
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel				Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38.1	38.2	39.1	39.2	39.3	40	41
HRc											15	30	25	38	34			45-49	50-55	56-60	61-65	66-70	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	421-469	481-560	577-654	670-739		400	550
Recommend																		◎	◎	◎	◎	◎	○	◎

X1-EH END MILLS

PLAIN SHANK **HPI91 SERIES**

CARBIDE, 2 FLUTE BALL NOSE for RIB PROCESSING

- Improvement of tool life by applying new coating.
- Application of tight tolerances for precision machining.



CARBIDE | 2 | 30° | R +0.001 ~-0.005 | PLAIN | C Coating

p.C57-C67

Unit : mm

EDP No.	Radius of Ball Nose	Mill Diameter	Shank Diameter	Length of Cut	Length Below Shank	Overall Length	Neck Diameter	Interference Angle(°)	Maximum reach lengths according to draft angle				
	R	D1	D2	L1	L3	L2	D3		0.5°	1°	1.5°	2°	3°
HPI91996	R0.4	**0.8**	6	0.8	2	50	0.75	12.85	2.23	2.33	2.45	2.57	2.88
HPI91009	R0.45	**0.9**	4	0.65	2	45	0.85	11.79	2.23	2.33	2.44	2.56	2.86
HPI91997	R0.45	**0.9**	4	0.65	4	45	0.85	9.34	4.33	4.55	4.79	5.05	5.70
HPI91998	R0.45	**0.9**	4	0.65	6	45	0.85	7.72	6.44	6.77	7.13	7.55	8.55
HPI91999	R0.45	**0.9**	4	0.65	8	45	0.85	6.58	8.54	8.99	9.48	10.04	11.16
HPI91010	R0.5	**1.0**	4	0.75	2	45	0.95	11.78	2.23	2.32	2.43	2.55	2.84
HPI91801	R0.5	**1.0**	4	0.75	2.5	45	0.95	11.04	2.75	2.88	3.02	3.17	3.55
HPI91802	R0.5	**1.0**	4	0.75	3	45	0.95	10.38	3.28	3.43	3.60	3.79	4.26
HPI91803	R0.5	**1.0**	4	0.75	4	45	0.95	9.27	4.33	4.54	4.78	5.04	5.68
HPI91804	R0.5	**1.0**	4	0.75	5	45	0.95	8.37	5.38	5.65	5.95	6.29	7.10
HPI91805	R0.5	**1.0**	4	0.75	6	45	0.95	7.63	6.44	6.76	7.13	7.54	8.53
HPI91806	R0.5	**1.0**	4	0.75	7	45	0.95	7.01	7.49	7.87	8.30	8.78	9.93
HPI91807	R0.5	**1.0**	4	0.75	8	45	0.95	6.49	8.54	8.98	9.47	10.03	11.10
HPI91808	R0.5	**1.0**	4	0.75	9	45	0.95	6.03	9.59	10.09	10.65	11.28	12.26
HPI91809	R0.5	**1.0**	4	0.75	10	45	0.95	5.64	10.64	11.20	11.82	12.52	13.43
HPI91810	R0.5	**1.0**	4	0.75	12	45	0.95	4.99	12.75	13.42	14.17	14.96	15.77
HPI91811	R0.5	**1.0**	4	0.75	13	45	0.95	4.71	13.80	14.53	15.35	16.06	16.94
HPI91812	R0.5	**1.0**	4	0.75	14	50	0.95	4.47	14.85	15.64	16.52	17.17	18.10
HPI91813	R0.5	**1.0**	4	0.75	16	50	0.95	4.05	16.96	17.86	18.87	19.38	20.44
HPI91814	R0.5	**1.0**	4	0.75	18	55	0.95	3.70	19.06	20.08	21.05	21.59	22.78
HPI91815	R0.5	**1.0**	4	0.75	20	55	0.95	3.41	21.16	22.30	23.20	23.81	25.11
HPI91816	R0.5	**1.0**	4	1	2.5	40	0.95	11.04	2.75	2.88	3.02	3.17	3.55
HPI91817	R0.5	**1.0**	4	1	2.5	50	0.95	11.04	2.75	2.88	3.02	3.17	3.55
HPI91818	R0.5	**1.0**	6	0.75	3	50	0.95	11.84	3.28	3.43	3.60	3.79	4.26
HPI91819	R0.5	**1.0**	6	0.75	4	50	0.95	10.95	4.33	4.54	4.78	5.04	5.68
HPI91820	R0.5	**1.0**	6	0.75	5	50	0.95	10.18	5.38	5.65	5.95	6.29	7.10

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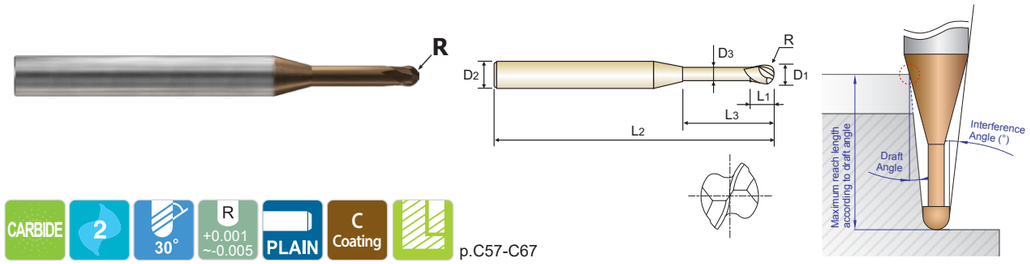
Radius Tolerance (mm)	Mill Dia. Tolerance (mm)	Shank Dia. Tolerance
+0.001~-0.005	0~-0.010	h4

◎ : 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	10	29	32	38	15	35	44		15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	409		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	39.1	39.2	39.3	40	41
HRc											15	30	25	38	34			45-49	50-55	56-60	61-65	66-70	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	421-469	481-560	577-654	670-739		400	550
Recommend																		◎	◎	◎	◎	◎	○	◎

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▶ Improvement of tool life by applying new coating.
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CARBIDE | 2 | 30° | R +0.001 ~-0.005 | PLAIN | C Coating

p.C57-C67

Unit : mm

EDP No.	Radius of Ball Nose	Mill Diameter	Shank Diameter	Length of Cut	Length Below Shank	Overall Length	Neck Diameter	Interference Angle(°)	Maximum reach lengths according to draft angle				
	R	D1	D2	L1	L3	L2	D3		0.5°	1°	1.5°	2°	3°
HPI91821	R0.5	**1.0**	6	0.75	6	50	0.95	9.51	6.44	6.76	7.13	7.54	8.53
HPI91822	R0.5	**1.0**	6	0.75	7	50	0.95	8.92	7.49	7.87	8.30	8.78	9.95
HPI91823	R0.5	**1.0**	6	0.75	8	50	0.95	8.40	8.54	8.98	9.47	10.03	11.37
HPI91824	R0.5	**1.0**	6	0.75	10	50	0.95	7.53	10.64	11.20	11.82	12.52	14.22
HPI91825	R0.5	**1.0**	6	0.75	22	60	0.95	4.62	23.27	24.52	25.92	27.11	28.60
HPI91826	R0.5	**1.0**	6	1	2.5	50	0.95	12.34	2.75	2.88	3.02	3.17	3.55
HPI91012	R0.6	**1.2**	4	0.9	2.4	45	1.15	11.13	2.56	2.63	2.70	2.78	2.95
HPI91827	R0.6	**1.2**	4	0.9	4	45	1.15	9.12	4.21	4.34	4.47	4.62	4.94
HPI91828	R0.6	**1.2**	4	0.9	6	45	1.15	7.44	6.28	6.48	6.69	6.92	7.43
HPI91829	R0.6	**1.2**	4	0.9	8	45	1.15	6.28	8.35	8.62	8.90	9.22	9.92
HPI91830	R0.6	**1.2**	4	0.9	10	45	1.15	5.43	10.41	10.75	11.12	11.52	12.40
HPI91831	R0.6	**1.2**	4	0.9	12	45	1.15	4.79	12.48	12.89	13.34	13.82	14.89
HPI91832	R0.6	**1.2**	4	0.9	14	50	1.15	4.28	14.55	15.03	15.55	16.12	17.37
HPI91833	R0.6	**1.2**	4	0.9	16	50	1.15	3.87	16.61	17.17	17.77	18.42	19.86
HPI91834	R0.6	**1.2**	4	1.2	3	40	1.15	10.28	3.18	3.27	3.36	3.47	3.70
HPI91014	R0.7	**1.4**	4	1	8	45	1.35	6.06	8.34	8.61	8.89	9.20	9.89
HPI91835	R0.7	**1.4**	4	1	12	50	1.35	4.58	12.48	12.89	13.33	13.80	14.86
HPI91836	R0.7	**1.4**	4	1	16	50	1.35	3.67	16.61	17.17	17.76	18.40	19.84
HPI91015	R0.75	**1.5**	4	1.1	3	45	1.45	10.11	3.17	3.26	3.35	3.44	3.66
HPI91837	R0.75	**1.5**	4	1.1	4	45	1.45	8.87	4.21	4.33	4.46	4.59	4.91
HPI91838	R0.75	**1.5**	4	1.1	6	45	1.45	7.12	6.27	6.47	6.67	6.89	7.39
HPI91839	R0.75	**1.5**	4	1.1	8	45	1.45	5.94	8.34	8.61	8.89	9.19	9.88
HPI91840	R0.75	**1.5**	4	1.1	10	45	1.45	5.10	10.41	10.74	11.11	11.49	12.37
HPI91841	R0.75	**1.5**	4	1.1	12	45	1.45	4.46	12.48	12.88	13.32	13.79	14.85
HPI91842	R0.75	**1.5**	4	1.1	14	50	1.45	3.97	14.54	15.02	15.54	16.09	17.34
HPI91843	R0.75	**1.5**	4	1.1	16	50	1.45	3.57	16.61	17.16	17.76	18.39	19.82

▶ NEXT PAGE

Radius Tolerance (mm)	Mill Dia. Tolerance (mm)	Shank Dia. Tolerance
+0.001~-0.005	0~-0.010	h4

◎ : 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	10	29	32	38	15	35	44		15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	409		200	240	180	180	260	160	250	130	230
Recommend					○			○	○		○	○										

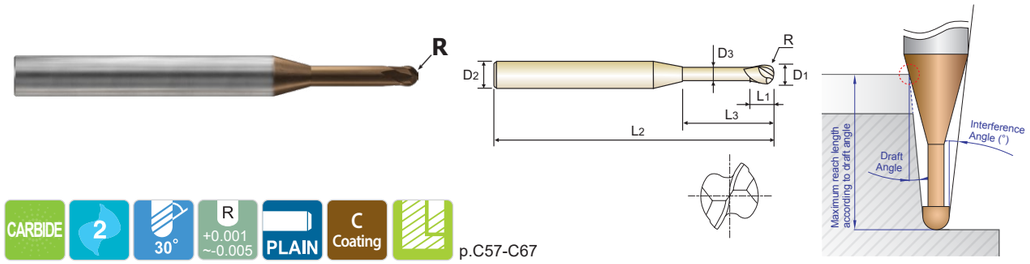
ISO	N									S							H					
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel				Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38.1	38.2	39.1	39.2	39.3	40	41
HRc											15	30	25	38	34			45-49	50-55	56-60	61-65	66-70	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	421-469	481-560	577-654	670-739		400	550
Recommend																		◎	◎	◎	◎	◎	○	◎

X1-EH END MILLS

PLAIN SHANK **HPI91 SERIES**

CARBIDE, 2 FLUTE BALL NOSE for RIB PROCESSING

- Improvement of tool life by applying new coating.
- Application of tight tolerances for precision machining.



CARBIDE | 2 | 30° | R +0.001 ~-0.005 | PLAIN | C Coating

p.C57-C67

Unit : mm

EDP No.	Radius of Ball Nose	Mill Diameter	Shank Diameter	Length of Cut	Length Below Shank	Overall Length	Neck Diameter	Interference Angle(°)	Maximum reach lengths according to draft angle				
	R	D1	D2	L1	L3	L2	D3		0.5°	1°	1.5°	2°	3°
HPI91844	R0.75	1.5	4	1.1	18	55	1.45	3.25	18.68	19.30	19.97	20.69	22.31
HPI91845	R0.75	1.5	4	1.1	20	55	1.45	2.98	20.74	21.44	22.19	22.99	-
HPI91846	R0.75	1.5	4	1.1	22	60	1.45	2.75	22.81	23.58	24.41	25.29	-
HPI91847	R0.75	1.5	4	1.1	30	70	1.45	2.10	31.08	32.14	33.27	34.49	-
HPI91848	R0.75	1.5	4	1.5	3.8	40	1.45	9.10	4.00	4.11	4.23	4.36	4.66
HPI91849	R0.75	1.5	4	1.5	3.8	50	1.45	9.10	4.00	4.11	4.23	4.36	4.66
HPI91850	R0.75	1.5	6	1.1	6	50	1.45	9.30	6.27	6.47	6.67	6.89	7.39
HPI91851	R0.75	1.5	6	1.1	8	50	1.45	8.13	8.34	8.61	8.89	9.19	9.88
HPI91852	R0.75	1.5	6	1.5	3.8	50	1.45	11.03	4.00	4.11	4.23	4.36	4.66
HPI91016	R0.8	1.6	4	1.2	8	45	1.55	5.82	8.34	8.60	8.88	9.19	9.87
HPI91853	R0.8	1.6	4	1.2	12	45	1.55	4.35	12.47	12.88	13.32	13.79	14.84
HPI91854	R0.8	1.6	4	1.2	16	50	1.55	3.47	16.61	17.16	17.75	18.39	19.81
HPI91855	R0.8	1.6	4	1.2	20	55	1.55	2.89	20.74	21.44	22.18	22.98	-
HPI91020	R1.0	2.0	4	1.5	3	45	1.95	9.74	3.16	3.24	3.32	3.41	3.60
HPI91856	R1.0	2.0	4	1.5	4	45	1.95	8.34	4.20	4.31	4.43	4.56	4.85
HPI91857	R1.0	2.0	4	1.5	6	45	1.95	6.46	6.26	6.45	6.64	6.86	7.33
HPI91858	R1.0	2.0	4	1.5	8	45	1.95	5.28	8.33	8.59	8.86	9.16	9.82
HPI91859	R1.0	2.0	4	1.5	10	45	1.95	4.46	10.40	10.73	11.08	11.46	12.30
HPI91860	R1.0	2.0	4	1.5	12	45	1.95	3.86	12.47	12.87	13.29	13.76	14.79
HPI91861	R1.0	2.0	4	1.5	13	45	1.95	3.62	13.50	13.94	14.40	14.91	16.03
HPI91862	R1.0	2.0	4	1.5	14	50	1.95	3.40	14.53	15.01	15.51	16.06	17.28
HPI91863	R1.0	2.0	4	1.5	16	50	1.95	3.04	16.60	17.15	17.73	18.36	19.76
HPI91864	R1.0	2.0	4	1.5	18	55	1.95	2.75	18.67	19.28	19.94	20.65	-
HPI91865	R1.0	2.0	4	1.5	20	55	1.95	2.51	20.74	21.42	22.16	22.95	-
HPI91866	R1.0	2.0	4	1.5	22	60	1.95	2.31	22.80	23.56	24.38	25.25	-
HPI91867	R1.0	2.0	4	1.5	25	65	1.95	2.06	25.90	26.77	27.70	28.70	-

▶ NEXT PAGE

Radius Tolerance (mm)	Mill Dia. Tolerance (mm)	Shank Dia. Tolerance
+0.001~-0.005	0~-0.010	h4

◎ : 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	10	29	32	38	15	35	44		15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	409		200	240	180	180	260	160	250	130	230
Recommend					○			○	○		○	○										

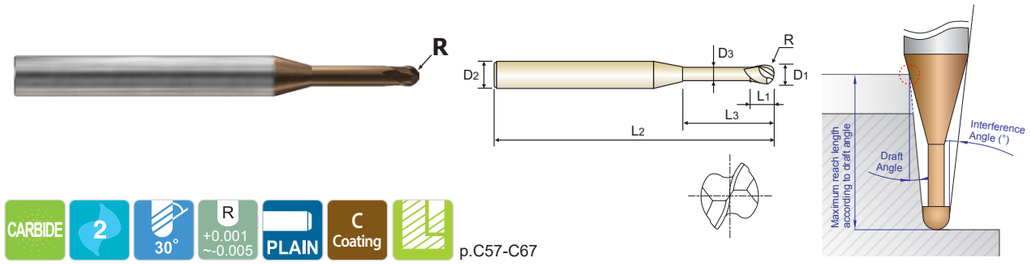
ISO	N									S							H					
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel				Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38.1	38.2	39.1	39.2	39.3	40	41
HRc											15	30	25	38	34			45-49	50-55	56-60	61-65	66-70	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	421-469	481-560	577-654	670-739		400	550
Recommend																		◎	◎	◎	◎	◎	○	◎

X1-EH END MILLS

PLAIN SHANK HPI91 SERIES

CARBIDE, 2 FLUTE BALL NOSE for RIB PROCESSING

- Improvement of tool life by applying new coating.
- Application of tight tolerances for precision machining.



CARBIDE | 2 | 30° | R +0.001 ~-0.005 | PLAIN | C Coating

p.C57-C67

Unit : mm

EDP No.	Radius of Ball Nose	Mill Diameter	Shank Diameter	Length of Cut	Length Below Shank	Overall Length	Neck Diameter	Interference Angle(°)	Maximum reach lengths according to draft angle				
	R	D1	D2	L1	L3	L2	D3		0.5°	1°	1.5°	2°	3°
HPI91868	R1.0	2.0	4	1.5	30	70	1.95	1.74	31.07	32.12	33.24	-	-
HPI91869	R1.0	2.0	4	1.5	35	70	1.95	1.51	36.24	37.47	38.79	-	-
HPI91870	R1.0	2.0	4	1.5	40	90	1.95	1.34	41.41	42.82	-	-	-
HPI91871	R1.0	2.0	4	2	5	40	1.95	7.28	5.23	5.38	5.54	5.71	6.09
HPI91872	R1.0	2.0	4	2	5	50	1.95	7.28	5.23	5.38	5.54	5.71	6.09
HPI91873	R1.0	2.0	6	1.5	4	50	1.95	10.73	4.20	4.31	4.43	4.56	4.85
HPI91874	R1.0	2.0	6	1.5	6	50	1.95	9.05	6.26	6.45	6.64	6.86	7.33
HPI91875	R1.0	2.0	6	1.5	8	50	1.95	7.82	8.33	8.59	8.86	9.16	9.82
HPI91876	R1.0	2.0	6	1.5	10	50	1.95	6.89	10.40	10.73	11.08	11.46	12.30
HPI91877	R1.0	2.0	6	1.5	16	60	1.95	5.07	16.60	17.15	17.73	18.36	19.76
HPI91878	R1.0	2.0	6	1.5	25	65	1.95	3.63	25.90	26.77	27.70	28.70	30.95
HPI91879	R1.0	2.0	6	2	5	50	1.95	9.82	5.23	5.38	5.54	5.71	6.09
HPI91025	R1.25	2.5	4	2.3	6	45	2.4	5.54	6.35	6.53	6.72	6.93	7.39
HPI91880	R1.25	2.5	4	2.3	8	45	2.4	4.41	8.42	8.67	8.94	9.23	9.87
HPI91881	R1.25	2.5	4	2.3	10	45	2.4	3.66	10.49	10.81	11.15	11.53	12.36
HPI91882	R1.25	2.5	4	2.3	15	50	2.4	2.57	15.66	16.16	16.70	17.28	-
HPI91883	R1.25	2.5	4	2.3	20	55	2.4	1.98	20.82	21.51	22.24	-	-
HPI91884	R1.25	2.5	4	2.3	25	65	2.4	1.61	25.99	26.85	27.78	-	-
HPI91885	R1.25	2.5	4	2.3	30	70	2.4	1.35	31.16	32.20	-	-	-
HPI91886	R1.25	2.5	4	2.3	35	70	2.4	1.17	36.33	37.55	-	-	-
HPI91030	R1.5	3.0	4	3	8	40	2.85	3.31	8.51	8.75	9.01	9.30	9.93
HPI91887	R1.5	3.0	6	2.5	6	60	2.85	8.22	6.44	6.61	6.80	7.00	7.44
HPI91888	R1.5	3.0	6	2.5	8	60	2.85	6.91	8.51	8.75	9.01	9.30	9.93
HPI91889	R1.5	3.0	6	2.5	10	60	2.85	5.96	10.58	10.89	11.23	11.60	12.41
HPI91890	R1.5	3.0	6	2.5	12	60	2.85	5.23	12.64	13.03	13.45	13.90	14.90
HPI91891	R1.5	3.0	6	2.5	14	60	2.85	4.67	14.71	15.17	15.66	16.20	17.39

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Radius Tolerance (mm)	Mill Dia. Tolerance (mm)	Shank Dia. Tolerance
+0.001~-0.005	0~-0.010	h4

◎ : 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	10	29	32	38	15	35	44		15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	409		200	240	180	180	260	160	250	130	230
Recommend					○			○	○		○	○										

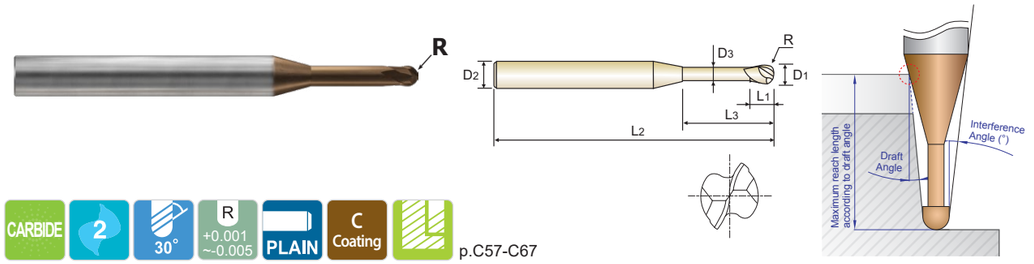
ISO	N									S							H					
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel				Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38.1	38.2	39.1	39.2	39.3	40	41
HRc											15	30	25	38	34			45-49	50-55	56-60	61-65	66-70	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	421-469	481-560	577-654	670-739		400	550
Recommend																		◎	◎	◎	◎	◎	○	◎

X1-EH END MILLS

PLAIN SHANK **HPI91 SERIES**

CARBIDE, 2 FLUTE BALL NOSE for RIB PROCESSING

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- Application of tight tolerances for precision machining.



CARBIDE | 2 | 30° | R +0.001 ~-0.005 | PLAIN | C Coating | p.C57-C67

Unit : mm

EDP No.	Radius of Ball Nose	Mill Diameter	Shank Diameter	Length of Cut	Length Below Shank	Overall Length	Neck Diameter	Interference Angle(°)	Maximum reach lengths according to draft angle				
	R	D1	D2	L1	L3	L2	D3		0.5°	1°	1.5°	2°	3°
HPI91892	R1.5	3.0	6	2.5	16	60	2.85	4.21	16.78	17.31	17.88	18.49	19.87
HPI91893	R1.5	3.0	6	2.5	20	65	2.85	3.52	20.91	21.59	22.31	23.09	24.85
HPI91894	R1.5	3.0	6	2.5	25	65	2.85	2.92	26.08	26.94	27.86	28.84	-
HPI91895	R1.5	3.0	6	2.5	30	70	2.85	2.50	31.25	32.29	33.40	34.59	-
HPI91896	R1.5	3.0	6	2.5	35	80	2.85	2.18	36.42	37.63	38.94	40.34	-
HPI91897	R1.5	3.0	6	2.5	40	90	2.85	1.94	41.59	42.98	44.48	-	-
HPI91898	R1.5	3.0	6	3	8	60	2.85	6.91	8.51	8.75	9.01	9.30	9.93
HPI91035	R1.75	3.5	6	2.8	15	60	3.35	3.93	15.74	16.22	16.75	17.31	18.57
HPI91899	R1.75	3.5	6	2.8	20	65	3.35	3.08	20.90	21.57	22.29	23.06	24.79
HPI91701	R1.75	3.5	6	2.8	25	65	3.35	2.54	26.07	26.92	27.83	28.81	-
HPI91702	R1.75	3.5	6	2.8	30	70	3.35	2.16	31.24	32.27	33.37	34.56	-
HPI91703	R1.75	3.5	6	2.8	35	80	3.35	1.87	36.41	37.62	38.91	-	-
HPI91704	R1.75	3.5	6	2.8	40	90	3.35	1.66	41.58	42.96	44.45	-	-
HPI91705	R1.75	3.5	6	2.8	45	90	3.35	1.49	46.75	48.31	-	-	-
HPI91040	R2.0	4.0	4	3	8	65	3.85	0.00	-	-	-	-	-
HPI91706	R2.0	4.0	6	3	8	65	3.85	5.70	8.49	8.72	8.96	9.22	9.81
HPI91707	R2.0	4.0	6	3	10	65	3.85	4.76	10.56	10.86	11.18	11.52	12.29
HPI91708	R2.0	4.0	6	3	12	65	3.85	4.08	12.63	13.00	13.39	13.82	14.78
HPI91709	R2.0	4.0	6	3	14	65	3.85	3.57	14.69	15.14	15.61	16.12	17.27
HPI91710	R2.0	4.0	6	3	15	65	3.85	3.36	15.73	16.21	16.72	17.27	18.51
HPI91711	R2.0	4.0	6	3	20	65	3.85	2.60	20.90	21.55	22.26	23.02	-
HPI91712	R2.0	4.0	6	3	25	70	3.85	2.12	26.06	26.90	27.80	28.77	-
HPI91713	R2.0	4.0	6	3	30	70	3.85	1.79	31.23	32.25	33.34	-	-
HPI91714	R2.0	4.0	6	3	35	80	3.85	1.55	36.40	37.60	38.88	-	-
HPI91715	R2.0	4.0	6	3	40	85	3.85	1.36	41.57	42.95	-	-	-
HPI91716	R2.0	4.0	6	3	45	90	3.85	1.22	46.74	48.30	-	-	-

▶ NEXT PAGE

Radius Tolerance (mm)	Mill Dia. Tolerance (mm)	Shank Dia. Tolerance
+0.001~-0.005	0~-0.010	h4

◎ : 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	10	29	32	38	15	35	44	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	409	200	240	180	180	260	160	250	130	230
Recommend					○			○	○		○	○									

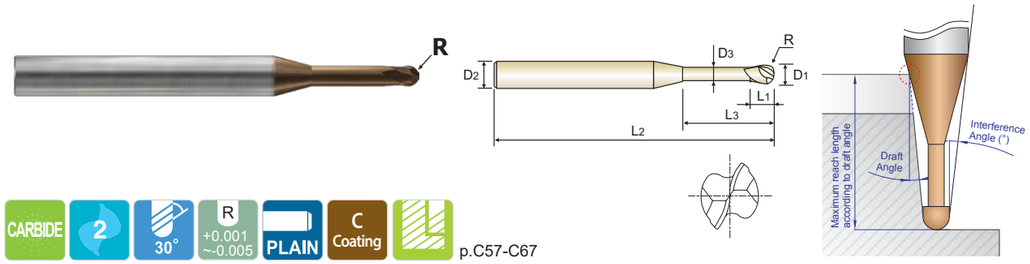
ISO	N									S							H					
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel				Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38.1	38.2	39.1	39.2	39.3	40	41
HRc											15	30	25	38	34			45-49	50-55	56-60	61-65	66-70	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	421-469	481-560	577-654	670-739		400	550
Recommend																		◎	◎	◎	◎	○	○	◎

X1-EH END MILLS

PLAIN SHANK HPI91 SERIES

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- Improvement of tool life by applying new coating.
- Application of tight tolerances for precision machining.



CARBIDE | 2 | 30° | R +0.001 ~-0.005 | PLAIN | C Coating | p.C57-C67

Unit : mm

EDP No.	Radius of Ball Nose	Mill Diameter	Shank Diameter	Length of Cut	Length Below Shank	Overall Length	Neck Diameter	Interference Angle(°)	Maximum reach lengths according to draft angle				
	R	D1	D2	L1	L3	L2	D3		0.5°	1°	1.5°	2°	3°
HPI91717	R2.0	4.0	6	3	50	100	3.85	1.10	51.91	53.64	-	-	-
HPI91718	R2.0	4.0	6	4	10	40	3.85	4.76	10.56	10.86	11.18	11.52	12.29
HPI91719	R2.0	4.0	6	4	10	60	3.85	4.76	10.56	10.86	11.18	11.52	12.29
HPI91050	R2.5	5.0	6	3.5	10	70	4.85	2.97	10.54	10.82	11.12	11.45	-
HPI91060	R3.0	6.0	6	6	10	70	5.85	0.00	-	-	-	-	-
HPI91720	R2.5	5.0	6	3.5	15	70	4.85	1.96	15.71	16.17	16.66	-	-
HPI91721	R2.5	5.0	6	3.5	20	70	4.85	1.46	20.88	21.52	-	-	-
HPI91722	R2.5	5.0	6	3.5	25	70	4.85	1.16	26.05	26.87	-	-	-
HPI91723	R2.5	5.0	6	3.5	30	80	4.85	0.97	31.22	-	-	-	-
HPI91724	R2.5	5.0	6	3.5	40	90	4.85	0.72	41.55	-	-	-	-
HPI91725	R2.5	5.0	6	5	12	45	4.85	2.46	12.61	12.96	13.34	13.75	-
HPI91726	R2.5	5.0	6	5	12	60	4.85	2.46	12.61	12.96	13.34	13.75	-
HPI91727	R3.0	6.0	6	6	15	45	5.85	0.00	-	-	-	-	-
HPI91728	R3.0	6.0	6	6	15	60	5.85	0.00	-	-	-	-	-
HPI91729	R3.0	6.0	6	6	15	70	5.85	0.00	-	-	-	-	-
HPI91730	R3.0	6.0	6	6	20	70	5.85	0.00	-	-	-	-	-
HPI91731	R3.0	6.0	6	6	25	70	5.85	0.00	-	-	-	-	-
HPI91732	R3.0	6.0	6	6	30	80	5.85	0.00	-	-	-	-	-
HPI91733	R3.0	6.0	6	6	35	85	5.85	0.00	-	-	-	-	-
HPI91734	R3.0	6.0	6	6	40	90	5.85	0.00	-	-	-	-	-
HPI91735	R3.0	6.0	6	6	50	120	5.85	0.00	-	-	-	-	-
HPI91736	R3.0	6.0	6	6	60	120	5.85	0.00	-	-	-	-	-

Radius Tolerance (mm)	Mill Dia. Tolerance (mm)	Shank Dia. Tolerance
+0.001~-0.005	0~-0.010	h4

◎ : 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	10	29	32	38	15	35	44	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	409	200	240	180	180	260	160	250	130	230
Recommend					○			○	○		○	○									

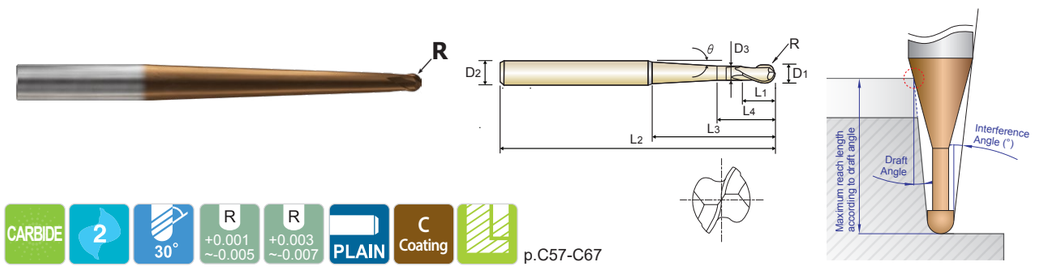
ISO	N									S							H					
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel				Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38.1	38.2	39.1	39.2	39.3	40	41
HRc											15	30	25	38	34			45-49	50-55	56-60	61-65	66-70	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	421-469	481-560	577-654	670-739		400	550
Recommend																		◎	◎	◎	◎	◎	○	◎

X1-EH END MILLS

PLAIN SHANK **HPI92 SERIES**

CARBIDE, 2 FLUTE BALL NOSE for RIB PROCESSING with TAPER NECK

- Improvement of tool life by applying new coating.
- Application of tight tolerances for precision machining.



CARBIDE | 2 | 30° | R +0.001 ~-0.005 | R +0.003 ~-0.007 | PLAIN | C Coating

R0.05~R3 R3.5~R6

p.C57-C67

Unit : mm

EDP No.	Radius of Ball Nose	Mill Diameter	Shank Diameter	Length of Cut	Length Below Shank	Overall Length	Neck Diameter	Neck Taper Angle(°)	Under Neck Parallel Length	Interference Angle(°)	Maximum reach lengths according to draft angle				
	R	D1	D2	L1	L3	L2	D3	θ°	L4		0.5°	1°	1.5°	2°	3°
HPI92001	R0.05	**0.1**	4	0.07	0.5	50	0.085	**3°**	0.17	14.23	0.37	0.44	0.51	0.53	0.56
HPI92901	R0.05	**0.1**	4	0.07	0.75	50	0.085	**3°**	0.17	13.88	0.37	0.44	0.58	0.76	0.81
HPI920015	R0.075	**0.15**	4	0.1	1	50	0.135	**3°**	0.25	13.55	0.46	0.55	0.71	1.00	1.08
HPI92902	R0.075	**0.15**	4	0.1	1.5	50	0.135	**3°**	0.25	12.92	0.46	0.55	0.71	1.03	1.58
HPI92002	R0.1	**0.2**	4	0.15	1.5	50	0.17	**0.5°**	0.35	12.59	1.57	1.62	1.67	1.73	1.86
HPI92903	R0.1	**0.2**	4	0.15	1.5	50	0.17	**1°**	0.35	12.64	1.53	1.58	1.63	1.69	1.82
HPI92904	R0.1	**0.2**	4	0.15	1.5	50	0.17	**1.5°**	0.35	12.69	1.33	1.54	1.59	1.64	1.77
HPI92905	R0.1	**0.2**	4	0.15	1.5	50	0.17	**2°**	0.35	12.75	1.01	1.46	1.55	1.60	1.72
HPI92906	R0.1	**0.2**	4	0.15	2	50	0.17	**0.5°**	0.35	11.93	2.07	2.13	2.21	2.29	2.46
HPI92907	R0.1	**0.2**	4	0.15	2	50	0.17	**1°**	0.35	12.00	2.01	2.08	2.15	2.23	2.40
HPI92908	R0.1	**0.2**	4	0.15	2	50	0.17	**1.5°**	0.35	12.07	1.33	2.02	2.09	2.16	2.33
HPI92909	R0.1	**0.2**	4	0.15	2	50	0.17	**2°**	0.35	12.14	1.01	1.46	2.03	2.10	2.26
HPI92910	R0.1	**0.2**	4	0.15	3	50	0.17	**3°**	0.35	11.28	0.74	0.90	1.17	1.71	3.13
HPI92911	R0.1	**0.2**	4	0.15	3	50	0.17	**5°**	0.35	11.69	0.57	0.63	0.70	0.80	1.15
HPI92912	R0.1	**0.2**	4	0.15	5	50	0.17	**3°**	0.35	9.68	0.74	0.90	1.17	1.71	5.13
HPI92913	R0.1	**0.2**	4	0.15	5	50	0.17	**5°**	0.35	10.23	0.57	0.63	0.70	0.80	1.15
HPI92003	R0.15	**0.3**	4	0.2	2	50	0.27	**0.5°**	0.5	11.92	2.07	2.14	2.21	2.29	2.46
HPI92914	R0.15	**0.3**	4	0.2	2	50	0.27	**1°**	0.5	11.99	2.02	2.08	2.15	2.23	2.40
HPI92915	R0.15	**0.3**	4	0.2	2	50	0.27	**1.5°**	0.5	12.05	1.53	2.03	2.10	2.17	2.34
HPI92916	R0.15	**0.3**	4	0.2	2	50	0.27	**2°**	0.5	12.12	1.19	1.71	2.05	2.12	2.28
HPI92917	R0.15	**0.3**	4	0.2	2	50	0.27	**3°**	0.5	12.26	0.91	1.10	1.42	2.00	2.15
HPI92918	R0.15	**0.3**	4	0.2	3	50	0.27	**0.5°**	0.5	10.77	3.07	3.17	3.28	3.40	3.66
HPI92919	R0.15	**0.3**	4	0.2	3	50	0.27	**1°**	0.5	10.86	2.57	3.08	3.19	3.30	3.56
HPI92920	R0.15	**0.3**	4	0.2	3	50	0.27	**1.5°**	0.5	10.95	1.53	2.92	3.10	3.21	3.46
HPI92921	R0.15	**0.3**	4	0.2	3	50	0.27	**2°**	0.5	11.04	1.19	1.71	3.01	3.12	3.36
HPI92922	R0.15	**0.3**	4	0.2	3	50	0.27	**3°**	0.5	11.23	0.91	1.10	1.42	2.06	3.15

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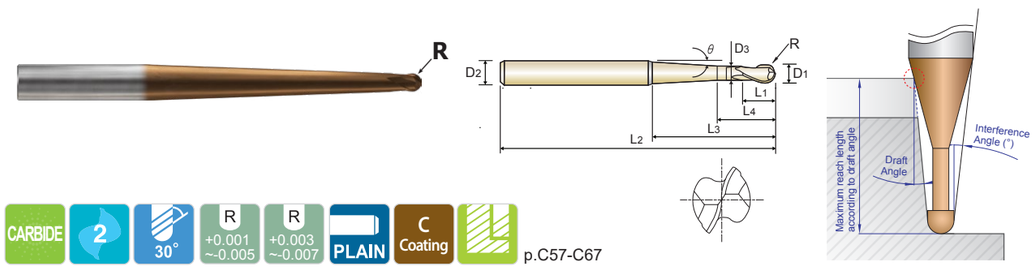
Size	Radius Tolerance (mm)	Mill Dia. Tolerance (mm)	Shank Dia. Tolerance
up to R3	+0.001~-0.005	0~-0.010	h4
over R3	+0.003~-0.007	0~-0.012	* Shank Dia.>ø6 : h5

◎ : 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	10	29	32	38	15	35	44	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	409	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	39.1	39.2	39.3	40	41
HRc											15	30	25	38	34			45-49	50-55	56-60	61-65	66-70	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	421-469	481-560	577-654	670-739		400	550
Recommend																		◎	◎	◎	◎	◎	○	◎

X1-EH END MILLS
PLAIN SHANK HPI92 SERIES
CARBIDE, 2 FLUTE BALL NOSE for RIB PROCESSING with TAPER NECK
▶ Improvement of tool life by applying new coating.
▶ Application of tight tolerances for precision machining.



CARBIDE | 2 | 30° | R +0.001 ~-0.005 | R +0.003 ~-0.007 | PLAIN | C Coating
R0.05~R3 R3.5~R6
p.C57-C67
Unit : mm

EDP No.	Radius of Ball Nose	Mill Diameter	Shank Diameter	Length of Cut	Length Below Shank	Overall Length	Neck Diameter	Neck Taper Angle(°)	Under Neck Parallel Length	Interference Angle(°)	Maximum reach lengths according to draft angle				
	R	D1	D2	L1	L3	L2	D3	θ°	L4		0.5°	1°	1.5°	2°	3°
HPI92923	R0.15	**0.3**	4	0.2	3	50	0.27	**5°**	0.5	11.62	0.73	0.80	0.89	1.02	1.45
HPI92924	R0.15	**0.3**	4	0.2	5	50	0.27	**3°**	0.5	9.61	0.91	1.10	1.42	2.06	5.15
HPI92925	R0.15	**0.3**	4	0.2	5	50	0.27	**5°**	0.5	10.14	0.73	0.80	0.89	1.02	1.45
HPI92926	R0.15	**0.3**	4	0.2	7	50	0.27	**3°**	0.5	8.39	0.91	1.10	1.42	2.06	7.15
HPI92927	R0.15	**0.3**	4	0.2	7	50	0.27	**5°**	0.5	8.99	0.73	0.80	0.89	1.02	1.45
HPI92004	R0.2	**0.4**	4	0.3	3	50	0.37	**0.5°**	0.7	10.73	3.07	3.17	3.28	3.40	3.66
HPI92928	R0.2	**0.4**	4	0.3	3	50	0.37	**1°**	0.7	10.81	2.92	3.09	3.20	3.31	3.56
HPI92929	R0.2	**0.4**	4	0.3	3	50	0.37	**1.5°**	0.7	10.90	1.81	3.01	3.12	3.23	3.47
HPI92930	R0.2	**0.4**	4	0.3	3	50	0.37	**2°**	0.7	10.98	1.44	2.06	3.03	3.14	3.38
HPI92931	R0.2	**0.4**	4	0.3	4	50	0.37	**0.5°**	0.7	9.76	4.07	4.21	4.35	4.51	4.86
HPI92932	R0.2	**0.4**	4	0.3	4	50	0.37	**1°**	0.7	9.86	2.92	4.09	4.24	4.39	4.73
HPI92933	R0.2	**0.4**	4	0.3	4	50	0.37	**1.5°**	0.7	9.96	1.81	3.42	4.12	4.26	4.59
HPI92934	R0.2	**0.4**	4	0.3	4	50	0.37	**2°**	0.7	10.06	1.44	2.06	3.92	4.14	4.46
HPI92935	R0.2	**0.4**	4	0.3	5	50	0.37	**3°**	0.7	9.52	1.14	1.38	1.77	2.56	5.19
HPI92936	R0.2	**0.4**	4	0.3	5	50	0.37	**5°**	0.7	10.04	0.95	1.04	1.16	1.32	1.87
HPI92937	R0.2	**0.4**	4	0.3	6	50	0.37	**0.5°**	0.7	8.26	6.07	6.28	6.50	6.74	7.27
HPI92938	R0.2	**0.4**	4	0.3	6	50	0.37	**1°**	0.7	8.37	2.92	6.09	6.31	6.54	7.05
HPI92939	R0.2	**0.4**	4	0.3	6	50	0.37	**1.5°**	0.7	8.49	1.81	3.42	6.12	6.34	6.84
HPI92940	R0.2	**0.4**	4	0.3	6	50	0.37	**2°**	0.7	8.61	1.44	2.06	3.92	6.14	6.62
HPI92941	R0.2	**0.4**	4	0.3	7	50	0.37	**3°**	0.7	8.30	1.14	1.38	1.77	2.56	7.19
HPI92942	R0.2	**0.4**	4	0.3	7	50	0.37	**5°**	0.7	8.88	0.95	1.04	1.16	1.32	1.87
HPI92005	R0.25	**0.5**	4	0.35	4	50	0.45	**0.5°**	0.85	9.67	4.12	4.25	4.40	4.55	4.90
HPI92943	R0.25	**0.5**	4	0.35	4	50	0.45	**1°**	0.85	9.76	4.01	4.14	4.28	4.43	4.77
HPI92944	R0.25	**0.5**	4	0.35	4	50	0.45	**1.5°**	0.85	9.86	2.58	4.03	4.17	4.32	4.65
HPI92945	R0.25	**0.5**	4	0.35	4	50	0.45	**2°**	0.85	9.96	2.00	2.88	4.05	4.20	4.52
HPI92946	R0.25	**0.5**	4	0.35	5	50	0.45	**0.5°**	0.85	8.85	5.12	5.29	5.47	5.66	6.10

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Size	Radius Tolerance (mm)	Mill Dia. Tolerance (mm)	Shank Dia. Tolerance
up to R3	+0.001~-0.005	0~-0.010	h4
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◎ : 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	10	29	32	38	15	35	44	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	409	200	240	180	180	260	160	250	130	230
Recommend					○			○	○		○	○									

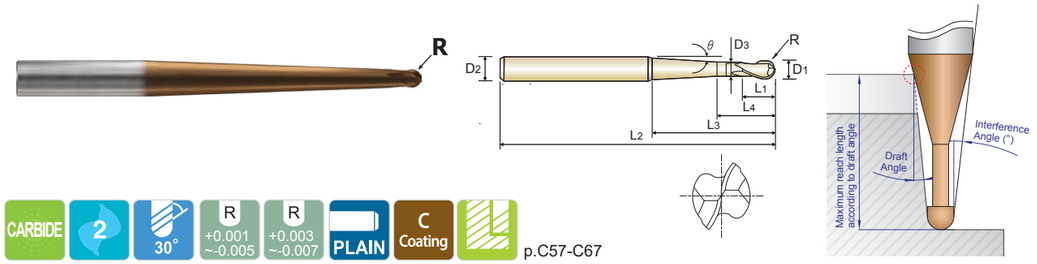
ISO	N										S							H						
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel					Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38.1	38.2	39.1	39.2	39.3	40	41
HRc											15	30	25	38	34			45-49	50-55	56-60	61-65	66-70	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	421-469	481-560	577-654	670-739		400	550
Recommend																		◎	◎	◎	◎	◎	○	◎

X1-EH END MILLS

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CARBIDE | 2 | 30° | R +0.001 ~-0.005 | R +0.003 ~-0.007 | PLAIN | C Coating | p.C57-C67

R0.05~R3 R3.5~R6

Unit : mm

EDP No.	Radius of Ball Nose	Mill Diameter	Shank Diameter	Length of Cut	Length Below Shank	Overall Length	Neck Diameter	Neck Taper Angle(°)	Under Neck Parallel Length	Interference Angle(°)	Maximum reach lengths according to draft angle				
	R	D1	D2	L1	L3	L2	D3	θ°	L4		0.5°	1°	1.5°	2°	3°
HPI92947	R0.25	**0.5**	4	0.35	5	50	0.45	**1°**	0.85	8.96	4.31	5.14	5.32	5.51	5.93
HPI92948	R0.25	**0.5**	4	0.35	5	50	0.45	**1.5°**	0.85	9.06	2.58	4.91	5.17	5.35	5.77
HPI92949	R0.25	**0.5**	4	0.35	5	50	0.45	**2°**	0.85	9.18	2.00	2.88	5.02	5.20	5.60
HPI92006	R0.3	**0.6**	4	0.45	4	50	0.55	**0.5°**	1.05	9.61	4.12	4.25	4.40	4.55	4.90
HPI92950	R0.3	**0.6**	4	0.45	4	50	0.55	**1°**	1.05	9.70	4.02	4.15	4.29	4.44	4.78
HPI92951	R0.3	**0.6**	4	0.45	4	50	0.55	**1.5°**	1.05	9.79	2.86	4.05	4.18	4.33	4.66
HPI92952	R0.3	**0.6**	4	0.45	4	50	0.55	**3°**	1.05	10.08	1.77	2.14	2.75	3.98	4.30
HPI92953	R0.3	**0.6**	4	0.45	5	50	0.55	**0.5°**	1.05	8.78	5.12	5.29	5.47	5.66	6.10
HPI92954	R0.3	**0.6**	4	0.45	5	50	0.55	**1°**	1.05	8.88	4.66	5.15	5.33	5.52	5.94
HPI92955	R0.3	**0.6**	4	0.45	5	50	0.55	**1.5°**	1.05	8.98	2.86	5.01	5.18	5.37	5.78
HPI92956	R0.3	**0.6**	4	0.45	5	50	0.55	**2°**	1.05	9.09	2.25	3.23	5.04	5.22	5.62
HPI92957	R0.3	**0.6**	4	0.45	5	50	0.55	**3°**	1.05	9.31	1.77	2.14	2.75	3.98	5.30
HPI92958	R0.3	**0.6**	4	0.45	5	50	0.55	**5°**	1.05	9.79	1.45	1.59	1.78	2.02	2.88
HPI92959	R0.3	**0.6**	4	0.45	6	50	0.55	**0.5°**	1.05	8.08	6.12	6.32	6.54	6.78	7.30
HPI92960	R0.3	**0.6**	4	0.45	6	50	0.55	**1°**	1.05	8.19	4.66	6.15	6.36	6.59	7.10
HPI92961	R0.3	**0.6**	4	0.45	6	50	0.55	**1.5°**	1.05	8.30	2.86	5.41	6.18	6.41	6.90
HPI92962	R0.3	**0.6**	4	0.45	6	50	0.55	**2°**	1.05	8.41	2.25	3.23	6.01	6.22	6.70
HPI92963	R0.3	**0.6**	4	0.45	7	50	0.55	**3°**	1.05	8.08	1.77	2.14	2.75	3.98	7.30
HPI92964	R0.3	**0.6**	4	0.45	7	50	0.55	**5°**	1.05	8.63	1.45	1.59	1.78	2.02	2.88
HPI92965	R0.3	**0.6**	4	0.45	8	50	0.55	**0.5°**	1.05	6.97	8.12	8.39	8.69	9.00	9.71
HPI92966	R0.3	**0.6**	4	0.45	8	50	0.55	**1°**	1.05	7.08	4.66	8.15	8.44	8.74	9.43
HPI92967	R0.3	**0.6**	4	0.45	8	50	0.55	**1.5°**	1.05	7.20	2.86	5.41	8.18	8.48	9.14
HPI92968	R0.3	**0.6**	4	0.45	8	50	0.55	**2°**	1.05	7.32	2.25	3.23	6.16	8.22	8.86
HPI92008	R0.4	**0.8**	4	0.6	8	60	0.75	**0.5°**	1.4	6.78	8.13	8.40	8.69	9.00	9.70
HPI92969	R0.4	**0.8**	4	0.6	8	60	0.75	**1°**	1.4	6.89	5.26	8.17	8.45	8.75	9.43
HPI92970	R0.4	**0.8**	4	0.6	8	60	0.75	**1.5°**	1.4	7.01	3.33	6.26	8.21	8.50	9.16

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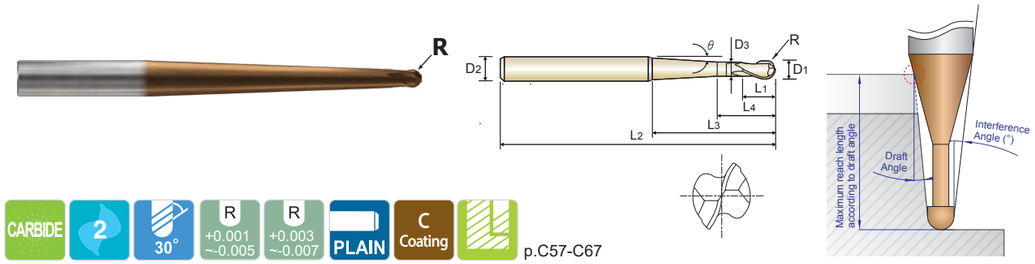
Size	Radius Tolerance (mm)	Mill Dia. Tolerance (mm)	Shank Dia. Tolerance
up to R3	+0.001~-0.005	0~-0.010	h4
over R3	+0.003~-0.007	0~-0.012	* Shank Dia.>ø6 : h5

◎ : 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	10	29	32	38	15	35	44	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	409	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	39.1	39.2	39.3	40	41
HRc											15	30	25	38	34			45-49	50-55	56-60	61-65	66-70	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	421-469	481-560	577-654	670-739		400	550
Recommend																		◎	◎	◎	◎	◎	○	◎

X1-EH END MILLS
PLAIN SHANK HPI92 SERIES
CARBIDE, 2 FLUTE BALL NOSE for RIB PROCESSING with TAPER NECK
▶ Improvement of tool life by applying new coating.
▶ Application of tight tolerances for precision machining.



CARBIDE | 2 | 30° | R +0.001 ~-0.005 | R +0.003 ~-0.007 | PLAIN | C Coating | p.C57-C67
R0.05~R3 R3.5~R6
Unit : mm

EDP No.	Radius of Ball Nose	Mill Diameter	Shank Diameter	Length of Cut	Length Below Shank	Overall Length	Neck Diameter	Neck Taper Angle(°)	Under Neck Parallel Length	Interference Angle(°)	Maximum reach lengths according to draft angle				
	R	D1	D2	L1	L3	L2	D3	θ°	L4		0.5°	1°	1.5°	2°	3°
HPI92971	R0.4	**0.8**	4	0.6	8	60	0.75	**2°**	1.4	7.12	2.69	3.83	7.26	8.26	8.89
HPI92972	R0.4	**0.8**	4	0.6	12	60	0.75	**0.5°**	1.4	5.28	12.13	12.54	12.98	13.45	14.51
HPI92973	R0.4	**0.8**	4	0.6	12	60	0.75	**1°**	1.4	5.38	5.26	12.17	12.59	13.05	14.08
HPI92974	R0.4	**0.8**	4	0.6	12	60	0.75	**1.5°**	1.4	5.50	3.33	6.26	12.21	12.65	13.65
HPI92975	R0.4	**0.8**	4	0.6	12	60	0.75	**2°**	1.4	5.61	2.69	3.83	7.26	12.26	13.22
HPI92010	R0.5	**1.0**	4	0.75	6	60	0.95	**0.5°**	2.75	7.71	6.17	6.37	6.58	6.81	7.32
HPI92976	R0.5	**1.0**	4	0.75	6	60	0.95	**1°**	2.75	7.78	6.06	6.26	6.46	6.69	7.19
HPI92977	R0.5	**1.0**	4	0.75	6	60	0.95	**1.5°**	2.75	7.85	5.31	6.14	6.35	6.57	7.06
HPI92978	R0.5	**1.0**	4	0.75	8	60	0.95	**0.5°**	2.75	6.57	8.17	8.44	8.73	9.03	9.73
HPI92979	R0.5	**1.0**	4	0.75	8	60	0.95	**1°**	2.75	6.66	7.86	8.26	8.54	8.84	9.51
HPI92980	R0.5	**1.0**	4	0.75	8	60	0.95	**1.5°**	2.75	6.75	5.31	8.07	8.35	8.64	9.30
HPI92981	R0.5	**1.0**	4	0.75	8	60	0.95	**2°**	2.75	6.84	4.45	6.43	8.16	8.44	9.09
HPI92982	R0.5	**1.0**	4	0.75	10	60	0.95	**0.5°**	2.75	5.73	10.17	10.51	10.87	11.26	12.13
HPI92983	R0.5	**1.0**	4	0.75	10	60	0.95	**1°**	2.75	5.82	7.86	10.26	10.61	10.99	11.84
HPI92984	R0.5	**1.0**	4	0.75	10	60	0.95	**1.5°**	2.75	5.91	5.31	10.00	10.35	10.72	11.55
HPI92985	R0.5	**1.0**	4	0.75	10	60	0.95	**2°**	2.75	6.01	4.45	6.43	10.09	10.44	11.25
HPI92986	R0.5	**1.0**	4	0.75	10	60	0.95	**3°**	2.75	6.22	3.77	4.59	5.95	8.67	10.66
HPI92987	R0.5	**1.0**	4	0.75	12	60	0.95	**0.5°**	2.75	5.08	12.17	12.58	13.02	13.48	14.54
HPI92988	R0.5	**1.0**	4	0.75	12	60	0.95	**1°**	2.75	5.17	7.86	12.26	12.68	13.14	14.16
HPI92989	R0.5	**1.0**	4	0.75	12	60	0.95	**1.5°**	2.75	5.26	5.31	10.11	12.35	12.79	13.79
HPI92990	R0.5	**1.0**	4	0.75	16	60	0.95	**0.5°**	2.75	4.13	16.17	16.72	17.30	17.93	19.35
HPI92991	R0.5	**1.0**	4	0.75	16	60	0.95	**1°**	2.75	4.22	7.86	16.26	16.83	17.44	18.81
HPI92992	R0.5	**1.0**	4	0.75	16	60	0.95	**1.5°**	2.75	4.31	5.31	10.11	16.35	16.94	18.28
HPI92993	R0.5	**1.0**	4	0.75	20	70	0.95	**0.5°**	2.75	3.49	20.17	20.86	21.59	22.38	24.16
HPI92994	R0.5	**1.0**	4	0.75	20	70	0.95	**1°**	2.75	3.57	7.86	20.26	20.97	21.74	23.46
HPI92995	R0.5	**1.0**	4	0.75	20	70	0.95	**1.5°**	2.75	3.65	5.31	10.11	20.35	21.09	22.76

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Size	Radius Tolerance (mm)	Mill Dia. Tolerance (mm)	Shank Dia. Tolerance
up to R3	+0.001~-0.005	0~-0.010	h4
over R3	+0.003~-0.007	0~-0.012	* Shank Dia.>ø6 : h5

◎ : 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	10	29	32	38	15	35	44	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	409	200	240	180	180	260	160	250	130	230
Recommend					○			○	○		○	○									

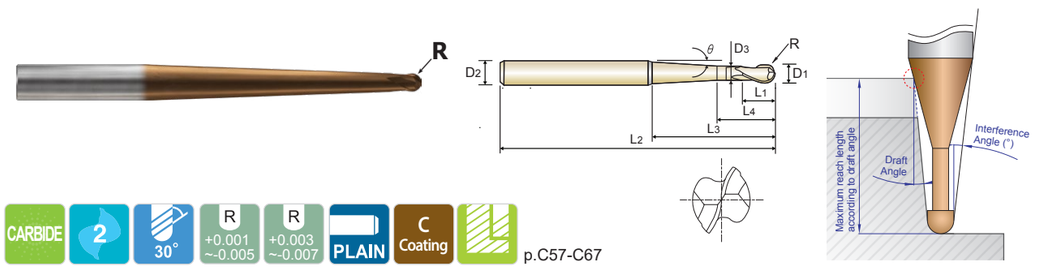
ISO	N									S							H						
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel					Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38.1	38.2	39.1	39.2	39.3	40	41
HRc											15	30	25	38	34			45-49	50-55	56-60	61-65	66-70	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	421-469	481-560	577-654	670-739		400	550
Recommend																		◎	◎	◎	◎	◎	○	◎

X1-EH END MILLS

PLAIN SHANK **HPI92 SERIES**

CARBIDE, 2 FLUTE BALL NOSE for RIB PROCESSING with TAPER NECK

- Improvement of tool life by applying new coating.
- Application of tight tolerances for precision machining.



CARBIDE | 2 | 30° | R +0.001 ~-0.005 | R +0.003 ~-0.007 | PLAIN | C Coating

R0.05~R3 R3.5~R6

p.C57-C67

Unit : mm

EDP No.	Radius of Ball Nose	Mill Diameter	Shank Diameter	Length of Cut	Length Below Shank	Overall Length	Neck Diameter	Neck Taper Angle(°)	Under Neck Parallel Length	Interference Angle(°)	Maximum reach lengths according to draft angle				
	R	D1	D2	L1	L3	L2	D3	θ°	L4		0.5°	1°	1.5°	2°	3°
HPI92996	R0.5	**1.0**	4	0.75	20	70	0.95	**2°**	2.75	3.74	4.45	6.43	12.36	20.44	22.06
HPI92997	R0.5	**1.0**	4	0.75	20	70	0.95	**3°**	2.75	3.93	3.77	4.59	5.95	8.67	20.66
HPI92998	R0.5	**1.0**	4	0.75	25	70	0.95	**0.5°**	2.75	2.91	25.17	26.03	26.95	27.95	-
HPI92999	R0.5	**1.0**	4	0.75	25	70	0.95	**1°**	2.75	2.99	7.86	25.26	26.15	27.11	-
HPI92801	R0.5	**1.0**	4	0.75	25	70	0.95	**1.5°**	2.75	3.06	5.31	10.11	25.35	26.28	28.37
HPI92802	R0.5	**1.0**	4	0.75	30	70	0.95	**0.5°**	2.75	2.50	30.17	31.21	32.31	33.51	-
HPI92803	R0.5	**1.0**	4	0.75	30	70	0.95	**1°**	2.75	2.57	7.86	30.26	31.33	32.49	-
HPI92804	R0.5	**1.0**	4	0.75	30	70	0.95	**1.5°**	2.75	2.64	5.31	10.11	30.35	31.47	-
HPI92805	R0.5	**1.0**	4	0.75	30	70	0.95	**2°**	2.75	2.71	4.45	6.43	12.36	30.44	-
HPI92896	R0.5	**1.0**	6	0.75	30	70	0.95	**3°**	2.75	4.26	3.77	4.59	5.95	8.67	30.66
HPI92015	R0.75	**1.5**	4	1.1	10	60	1.45	**0.5°**	3.1	5.18	10.18	10.50	10.86	11.24	12.09
HPI92806	R0.75	**1.5**	4	1.1	10	60	1.45	**1°**	3.1	5.27	8.31	10.26	10.61	10.98	11.81
HPI92807	R0.75	**1.5**	4	1.1	10	60	1.45	**1.5°**	3.1	5.36	5.71	10.02	10.36	10.72	11.53
HPI92808	R0.75	**1.5**	4	1.1	10	60	1.45	**2°**	3.1	5.45	4.84	6.88	10.11	10.46	11.25
HPI92809	R0.75	**1.5**	4	1.1	15	60	1.45	**0.5°**	3.1	3.84	15.18	15.68	16.22	16.80	18.10
HPI92810	R0.75	**1.5**	4	1.1	15	60	1.45	**1°**	3.1	3.92	8.31	15.26	15.79	16.35	17.62
HPI92811	R0.75	**1.5**	4	1.1	15	60	1.45	**1.5°**	3.1	4.01	5.71	10.66	15.36	15.91	17.14
HPI92812	R0.75	**1.5**	4	1.1	15	60	1.45	**2°**	3.1	4.10	4.84	6.88	13.01	15.46	16.65
HPI92813	R0.75	**1.5**	4	1.1	20	70	1.45	**0.5°**	3.1	3.05	20.18	20.85	21.58	22.36	24.11
HPI92814	R0.75	**1.5**	4	1.1	20	70	1.45	**1°**	3.1	3.12	8.31	20.26	20.97	21.73	23.43
HPI92815	R0.75	**1.5**	4	1.1	20	70	1.45	**1.5°**	3.1	3.20	5.71	10.66	20.36	21.09	22.74
HPI92816	R0.75	**1.5**	4	1.1	20	70	1.45	**2°**	3.1	3.28	4.84	6.88	13.01	20.46	22.06
HPI92817	R0.75	**1.5**	4	1.1	25	70	1.45	**0.5°**	3.1	2.53	25.18	26.03	26.94	27.92	-
HPI92818	R0.75	**1.5**	4	1.1	25	70	1.45	**1°**	3.1	2.59	8.31	25.26	26.15	27.10	-
HPI92819	R0.75	**1.5**	4	1.1	30	70	1.45	**0.5°**	3.1	2.16	30.18	31.20	32.30	33.48	-
HPI92820	R0.75	**1.5**	4	1.1	30	70	1.45	**1°**	3.1	2.22	8.31	30.26	31.33	32.48	-

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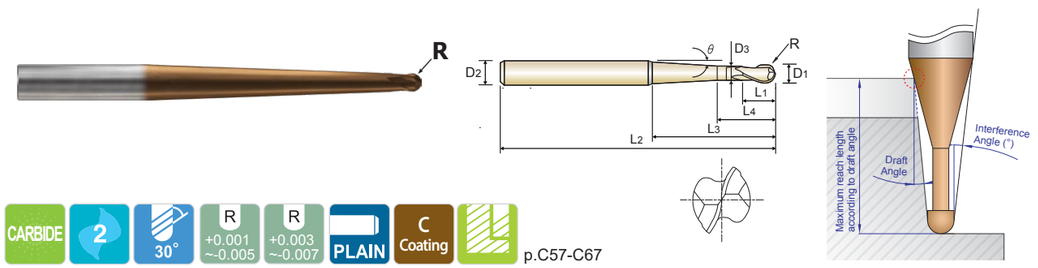
Size	Radius Tolerance (mm)	Mill Dia. Tolerance (mm)	Shank Dia. Tolerance
up to R3	+0.001~-0.005	0~-0.010	h4
over R3	+0.003~-0.007	0~-0.012	* Shank Dia.>ø6 : h5

◎ : 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	10	29	32	38	15	35	44	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	409	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	39.1	39.2	39.3	40	41
HRc											15	30	25	38	34			45-49	50-55	56-60	61-65	66-70	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	421-469	481-560	577-654	670-739		400	550
Recommend																		◎	◎	◎	◎	◎	○	◎

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R0.05~R3 R3.5~R6
p.C57-C67
Unit : mm

EDP No.	Radius of Ball Nose	Mill Diameter	Shank Diameter	Length of Cut	Length Below Shank	Overall Length	Neck Diameter	Neck Taper Angle(°)	Under Neck Parallel Length	Interference Angle(°)	Maximum reach lengths according to draft angle				
	R	D1	D2	L1	L3	L2	D3	θ°	L4		0.5°	1°	1.5°	2°	3°
HPI92020	R1.0	**2.0**	4	1.5	12	60	1.95	**0.5°**	3.5	3.93	12.18	12.57	12.99	13.44	14.45
HPI92821	R1.0	**2.0**	4	1.5	12	60	1.95	**1°**	3.5	4.01	8.86	12.27	12.68	13.12	14.10
HPI92822	R1.0	**2.0**	4	1.5	12	60	1.95	**1.5°**	3.5	4.09	6.18	11.36	12.37	12.80	13.76
HPI92823	R1.0	**2.0**	4	1.5	12	60	1.95	**2°**	3.5	4.17	5.29	7.43	12.07	12.48	13.41
HPI92824	R1.0	**2.0**	4	1.5	16	60	1.95	**0.5°**	3.5	3.11	16.18	16.71	17.28	17.89	19.26
HPI92825	R1.0	**2.0**	4	1.5	16	60	1.95	**1°**	3.5	3.18	8.86	16.27	16.83	17.42	18.75
HPI92826	R1.0	**2.0**	4	1.5	16	60	1.95	**1.5°**	3.5	3.25	6.18	11.36	16.37	16.95	18.24
HPI92827	R1.0	**2.0**	4	1.5	16	60	1.95	**2°**	3.5	3.33	5.29	7.43	13.86	16.48	17.74
HPI92828	R1.0	**2.0**	4	1.5	20	70	1.95	**0.5°**	3.5	2.57	20.18	20.85	21.57	22.34	-
HPI92829	R1.0	**2.0**	4	1.5	20	70	1.95	**1°**	3.5	2.63	8.86	20.27	20.97	21.72	-
HPI92830	R1.0	**2.0**	4	1.5	20	70	1.95	**1.5°**	3.5	2.70	6.18	11.36	20.37	21.10	-
HPI92831	R1.0	**2.0**	4	1.5	20	70	1.95	**2°**	3.5	2.77	5.29	7.43	13.86	20.48	-
HPI92832	R1.0	**2.0**	4	1.5	25	70	1.95	**0.5°**	3.5	2.11	25.18	26.02	26.93	27.90	-
HPI92833	R1.0	**2.0**	4	1.5	25	70	1.95	**1°**	3.5	2.17	8.86	25.27	26.15	27.09	-
HPI92834	R1.0	**2.0**	4	1.5	25	70	1.95	**1.5°**	3.5	2.23	6.18	11.36	25.37	26.29	-
HPI92835	R1.0	**2.0**	4	1.5	30	70	1.95	**0.5°**	3.5	1.79	30.18	31.20	32.29	-	-
HPI92836	R1.0	**2.0**	4	1.5	30	70	1.95	**1°**	3.5	1.84	8.86	30.27	31.33	-	-
HPI92837	R1.0	**2.0**	4	1.5	35	80	1.95	**0.5°**	3.5	1.56	35.18	36.37	37.65	-	-
HPI92838	R1.0	**2.0**	4	1.5	40	80	1.95	**0.5°**	3.5	1.38	40.18	41.55	-	-	-
HPI92839	R1.0	**2.0**	4	1.5	50	90	1.95	**0.5°**	3.5	1.12	50.18	51.89	-	-	-
HPI92840	R1.0	**2.0**	6	1.5	25	70	1.95	**2°**	3.5	3.98	5.29	7.43	13.86	25.48	27.47
HPI92841	R1.0	**2.0**	6	1.5	30	70	1.95	**1.5°**	3.5	3.37	6.18	11.36	30.37	31.48	33.95
HPI92842	R1.0	**2.0**	6	1.5	30	70	1.95	**2°**	3.5	3.46	5.29	7.43	13.86	30.48	32.87
HPI92843	R1.0	**2.0**	6	1.5	35	80	1.95	**1°**	3.5	2.90	8.86	35.27	36.51	37.84	-
HPI92844	R1.0	**2.0**	6	1.5	35	80	1.95	**1.5°**	3.5	2.98	6.18	11.36	35.37	36.66	-
HPI92845	R1.0	**2.0**	6	1.5	40	80	1.95	**1°**	3.5	2.59	8.86	40.27	41.69	43.22	-

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Size	Radius Tolerance (mm)	Mill Dia. Tolerance (mm)	Shank Dia. Tolerance
up to R3	+0.001~-0.005	0~-0.010	h4
over R3	+0.003~-0.007	0~-0.012	* Shank Dia.>ø6 : h5

◎ : 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	10	29	32	38	15	35	44	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	409	200	240	180	180	260	160	250	130	230
Recommend					○			○	○		○	○									

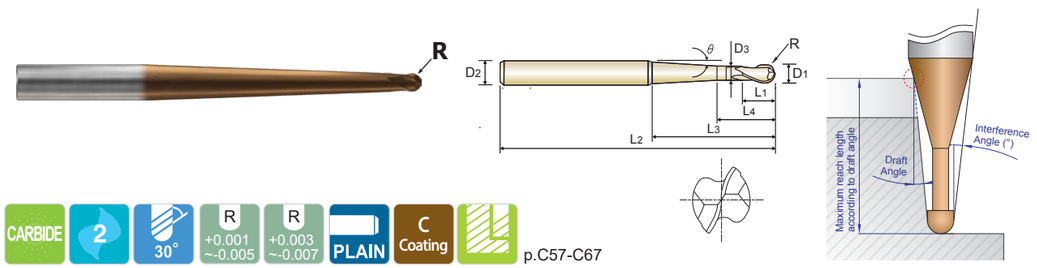
ISO	N										S							H						
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel					Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38.1	38.2	39.1	39.2	39.3	40	41
HRc											15	30	25	38	34			45-49	50-55	56-60	61-65	66-70	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	421-469	481-560	577-654	670-739		400	550
Recommend																		◎	◎	◎	◎	◎	○	◎

X1-EH END MILLS

PLAIN SHANK **HPI92 SERIES**

CARBIDE, 2 FLUTE BALL NOSE for RIB PROCESSING with TAPER NECK

- Improvement of tool life by applying new coating.
- Application of tight tolerances for precision machining.



CARBIDE | 2 | 30° | R +0.001 ~-0.005 | R +0.003 ~-0.007 | PLAIN | C Coating

R0.05~R3 R3.5~R6

p.C57-C67

Unit : mm

EDP No.	Radius of Ball Nose	Mill Diameter	Shank Diameter	Length of Cut	Length Below Shank	Overall Length	Neck Diameter	Neck Taper Angle(°)	Under Neck Parallel Length	Interference Angle(°)	Maximum reach lengths according to draft angle				
	R	D1	D2	L1	L3	L2	D3	θ°	L4		0.5°	1°	1.5°	2°	3°
HPI92846	R1.0	**2.0**	6	1.5	40	80	1.95	**1.5°**	3.5	2.66	6.18	11.36	40.37	41.85	-
HPI92847	R1.0	**2.0**	6	1.5	40	80	1.95	**2°**	3.5	2.74	5.29	7.43	13.86	40.48	-
HPI92848	R1.0	**2.0**	6	1.5	50	90	1.95	**1°**	3.5	2.14	8.86	50.27	52.05	53.97	-
HPI92849	R1.0	**2.0**	6	1.5	50	90	1.95	**1.5°**	3.5	2.20	6.18	11.36	50.37	52.22	-
HPI92850	R1.0	**2.0**	6	1.5	50	90	1.95	**2°**	3.5	2.27	5.29	7.43	13.86	50.48	-
HPI92030	R1.5	**3.0**	6	2.5	15	70	2.85	**0.5°**	4.5	4.51	15.39	15.87	16.39	16.95	18.21
HPI92851	R1.5	**3.0**	6	2.5	15	70	2.85	**1°**	4.5	4.59	15.04	15.51	16.01	16.56	17.78
HPI92852	R1.5	**3.0**	6	2.5	15	70	2.85	**1.5°**	4.5	4.67	10.30	15.14	15.64	16.17	17.35
HPI92853	R1.5	**3.0**	6	2.5	15	70	2.85	**2°**	4.5	4.76	8.36	11.79	15.26	15.77	16.93
HPI92854	R1.5	**3.0**	6	2.5	20	70	2.85	**0.5°**	4.5	3.60	20.39	21.05	21.75	22.51	24.22
HPI92855	R1.5	**3.0**	6	2.5	20	70	2.85	**1°**	4.5	3.67	16.09	20.51	21.19	21.93	23.59
HPI92856	R1.5	**3.0**	6	2.5	20	70	2.85	**1.5°**	4.5	3.75	10.30	19.09	20.64	21.35	22.96
HPI92857	R1.5	**3.0**	6	2.5	20	70	2.85	**2°**	4.5	3.84	8.36	11.79	20.08	20.77	22.33
HPI92858	R1.5	**3.0**	6	2.5	25	70	2.85	**0.5°**	4.5	2.99	25.39	26.22	27.12	28.08	-
HPI92859	R1.5	**3.0**	6	2.5	25	70	2.85	**1°**	4.5	3.06	16.09	25.51	26.38	27.31	29.40
HPI92860	R1.5	**3.0**	6	2.5	25	70	2.85	**1.5°**	4.5	3.14	10.30	19.09	25.64	26.54	28.57
HPI92861	R1.5	**3.0**	6	2.5	30	70	2.85	**0.5°**	4.5	2.56	30.39	31.40	32.48	33.64	-
HPI92862	R1.5	**3.0**	6	2.5	30	70	2.85	**1°**	4.5	2.63	16.09	30.51	31.56	32.68	-
HPI92863	R1.5	**3.0**	6	2.5	30	70	2.85	**1.5°**	4.5	2.69	10.30	19.09	30.64	31.73	-
HPI92864	R1.5	**3.0**	6	2.5	30	70	2.85	**2°**	4.5	2.77	8.36	11.79	22.08	30.77	-
HPI92865	R1.5	**3.0**	6	2.5	40	80	2.85	**0.5°**	4.5	1.99	40.39	41.75	43.20	-	-
HPI92866	R1.5	**3.0**	6	2.5	40	80	2.85	**1°**	4.5	2.04	16.09	40.51	41.92	43.43	-
HPI92867	R1.5	**3.0**	6	2.5	40	80	2.85	**1.5°**	4.5	2.10	10.30	19.09	40.64	42.10	-
HPI92868	R1.5	**3.0**	6	2.5	50	90	2.85	**0.5°**	4.5	1.62	50.39	52.09	53.92	-	-
HPI92869	R1.5	**3.0**	6	2.5	50	90	2.85	**1°**	4.5	1.67	16.09	50.51	52.28	-	-
HPI92870	R1.5	**3.0**	6	2.5	50	90	2.85	**1.5°**	4.5	1.72	10.30	19.09	50.64	-	-

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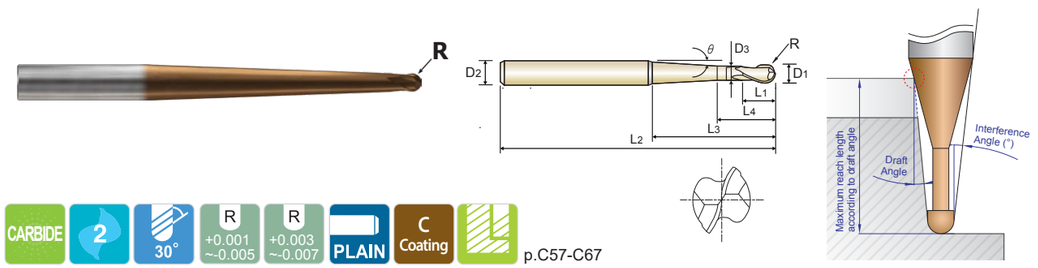
Size	Radius Tolerance (mm)	Mill Dia. Tolerance (mm)	Shank Dia. Tolerance
up to R3	+0.001~-0.005	0~-0.010	h4
over R3	+0.003~-0.007	0~-0.012	* Shank Dia.>ø6 : h5

◎ : 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	10	29	32	38	15	35	44	15	23	10	10	26	3	25		21		
HB	125	190	250	270	300	180	275	300	350	200	325	409	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	39.1	39.2	39.3	40	41
HRc											15	30	25	38	34			45-49	50-55	56-60	61-65	66-70	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	421-469	481-560	577-654	670-739		400	550
Recommend																		◎	◎	◎	◎	◎	○	◎

X1-EH END MILLS
PLAIN SHANK HPI92 SERIES
CARBIDE, 2 FLUTE BALL NOSE for RIB PROCESSING with TAPER NECK
▶ Improvement of tool life by applying new coating.
▶ Application of tight tolerances for precision machining.



CARBIDE | 2 | 30° | R +0.001 ~-0.005 | R +0.003 ~-0.007 | PLAIN | C Coating
R0.05~R3 R3.5~R6
p.C57-C67
Unit : mm

EDP No.	Radius of Ball Nose	Mill Diameter	Shank Diameter	Length of Cut	Length Below Shank	Overall Length	Neck Diameter	Neck Taper Angle(°)	Under Neck Parallel Length	Interference Angle(°)	Maximum reach lengths according to draft angle				
	R	D1	D2	L1	L3	L2	D3	θ°	L4		0.5°	1°	1.5°	2°	3°
HPI92040	R2.0	**4.0**	6	3	20	80	3.85	**1°**	5	2.72	16.59	20.51	21.18	21.90	-
HPI92871	R2.0	**4.0**	6	3	30	80	3.85	**1°**	5	1.89	16.59	30.51	31.54	-	-
HPI92872	R2.0	**4.0**	6	3	40	80	3.85	**1°**	5	1.44	16.59	40.51	-	-	-
HPI92873	R2.0	**4.0**	6	3	50	90	3.85	**1°**	5	1.17	16.59	50.51	-	-	-
HPI92874	R2.0	**4.0**	6	3	61.1	110	3.85	**1°**	5	0.96	16.59	-	-	-	-
HPI92897	R2.5	**5.0**	8	10	30	80	4.85	**1°**	13	2.66	30.07	31.03	32.06	33.17	-
HPI92898	R2.5	**5.0**	8	10	40	90	4.85	**1°**	13	2.06	32.09	41.03	42.42	43.92	-
HPI92899	R2.5	**5.0**	8	10	60	110	4.85	**1°**	13	1.42	32.09	61.03	-	-	-
HPI92701	R2.5	**5.0**	8	10	90	140	4.85	**1°**	13	0.97	32.09	-	-	-	-
HPI92702	R2.5	**5.0**	8	10	74	150	4.75	**1.5°**	13	1.20	25.41	48.31	-	-	-
HPI92703	R2.5	**5.0**	8	10	100	150	4.85	**0.5°**	13	0.85	100.64	-	-	-	-
HPI92704	R3.0	**6.0**	8	12	30	80	5.85	**1°**	15	1.91	30.19	31.14	32.15	-	-
HPI92705	R3.0	**6.0**	8	12	40	90	5.85	**1°**	15	1.45	35.59	41.14	-	-	-
HPI92706	R3.0	**6.0**	8	12	45	95	5.85	**1°**	15	1.30	35.59	46.14	-	-	-
HPI92707	R3.0	**6.0**	8	12	50	100	5.85	**1°**	15	1.18	35.59	51.14	-	-	-
HPI92708	R3.0	**6.0**	8	12	120	200	5.85	**0.5°**	15	0.49	-	-	-	-	-
HPI92709	R3.0	**6.0**	10	12	30	80	5.85	**3°**	15	3.60	19.11	23.14	29.84	30.99	33.27
HPI92710	R3.0	**6.0**	10	12	50	100	5.85	**1.5°**	15	2.23	25.29	47.58	51.61	53.43	-
HPI92711	R3.0	**6.0**	10	12	60	110	5.85	**1°**	15	1.85	35.59	61.14	63.24	-	-
HPI92712	R3.0	**6.0**	10	12	70	120	5.85	**1°**	15	1.61	35.59	71.14	73.60	-	-
HPI92713	R3.0	**6.0**	10	12	80	130	5.85	**1°**	15	1.42	35.59	81.14	-	-	-
HPI92714	R3.0	**6.0**	10	12	96	200	5.75	**1.5°**	15	1.23	28.16	53.31	-	-	-
HPI92715	R3.0	**6.0**	10	12	120	200	5.85	**1°**	15	0.97	35.59	-	-	-	-
HPI92070	R3.5	**7.0**	10	14	40	90	6.7	**3°**	17	2.25	23.13	28.03	36.20	40.94	-
HPI92875	R3.5	**7.0**	10	14	45	95	6.7	**1°**	17	1.87	45.09	46.54	48.09	-	-
HPI92876	R3.5	**7.0**	10	14	60	110	6.7	**1.5°**	17	1.47	32.34	60.04	-	-	-

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Size	Radius Tolerance (mm)	Mill Dia. Tolerance (mm)	Shank Dia. Tolerance
up to R3	+0.001~-0.005	0~-0.010	h4
over R3	+0.003~-0.007	0~-0.012	* Shank Dia.>ø6 : h5

◎ : 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	10	29	32	38	15	35	44	15	23	10	10	26	3	25		21		
HB	125	190	250	270	300	180	275	300	350	200	325	409	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	39.1	39.2	39.3	40	41
HRc											15	30	25	38	34			45-49	50-55	56-60	61-65	66-70	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	421-469	481-560	577-654	670-739		400	550
Recommend																		◎	◎	◎	◎	◎	○	◎

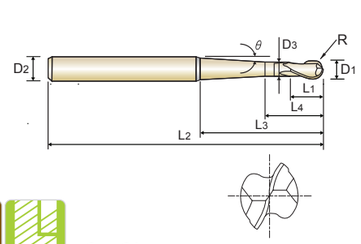
X1-EH END MILLS

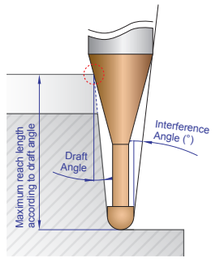
PLAIN SHANK **HPI92** SERIES

CARBIDE, 2 FLUTE BALL NOSE for RIB PROCESSING with TAPER NECK

- Improvement of tool life by applying new coating.
- Application of tight tolerances for precision machining.







CARBIDE | 2 | 30° | R +0.001 ~-0.005 | R +0.003 ~-0.007 | PLAIN | C Coating

R0.05~R3 R3.5~R6

p.C57-C67

Unit : mm

EDP No.	Radius of Ball Nose	Mill Diameter	Shank Diameter	Length of Cut	Length Below Shank	Overall Length	Neck Diameter	Neck Taper Angle(°)	Under Neck Parallel Length	Interference Angle(°)	Maximum reach lengths according to draft angle				
	R	D1	D2	L1	L3	L2	D3	θ°	L4		0.5°	1°	1.5°	2°	3°
HPI92080	R4.0	**8.0**	10	14	35	95	7.7	**3°**	17	1.80	23.03	27.78	35.08	-	-
HPI92877	R4.0	**8.0**	10	14	50	110	7.7	**1°**	17	1.19	47.18	51.50	-	-	-
HPI92878	R4.0	**8.0**	10	14	50	110	7.7	**1.5°**	17	1.22	32.09	50.35	-	-	-
HPI92879	R4.0	**8.0**	10	14	55	115	7.7	**1°**	17	1.08	47.18	56.50	-	-	-
HPI92880	R4.0	**8.0**	10	14	60	120	7.7	**1°**	17	1.00	47.18	-	-	-	-
HPI92881	R4.0	**8.0**	10	14	70	130	7.7	**1°**	17	0.86	47.18	-	-	-	-
HPI92882	R4.0	**8.0**	10	14	120	200	7.7	**0.5°**	17	0.49	-	-	-	-	-
HPI92883	R4.0	**8.0**	12	14	80	140	7.7	**1°**	17	1.43	47.18	81.50	-	-	-
HPI92884	R4.0	**8.0**	12	14	98	200	7.7	**1.5°**	17	1.22	32.09	60.17	-	-	-
HPI92885	R4.0	**8.0**	12	14	120	200	7.7	**1°**	17	0.98	47.18	-	-	-	-
HPI92100	R5.0	**10.0**	12	18	35	105	9.7	**3°**	21	1.82	27.63	33.28	35.83	-	-
HPI92886	R5.0	**10.0**	12	18	55	125	9.7	**1.5°**	21	1.12	37.59	55.53	-	-	-
HPI92887	R5.0	**10.0**	12	18	60	130	9.7	**1°**	21	1.01	54.18	61.71	-	-	-
HPI92888	R5.0	**10.0**	12	18	65	135	9.7	**1°**	21	0.93	54.18	-	-	-	-
HPI92889	R5.0	**10.0**	12	18	75	140	9.7	**1°**	21	0.81	54.18	-	-	-	-
HPI92890	R5.0	**10.0**	12	18	86	200	9.7	**1°**	21	0.71	54.18	-	-	-	-
HPI92891	R5.0	**10.0**	12	18	120	200	9.7	**0.5°**	21	0.49	-	-	-	-	-
HPI92892	R5.0	**10.0**	16	18	120	200	9.7	**1.5°**	21	1.47	37.59	70.17	-	-	-
HPI92120	R6.0	**12.0**	16	22	60	140	11.7	**3°**	25	2.08	32.23	38.78	49.69	60.86	-
HPI92893	R6.0	**12.0**	16	22	80	160	11.7	**1.5°**	25	1.49	43.09	80.01	-	-	-
HPI92894	R6.0	**12.0**	16	22	106	200	11.7	**1.5°**	25	1.14	43.09	80.17	-	-	-
HPI92895	R6.0	**12.0**	16	22	120	200	11.7	**1°**	25	0.99	61.18	-	-	-	-

Size	Radius Tolerance (mm)	Mill Dia. Tolerance (mm)	Shank Dia. Tolerance
up to R3	+0.001~-0.005	0~-0.010	h4
over R3	+0.003~-0.007	0~-0.012	* Shank Dia.>ø6 : h5

◎ : 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	10	29	32	38	15	35	44	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	409	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	39.1	39.2	39.3	40	41
HRc											15	30	25	38	34			45-49	50-55	56-60	61-65	66-70	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	421-469	481-560	577-654	670-739		400	550
Recommend																		◎	◎	◎	◎	◎	○	◎

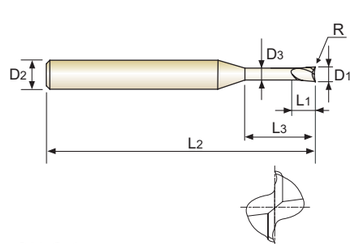
X1-EH END MILLS

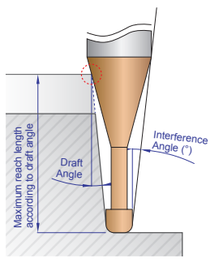
PLAIN SHANK **HPI89** SERIES

CARBIDE, 2 FLUTE CORNER RADIUS for RIB PROCESSING

- Improvement of tool life by applying new coating.
- Application of tight tolerances for precision machining.







CARBIDE | 2 | 35° | R ±0.005 | PLAIN | C Coating

p.C68-C70

Unit : mm

EDP No.	Corner Radius	Mill Diameter	Shank Diameter	Length of Cut	Length Below Shank	Overall Length	Neck Diameter	Interference Angle(°)	Maximum reach lengths according to draft angle				
	R	D1	D2	L1	L3	L2	D3		0.5°	1°	1.5°	2°	3°
HPI89002	R0.02	**0.2**	4	0.15	0.5	45	0.17	13.99	0.61	0.65	0.68	0.72	0.82
HPI89901	R0.05	**0.2**	4	0.15	0.5	45	0.17	14.04	0.61	0.64	0.68	0.72	0.81
HPI89902	R0.02	**0.2**	4	0.15	1	45	0.17	13.16	1.14	1.20	1.27	1.35	1.54
HPI89903	R0.05	**0.2**	4	0.15	1	45	0.17	13.21	1.14	1.20	1.27	1.34	1.52
HPI89904	R0.02	**0.2**	4	0.15	1.5	45	0.17	12.42	1.67	1.76	1.86	1.97	2.25
HPI89905	R0.05	**0.2**	4	0.15	1.5	45	0.17	12.46	1.66	1.75	1.85	1.96	2.23
HPI89906	R0.02	**0.2**	4	0.15	2	45	0.17	11.76	2.19	2.31	2.45	2.60	2.96
HPI89907	R0.05	**0.2**	4	0.15	2	45	0.17	11.80	2.19	2.31	2.44	2.59	2.95
HPI89003	R0.02	**0.3**	4	0.25	1	45	0.27	13.12	1.14	1.20	1.27	1.35	1.54
HPI89908	R0.05	**0.3**	4	0.25	1	45	0.27	13.16	1.14	1.20	1.27	1.34	1.52
HPI89909	R0.02	**0.3**	4	0.25	1.5	45	0.27	12.36	1.67	1.76	1.86	1.97	2.25
HPI89910	R0.05	**0.3**	4	0.25	1.5	45	0.27	12.41	1.66	1.75	1.85	1.96	2.23
HPI89911	R0.02	**0.3**	4	0.25	2	45	0.27	11.69	2.19	2.31	2.45	2.60	2.96
HPI89912	R0.05	**0.3**	4	0.25	2	45	0.27	11.73	2.19	2.31	2.44	2.59	2.95
HPI89913	R0.02	**0.3**	4	0.25	2.5	45	0.27	11.09	2.72	2.87	3.03	3.22	3.67
HPI89914	R0.05	**0.3**	4	0.25	2.5	45	0.27	11.12	2.72	2.86	3.03	3.21	3.66
HPI89915	R0.02	**0.3**	4	0.25	3	45	0.27	10.54	3.24	3.42	3.62	3.84	4.38
HPI89916	R0.05	**0.3**	4	0.25	3	45	0.27	10.57	3.24	3.42	3.61	3.83	4.37
HPI89004	R0.02	**0.4**	4	0.3	1	45	0.37	13.07	1.14	1.20	1.27	1.35	1.54
HPI89917	R0.05	**0.4**	4	0.3	1	45	0.37	13.12	1.14	1.20	1.27	1.34	1.52
HPI89918	R0.1	**0.4**	4	0.3	1	45	0.37	13.20	1.14	1.19	1.26	1.33	1.50
HPI89919	R0.02	**0.4**	4	0.3	1.5	45	0.37	12.30	1.67	1.76	1.86	1.97	2.25
HPI89920	R0.05	**0.4**	4	0.3	1.5	45	0.37	12.35	1.66	1.75	1.85	1.96	2.23
HPI89921	R0.02	**0.4**	4	0.3	2	45	0.37	11.62	2.19	2.31	2.45	2.60	2.96
HPI89922	R0.05	**0.4**	4	0.3	2	45	0.37	11.66	2.19	2.31	2.44	2.59	2.95
HPI89923	R0.1	**0.4**	4	0.3	2	45	0.37	11.72	2.19	2.30	2.43	2.58	2.92

▶ NEXT PAGE

Corner Radius Tolerance (mm)	Mill Dia. Tolerance (mm)	Shank Dia. Tolerance
±0.005	0~-0.010	h4

◎ : 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	10	29	32	38	15	35	44	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	409	200	240	180	180	260	160	250	130	230
Recommend					○			○	○		○	○									

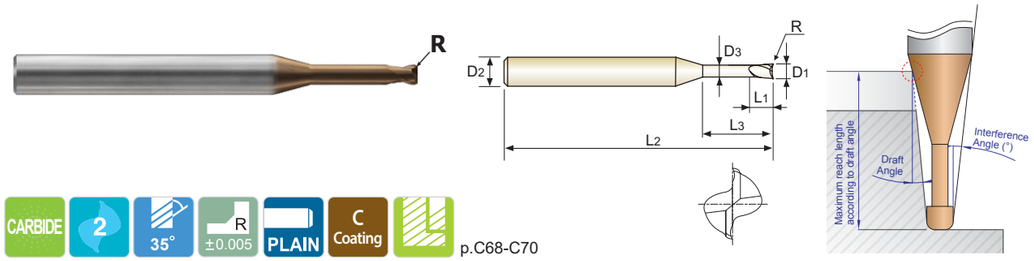
ISO	N									S							H						
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials	Heat Resistant Super Alloys					Titanium Alloys		Hardened steel					Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38.1	38.2	39.1	39.2	39.3	40	41
HRc											15	30	25	38	34			45-49	50-55	56-60	61-65	66-70	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	421-469	481-560	577-654	670-739		400	550
Recommend																		◎	◎	◎	◎	◎	○	◎

X1-EH END MILLS

PLAIN SHANK **HPI89 SERIES**

CARBIDE, 2 FLUTE CORNER RADIUS for RIB PROCESSING

- Improvement of tool life by applying new coating.
- Application of tight tolerances for precision machining.



CARBIDE | 2 | 35° | R ±0.005 | PLAIN | C Coating | p.C68-C70

Unit : mm

EDP No.	Corner Radius	Mill Diameter	Shank Diameter	Length of Cut	Length Below Shank	Overall Length	Neck Diameter	Interference Angle(°)	Maximum reach lengths according to draft angle				
	R	D1	D2	L1	L3	L2	D3		0.5°	1°	1.5°	2°	3°
HPI89924	R0.02	**0.4**	4	0.3	2.5	45	0.37	11.01	2.72	2.87	3.03	3.22	3.67
HPI89925	R0.05	**0.4**	4	0.3	2.5	45	0.37	11.04	2.72	2.86	3.03	3.21	3.66
HPI89926	R0.02	**0.4**	4	0.3	3	45	0.37	10.46	3.24	3.42	3.62	3.84	4.38
HPI89927	R0.05	**0.4**	4	0.3	3	45	0.37	10.49	3.24	3.42	3.61	3.83	4.37
HPI89928	R0.1	**0.4**	4	0.3	3	45	0.37	10.54	3.24	3.41	3.61	3.82	4.35
HPI89929	R0.02	**0.4**	4	0.3	4	45	0.37	9.50	4.30	4.53	4.79	5.09	5.80
HPI89930	R0.05	**0.4**	4	0.3	4	45	0.37	9.53	4.30	4.53	4.79	5.08	5.79
HPI89931	R0.1	**0.4**	4	0.3	4	45	0.37	9.57	4.29	4.52	4.78	5.07	5.77
HPI89005	R0.02	**0.5**	4	0.4	1	45	0.45	12.96	1.20	1.27	1.34	1.42	1.62
HPI89932	R0.05	**0.5**	4	0.4	1	45	0.45	13.01	1.20	1.26	1.33	1.41	1.60
HPI89933	R0.1	**0.5**	4	0.4	1	45	0.45	13.09	1.20	1.26	1.32	1.40	1.58
HPI89934	R0.02	**0.5**	4	0.4	2	45	0.45	11.50	2.25	2.37	2.51	2.67	3.04
HPI89935	R0.05	**0.5**	4	0.4	2	45	0.45	11.54	2.25	2.37	2.51	2.66	3.03
HPI89936	R0.1	**0.5**	4	0.4	2	45	0.45	11.60	2.25	2.37	2.50	2.65	3.01
HPI89937	R0.02	**0.5**	4	0.4	3	45	0.45	10.33	3.30	3.48	3.69	3.91	4.46
HPI89938	R0.05	**0.5**	4	0.4	3	45	0.45	10.36	3.30	3.48	3.68	3.91	4.45
HPI89939	R0.1	**0.5**	4	0.4	3	45	0.45	10.41	3.30	3.48	3.67	3.89	4.43
HPI89940	R0.02	**0.5**	4	0.4	4	45	0.45	9.37	4.36	4.59	4.86	5.16	5.88
HPI89941	R0.05	**0.5**	4	0.4	4	45	0.45	9.40	4.35	4.59	4.86	5.15	5.87
HPI89942	R0.1	**0.5**	4	0.4	4	45	0.45	9.44	4.35	4.59	4.85	5.14	5.85
HPI89943	R0.02	**0.5**	4	0.4	5	45	0.45	8.58	5.41	5.70	6.04	6.41	7.31
HPI89944	R0.05	**0.5**	4	0.4	5	45	0.45	8.60	5.41	5.70	6.03	6.40	7.30
HPI89945	R0.1	**0.5**	4	0.4	5	45	0.45	8.63	5.40	5.70	6.02	6.39	7.27
HPI89946	R0.02	**0.5**	4	0.4	6	45	0.45	7.90	6.46	6.81	7.21	7.65	8.73
HPI89947	R0.05	**0.5**	4	0.4	6	45	0.45	7.92	6.46	6.81	7.20	7.65	8.72
HPI89948	R0.1	**0.5**	4	0.4	6	45	0.45	7.95	6.46	6.81	7.20	7.63	8.70

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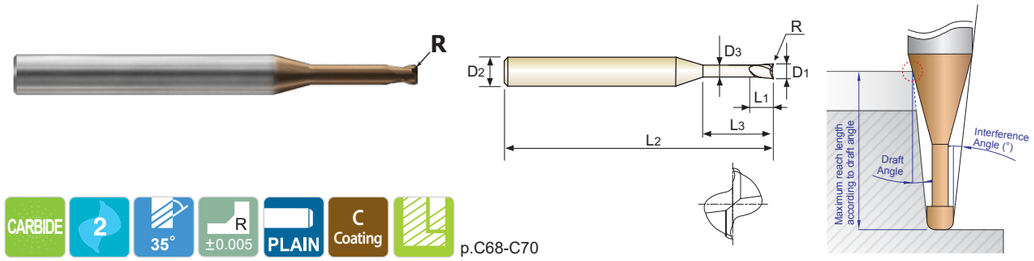
Corner Radius Tolerance (mm)	Mill Dia. Tolerance (mm)	Shank Dia. Tolerance
±0.005	0~-0.010	h4

◎ : 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	10	29	32	38	15	35	44		15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	409		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	39.1	39.2	39.3	40	41
HRc											15	30	25	38	34			45-49	50-55	56-60	61-65	66-70	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	421-469	481-560	577-654	670-739		400	550
Recommend																		◎	◎	◎	◎	◎	○	◎

X1-EH END MILLS
PLAIN SHANK HPI89 SERIES
CARBIDE, 2 FLUTE CORNER RADIUS for RIB PROCESSING
▶ Improvement of tool life by applying new coating.
▶ Application of tight tolerances for precision machining.



CARBIDE | 2 | 35° | R ±0.005 | PLAIN | C Coating | p.C68-C70

Unit : mm

EDP No.	Corner Radius	Mill Diameter	Shank Diameter	Length of Cut	Length Below Shank	Overall Length	Neck Diameter	Interference Angle(°)	Maximum reach lengths according to draft angle				
	R	D1	D2	L1	L3	L2	D3		0.5°	1°	1.5°	2°	3°
HPI89006	R0.02	**0.6**	4	0.5	2	45	0.55	11.42	2.25	2.37	2.51	2.67	3.04
HPI89949	R0.05	**0.6**	4	0.5	2	45	0.55	11.46	2.25	2.37	2.51	2.66	3.03
HPI89950	R0.1	**0.6**	4	0.5	2	45	0.55	11.52	2.25	2.37	2.50	2.65	3.01
HPI89951	R0.02	**0.6**	4	0.5	4	45	0.55	9.27	4.36	4.59	4.86	5.16	5.88
HPI89952	R0.05	**0.6**	4	0.5	4	45	0.55	9.29	4.35	4.59	4.86	5.15	5.87
HPI89953	R0.1	**0.6**	4	0.5	4	45	0.55	9.34	4.35	4.59	4.85	5.14	5.85
HPI89954	R0.02	**0.6**	4	0.5	6	45	0.55	7.80	6.46	6.81	7.21	7.65	8.73
HPI89955	R0.05	**0.6**	4	0.5	6	45	0.55	7.81	6.46	6.81	7.20	7.65	8.72
HPI89956	R0.1	**0.6**	4	0.5	6	45	0.55	7.85	6.46	6.81	7.20	7.63	8.70
HPI89957	R0.02	**0.6**	4	0.5	8	50	0.55	6.72	8.56	9.03	9.56	10.15	11.41
HPI89958	R0.05	**0.6**	4	0.5	8	50	0.55	6.74	8.56	9.03	9.55	10.14	11.40
HPI89959	R0.1	**0.6**	4	0.5	8	50	0.55	6.76	8.56	9.03	9.54	10.13	11.39
HPI89960	R0.02	**0.6**	4	0.5	10	50	0.55	5.91	10.67	11.25	11.91	12.64	13.74
HPI89961	R0.05	**0.6**	4	0.5	10	50	0.55	5.92	10.67	11.25	11.90	12.63	13.74
HPI89962	R0.1	**0.6**	4	0.5	10	50	0.55	5.94	10.66	11.25	11.89	12.62	13.73
HPI89007	R0.02	**0.7**	4	0.55	2	45	0.65	11.34	2.25	2.37	2.51	2.67	3.04
HPI89963	R0.05	**0.7**	4	0.55	2	45	0.65	11.38	2.25	2.37	2.51	2.66	3.03
HPI89964	R0.1	**0.7**	4	0.55	2	45	0.65	11.44	2.25	2.37	2.50	2.65	3.01
HPI89965	R0.02	**0.7**	4	0.55	4	45	0.65	9.16	4.36	4.59	4.86	5.16	5.88
HPI89966	R0.05	**0.7**	4	0.55	4	45	0.65	9.19	4.35	4.59	4.86	5.15	5.87
HPI89967	R0.1	**0.7**	4	0.55	4	45	0.65	9.23	4.35	4.59	4.85	5.14	5.85
HPI89968	R0.02	**0.7**	4	0.55	6	45	0.65	7.68	6.46	6.81	7.21	7.65	8.73
HPI89969	R0.05	**0.7**	4	0.55	6	45	0.65	7.70	6.46	6.81	7.20	7.65	8.72
HPI89970	R0.1	**0.7**	4	0.55	6	45	0.65	7.73	6.46	6.81	7.20	7.63	8.70
HPI89008	R0.02	**0.8**	4	0.65	2	45	0.75	11.25	2.25	2.37	2.51	2.67	3.04
HPI89971	R0.05	**0.8**	4	0.65	2	45	0.75	11.29	2.25	2.37	2.51	2.66	3.03

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Corner Radius Tolerance (mm)	Mill Dia. Tolerance (mm)	Shank Dia. Tolerance
±0.005	0~-0.010	h4

◎ : 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	10	29	32	38	15	35	44		15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	409		200	240	180	180	260	160	250	130	230
Recommend					○			○	○		○	○										

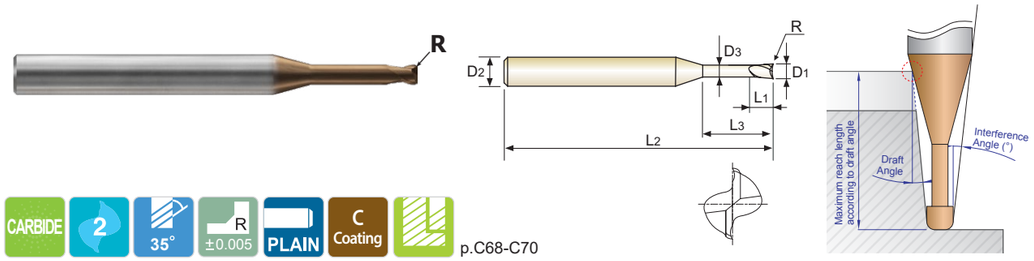
ISO	N									S							H					
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel					Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38.1	38.2	39.1	39.2	39.3	40	41
HRc											15	30	25	38	34			45-49	50-55	56-60	61-65	66-70	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	421-469	481-560	577-654	670-739		400	550
Recommend																		◎	◎	◎	◎	◎	○	◎

X1-EH END MILLS

PLAIN SHANK **HPI89 SERIES**

CARBIDE, 2 FLUTE CORNER RADIUS for RIB PROCESSING

- Improvement of tool life by applying new coating.
- Application of tight tolerances for precision machining.



CARBIDE | 2 | 35° | R ±0.005 | PLAIN | C Coating

p.C68-C70

Unit : mm

EDP No.	Corner Radius	Mill Diameter	Shank Diameter	Length of Cut	Length Below Shank	Overall Length	Neck Diameter	Interference Angle(°)	Maximum reach lengths according to draft angle				
	R	D1	D2	L1	L3	L2	D3		0.5°	1°	1.5°	2°	3°
HPI89972	R0.1	**0.8**	4	0.65	2	45	0.75	11.36	2.25	2.37	2.50	2.65	3.01
HPI89973	R0.2	**0.8**	4	0.65	2	45	0.75	11.50	2.24	2.36	2.48	2.62	2.96
HPI89974	R0.02	**0.8**	4	0.65	4	45	0.75	9.05	4.36	4.59	4.86	5.16	5.88
HPI89975	R0.05	**0.8**	4	0.65	4	45	0.75	9.08	4.35	4.59	4.86	5.15	5.87
HPI89976	R0.1	**0.8**	4	0.65	4	45	0.75	9.12	4.35	4.59	4.85	5.14	5.85
HPI89977	R0.2	**0.8**	4	0.65	4	45	0.75	9.21	4.35	4.57	4.83	5.12	5.81
HPI89978	R0.02	**0.8**	4	0.65	6	45	0.75	7.57	6.46	6.81	7.21	7.65	8.73
HPI89979	R0.05	**0.8**	4	0.65	6	45	0.75	7.59	6.46	6.81	7.20	7.65	8.72
HPI89980	R0.1	**0.8**	4	0.65	6	45	0.75	7.62	6.46	6.81	7.20	7.63	8.70
HPI89981	R0.2	**0.8**	4	0.65	6	45	0.75	7.68	6.45	6.79	7.18	7.61	8.65
HPI89982	R0.02	**0.8**	4	0.65	8	50	0.75	6.50	8.56	9.03	9.56	10.15	11.29
HPI89983	R0.05	**0.8**	4	0.65	8	50	0.75	6.51	8.56	9.03	9.55	10.14	11.29
HPI89984	R0.1	**0.8**	4	0.65	8	50	0.75	6.54	8.56	9.03	9.54	10.13	11.28
HPI89985	R0.2	**0.8**	4	0.65	8	50	0.75	6.58	8.56	9.01	9.53	10.10	11.26
HPI89986	R0.05	**0.8**	4	0.65	12	50	0.75	5.08	12.77	13.47	14.25	15.11	15.96
HPI89987	R0.1	**0.8**	4	0.65	12	50	0.75	5.09	12.77	13.46	14.24	15.11	15.95
HPI89988	R0.2	**0.8**	4	0.65	12	50	0.75	5.12	12.76	13.45	14.22	15.09	15.93
HPI89009	R0.1	**0.9**	4	0.7	4	45	0.85	9.01	4.35	4.59	4.85	5.14	5.85
HPI89989	R0.1	**0.9**	4	0.7	8	50	0.85	6.42	8.56	9.03	9.54	10.13	11.22
HPI89010	R0.1	**1.0**	4	0.8	4	50	0.95	8.89	4.35	4.59	4.85	5.14	5.85
HPI89990	R0.2	**1.0**	4	0.8	4	50	0.95	8.98	4.35	4.57	4.83	5.12	5.81
HPI89991	R0.1	**1.0**	4	0.8	6	50	0.95	7.37	6.46	6.81	7.20	7.63	8.70
HPI89992	R0.2	**1.0**	4	0.8	6	50	0.95	7.44	6.45	6.79	7.18	7.61	8.65
HPI89993	R0.3	**1.0**	4	0.8	6	50	0.95	7.50	6.45	6.78	7.16	7.58	8.61
HPI89994	R0.1	**1.0**	4	0.8	8	50	0.95	6.30	8.56	9.03	9.54	10.13	11.16
HPI89995	R0.2	**1.0**	4	0.8	8	50	0.95	6.34	8.56	9.01	9.53	10.10	11.15

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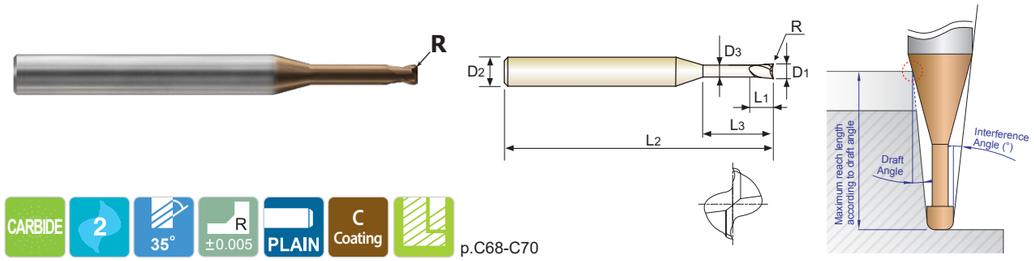
Corner Radius Tolerance (mm)	Mill Dia. Tolerance (mm)	Shank Dia. Tolerance
±0.005	0~-0.010	h4

◎ : 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	10	29	32	38	15	35	44	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	409	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	39.1	39.2	39.3	40	41
HRc											15	30	25	38	34			45-49	50-55	56-60	61-65	66-70	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	421-469	481-560	577-654	670-739		400	550
Recommend																		◎	◎	◎	◎	◎	○	◎

X1-EH END MILLS
PLAIN SHANK HPI89 SERIES
CARBIDE, 2 FLUTE CORNER RADIUS for RIB PROCESSING
▶ Improvement of tool life by applying new coating.
▶ Application of tight tolerances for precision machining.



CARBIDE | 2 | 35° | R ±0.005 | PLAIN | C Coating
p.C68-C70
Unit : mm

EDP No.	Corner Radius	Mill Diameter	Shank Diameter	Length of Cut	Length Below Shank	Overall Length	Neck Diameter	Interference Angle(°)	Maximum reach lengths according to draft angle				
	R	D1	D2	L1	L3	L2	D3		0.5°	1°	1.5°	2°	3°
HPI89996	R0.1	**1.0**	4	0.8	10	50	0.95	5.50	10.66	11.25	11.89	12.62	13.50
HPI89997	R0.2	**1.0**	4	0.8	10	50	0.95	5.53	10.66	11.23	11.88	12.60	13.48
HPI89998	R0.3	**1.0**	4	0.8	10	50	0.95	5.57	10.65	11.22	11.86	12.57	13.47
HPI89999	R0.1	**1.0**	4	0.8	12	55	0.95	4.87	12.77	13.46	14.24	15.00	15.84
HPI89801	R0.2	**1.0**	4	0.8	12	55	0.95	4.90	12.76	13.45	14.22	14.99	15.82
HPI89802	R0.1	**1.0**	4	0.8	16	60	0.95	3.97	16.98	17.90	18.92	19.42	20.51
HPI89803	R0.2	**1.0**	4	0.8	16	60	0.95	3.99	16.97	17.89	18.92	19.41	20.49
HPI89804	R0.3	**1.0**	4	0.8	16	60	0.95	4.01	16.97	17.88	18.90	19.40	20.47
HPI89805	R0.1	**1.0**	4	0.8	20	60	0.95	3.35	21.19	22.34	23.23	23.85	25.18
HPI89806	R0.2	**1.0**	4	0.8	20	60	0.95	3.37	21.18	22.33	23.23	23.84	25.16
HPI89807	R0.3	**1.0**	4	0.8	20	60	0.95	3.38	21.17	22.32	23.22	23.83	25.15
HPI89015	R0.1	**1.5**	4	1.35	4	50	1.45	8.21	4.23	4.37	4.53	4.69	5.06
HPI89808	R0.2	**1.5**	4	1.35	4	50	1.45	8.31	4.22	4.36	4.51	4.68	5.04
HPI89809	R0.1	**1.5**	4	1.35	8	50	1.45	5.64	8.36	8.65	8.96	9.29	10.04
HPI89810	R0.2	**1.5**	4	1.35	8	50	1.45	5.68	8.36	8.64	8.95	9.28	10.01
HPI89811	R0.3	**1.5**	4	1.35	8	50	1.45	5.73	8.36	8.64	8.94	9.26	9.99
HPI89812	R0.2	**1.5**	4	1.35	12	55	1.45	4.32	12.49	12.92	13.38	13.88	14.99
HPI89813	R0.1	**1.5**	4	1.35	15	55	1.45	3.64	15.60	16.14	16.72	17.34	18.74
HPI89814	R0.2	**1.5**	4	1.35	15	55	1.45	3.66	15.59	16.13	16.71	17.33	18.71
HPI89815	R0.3	**1.5**	4	1.35	15	55	1.45	3.68	15.59	16.12	16.70	17.31	18.69
HPI89816	R0.1	**1.5**	4	1.35	20	60	1.45	2.90	20.77	21.49	22.26	23.09	-
HPI89817	R0.2	**1.5**	4	1.35	20	60	1.45	2.91	20.76	21.48	22.25	23.07	-
HPI89818	R0.3	**1.5**	4	1.35	20	60	1.45	2.93	20.76	21.47	22.24	23.06	-
HPI89020	R0.2	**2.0**	4	1.7	6	50	1.95	5.93	6.29	6.50	6.73	6.98	7.53
HPI89819	R0.5	**2.0**	4	1.7	6	50	1.95	6.12	6.28	6.48	6.70	6.93	7.45
HPI89820	R0.2	**2.0**	4	1.7	8	50	1.95	4.92	8.36	8.64	8.95	9.28	10.01

▶ NEXT PAGE

Corner Radius Tolerance (mm)	Mill Dia. Tolerance (mm)	Shank Dia. Tolerance
±0.005	0~-0.010	h4

◎ : 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	10	29	32	38	15	35	44	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	409	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	39.1	39.2	39.3	40	41
HRc											15	30	25	38	34			45-49	50-55	56-60	61-65	66-70	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	421-469	481-560	577-654	670-739		400	550
Recommend																		◎	◎	◎	◎	◎	○	◎

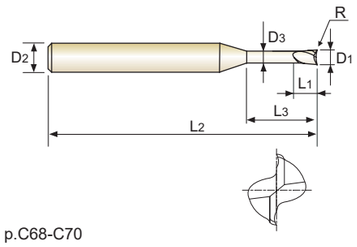
X1-EH END MILLS

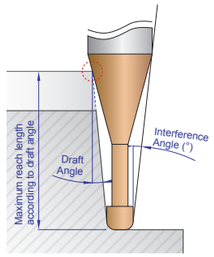
PLAIN SHANK **HPI89 SERIES**

CARBIDE, 2 FLUTE CORNER RADIUS for RIB PROCESSING

- Improvement of tool life by applying new coating.
- Application of tight tolerances for precision machining.







CARBIDE | 2 | 35° | R ±0.005 | PLAIN | C Coating | p.C68-C70

Unit : mm

EDP No.	Corner Radius	Mill Diameter	Shank Diameter	Length of Cut	Length Below Shank	Overall Length	Neck Diameter	Interference Angle(°)	Maximum reach lengths according to draft angle				
	R	D1	D2	L1	L3	L2	D3		0.5°	1°	1.5°	2°	3°
HPI89821	R0.3	**2.0**	4	1.7	8	50	1.95	4.96	8.36	8.64	8.94	9.26	9.99
HPI89822	R0.5	**2.0**	4	1.7	8	50	1.95	5.05	8.35	8.62	8.92	9.23	9.94
HPI89823	R0.8	**2.0**	4	1.7	8	50	1.95	5.18	8.34	8.60	8.88	9.19	9.87
HPI89824	R0.2	**2.0**	4	1.7	12	55	1.95	3.66	12.49	12.92	13.38	13.88	14.99
HPI89825	R0.5	**2.0**	4	1.7	12	55	1.95	3.73	12.48	12.90	13.35	13.83	14.91
HPI89826	R0.2	**2.0**	4	1.7	16	55	1.95	2.92	16.63	17.20	17.81	18.48	-
HPI89827	R0.3	**2.0**	4	1.7	16	55	1.95	2.93	16.62	17.19	17.80	18.46	-
HPI89828	R0.5	**2.0**	4	1.7	16	55	1.95	2.96	16.62	17.18	17.78	18.43	-
HPI89829	R0.8	**2.0**	4	1.7	16	55	1.95	3.01	16.61	17.16	17.75	18.39	19.81
HPI89830	R0.2	**2.0**	4	1.7	20	60	1.95	2.42	20.76	21.48	22.25	23.07	-
HPI89831	R0.3	**2.0**	4	1.7	20	60	1.95	2.43	20.76	21.47	22.24	23.06	-
HPI89832	R0.5	**2.0**	4	1.7	20	60	1.95	2.45	20.75	21.46	22.22	23.03	-
HPI89833	R0.8	**2.0**	4	1.7	20	60	1.95	2.49	20.74	21.44	22.18	22.98	-
HPI89834	R0.2	**2.0**	4	1.7	25	65	1.95	2.00	25.93	26.83	27.79	28.82	-
HPI89835	R0.5	**2.0**	4	1.7	25	65	1.95	2.02	25.92	26.81	27.76	28.78	-
HPI89836	R0.2	**2.0**	4	1.7	30	70	1.95	1.70	31.10	32.18	33.33	-	-
HPI89837	R0.5	**2.0**	4	1.7	30	70	1.95	1.72	31.09	32.16	33.30	-	-
HPI89030	R0.2	**3.0**	6	2.5	8	55	2.85	6.26	8.55	8.84	9.16	9.49	10.24
HPI89838	R0.3	**3.0**	6	2.5	8	55	2.85	6.30	8.55	8.84	9.14	9.48	10.22
HPI89839	R0.5	**3.0**	6	2.5	8	55	2.85	6.40	8.54	8.82	9.12	9.45	10.17
HPI89840	R0.2	**3.0**	6	2.5	12	60	2.85	4.85	12.69	13.12	13.59	14.09	15.22
HPI89841	R0.5	**3.0**	6	2.5	12	60	2.85	4.93	12.68	13.10	13.56	14.05	15.14
HPI89842	R0.2	**3.0**	6	2.5	16	60	2.85	3.96	16.82	17.40	18.02	18.69	20.19
HPI89843	R0.3	**3.0**	6	2.5	16	60	2.85	3.98	16.82	17.39	18.01	18.67	20.17
HPI89844	R0.5	**3.0**	6	2.5	16	60	2.85	4.01	16.81	17.38	17.99	18.64	20.12
HPI89845	R0.2	**3.0**	6	2.5	20	65	2.85	3.34	20.96	21.68	22.45	23.29	25.16

▶ NEXT PAGE

Corner Radius Tolerance (mm)	Mill Dia. Tolerance (mm)	Shank Dia. Tolerance
±0.005	0~-0.010	h4

◎ : 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	10	29	32	38	15	35	44	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	409	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	39.1	39.2	39.3	40	41
HRc											15	30	25	38	34			45-49	50-55	56-60	61-65	66-70	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	421-469	481-560	577-654	670-739		400	550
Recommend																		◎	◎	◎	◎	◎	○	◎

CARBIDE
HSS
i-Xmill END MILLS
X-1EH END MILLS
4G MILL END MILLS
X-POWER PRO END MILLS
TitaNox-POWER END MILLS
V7 PLUS END MILLS
ALU-CUT END MILLS
K-2 END MILLS
GENERAL CARBIDE END MILLS

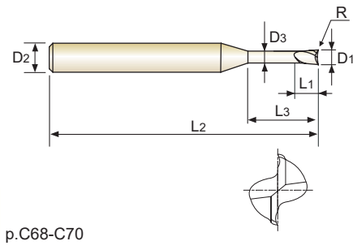
X1-EH END MILLS

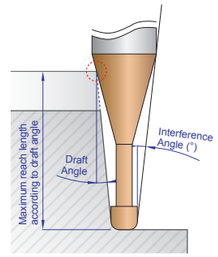
PLAIN SHANK **HPI89 SERIES**

CARBIDE, 2 FLUTE CORNER RADIUS for RIB PROCESSING

- Improvement of tool life by applying new coating.
- Application of tight tolerances for precision machining.







CARBIDE | 2 | 35° | R ±0.005 | PLAIN | C Coating | p.C68-C70

Unit : mm

EDP No.	Corner Radius	Mill Diameter	Shank Diameter	Length of Cut	Length Below Shank	Overall Length	Neck Diameter	Interference Angle(°)	Maximum reach lengths according to draft angle				
	R	D1	D2	L1	L3	L2	D3		0.5°	1°	1.5°	2°	3°
HPI89846	R0.3	**3.0**	6	2.5	20	65	2.85	3.36	20.95	21.67	22.44	23.27	25.14
HPI89847	R0.5	**3.0**	6	2.5	20	65	2.85	3.38	20.95	21.66	22.42	23.24	25.09
HPI89848	R0.2	**3.0**	6	2.5	30	75	2.85	2.41	31.29	32.38	33.54	34.79	-
HPI89849	R0.3	**3.0**	6	2.5	30	75	2.85	2.41	31.29	32.37	33.53	34.77	-
HPI89850	R0.5	**3.0**	6	2.5	30	75	2.85	2.43	31.28	32.36	33.51	34.74	-
HPI89851	R0.2	**3.0**	6	2.5	35	80	2.85	2.11	36.46	37.72	39.08	40.54	-
HPI89852	R0.5	**3.0**	6	2.5	35	80	2.85	2.13	36.45	37.70	39.05	40.49	-

Corner Radius Tolerance (mm)	Mill Dia. Tolerance (mm)	Shank Dia. Tolerance
±0.005	0~-0.010	h4

◎ : 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	10	29	32	38	15	35	44	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	409	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	39.1	39.2	39.3	40	41
HRc											15	30	25	38	34			45-49	50-55	56-60	61-65	66-70	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	421-469	481-560	577-654	670-739		400	550
Recommend																		◎	◎	◎	◎	◎	○	◎

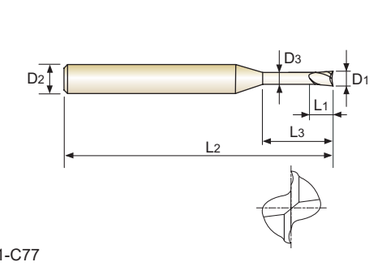
X1-EH END MILLS

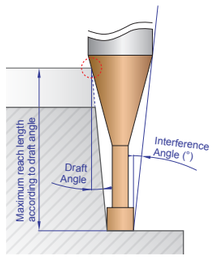
PLAIN SHANK **HPI88 SERIES**

CARBIDE, 2 FLUTE for RIB PROCESSING

- Improvement of tool life by applying new coating.
- Application of tight tolerances for precision machining.







CARBIDE | 2 | 35° | PLAIN | C Coating |  p.C71-C77

Unit : mm

EDP No.	Mill Diameter	Shank Diameter	Length of Cut	Length Below Shank	Overall Length	Neck Diameter	Interference Angle(°)	Maximum reach lengths according to draft angle				
	D_1	D_2	L_1	L_3	L_2	D_3		0.5°	1°	1.5°	2°	3°
HPI88001	0.1	4	0.08	0.3	45	0.085	14.38	0.36	0.38	0.40	0.43	0.49
HPI88901	0.1	4	0.08	0.5	45	0.085	14.03	0.57	0.60	0.64	0.68	0.77
HPI88902	0.1	4	0.08	0.75	45	0.085	13.61	0.83	0.88	0.93	0.99	1.13
HPI88903	0.1	4	0.08	1	45	0.085	13.21	1.10	1.16	1.22	1.30	1.48
HPI880015	0.15	4	0.12	0.3	45	0.135	14.37	0.36	0.38	0.40	0.43	0.49
HPI88904	0.15	4	0.12	0.5	45	0.135	14.01	0.57	0.60	0.64	0.68	0.77
HPI88905	0.15	4	0.12	0.75	45	0.135	13.59	0.83	0.88	0.93	0.99	1.13
HPI88906	0.15	4	0.12	1	45	0.135	13.19	1.10	1.16	1.22	1.30	1.48
HPI88907	0.15	4	0.12	1.5	45	0.135	12.46	1.62	1.71	1.81	1.92	2.19
HPI88002	0.2	4	0.15	0.5	45	0.17	13.95	0.62	0.65	0.69	0.73	0.83
HPI88908	0.2	4	0.15	0.75	45	0.17	13.53	0.88	0.93	0.98	1.04	1.19
HPI88909	0.2	4	0.15	1	45	0.17	13.13	1.14	1.20	1.27	1.35	1.54
HPI88910	0.2	4	0.15	1.5	45	0.17	12.39	1.67	1.76	1.86	1.98	2.26
HPI88911	0.2	4	0.15	2	45	0.17	11.73	2.19	2.31	2.45	2.60	2.97
HPI88912	0.2	4	0.15	2.5	45	0.17	11.14	2.72	2.87	3.04	3.22	3.68
HPI88913	0.2	4	0.15	3	45	0.17	10.61	3.25	3.42	3.62	3.85	4.39
HPI88003	0.3	4	0.25	1	45	0.27	13.08	1.14	1.20	1.27	1.35	1.54
HPI88914	0.3	4	0.25	1.5	45	0.27	12.33	1.67	1.76	1.86	1.98	2.26
HPI88915	0.3	4	0.25	2	45	0.27	11.67	2.19	2.31	2.45	2.60	2.97
HPI88916	0.3	4	0.25	2.5	45	0.27	11.06	2.72	2.87	3.04	3.22	3.68
HPI88917	0.3	4	0.25	3	45	0.27	10.52	3.25	3.42	3.62	3.85	4.39
HPI88004	0.4	4	0.3	1	45	0.37	13.04	1.14	1.20	1.27	1.35	1.54
HPI88918	0.4	4	0.3	1.5	45	0.37	12.27	1.67	1.76	1.86	1.98	2.26
HPI88919	0.4	4	0.3	2	45	0.37	11.59	2.19	2.31	2.45	2.60	2.97
HPI88920	0.4	4	0.3	2.5	45	0.37	10.98	2.72	2.87	3.04	3.22	3.68
HPI88921	0.4	4	0.3	3	45	0.37	10.44	3.25	3.42	3.62	3.85	4.39

▶ NEXT PAGE

Mill Dia. Tolerance (mm)	Shank Dia. Tolerance
0~-0.010	h4

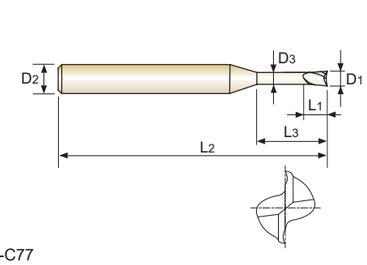
◎ : Excellent ○ : Good

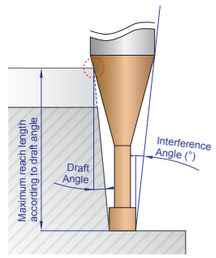
ISO	P													M		K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel				Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11.1	11.2	12	13	14.1	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	44	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	409	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	39.1	39.2	39.3	40	41
HRc											15	30	25	38	34			45-49	50-55	56-60	61-65	66-70	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	421-469	481-560	577-654	670-739		400	550
Recommend																		◎	◎	◎	◎	◎	○	◎

X1-EH END MILLS
PLAIN SHANK HPI88 SERIES
CARBIDE, 2 FLUTE for RIB PROCESSING
▶ Improvement of tool life by applying new coating.
▶ Application of tight tolerances for precision machining.







CARBIDE | 2 | 35° | PLAIN | C Coating |  p.C71-C77

Unit : mm

EDP No.	Mill Diameter	Shank Diameter	Length of Cut	Length Below Shank	Overall Length	Neck Diameter	Interference Angle(°)	Maximum reach lengths according to draft angle				
	D_1	D_2	L_1	L_3	L_2	D_3		0.5°	1°	1.5°	2°	3°
HPI88922	0.4	4	0.3	3.5	45	0.37	9.94	3.77	3.98	4.21	4.47	5.10
HPI88923	0.4	4	0.3	4	45	0.37	9.49	4.30	4.53	4.80	5.09	5.81
HPI88924	0.4	4	0.3	5	45	0.37	8.69	5.35	5.64	5.97	6.34	7.24
HPI88925	0.4	4	0.3	6	45	0.37	8.02	6.40	6.75	7.15	7.59	8.66
HPI88926	0.4	4	0.3	8	45	0.37	6.95	8.51	8.97	9.50	10.08	11.48
HPI88927	0.4	4	0.3	10	45	0.37	6.13	10.61	11.19	11.84	12.58	13.82
HPI88005	0.5	4	0.4	1	45	0.45	12.93	1.20	1.27	1.34	1.42	1.62
HPI88928	0.5	4	0.4	1.5	45	0.45	12.16	1.73	1.82	1.93	2.05	2.34
HPI88929	0.5	4	0.4	2	45	0.45	11.47	2.25	2.38	2.52	2.67	3.05
HPI88930	0.5	4	0.4	2.5	45	0.45	10.86	2.78	2.93	3.10	3.29	3.76
HPI88931	0.5	4	0.4	3	45	0.45	10.31	3.31	3.49	3.69	3.92	4.47
HPI88932	0.5	4	0.4	3.5	45	0.45	9.81	3.83	4.04	4.28	4.54	5.18
HPI88933	0.5	4	0.4	4	45	0.45	9.35	4.36	4.60	4.86	5.16	5.89
HPI88934	0.5	4	0.4	4.5	45	0.45	8.94	4.88	5.15	5.45	5.79	6.60
HPI88935	0.5	4	0.4	5	45	0.45	8.56	5.41	5.71	6.04	6.41	7.32
HPI88936	0.5	4	0.4	6	45	0.45	7.89	6.46	6.82	7.21	7.66	8.74
HPI88937	0.5	4	0.4	7	45	0.45	7.32	7.51	7.93	8.39	8.91	10.16
HPI88938	0.5	4	0.4	8	50	0.45	6.82	8.57	9.04	9.56	10.15	11.47
HPI88939	0.5	4	0.4	9	50	0.45	6.39	9.62	10.15	10.74	11.40	12.64
HPI88940	0.5	4	0.4	10	50	0.45	6.01	10.67	11.26	11.91	12.65	13.80
HPI88006	0.6	4	0.5	1.5	45	0.55	12.09	1.73	1.82	1.93	2.05	2.34
HPI88941	0.6	4	0.5	2	45	0.55	11.39	2.25	2.38	2.52	2.67	3.05
HPI88942	0.6	4	0.5	3	45	0.55	10.21	3.31	3.49	3.69	3.92	4.47
HPI88943	0.6	4	0.5	4	45	0.55	9.25	4.36	4.60	4.86	5.16	5.89
HPI88944	0.6	4	0.5	5	45	0.55	8.45	5.41	5.71	6.04	6.41	7.32
HPI88945	0.6	4	0.5	6	45	0.55	7.78	6.46	6.82	7.21	7.66	8.74

▶ NEXT PAGE

Mill Dia. Tolerance (mm)	Shank Dia. Tolerance
0~-0.010	h4

◎ : 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	10	29	32	38	15	35	44	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	409	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	39.1	39.2	39.3	40	41
HRc											15	30	25	38	34			45-49	50-55	56-60	61-65	66-70	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	421-469	481-560	577-654	670-739		400	550
Recommend																		◎	◎	◎	◎	◎	○	◎

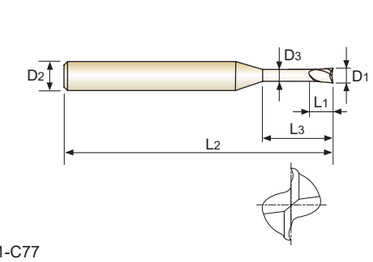
X1-EH END MILLS

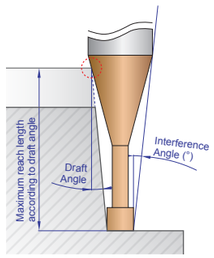
PLAIN SHANK **HPI88 SERIES**

CARBIDE, 2 FLUTE for RIB PROCESSING

- Improvement of tool life by applying new coating.
- Application of tight tolerances for precision machining.







CARBIDE | 2 | 35° | PLAIN | C Coating | p.C71-C77

Unit : mm

EDP No.	Mill Diameter	Shank Diameter	Length of Cut	Length Below Shank	Overall Length	Neck Diameter	Interference Angle(°)	Maximum reach lengths according to draft angle				
	D_1	D_2	L_1	L_3	L_2	D_3		0.5°	1°	1.5°	2°	3°
HPI88007	0.7	4	0.55	2	45	0.65	11.31	2.25	2.38	2.52	2.67	3.05
HPI88946	0.7	4	0.55	4	45	0.65	9.14	4.36	4.60	4.86	5.16	5.89
HPI88947	0.7	4	0.55	6	45	0.65	7.67	6.46	6.82	7.21	7.66	8.74
HPI88948	0.7	4	0.55	8	50	0.65	6.60	8.57	9.04	9.56	10.15	11.35
HPI88949	0.7	4	0.55	10	50	0.65	5.80	10.67	11.26	11.91	12.65	13.69
HPI88008	0.8	4	0.65	3	45	0.75	10.01	3.31	3.49	3.69	3.92	4.47
HPI88950	0.8	4	0.65	4	45	0.75	9.03	4.36	4.60	4.86	5.16	5.89
HPI88951	0.8	4	0.65	5	45	0.75	8.23	5.41	5.71	6.04	6.41	7.32
HPI88952	0.8	4	0.65	6	45	0.75	7.55	6.46	6.82	7.21	7.66	8.74
HPI88953	0.8	4	0.65	8	50	0.75	6.49	8.57	9.04	9.56	10.15	11.29
HPI88954	0.8	4	0.65	10	50	0.75	5.69	10.67	11.26	11.91	12.65	13.63
HPI88955	0.8	4	0.65	12	50	0.75	5.06	12.77	13.48	14.26	15.12	15.97
HPI88010	1.0	4	0.8	2	50	0.95	11.04	2.25	2.38	2.52	2.67	3.05
HPI88956	1.0	4	0.8	3	50	0.95	9.79	3.31	3.49	3.69	3.92	4.47
HPI88957	1.0	4	0.8	4	50	0.95	8.80	4.36	4.60	4.86	5.16	5.89
HPI88958	1.0	4	0.8	5	50	0.95	7.99	5.41	5.71	6.04	6.41	7.32
HPI88959	1.0	4	0.8	6	50	0.95	7.31	6.46	6.82	7.21	7.66	8.74
HPI88960	1.0	4	0.8	7	50	0.95	6.74	7.51	7.93	8.39	8.91	10.01
HPI88961	1.0	4	0.8	8	50	0.95	6.25	8.57	9.04	9.56	10.15	11.18
HPI88962	1.0	4	0.8	9	50	0.95	5.83	9.62	10.15	10.74	11.40	12.35
HPI88963	1.0	4	0.8	10	50	0.95	5.46	10.67	11.26	11.91	12.65	13.52
HPI88964	1.0	4	0.8	12	50	0.95	4.85	12.77	13.48	14.26	15.01	15.85
HPI88965	1.0	4	0.8	14	50	0.95	4.36	14.88	15.70	16.61	17.22	18.19
HPI88966	1.0	4	0.8	16	60	0.95	3.96	16.98	17.92	18.93	19.43	20.53
HPI88967	1.0	4	0.8	18	60	0.95	3.62	19.09	20.13	21.09	21.65	22.86
HPI88968	1.0	4	0.8	20	60	0.95	3.34	21.19	22.35	23.24	23.86	25.20

▶ NEXT PAGE

Mill Dia. Tolerance (mm)	Shank Dia. Tolerance
0~-0.010	h4

◎ : 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	10	29	32	38	15	35	44	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	409	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	39.1	39.2	39.3	40	41
HRc											15	30	25	38	34			45-49	50-55	56-60	61-65	66-70	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	421-469	481-560	577-654	670-739		400	550
Recommend																		◎	◎	◎	◎	◎	○	◎

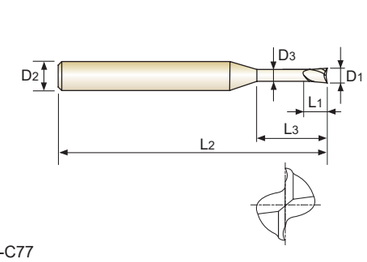
X1-EH END MILLS

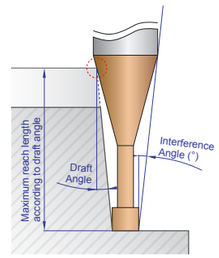
PLAIN SHANK HPI88 SERIES

CARBIDE, 2 FLUTE for RIB PROCESSING

- Improvement of tool life by applying new coating.
- Application of tight tolerances for precision machining.







CARBIDE | 2 | 35° | PLAIN | C Coating | p.C71-C77

Unit : mm

EDP No.	Mill Diameter	Shank Diameter	Length of Cut	Length Below Shank	Overall Length	Neck Diameter	Interference Angle(°)	Maximum reach lengths according to draft angle				
	D_1	D_2	L_1	L_3	L_2	D_3		0.5°	1°	1.5°	2°	3°
HPI88969	1.0	4	0.8	22	60	0.95	3.10	23.29	24.57	25.40	26.07	27.53
HPI88012	1.2	4	1	6	50	1.15	7.05	6.30	6.52	6.75	7.01	7.57
HPI88970	1.2	4	1	8	50	1.15	6.00	8.37	8.66	8.97	9.31	10.06
HPI88971	1.2	4	1	10	50	1.15	5.22	10.43	10.80	11.19	11.61	12.55
HPI88972	1.2	4	1	12	50	1.15	4.62	12.50	12.94	13.40	13.91	15.03
HPI88973	1.2	4	1	16	60	1.15	3.76	16.64	17.21	17.84	18.50	20.01
HPI88014	1.4	4	1.1	6	50	1.35	6.77	6.30	6.52	6.75	7.01	7.57
HPI88974	1.4	4	1.1	12	50	1.35	4.39	12.50	12.94	13.40	13.91	15.03
HPI88015	1.5	4	1.2	4	50	1.45	8.12	4.23	4.38	4.54	4.71	5.09
HPI88975	1.5	4	1.2	6	50	1.45	6.63	6.30	6.52	6.75	7.01	7.57
HPI88976	1.5	4	1.2	8	50	1.45	5.60	8.37	8.66	8.97	9.31	10.06
HPI88977	1.5	4	1.2	10	50	1.45	4.84	10.43	10.80	11.19	11.61	12.55
HPI88978	1.5	4	1.2	12	50	1.45	4.27	12.50	12.94	13.40	13.91	15.03
HPI88979	1.5	4	1.2	14	60	1.45	3.81	14.57	15.08	15.62	16.21	17.52
HPI88980	1.5	4	1.2	16	60	1.45	3.45	16.64	17.21	17.84	18.50	20.01
HPI88981	1.5	4	1.2	18	60	1.45	3.14	18.70	19.35	20.05	20.80	22.49
HPI88982	1.5	4	1.2	20	60	1.45	2.89	20.77	21.49	22.27	23.10	-
HPI88983	1.5	4	1.2	25	70	1.45	2.41	25.94	26.84	27.81	28.85	-
HPI88984	1.5	4	1.2	30	70	1.45	2.06	31.11	32.19	33.35	34.60	-
HPI88985	1.5	4	1.2	35	80	1.45	1.80	36.27	37.54	38.89	-	-
HPI88016	1.6	4	1.3	6	50	1.55	6.48	6.30	6.52	6.75	7.01	7.57
HPI88986	1.6	4	1.3	8	50	1.55	5.45	8.37	8.66	8.97	9.31	10.06
HPI88018	1.8	4	1.4	6	50	1.75	6.16	6.30	6.52	6.75	7.01	7.57
HPI88987	1.8	4	1.4	8	50	1.75	5.15	8.37	8.66	8.97	9.31	10.06
HPI88988	1.8	4	1.4	10	50	1.75	4.43	10.43	10.80	11.19	11.61	12.55
HPI88989	1.8	4	1.4	12	50	1.75	3.88	12.50	12.94	13.40	13.91	15.03

▶ NEXT PAGE

Mill Dia. Tolerance (mm)	Shank Dia. Tolerance
0~-0.010	h4

◎ : 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	10	29	32	38	15	35	44	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	409	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	39.1	39.2	39.3	40	41
HRc											15	30	25	38	34			45-49	50-55	56-60	61-65	66-70	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	421-469	481-560	577-654	670-739		400	550
Recommend																		◎	◎	◎	◎	◎	○	◎

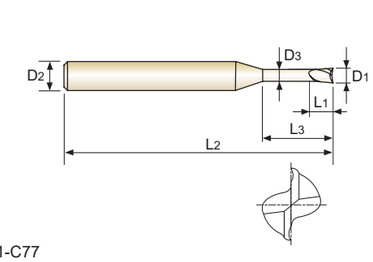
X1-EH END MILLS

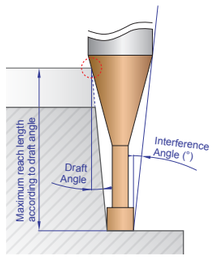
PLAIN SHANK **HPI88 SERIES**

CARBIDE, 2 FLUTE for RIB PROCESSING

- Improvement of tool life by applying new coating.
- Application of tight tolerances for precision machining.







CARBIDE | 2 | 35° | PLAIN | C Coating | p.C71-C77

Unit : mm

EDP No.	Mill Diameter	Shank Diameter	Length of Cut	Length Below Shank	Overall Length	Neck Diameter	Interference Angle(°)	Maximum reach lengths according to draft angle				
	D_1	D_2	L_1	L_3	L_2	D_3		0.5°	1°	1.5°	2°	3°
HPI88990	1.8	4	1.4	14	50	1.75	3.46	14.57	15.08	15.62	16.21	17.52
HPI88991	1.8	4	1.4	16	60	1.75	3.12	16.64	17.21	17.84	18.50	20.01
HPI88992	1.8	4	1.4	18	60	1.75	2.84	18.70	19.35	20.05	20.80	-
HPI88020	2.0	4	1.6	4	50	1.95	7.28	4.23	4.38	4.54	4.71	5.09
HPI88993	2.0	4	1.6	6	50	1.95	5.81	6.30	6.52	6.75	7.01	7.57
HPI88994	2.0	4	1.6	8	50	1.95	4.83	8.37	8.66	8.97	9.31	10.06
HPI88995	2.0	4	1.6	10	50	1.95	4.14	10.43	10.80	11.19	11.61	12.55
HPI88996	2.0	4	1.6	12	50	1.95	3.62	12.50	12.94	13.40	13.91	15.03
HPI88997	2.0	4	1.6	14	60	1.95	3.21	14.57	15.08	15.62	16.21	17.52
HPI88998	2.0	4	1.6	16	60	1.95	2.89	16.64	17.21	17.84	18.50	-
HPI88999	2.0	4	1.6	18	60	1.95	2.62	18.70	19.35	20.05	20.80	-
HPI88801	2.0	4	1.6	20	60	1.95	2.40	20.77	21.49	22.27	23.10	-
HPI88802	2.0	4	1.6	25	70	1.95	1.99	25.94	26.84	27.81	-	-
HPI88803	2.0	4	1.6	30	70	1.95	1.69	31.11	32.19	33.35	-	-
HPI88804	2.0	4	1.6	35	80	1.95	1.48	36.27	37.54	-	-	-
HPI88805	2.0	4	1.6	40	90	1.95	1.31	41.44	42.89	-	-	-
HPI88806	2.0	4	1.6	50	100	1.95	1.06	51.78	53.58	-	-	-
HPI88025	2.5	4	2	8	50	2.4	3.91	8.46	8.76	9.07	9.41	10.18
HPI88807	2.5	4	2	12	50	2.4	2.87	12.60	13.04	13.51	14.01	-
HPI88808	2.5	4	2	16	60	2.4	2.26	16.73	17.31	17.94	18.61	-
HPI88809	2.5	4	2	20	60	2.4	1.87	20.87	21.59	22.37	-	-
HPI88810	2.5	4	2	30	70	2.4	1.30	31.20	32.29	-	-	-
HPI88811	2.5	4	2	40	90	2.4	1.00	41.54	-	-	-	-
HPI88812	2.5	4	2	50	100	2.4	0.81	51.88	-	-	-	-
HPI88030	3.0	6	4.5	8	50	2.85	6.17	8.56	8.86	9.18	9.52	10.29
HPI88813	3.0	6	4.5	12	50	2.85	4.80	12.69	13.14	13.61	14.12	15.27

▶ NEXT PAGE

Mill Dia. Tolerance (mm)	Shank Dia. Tolerance
0~-0.010	h4

◎ : 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	10	29	32	38	15	35	44	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	409	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	39.1	39.2	39.3	40	41
HRc											15	30	25	38	34			45-49	50-55	56-60	61-65	66-70	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	421-469	481-560	577-654	670-739		400	550
Recommend																		◎	◎	◎	◎	◎	○	◎

CARBIDE
HSS
i-Xmill END MILLS
X-1EH END MILLS
4G MILL END MILLS
X-POWER PRO END MILLS
TitaNox-POWER END MILLS
V7 PLUS END MILLS
ALU-CUT END MILLS
K-2 END MILLS
GENERAL CARBIDE END MILLS

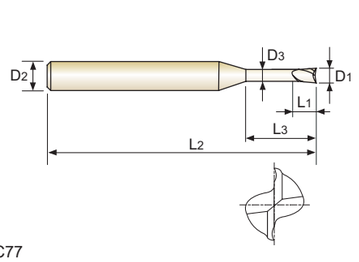
X1-EH END MILLS

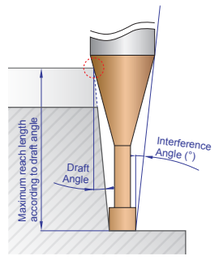
PLAIN SHANK **HPI88 SERIES**

CARBIDE, 2 FLUTE for RIB PROCESSING

- Improvement of tool life by applying new coating.
- Application of tight tolerances for precision machining.







CARBIDE | 2 | 35° | PLAIN | C Coating | p.C71-C77

Unit : mm

EDP No.	Mill Diameter	Shank Diameter	Length of Cut	Length Below Shank	Overall Length	Neck Diameter	Interference Angle(°)	Maximum reach lengths according to draft angle				
	D_1	D_2	L_1	L_3	L_2	D_3		0.5°	1°	1.5°	2°	3°
HPI88814	3.0	6	4.5	16	60	2.85	3.92	16.83	17.41	18.04	18.72	20.24
HPI88815	3.0	6	4.5	20	60	2.85	3.32	20.96	21.69	22.48	23.32	25.21
HPI88816	3.0	6	4.5	25	70	2.85	2.78	26.13	27.04	28.02	29.07	-
HPI88817	3.0	6	4.5	30	70	2.85	2.39	31.30	32.39	33.56	34.82	-
HPI88040	4.0	6	6	12	60	3.85	3.57	12.69	13.14	13.61	14.12	15.27
HPI88818	4.0	6	6	16	60	3.85	2.86	16.83	17.41	18.04	18.72	-
HPI88819	4.0	6	6	20	70	3.85	2.38	20.96	21.69	22.48	23.32	-
HPI88820	4.0	6	6	30	80	3.85	1.68	31.30	32.39	33.56	-	-
HPI88821	4.0	6	6	40	90	3.85	1.30	41.64	43.09	-	-	-
HPI88822	4.0	6	6	50	100	3.85	1.06	51.97	53.78	-	-	-
HPI88050	5.0	6	7.5	20	70	4.85	1.29	20.96	21.69	-	-	-
HPI88823	5.0	6	7.5	30	80	4.85	0.89	31.30	-	-	-	-
HPI88824	5.0	6	7.5	40	90	4.85	0.68	41.64	-	-	-	-
HPI88825	5.0	6	7.5	50	100	4.85	0.55	51.97	-	-	-	-
HPI88060	6.0	6	9	20	70	5.85	0.00	-	-	-	-	-
HPI88826	6.0	6	9	30	80	5.85	0.00	-	-	-	-	-
HPI88827	6.0	6	9	40	90	5.85	0.00	-	-	-	-	-
HPI88828	6.0	6	9	50	100	5.85	0.00	-	-	-	-	-

Mill Dia. Tolerance (mm)	Shank Dia. Tolerance
0~-0.010	h4

◎ : 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	10	29	32	38	15	35	44	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	409	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	39.1	39.2	39.3	40	41
HRc											15	30	25	38	34			45-49	50-55	56-60	61-65	66-70	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	421-469	481-560	577-654	670-739		400	550
Recommend																		◎	◎	◎	◎	◎	○	◎

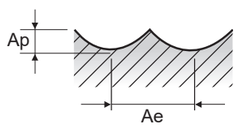
X1-EH END MILLS

RECOMMENDED CUTTING CONDITIONS

HPI90 SERIES — 2 FLUTE BALL NOSE

Vc = m/min.
fz = mm/tooth
RPM = rev./min.
FEED = mm/min.

ISO	VDI 3323	Material Description	Ae	Ap	Para meter	Diameter (Ø)																	
						0.2	0.3	0.4	0.5	0.6	0.8	1.0	1.5	2.0	2.5	3.0	4.0	5.0	6.0	8.0	10.0	12.0	16.0	20.0
P	5	Non-alloy steel	0.05D	0.02D	Vc	31	46	67	82	98	129	160	242	319	320	319	324	299	268	288	299	268	288	288
					fz	0.012	0.015	0.019	0.024	0.029	0.039	0.048	0.054	0.057	0.074	0.091	0.120	0.156	0.174	0.189	0.199	0.212	0.238	0.264
					RPM	49178	49178	53277	52458	51911	51228	50818	51365	50818	40685	33879	25819	19016	14207	11475	9508	7104	5737	4590
					FEED	1180	1475	2025	2518	3011	3995	4878	5548	5794	5979	6166	6196	5933	4944	4337	3784	3012	2732	2424
	8~9	Low alloy steel	0.05D	0.02D	Vc	31	46	67	82	98	129	160	242	319	320	319	324	299	268	288	299	268	288	288
					Fz	0.012	0.015	0.019	0.024	0.029	0.039	0.048	0.054	0.057	0.074	0.091	0.120	0.156	0.174	0.189	0.199	0.212	0.238	0.264
					RPM	49178	49178	53277	52458	51911	51228	50818	51365	50818	40685	33879	25819	19016	14207	11475	9508	7104	5737	4590
					FEED	1180	1475	2025	2518	3011	3995	4878	5548	5794	5979	6166	6196	5933	4944	4337	3784	3012	2732	2424
	11.1	High alloyed steel, and tool steel	0.05D	0.02D	Vc	31	46	67	82	98	129	160	242	319	320	319	324	299	268	288	299	268	288	288
					fz	0.012	0.015	0.019	0.024	0.029	0.039	0.048	0.054	0.057	0.074	0.091	0.120	0.156	0.174	0.189	0.199	0.212	0.238	0.264
					RPM	49178	49178	53277	52458	51911	51228	50818	51365	50818	40685	33879	25819	19016	14207	11475	9508	7104	5737	4590
					FEED	1180	1475	2025	2518	3011	3995	4878	5548	5794	5979	6166	6196	5933	4944	4337	3784	3012	2732	2424
	11.2		0.05D	0.02D	Vc	31	46	67	82	98	129	160	232	309	309	309	309	288	263	278	288	257	278	278
					fz	0.011	0.014	0.017	0.021	0.025	0.033	0.042	0.047	0.050	0.066	0.083	0.111	0.138	0.153	0.164	0.174	0.187	0.206	0.227
					RPM	49178	49178	53277	52458	51911	51228	50818	49178	49178	39295	32786	24589	18360	13934	11065	9180	6830	5532	4426
					FEED	1082	1377	1812	2203	2596	3381	4268	4623	4918	5180	5443	5459	5068	4264	3630	3195	2554	2279	2010
H	38.1	Hardened steel	0.05D	0.02D	Vc	31	46	67	82	98	129	160	232	309	309	309	309	288	263	278	288	257	278	278
					fz	0.011	0.014	0.017	0.021	0.025	0.033	0.042	0.047	0.050	0.066	0.083	0.111	0.138	0.153	0.164	0.174	0.187	0.206	0.227
					RPM	49178	49178	53277	52458	51911	51228	50818	49178	49178	39295	32786	24589	18360	13934	11065	9180	6830	5532	4426
					FEED	1082	1377	1812	2203	2596	3381	4268	4623	4918	5180	5443	5459	5068	4264	3630	3195	2554	2279	2010
	38.2		0.05D	0.02D	Vc	29	41	57	72	88	118	144	211	258	257	258	257	242	211	232	242	216	232	232
					fz	0.010	0.013	0.017	0.021	0.024	0.033	0.042	0.047	0.050	0.063	0.075	0.100	0.125	0.141	0.150	0.160	0.170	0.189	0.208
					RPM	45900	43714	45081	45900	46447	47130	45900	44807	40983	32754	27322	20491	15410	11202	9221	7704	5737	4610	3688
					FEED	918	1136	1533	1928	2230	3111	3855	4212	4098	4098	4098	4098	3852	3159	2767	2466	1951	1743	1535
	39.1		0.05D	0.02D	Vc	26	41	52	67	77	103	129	180	227	227	227	227	216	196	206	211	196	206	206
					fz	0.010	0.012	0.015	0.019	0.023	0.030	0.038	0.042	0.045	0.056	0.067	0.090	0.113	0.125	0.134	0.144	0.155	0.169	0.188
					RPM	40983	43714	40983	42621	40983	40983	40983	38250	36064	28840	24043	18032	13770	10382	8197	6721	5191	4098	3278
					FEED	820	1050	1230	1619	1885	2459	3115	3213	3246	3233	3222	3246	3112	2596	2197	1935	1609	1385	1233
	39.2		0.05D	0.02D	Vc	21	36	46	57	67	93	113	160	206	206	206	206	185	170	180	185	170	180	180
					fz	0.010	0.012	0.015	0.019	0.023	0.030	0.037	0.041	0.044	0.055	0.067	0.088	0.111	0.122	0.132	0.142	0.142	0.143	0.143
					RPM	32786	38250	36884	36064	35519	36884	36064	33879	32786	26265	21858	16392	11803	9017	7172	5902	4508	3586	2869
					FEED	656	918	1106	1371	1634	2213	2669	2778	2885	2907	2929	2885	2620	2200	1893	1676	1280	1026	821
	39.3		0.05D	0.02D	Vc	21	31	41	52	62	82	113	144	185	185	185	185	170	155	170	170	154	165	165
					fz	0.009	0.011	0.014	0.017	0.022	0.029	0.033	0.039	0.040	0.051	0.061	0.079	0.100	0.109	0.119	0.130	0.131	0.133	0.129
					RPM	32786	32786	32786	32786	32786	32786	36064	30600	29507	23587	19672	14754	10819	8197	6762	5410	4098	3278	2622
					FEED	590	721	918	1114	1443	1901	2380	2387	2361	2380	2400	2331	2164	1787	1609	1407	1073	872	677
	40	Chilled Cast Iron	0.05D	0.02D	Vc	31	46	67	82	98	129	160	232	309	309	309	309	288	263	278	288	257	278	278
					fz	0.011	0.014	0.017	0.021	0.025	0.033	0.042	0.047	0.050	0.066	0.083	0.111	0.138	0.153	0.164	0.174	0.187	0.206	0.227
					RPM	49178	49178	53277	52458	51911	51228	50818	49178	49178	39295	32786	24589	18360	13934	11065	9180	6830	5532	4426
					FEED	1082	1377	1812	2203	2596	3381	4268	4623	4918	5180	5443	5459	5068	4264	3630	3195	2554	2279	2010
	41	Hardened Cast Iron	0.05D	0.02D	Vc	29	41	57	72	88	118	144	211	258	257	258	257	242	211	232	242	216	232	232
					fz	0.010	0.013	0.017	0.021	0.024	0.033	0.042	0.047	0.050	0.063	0.075	0.100	0.125	0.141	0.150	0.160	0.170	0.189	0.208
					RPM	45900	43714	45081	45900	46447	47130	45900	44807	40983	32754	27322	20491	15410	11202	9221	7704	5737	4610	3688
					FEED	918	1136	1533	1928	2230	3111	3855	4212	4098	4098	4098	4098	3852	3159	2767	2466	1951	1743	1535



X1-EH END MILLS

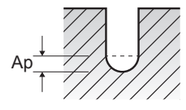
RECOMMENDED CUTTING CONDITIONS

HPI91, HPI92 SERIES — 2 FLUTE BALL NOSE FOR RIB PROCESSING

Vc = m/min.
fz = mm/tooth
RPM = rev./min.
FEED = mm/min.
Ap = mm
LBS = Length Below Shank

ISO	VDI 3323	Material Description	Para-meter	Diameter (Ø)																		
				0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.3	
			LBS	0.3	0.5	0.75	1	1.25	1.5	1.75	2	2.5	3	5	0.5	0.6	0.75	1	1.25	1.5	1.75	
P	5	Non-alloy steel	Vc	31	31	31	31	28	28	28	28	25	25	9	46	46	46	46	46	46	42	
			fz	0.012	0.012	0.012	0.012	0.011	0.011	0.011	0.011	0.010	0.010	0.007	0.015	0.015	0.015	0.015	0.015	0.015	0.014	
			RPM	49178	49178	49178	49178	44260	44260	44260	44260	39342	39342	14753	49178	49178	49178	49178	49178	49178	44260	
			FEED	1180	1180	1180	1180	974	974	974	974	787	787	207	1475	1475	1475	1475	1475	1475	1239	
			Ap	0.004	0.004	0.004	0.004	0.003	0.003	0.003	0.003	0.003	0.003	0.001	0.006	0.006	0.006	0.005	0.005	0.005	0.005	
	8-9	Low alloy steel	Vc	31	31	31	31	28	28	28	28	25	25	9	46	46	46	46	46	46	42	
			fz	0.012	0.012	0.012	0.012	0.011	0.011	0.011	0.011	0.010	0.010	0.007	0.015	0.015	0.015	0.015	0.015	0.015	0.014	
			RPM	49178	49178	49178	49178	44260	44260	44260	44260	39342	39342	14753	49178	49178	49178	49178	49178	49178	44260	
			FEED	1180	1180	1180	1180	974	974	974	974	787	787	207	1475	1475	1475	1475	1475	1475	1239	
			Ap	0.004	0.004	0.004	0.004	0.003	0.003	0.003	0.003	0.003	0.003	0.001	0.006	0.006	0.006	0.005	0.005	0.005	0.005	
	11.1	High alloyed steel, and tool steel	Vc	31	31	31	31	28	28	28	28	25	25	9	46	46	46	46	46	46	42	
			fz	0.012	0.012	0.012	0.012	0.011	0.011	0.011	0.011	0.010	0.010	0.007	0.015	0.015	0.015	0.015	0.015	0.015	0.014	
			RPM	49178	49178	49178	49178	44260	44260	44260	44260	39342	39342	14753	49178	49178	49178	49178	49178	49178	44260	
			FEED	1180	1180	1180	1180	974	974	974	974	787	787	207	1475	1475	1475	1475	1475	1475	1239	
			Ap	0.004	0.004	0.004	0.004	0.003	0.003	0.003	0.003	0.003	0.003	0.001	0.006	0.006	0.006	0.005	0.005	0.005	0.005	
	11.2		Vc	31	31	31	31	28	28	28	28	25	25	9	46	46	46	46	46	46	42	
			fz	0.011	0.011	0.011	0.011	0.010	0.010	0.010	0.010	0.009	0.009	0.007	0.014	0.014	0.014	0.014	0.014	0.014	0.013	
			RPM	49178	49178	49178	49178	44260	44260	44260	44260	39342	39342	14753	49178	49178	49178	49178	49178	49178	44260	
			FEED	1082	1082	1082	1082	885	885	885	885	708	708	207	1377	1377	1377	1377	1377	1377	1151	
			Ap	0.003	0.003	0.003	0.003	0.003	0.003	0.002	0.002	0.002	0.002	0.001	0.005	0.005	0.005	0.005	0.005	0.005	0.004	
H	38.1	Hardened steel	Vc	31	31	31	31	28	28	28	28	25	25	9	46	46	46	46	46	46	42	
			fz	0.011	0.011	0.011	0.011	0.010	0.010	0.010	0.010	0.009	0.009	0.007	0.014	0.014	0.014	0.014	0.014	0.014	0.013	
			RPM	49178	49178	49178	49178	44260	44260	44260	44260	39342	39342	14753	49178	49178	49178	49178	49178	49178	44260	
			FEED	1082	1082	1082	1082	885	885	885	885	708	708	207	1377	1377	1377	1377	1377	1377	1151	
			Ap	0.003	0.003	0.003	0.003	0.003	0.003	0.002	0.002	0.002	0.002	0.001	0.005	0.005	0.005	0.005	0.005	0.005	0.004	
	38.2		Vc	29	29	29	29	26	26	26	26	23	23	9	41	41	41	41	41	41	37	
			fz	0.010	0.010	0.010	0.010	0.009	0.009	0.009	0.009	0.008	0.008	0.006	0.013	0.013	0.013	0.013	0.013	0.013	0.012	
			RPM	45900	45900	45900	45900	41310	41310	41310	41310	36720	36720	13770	43714	43714	43714	43714	43714	43714	39343	
			FEED	918	918	918	918	744	744	744	744	588	588	165	1137	1137	1137	1137	1137	1137	944	
			Ap	0.003	0.003	0.003	0.003	0.003	0.003	0.002	0.002	0.002	0.002	0.001	0.005	0.005	0.005	0.005	0.005	0.005	0.004	
	39.1		Vc	26	26	26	26	23	23	23	23	21	21	8	41	41	41	41	41	41	37	
			fz	0.010	0.010	0.010	0.010	0.009	0.009	0.009	0.009	0.008	0.008	0.006	0.012	0.012	0.012	0.012	0.012	0.012	0.011	
			RPM	40983	40983	40983	40983	36885	36885	36885	36885	32786	32786	12295	43714	43714	43714	43714	43714	43714	39343	
			FEED	820	820	820	820	664	664	664	664	525	525	148	1049	1049	1049	1049	1049	1049	866	
			Ap	0.003	0.003	0.003	0.003	0.003	0.003	0.002	0.002	0.002	0.002	0.001	0.005	0.005	0.005	0.004	0.004	0.004	0.004	
	39.2		Vc	21	21	21	21	19	19	19	19	16	16	6	36	36	36	36	36	36	32	
			fz	0.010	0.010	0.010	0.010	0.009	0.009	0.009	0.009	0.008	0.008	0.006	0.012	0.012	0.012	0.012	0.012	0.012	0.011	
			RPM	32786	32786	32786	32786	29507	29507	29507	29507	26229	26229	9836	38250	38250	38250	38250	38250	38250	34425	
			FEED	656	656	656	656	531	531	531	531	420	420	118	918	918	918	918	918	918	757	
			Ap	0.003	0.003	0.003	0.003	0.003	0.003	0.002	0.002	0.002	0.002	0.001	0.005	0.005	0.005	0.004	0.004	0.004	0.004	
	39.3		Vc	21	21	21	21	19	19	19	19	16	16	6	31	31	31	31	31	31	28	
			fz	0.009	0.009	0.009	0.009	0.008	0.008	0.008	0.008	0.007	0.007	0.005	0.011	0.011	0.011	0.011	0.011	0.011	0.010	
			RPM	32786	32786	32786	32786	29507	29507	29507	29507	26229	26229	9836	32786	32786	32786	32786	32786	32786	29507	
			FEED	590	590	590	590	472	472	472	472	367	367	98	721	721	721	721	721	721	590	
			Ap	0.003	0.003	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.001	0.004	0.004	0.004	0.004	0.004	0.004	0.003	
	40	Chilled Cast Iron	Vc	31	31	31	31	28	28	28	28	25	25	9	46	46	46	46	46	46	42	
			fz	0.011	0.011	0.011	0.011	0.010	0.010	0.010	0.010	0.009	0.009	0.007	0.014	0.014	0.014	0.014	0.014	0.014	0.013	
			RPM	49178	49178	49178	49178	44260	44260	44260	44260	39342	39342	14753	49178	49178	49178	49178	49178	49178	44260	
			FEED	1082	1082	1082	1082	885	885	885	885	708	708	207	1377	1377	1377	1377	1377	1377	1151	
			Ap	0.003	0.003	0.003	0.003	0.003	0.003	0.002	0.002	0.002	0.002	0.001	0.005	0.005	0.005	0.005	0.005	0.005	0.004	
	41	Hardened Cast Iron	Vc	29	29	29	29	26	26	26	26	23	23	9	41	41	41	41	41	41	37	
			fz	0.010	0.010	0.010	0.010	0.009	0.009	0.009	0.009	0.008	0.008	0.006	0.013	0.013	0.013	0.013	0.013	0.013	0.012	
			RPM	45900	45900	45900	45900	41310	41310	41310	41310	36720	36720	13770	43714	43714	43714	43714	43714	43714	39343	
			FEED	918	918	918	918	744	744	744	744	588	588	165	1137	1137	1137	1137	1137	1137	944	
			Ap	0.003	0.003	0.003	0.003	0.003	0.003	0.002	0.002	0.002	0.002	0.001	0.005	0.005	0.005	0.005	0.005	0.005	0.004	

▶ NEXT PAGE



X1-EH END MILLS

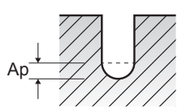
RECOMMENDED CUTTING CONDITIONS

HPI91, HPI92 SERIES — 2 FLUTE BALL NOSE for RIB PROCESSING

Vc = m/min.
fz = mm/tooth
RPM = rev./min.
FEED = mm/min.
Ap = mm
LBS = Length Below Shank

ISO	VDI 3323	Para-meter	Diameter (Ø)																					
			0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.5
			LBS	2	2.25	2.5	3	3.5	4	5	7	0.5	0.8	1	1.5	2	2.5	3	3.5	4	4.5	5	6	7	1
P	5	Vc	42	42	42	42	37	37	28	14	67	67	67	67	67	60	60	60	60	54	54	54	40	82
		fz	0.014	0.014	0.014	0.014	0.012	0.012	0.011	0.009	0.019	0.019	0.019	0.019	0.019	0.017	0.017	0.017	0.017	0.015	0.015	0.015	0.013	0.024
		RPM	44260	44260	44260	44260	39342	39342	29507	14753	53277	53277	53277	53277	53277	47949	47949	47949	47949	42622	42622	42622	31966	52458
		FEED	1239	1239	1239	1239	944	944	649	266	2025	2025	2025	2025	2025	1630	1630	1630	1630	1279	1279	1279	831	2518
		Ap	0.005	0.005	0.004	0.004	0.004	0.004	0.003	0.002	0.008	0.008	0.008	0.007	0.007	0.006	0.006	0.006	0.006	0.006	0.006	0.005	0.004	0.010
	8-9	Vc	42	42	42	42	37	37	28	14	67	67	67	67	67	60	60	60	60	54	54	54	40	82
		fz	0.014	0.014	0.014	0.014	0.012	0.012	0.011	0.009	0.019	0.019	0.019	0.019	0.019	0.017	0.017	0.017	0.017	0.015	0.015	0.015	0.013	0.024
		RPM	44260	44260	44260	44260	39342	39342	29507	14753	53277	53277	53277	53277	53277	47949	47949	47949	47949	42622	42622	42622	31966	52458
		FEED	1239	1239	1239	1239	944	944	649	266	2025	2025	2025	2025	2025	1630	1630	1630	1630	1279	1279	1279	831	2518
		Ap	0.005	0.005	0.004	0.004	0.004	0.004	0.003	0.002	0.008	0.008	0.008	0.007	0.007	0.006	0.006	0.006	0.006	0.006	0.006	0.005	0.004	0.010
	11.1	Vc	42	42	42	42	37	37	28	14	67	67	67	67	67	60	60	60	60	54	54	54	40	82
		fz	0.014	0.014	0.014	0.014	0.012	0.012	0.011	0.009	0.019	0.019	0.019	0.019	0.019	0.017	0.017	0.017	0.017	0.015	0.015	0.015	0.013	0.024
		RPM	44260	44260	44260	44260	39342	39342	29507	14753	53277	53277	53277	53277	53277	47949	47949	47949	47949	42622	42622	42622	31966	52458
		FEED	1239	1239	1239	1239	944	944	649	266	2025	2025	2025	2025	2025	1630	1630	1630	1630	1279	1279	1279	831	2518
		Ap	0.005	0.005	0.004	0.004	0.004	0.004	0.003	0.002	0.008	0.008	0.008	0.007	0.007	0.006	0.006	0.006	0.006	0.006	0.006	0.005	0.004	0.010
	11.2	Vc	42	42	42	42	37	37	28	14	67	67	67	67	67	60	60	60	60	54	54	54	40	82
		fz	0.013	0.013	0.013	0.013	0.011	0.011	0.010	0.008	0.017	0.017	0.017	0.017	0.017	0.015	0.015	0.015	0.015	0.014	0.014	0.014	0.012	0.021
		RPM	44260	44260	44260	44260	39342	39342	29507	14753	53277	53277	53277	53277	53277	47949	47949	47949	47949	42622	42622	42622	31966	52458
		FEED	1151	1151	1151	1151	866	866	590	236	1811	1811	1811	1811	1811	1438	1438	1438	1438	1193	1193	1193	767	2203
		Ap	0.004	0.004	0.004	0.004	0.004	0.003	0.003	0.001	0.007	0.007	0.007	0.006	0.006	0.005	0.005	0.005	0.005	0.005	0.005	0.004	0.003	0.009
H	38.1	Vc	42	42	42	42	37	37	28	14	67	67	67	67	67	60	60	60	60	54	54	54	40	82
		fz	0.013	0.013	0.013	0.013	0.011	0.011	0.010	0.008	0.017	0.017	0.017	0.017	0.017	0.015	0.015	0.015	0.015	0.014	0.014	0.014	0.012	0.021
		RPM	44260	44260	44260	44260	39342	39342	29507	14753	53277	53277	53277	53277	53277	47949	47949	47949	47949	42622	42622	42622	31966	52458
		FEED	1151	1151	1151	1151	866	866	590	236	1811	1811	1811	1811	1811	1438	1438	1438	1438	1193	1193	1193	767	2203
		Ap	0.004	0.004	0.004	0.004	0.004	0.003	0.003	0.001	0.007	0.007	0.007	0.006	0.006	0.005	0.005	0.005	0.005	0.005	0.005	0.004	0.003	0.009
	38.2	Vc	37	37	37	37	33	33	25	12	57	57	57	57	57	51	51	51	51	45	45	45	34	72
		fz	0.012	0.012	0.012	0.012	0.010	0.010	0.009	0.008	0.017	0.017	0.017	0.017	0.017	0.015	0.015	0.015	0.015	0.014	0.014	0.014	0.012	0.021
		RPM	39343	39343	39343	39343	34971	34971	26228	13114	45081	45081	45081	45081	45081	40573	40573	40573	40573	36065	36065	36065	27049	45900
		FEED	944	944	944	944	699	699	472	210	1533	1533	1533	1533	1533	1217	1217	1217	1217	1010	1010	1010	649	1928
		Ap	0.004	0.004	0.004	0.004	0.004	0.003	0.003	0.001	0.007	0.007	0.007	0.006	0.006	0.005	0.005	0.005	0.005	0.005	0.005	0.004	0.003	0.009
	39.1	Vc	37	37	37	37	33	33	25	12	52	52	52	52	52	46	46	46	46	41	41	41	31	67
		fz	0.011	0.011	0.011	0.011	0.010	0.010	0.008	0.007	0.015	0.015	0.015	0.015	0.015	0.014	0.014	0.014	0.014	0.012	0.012	0.012	0.011	0.019
		RPM	39343	39343	39343	39343	34971	34971	26228	13114	40983	40983	40983	40983	40983	36885	36885	36885	36885	32786	32786	32786	24590	42621
		FEED	866	866	866	866	699	699	420	184	1229	1229	1229	1229	1229	1033	1033	1033	1033	787	787	787	541	1620
		Ap	0.004	0.004	0.003	0.003	0.003	0.003	0.002	0.001	0.006	0.006	0.006	0.006	0.006	0.005	0.005	0.004	0.004	0.004	0.004	0.004	0.003	0.008
	39.2	Vc	32	32	32	32	29	29	22	11	46	46	46	46	46	42	42	42	42	37	37	37	28	57
		fz	0.011	0.011	0.011	0.011	0.010	0.010	0.008	0.007	0.015	0.015	0.015	0.015	0.015	0.014	0.014	0.014	0.014	0.012	0.012	0.012	0.011	0.019
		RPM	34425	34425	34425	34425	30600	30600	22950	11475	36884	36884	36884	36884	36884	33196	33196	33196	33196	29507	29507	29507	22130	36064
		FEED	757	757	757	757	612	612	367	161	1107	1107	1107	1107	1107	929	929	929	929	708	708	708	487	1370
		Ap	0.004	0.004	0.003	0.003	0.003	0.003	0.002	0.001	0.006	0.006	0.006	0.006	0.006	0.005	0.005	0.004	0.004	0.004	0.004	0.004	0.003	0.008
	39.3	Vc	28	28	28	28	25	25	19	9	41	41	41	41	41	37	37	37	37	33	33	33	25	52
		fz	0.010	0.010	0.010	0.010	0.009	0.009	0.008	0.007	0.014	0.014	0.014	0.014	0.014	0.013	0.013	0.013	0.013	0.011	0.011	0.011	0.010	0.017
		RPM	29507	29507	29507	29507	26229	26229	19672	9836	32786	32786	32786	32786	32786	29507	29507	29507	29507	26229	26229	26229	19672	32786
		FEED	590	590	590	590	472	472	315	138	918	918	918	918	918	767	767	767	767	577	577	577	393	1115
		Ap	0.003	0.003	0.003	0.003	0.003	0.003	0.002	0.001	0.005	0.005	0.005	0.005	0.005	0.004	0.004	0.004	0.004	0.004	0.004	0.003	0.003	0.007
	40	Vc	42	42	42	42	37	37	28	14	67	67	67	67	67	60	60	60	60	54	54	54	40	82
		fz	0.013	0.013	0.013	0.013	0.011	0.011	0.010	0.008	0.017	0.017	0.017	0.017	0.017	0.015	0.015	0.015	0.015	0.014	0.014	0.014	0.012	0.021
		RPM	44260	44260	44260	44260	39342	39342	29507	14753	53277	53277	53277	53277	53277	47949	47949	47949	47949	42622	42622	42622	31966	52458
		FEED	1151	1151	1151	1151	866	866	590	236	1811	1811	1811	1811	1811	1438	1438	1438	1438	1193	1193	1193	767	2203
		Ap	0.004	0.004	0.004	0.004	0.004	0.003	0.003	0.001	0.007	0.007	0.007	0.006	0.006	0.005	0.005	0.005	0.005	0.005	0.005	0.004	0.003	0.009
	41	Vc	37	37	37	37	33	33	25	12	57	57	57	57	57	51	51	51	51	45	45	45	34	72
		fz	0.012	0.012	0.012	0.012	0.010	0.010	0.009	0.008	0.017	0.017	0.017	0.017	0.017	0.015	0.015	0.015	0.015	0.014	0.014	0.014	0.012	0.021
		RPM	39343	39343	39343	39343	34971	34971	26228	13114	45081	45081	45081	45081	45081	40573	40573	40573	40573	36065	36065	36065	27049	45900
		FEED	944	944	944	944	699	699	472	210	1533	1533	1533	1533	1533	1217	1217	1217	1217	1010	1010	1010	649	1928
		Ap	0.004	0.004	0.004	0.004	0.004	0.003	0.003	0.001	0.007	0.007	0.007	0.006	0.006	0.005	0.005	0.005	0.005	0.005	0.005	0.004	0.003	0.009

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X1-EH END MILLS

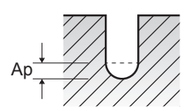
RECOMMENDED CUTTING CONDITIONS

HPI91, HPI92 SERIES — 2 FLUTE BALL NOSE FOR RIB PROCESSING

Vc = m/min.
fz = mm/tooth
RPM = rev./min.
FEED = mm/min.
Ap = mm
LBS = Length Below Shank

ISO	VDI 3323	Para-meter	Diameter (Ø)																					
			0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6		
			LBS	1.25	1.5	2	2.5	3	3.5	4	4.5	5	5.5	6	8	10	1	1.5	2	2.5	3	3.5	4	4.5
P	5	Vc	82	82	82	82	74	74	74	74	74	66	66	49	49	98	98	98	98	98	88	88	88	
		fz	0.024	0.024	0.024	0.024	0.022	0.022	0.022	0.022	0.022	0.019	0.019	0.017	0.017	0.029	0.029	0.029	0.029	0.029	0.026	0.026	0.026	
		RPM	52458	52458	52458	52458	47212	47212	47212	47212	47212	41966	41966	31475	31475	51911	51911	51911	51911	51911	46720	46720	46720	
		FEED	2518	2518	2518	2518	2077	2077	2077	2077	2077	1595	1595	1070	1070	3011	3011	3011	3011	3011	2429	2429	2429	
		Ap	0.010	0.010	0.009	0.009	0.008	0.008	0.008	0.007	0.007	0.007	0.007	0.007	0.005	0.012	0.012	0.011	0.011	0.011	0.010	0.010	0.010	
	8-9	Vc	82	82	82	82	74	74	74	74	74	66	66	49	49	98	98	98	98	98	88	88	88	
		fz	0.024	0.024	0.024	0.024	0.022	0.022	0.022	0.022	0.022	0.019	0.019	0.017	0.017	0.029	0.029	0.029	0.029	0.029	0.026	0.026	0.026	
		RPM	52458	52458	52458	52458	47212	47212	47212	47212	47212	41966	41966	31475	31475	51911	51911	51911	51911	51911	46720	46720	46720	
		FEED	2518	2518	2518	2518	2077	2077	2077	2077	2077	1595	1595	1070	1070	3011	3011	3011	3011	3011	2429	2429	2429	
		Ap	0.010	0.010	0.009	0.009	0.008	0.008	0.008	0.007	0.007	0.007	0.007	0.007	0.005	0.012	0.012	0.011	0.011	0.011	0.010	0.010	0.010	
	11.1	Vc	82	82	82	82	74	74	74	74	74	66	66	49	49	98	98	98	98	98	88	88	88	
		fz	0.024	0.024	0.024	0.024	0.022	0.022	0.022	0.022	0.022	0.019	0.019	0.017	0.017	0.029	0.029	0.029	0.029	0.029	0.026	0.026	0.026	
		RPM	52458	52458	52458	52458	47212	47212	47212	47212	47212	41966	41966	31475	31475	51911	51911	51911	51911	51911	46720	46720	46720	
		FEED	2518	2518	2518	2518	2077	2077	2077	2077	2077	1595	1595	1070	1070	3011	3011	3011	3011	3011	2429	2429	2429	
		Ap	0.010	0.010	0.009	0.009	0.008	0.008	0.008	0.007	0.007	0.007	0.007	0.007	0.005	0.012	0.012	0.011	0.011	0.011	0.010	0.010	0.010	
	11.2	Vc	82	82	82	82	74	74	74	74	74	66	66	49	49	98	98	98	98	98	88	88	88	
		fz	0.021	0.021	0.021	0.021	0.019	0.019	0.019	0.019	0.019	0.017	0.017	0.015	0.015	0.025	0.025	0.025	0.025	0.025	0.023	0.023	0.023	
		RPM	52458	52458	52458	52458	47212	47212	47212	47212	47212	41966	41966	31475	31475	51911	51911	51911	51911	51911	46720	46720	46720	
		FEED	2203	2203	2203	2203	1794	1794	1794	1794	1794	1427	1427	944	944	2596	2596	2596	2596	2596	2149	2149	2149	
		Ap	0.009	0.009	0.008	0.008	0.007	0.007	0.007	0.006	0.006	0.006	0.006	0.006	0.004	0.010	0.010	0.009	0.009	0.009	0.008	0.008	0.008	
H	38.1	Vc	82	82	82	82	74	74	74	74	74	66	66	49	49	98	98	98	98	98	88	88	88	
		fz	0.021	0.021	0.021	0.021	0.019	0.019	0.019	0.019	0.019	0.017	0.017	0.015	0.015	0.025	0.025	0.025	0.025	0.025	0.023	0.023	0.023	
		RPM	52458	52458	52458	52458	47212	47212	47212	47212	47212	41966	41966	31475	31475	51911	51911	51911	51911	51911	46720	46720	46720	
		FEED	2203	2203	2203	2203	1794	1794	1794	1794	1794	1427	1427	944	944	2596	2596	2596	2596	2596	2149	2149	2149	
		Ap	0.009	0.009	0.008	0.008	0.007	0.007	0.007	0.006	0.006	0.006	0.006	0.006	0.004	0.010	0.010	0.009	0.009	0.009	0.008	0.008	0.008	
	38.2	Vc	72	72	72	72	65	65	65	65	65	58	58	43	43	88	88	88	88	88	79	79	79	
		fz	0.021	0.021	0.021	0.021	0.019	0.019	0.019	0.019	0.019	0.017	0.017	0.015	0.015	0.024	0.024	0.024	0.024	0.024	0.022	0.022	0.022	
		RPM	45900	45900	45900	45900	41310	41310	41310	41310	41310	36720	36720	27540	27540	46447	46447	46447	46447	46447	41802	41802	41802	
		FEED	1928	1928	1928	1928	1570	1570	1570	1570	1570	1248	1248	826	826	2229	2229	2229	2229	2229	1839	1839	1839	
		Ap	0.009	0.009	0.008	0.008	0.007	0.007	0.007	0.006	0.006	0.006	0.006	0.006	0.004	0.010	0.010	0.009	0.009	0.009	0.008	0.008	0.008	
	39.1	Vc	67	67	67	67	60	60	60	60	60	54	54	40	40	77	77	77	77	77	70	70	70	
		fz	0.019	0.019	0.019	0.019	0.017	0.017	0.017	0.017	0.017	0.015	0.015	0.013	0.013	0.023	0.023	0.023	0.023	0.023	0.021	0.021	0.021	
		RPM	42621	42621	42621	42621	38359	38359	38359	38359	38359	34097	34097	25573	25573	40983	40983	40983	40983	40983	36885	36885	36885	
		FEED	1620	1620	1620	1620	1304	1304	1304	1304	1304	1023	1023	665	665	1885	1885	1885	1885	1885	1549	1549	1549	
		Ap	0.008	0.008	0.007	0.007	0.007	0.006	0.006	0.006	0.006	0.006	0.006	0.006	0.005	0.004	0.010	0.010	0.009	0.009	0.009	0.008	0.008	0.008
	39.2	Vc	57	57	57	57	51	51	51	51	51	45	45	34	34	67	67	67	67	67	60	60	60	
		fz	0.019	0.019	0.019	0.019	0.017	0.017	0.017	0.017	0.017	0.015	0.015	0.013	0.013	0.023	0.023	0.023	0.023	0.023	0.021	0.021	0.021	
		RPM	36064	36064	36064	36064	32458	32458	32458	32458	32458	28851	28851	21638	21638	35519	35519	35519	35519	35519	31967	31967	31967	
		FEED	1370	1370	1370	1370	1104	1104	1104	1104	1104	866	866	563	563	1634	1634	1634	1634	1634	1343	1343	1343	
		Ap	0.008	0.008	0.007	0.007	0.007	0.006	0.006	0.006	0.006	0.006	0.006	0.006	0.005	0.004	0.010	0.010	0.009	0.009	0.009	0.008	0.008	0.008
	39.3	Vc	52	52	52	52	46	46	46	46	46	41	41	31	31	62	62	62	62	62	56	56	56	
		fz	0.017	0.017	0.017	0.017	0.015	0.015	0.015	0.015	0.015	0.014	0.014	0.012	0.012	0.022	0.022	0.022	0.022	0.022	0.020	0.020	0.020	
		RPM	32786	32786	32786	32786	29507	29507	29507	29507	29507	26229	26229	19672	19672	32786	32786	32786	32786	32786	29507	29507	29507	
		FEED	1115	1115	1115	1115	885	885	885	885	885	734	734	472	472	1443	1443	1443	1443	1443	1180	1180	1180	
		Ap	0.007	0.007	0.006	0.006	0.006	0.005	0.005	0.005	0.005	0.005	0.005	0.004	0.003	0.008	0.008	0.007	0.007	0.007	0.006	0.006	0.006	
	40	Vc	82	82	82	82	74	74	74	74	74	66	66	49	49	98	98	98	98	98	88	88	88	
		fz	0.021	0.021	0.021	0.021	0.019	0.019	0.019	0.019	0.019	0.017	0.017	0.015	0.015	0.025	0.025	0.025	0.025	0.025	0.023	0.023	0.023	
		RPM	52458	52458	52458	52458	47212	47212	47212	47212	47212	41966	41966	31475	31475	51911	51911	51911	51911	51911	46720	46720	46720	
		FEED	2203	2203	2203	2203	1794	1794	1794	1794	1794	1427	1427	944	944	2596	2596	2596	2596	2596	2149	2149	2149	
		Ap	0.009	0.009	0.008	0.008	0.007	0.007	0.007	0.006	0.006	0.006	0.006	0.006	0.004	0.010	0.010	0.009	0.009	0.009	0.008	0.008	0.008	
	41	Vc	72	72	72	72	65	65	65	65	65	58	58	43	43	88	88	88	88	88	79	79	79	
		fz	0.021	0.021	0.021	0.021	0.019	0.019	0.019	0.019	0.019	0.017	0.017	0.015	0.015	0.024	0.024	0.024	0.024	0.024	0.022	0.022	0.022	
		RPM	45900	45900	45900	45900	41310	41310	41310	41310	41310	36720	36720	27540	27540	46447	46447	46447	46447	46447	41802	41802	41802	
		FEED	1928	1928	1928	1928	1570	1570	1570	1570	1570	1248	1248	826	826	2229	2229	2229	2229	2229	1839	1839	1839	
		Ap	0.009	0.009	0.008	0.008	0.007	0.007	0.007	0.006	0.006	0.006	0.006	0.006	0.004	0.010	0.010	0.009	0.009	0.009	0.008	0.008	0.008	

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X1-EH END MILLS

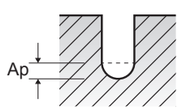
RECOMMENDED CUTTING CONDITIONS

HPI91, HPI92 SERIES — 2 FLUTE BALL NOSE for RIB PROCESSING

Vc = m/min.
fz = mm/tooth
RPM = rev./min.
FEED = mm/min.
Ap = mm
LBS = Length Below Shank

ISO	VDI 3323	Para-meter	Diameter (Ø)																					
			0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.7	0.7	0.7	0.7	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.9
			LBS	5	5.5	6	7	8	9	10	12	2	4	6	8	2	3	4	5	6	7	8	10	12	2
P	5	Vc	88	88	88	78	78	78	59	59	114	103	103	91	129	129	129	116	116	116	116	103	103	145
		fz	0.026	0.026	0.026	0.023	0.023	0.023	0.020	0.020	0.029	0.026	0.026	0.023	0.039	0.039	0.039	0.035	0.035	0.035	0.035	0.031	0.031	0.039
		RPM	46720	46720	46720	41529	41529	41529	31147	31147	51911	46720	46720	41529	51228	51228	51228	46105	46105	46105	46105	40982	40982	51228
		FEED	2429	2429	2429	1910	1910	1910	1246	1246	3011	2429	2429	1910	3996	3996	3996	3227	3227	3227	3227	2541	2541	3996
		Ap	0.008	0.008	0.008	0.008	0.008	0.008	0.006	0.006	0.014	0.011	0.010	0.010	0.016	0.014	0.014	0.013	0.013	0.011	0.011	0.011	0.010	0.018
	8-9	Vc	88	88	88	78	78	78	59	59	114	103	103	91	129	129	129	116	116	116	116	103	103	145
		fz	0.026	0.026	0.026	0.023	0.023	0.023	0.020	0.020	0.029	0.026	0.026	0.023	0.039	0.039	0.039	0.035	0.035	0.035	0.035	0.031	0.031	0.039
		RPM	46720	46720	46720	41529	41529	41529	31147	31147	51911	46720	46720	41529	51228	51228	51228	46105	46105	46105	46105	40982	40982	51228
		FEED	2429	2429	2429	1910	1910	1910	1246	1246	3011	2429	2429	1910	3996	3996	3996	3227	3227	3227	3227	2541	2541	3996
		Ap	0.008	0.008	0.008	0.008	0.008	0.008	0.006	0.006	0.014	0.011	0.010	0.010	0.016	0.014	0.014	0.013	0.013	0.011	0.011	0.011	0.010	0.018
	11.1	Vc	88	88	88	78	78	78	59	59	114	103	103	91	129	129	129	116	116	116	116	103	103	145
		fz	0.026	0.026	0.026	0.023	0.023	0.023	0.020	0.020	0.029	0.026	0.026	0.023	0.039	0.039	0.039	0.035	0.035	0.035	0.035	0.031	0.031	0.039
		RPM	46720	46720	46720	41529	41529	41529	31147	31147	51911	46720	46720	41529	51228	51228	51228	46105	46105	46105	46105	40982	40982	51228
		FEED	2429	2429	2429	1910	1910	1910	1246	1246	3011	2429	2429	1910	3996	3996	3996	3227	3227	3227	3227	2541	2541	3996
		Ap	0.008	0.008	0.008	0.008	0.008	0.008	0.006	0.006	0.014	0.011	0.010	0.010	0.016	0.014	0.014	0.013	0.013	0.011	0.011	0.011	0.010	0.018
	11.2	Vc	88	88	88	78	78	78	59	59	114	103	103	91	129	129	129	116	116	116	116	103	103	145
		fz	0.023	0.023	0.023	0.020	0.020	0.020	0.018	0.018	0.025	0.023	0.023	0.020	0.033	0.033	0.033	0.030	0.030	0.030	0.030	0.026	0.026	0.033
		RPM	46720	46720	46720	41529	41529	41529	31147	31147	51911	46720	46720	41529	51228	51228	51228	46105	46105	46105	46105	40982	40982	51228
		FEED	2149	2149	2149	1661	1661	1661	1121	1121	2596	2149	2149	1661	3381	3381	3381	2766	2766	2766	2766	2131	2131	3381
		Ap	0.007	0.007	0.007	0.007	0.007	0.007	0.005	0.005	0.012	0.010	0.008	0.008	0.014	0.012	0.012	0.011	0.011	0.010	0.010	0.010	0.009	0.015
H	38.1	Vc	88	88	88	78	78	78	59	59	114	103	103	91	129	129	129	116	116	116	116	103	103	145
		fz	0.023	0.023	0.023	0.020	0.020	0.020	0.018	0.018	0.025	0.023	0.023	0.020	0.033	0.033	0.033	0.030	0.030	0.030	0.030	0.026	0.026	0.033
		RPM	46720	46720	46720	41529	41529	41529	31147	31147	51911	46720	46720	41529	51228	51228	51228	46105	46105	46105	46105	40982	40982	51228
		FEED	2149	2149	2149	1661	1661	1661	1121	1121	2596	2149	2149	1661	3381	3381	3381	2766	2766	2766	2766	2131	2131	3381
		Ap	0.007	0.007	0.007	0.007	0.007	0.007	0.005	0.005	0.012	0.010	0.008	0.008	0.014	0.012	0.012	0.011	0.011	0.010	0.010	0.010	0.009	0.015
	38.2	Vc	79	79	79	70	70	70	53	53	102	92	92	82	118	118	118	107	107	107	107	95	95	133
		fz	0.022	0.022	0.022	0.019	0.019	0.019	0.017	0.017	0.024	0.022	0.022	0.019	0.033	0.033	0.033	0.030	0.030	0.030	0.030	0.026	0.026	0.033
		RPM	41802	41802	41802	37158	37158	37158	27868	27868	46447	41802	41802	37158	47130	47130	47130	42417	42417	42417	42417	37704	37704	47130
		FEED	1839	1839	1839	1412	1412	1412	948	948	2229	1839	1839	1412	3111	3111	3111	2545	2545	2545	2545	1961	1961	3111
		Ap	0.007	0.007	0.007	0.007	0.007	0.007	0.005	0.005	0.012	0.010	0.008	0.008	0.014	0.012	0.012	0.011	0.011	0.010	0.010	0.010	0.009	0.015
	39.1	Vc	70	70	70	62	62	62	46	46	90	81	81	72	103	103	103	93	93	93	93	82	82	116
		fz	0.021	0.021	0.021	0.018	0.018	0.018	0.016	0.016	0.023	0.021	0.021	0.018	0.030	0.030	0.030	0.027	0.027	0.027	0.027	0.024	0.024	0.030
		RPM	36885	36885	36885	32786	32786	32786	24590	24590	40983	36885	36885	32786	40983	40983	40983	36885	36885	36885	36885	32786	32786	40983
		FEED	1549	1549	1549	1180	1180	1180	787	787	1885	1549	1549	1180	2459	2459	2459	1992	1992	1992	1992	1574	1574	2459
		Ap	0.007	0.007	0.007	0.007	0.006	0.006	0.005	0.005	0.011	0.009	0.008	0.008	0.013	0.012	0.012	0.010	0.010	0.009	0.009	0.009	0.008	0.014
	39.2	Vc	60	60	60	54	54	54	40	40	78	70	70	62	93	93	93	83	83	83	83	74	74	104
		fz	0.021	0.021	0.021	0.018	0.018	0.018	0.016	0.016	0.023	0.021	0.021	0.018	0.030	0.030	0.030	0.027	0.027	0.027	0.027	0.024	0.024	0.030
		RPM	31967	31967	31967	28415	28415	28415	21311	21311	35519	31967	31967	28415	36884	36884	36884	33196	33196	33196	33196	29507	29507	36884
		FEED	1343	1343	1343	1023	1023	1023	682	682	1634	1343	1343	1023	2213	2213	2213	1793	1793	1793	1793	1416	1416	2213
		Ap	0.007	0.007	0.007	0.007	0.006	0.006	0.005	0.005	0.011	0.009	0.008	0.008	0.013	0.012	0.012	0.010	0.010	0.009	0.009	0.009	0.008	0.014
	39.3	Vc	56	56	56	49	49	49	37	37	72	65	65	58	82	82	82	74	74	74	74	66	66	93
		fz	0.020	0.020	0.020	0.018	0.018	0.018	0.015	0.015	0.022	0.020	0.020	0.018	0.029	0.029	0.029	0.026	0.026	0.026	0.026	0.023	0.023	0.029
		RPM	29507	29507	29507	26229	26229	26229	19672	19672	32786	29507	29507	26229	32786	32786	32786	29507	29507	29507	29507	26229	26229	32786
		FEED	1180	1180	1180	944	944	944	590	590	1443	1180	1180	944	1902	1902	1902	1534	1534	1534	1534	1207	1207	1902
		Ap	0.005	0.005	0.005	0.005	0.005	0.005	0.004	0.004	0.009	0.007	0.006	0.006	0.010	0.009	0.009	0.008	0.008	0.007	0.007	0.007	0.007	0.012
	40	Vc	88	88	88	78	78	78	59	59	114	103	103	91	129	129	129	116	116	116	116	103	103	145
		fz	0.023	0.023	0.023	0.020	0.020	0.020	0.018	0.018	0.025	0.023	0.023	0.020	0.033	0.033	0.033	0.030	0.030	0.030	0.030	0.026	0.026	0.033
		RPM	46720	46720	46720	41529	41529	41529	31147	31147	51911	46720	46720	41529	51228	51228	51228	46105	46105	46105	46105	40982	40982	51228
		FEED	2149	2149	2149	1661	1661	1661	1121	1121	2596	2149	2149	1661	3381	3381	3381	2766	2766	2766	2766	2131	2131	3381
		Ap	0.007	0.007	0.007	0.007	0.007	0.007	0.005	0.005	0.012	0.010	0.008	0.008	0.014	0.012	0.012	0.011	0.011	0.010	0.010	0.010	0.009	0.015
	41	Vc	79	79	79	70	70	70	53	53	102	92	92	82	118	118	118	107	107	107	107	95	95	133
		fz	0.022	0.022	0.022	0.019	0.019	0.019	0.017	0.017	0.024	0.022	0.022	0.019	0.033	0.033	0.033	0.030	0.030	0.030	0.030	0.026	0.026	0.033
		RPM	41802	41802	41802	37158	37158	37158	27868	27868	46447	41802	41802	37158	47130	47130	47130	42417	42417	42417	42417	37704	37704	47130
		FEED	1839	1839	1839	1412	1412	1412	948	948	2229	1839	1839	1412	3111	3111	3111	2545	2545	2545	2545	1961	1961	3111
		Ap	0.007	0.007	0.007	0.007	0.007	0.007	0.005	0.005	0.012	0.010	0.008	0.008	0.014	0.012	0.012	0.011	0.011	0.010	0.010	0.010	0.009	0.015

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X1-EH END MILLS

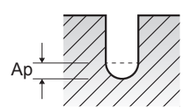
RECOMMENDED CUTTING CONDITIONS

HPI91, HPI92 SERIES — 2 FLUTE BALL NOSE for RIB PROCESSING

Vc = m/min.
fz = mm/tooth
RPM = rev./min.
FEED = mm/min.
Ap = mm
LBS = Length Below Shank

ISO	VDI 3323	Para-meter	Diameter (Ø)																					
			0.9	0.9	0.9	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
			LBS	4	6	8	2	2.5	3	4	5	6	7	8	9	10	12	13	14	16	18	20	22	25
P	5	Vc	145	130	130	160	160	160	160	160	144	144	144	144	144	128	128	128	96	96	96	48	48
		fz	0.039	0.035	0.035	0.048	0.048	0.048	0.048	0.048	0.043	0.043	0.043	0.043	0.043	0.038	0.038	0.038	0.034	0.034	0.034	0.029	0.029
		RPM	51228	46105	46105	50818	50818	50818	50818	50818	45736	45736	45736	45736	45736	40654	40654	40654	30491	30491	30491	15245	15245
		FEED	3996	3227	3227	4879	4879	4879	4879	4879	3933	3933	3933	3933	3933	3090	3090	3090	2073	2073	2073	884	884
		Ap	0.016	0.014	0.013	0.020	0.020	0.020	0.018	0.018	0.016	0.016	0.016	0.014	0.014	0.014	0.014	0.013	0.013	0.010	0.010	0.005	0.005
	8-9	Vc	145	130	130	160	160	160	160	160	144	144	144	144	144	128	128	128	96	96	96	48	48
		fz	0.039	0.035	0.035	0.048	0.048	0.048	0.048	0.048	0.043	0.043	0.043	0.043	0.043	0.038	0.038	0.038	0.034	0.034	0.034	0.029	0.029
		RPM	51228	46105	46105	50818	50818	50818	50818	50818	45736	45736	45736	45736	45736	40654	40654	40654	30491	30491	30491	15245	15245
		FEED	3996	3227	3227	4879	4879	4879	4879	4879	3933	3933	3933	3933	3933	3090	3090	3090	2073	2073	2073	884	884
		Ap	0.016	0.014	0.013	0.020	0.020	0.020	0.018	0.018	0.016	0.016	0.016	0.014	0.014	0.014	0.014	0.013	0.013	0.010	0.010	0.005	0.005
	11.1	Vc	145	130	130	160	160	160	160	160	144	144	144	144	144	128	128	128	96	96	96	48	48
		fz	0.039	0.035	0.035	0.048	0.048	0.048	0.048	0.048	0.043	0.043	0.043	0.043	0.043	0.038	0.038	0.038	0.034	0.034	0.034	0.029	0.029
		RPM	51228	46105	46105	50818	50818	50818	50818	50818	45736	45736	45736	45736	45736	40654	40654	40654	30491	30491	30491	15245	15245
		FEED	3996	3227	3227	4879	4879	4879	4879	4879	3933	3933	3933	3933	3933	3090	3090	3090	2073	2073	2073	884	884
		Ap	0.016	0.014	0.013	0.020	0.020	0.020	0.018	0.018	0.016	0.016	0.016	0.014	0.014	0.014	0.014	0.013	0.013	0.010	0.010	0.005	0.005
	11.2	Vc	145	130	130	160	160	160	160	160	144	144	144	144	144	128	128	128	96	96	96	48	48
		fz	0.033	0.030	0.030	0.042	0.042	0.042	0.042	0.042	0.038	0.038	0.038	0.038	0.038	0.034	0.034	0.034	0.029	0.029	0.029	0.025	0.025
		RPM	51228	46105	46105	50818	50818	50818	50818	50818	45736	45736	45736	45736	45736	40654	40654	40654	30491	30491	30491	15245	15245
		FEED	3381	2766	2766	4269	4269	4269	4269	4269	3476	3476	3476	3476	3476	2764	2764	2764	1768	1768	1768	762	762
		Ap	0.014	0.012	0.011	0.017	0.017	0.017	0.015	0.015	0.014	0.014	0.014	0.012	0.012	0.012	0.012	0.011	0.011	0.009	0.009	0.004	0.004
H	38.1	Vc	145	130	130	160	160	160	160	160	144	144	144	144	144	128	128	128	96	96	96	48	48
		fz	0.033	0.030	0.030	0.042	0.042	0.042	0.042	0.042	0.038	0.038	0.038	0.038	0.038	0.034	0.034	0.034	0.029	0.029	0.029	0.025	0.025
		RPM	51228	46105	46105	50818	50818	50818	50818	50818	45736	45736	45736	45736	45736	40654	40654	40654	30491	30491	30491	15245	15245
		FEED	3381	2766	2766	4269	4269	4269	4269	4269	3476	3476	3476	3476	3476	2764	2764	2764	1768	1768	1768	762	762
		Ap	0.014	0.012	0.011	0.017	0.017	0.017	0.015	0.015	0.014	0.014	0.014	0.012	0.012	0.012	0.012	0.011	0.011	0.009	0.009	0.004	0.004
	38.2	Vc	133	120	120	144	144	144	144	144	130	130	130	130	130	115	115	115	87	87	87	43	43
		fz	0.033	0.030	0.030	0.042	0.042	0.042	0.042	0.042	0.038	0.038	0.038	0.038	0.038	0.034	0.034	0.034	0.029	0.029	0.029	0.025	0.025
		RPM	47130	42417	42417	45900	45900	45900	45900	45900	41310	41310	41310	41310	41310	36720	36720	36720	27540	27540	27540	13770	13770
		FEED	3111	2545	2545	3856	3856	3856	3856	3856	3140	3140	3140	3140	3140	2497	2497	2497	1597	1597	1597	689	689
		Ap	0.014	0.012	0.011	0.017	0.017	0.017	0.015	0.015	0.014	0.014	0.014	0.012	0.012	0.012	0.012	0.011	0.011	0.009	0.009	0.004	0.004
	39.1	Vc	116	104	104	129	129	129	129	129	116	116	116	116	116	103	103	103	77	77	77	39	39
		fz	0.030	0.027	0.027	0.038	0.038	0.038	0.038	0.038	0.034	0.034	0.034	0.034	0.034	0.030	0.030	0.030	0.027	0.027	0.027	0.023	0.023
		RPM	40983	36885	36885	40983	40983	40983	40983	40983	36885	36885	36885	36885	36885	32786	32786	32786	24590	24590	24590	12295	12295
		FEED	2459	1992	1992	3115	3115	3115	3115	3115	2508	2508	2508	2508	2508	1967	1967	1967	1328	1328	1328	566	566
		Ap	0.013	0.012	0.010	0.016	0.016	0.016	0.014	0.014	0.013	0.013	0.013	0.011	0.011	0.011	0.011	0.010	0.010	0.008	0.008	0.004	0.004
	39.2	Vc	104	94	94	113	113	113	113	113	102	102	102	102	102	91	91	91	68	68	68	34	34
		fz	0.030	0.027	0.027	0.037	0.037	0.037	0.037	0.037	0.033	0.033	0.033	0.033	0.033	0.030	0.030	0.030	0.026	0.026	0.026	0.022	0.022
		RPM	36884	33196	33196	36064	36064	36064	36064	36064	32458	32458	32458	32458	32458	28851	28851	28851	21638	21638	21638	10819	10819
		FEED	2213	1793	1793	2669	2669	2669	2669	2669	2142	2142	2142	2142	2142	1731	1731	1731	1125	1125	1125	476	476
		Ap	0.013	0.012	0.010	0.016	0.016	0.016	0.014	0.014	0.013	0.013	0.013	0.011	0.011	0.011	0.011	0.010	0.010	0.008	0.008	0.004	0.004
	39.3	Vc	93	83	83	113	113	113	113	113	102	102	102	102	102	91	91	91	68	68	68	34	34
		fz	0.029	0.026	0.026	0.033	0.033	0.033	0.033	0.033	0.030	0.030	0.030	0.030	0.030	0.026	0.026	0.026	0.023	0.023	0.023	0.020	0.020
		RPM	32786	29507	29507	36064	36064	36064	36064	36064	32458	32458	32458	32458	32458	28851	28851	28851	21638	21638	21638	10819	10819
		FEED	1902	1534	1534	2380	2380	2380	2380	2380	1947	1947	1947	1947	1947	1500	1500	1500	995	995	995	433	433
		Ap	0.011	0.009	0.008	0.013	0.013	0.013	0.012	0.012	0.010	0.010	0.010	0.009	0.009	0.009	0.009	0.008	0.008	0.007	0.007	0.003	0.003
	40	Vc	145	130	130	160	160	160	160	160	144	144	144	144	144	128	128	128	96	96	96	48	48
		fz	0.033	0.030	0.030	0.042	0.042	0.042	0.042	0.042	0.038	0.038	0.038	0.038	0.038	0.034	0.034	0.034	0.029	0.029	0.029	0.025	0.025
		RPM	51228	46105	46105	50818	50818	50818	50818	50818	45736	45736	45736	45736	45736	40654	40654	40654	30491	30491	30491	15245	15245
		FEED	3381	2766	2766	4269	4269	4269	4269	4269	3476	3476	3476	3476	3476	2764	2764	2764	1768	1768	1768	762	762
		Ap	0.014	0.012	0.011	0.017	0.017	0.017	0.015	0.015	0.014	0.014	0.014	0.012	0.012	0.012	0.012	0.011	0.011	0.009	0.009	0.004	0.004
	41	Vc	133	120	120	144	144	144	144	144	130	130	130	130	130	115	115	115	87	87	87	43	43
		fz	0.033	0.030	0.030	0.042	0.042	0.042	0.042	0.042	0.038	0.038	0.038	0.038	0.038	0.034	0.034	0.034	0.029	0.029	0.029	0.025	0.025
		RPM	47130	42417	42417	45900	45900	45900	45900	45900	41310	41310	41310	41310	41310	36720	36720	36720	27540	27540	27540	13770	13770
		FEED	3111	2545	2545	3856	3856	3856	3856	3856	3140	3140	3140	3140	3140	2497	2497	2497	1597	1597	1597	689	689
		Ap	0.014	0.012	0.011	0.017	0.017	0.017	0.015	0.015	0.014	0.014	0.014	0.012	0.012	0.012	0.012	0.011	0.011	0.009	0.009	0.004	0.004

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X1-EH END MILLS

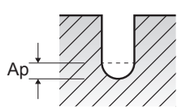
RECOMMENDED CUTTING CONDITIONS

HPI91, HPI92 SERIES — 2 FLUTE BALL NOSE for RIB PROCESSING

Vc = m/min.
fz = mm/tooth
RPM = rev./min.
FEED = mm/min.
Ap = mm
LBS = Length Below Shank

ISO	VDI 3323	Para-meter	Diameter (Ø)																					
			1	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.4	1.4	1.4	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5
			LBS	30	2.4	4	6	8	10	12	14	16	8	12	16	3	3.8	4	6	8	10	12	14	15	16
P	5	Vc	48	196	196	196	176	176	176	157	157	197	197	175	242	242	242	242	218	218	218	218	218	194
		fz	0.029	0.051	0.051	0.051	0.046	0.046	0.046	0.041	0.041	0.048	0.048	0.042	0.054	0.054	0.054	0.054	0.049	0.049	0.049	0.049	0.049	0.043
		RPM	15245	51911	51911	51911	46720	46720	46720	41529	41529	44814	44814	39834	51365	51365	51365	51365	46229	46229	46229	46229	46229	41092
		FEED	884	5295	5295	5295	4298	4298	4298	3405	3405	4302	4302	3346	5547	5547	5547	5547	4530	4530	4530	4530	4530	3534
		Ap	0.005	0.024	0.022	0.022	0.019	0.017	0.017	0.017	0.016	0.022	0.020	0.020	0.030	0.030	0.030	0.027	0.024	0.024	0.024	0.021	0.021	0.021
	8-9	Vc	48	196	196	196	176	176	176	157	157	197	197	175	242	242	242	242	218	218	218	218	218	194
		fz	0.029	0.051	0.051	0.051	0.046	0.046	0.046	0.041	0.041	0.048	0.048	0.042	0.054	0.054	0.054	0.054	0.049	0.049	0.049	0.049	0.049	0.043
		RPM	15245	51911	51911	51911	46720	46720	46720	41529	41529	44814	44814	39834	51365	51365	51365	51365	46229	46229	46229	46229	46229	41092
		FEED	884	5295	5295	5295	4298	4298	4298	3405	3405	4302	4302	3346	5547	5547	5547	5547	4530	4530	4530	4530	4530	3534
		Ap	0.005	0.024	0.022	0.022	0.019	0.017	0.017	0.017	0.016	0.022	0.020	0.020	0.030	0.030	0.030	0.027	0.024	0.024	0.024	0.021	0.021	0.021
	11.1	Vc	48	196	196	196	176	176	176	157	157	197	197	175	242	242	242	242	218	218	218	218	218	194
		fz	0.029	0.051	0.051	0.051	0.046	0.046	0.046	0.041	0.041	0.048	0.048	0.042	0.054	0.054	0.054	0.054	0.049	0.049	0.049	0.049	0.049	0.043
		RPM	15245	51911	51911	51911	46720	46720	46720	41529	41529	44814	44814	39834	51365	51365	51365	51365	46229	46229	46229	46229	46229	41092
		FEED	884	5295	5295	5295	4298	4298	4298	3405	3405	4302	4302	3346	5547	5547	5547	5547	4530	4530	4530	4530	4530	3534
		Ap	0.005	0.024	0.022	0.022	0.019	0.017	0.017	0.017	0.016	0.022	0.020	0.020	0.030	0.030	0.030	0.027	0.024	0.024	0.024	0.021	0.021	0.021
	11.2	Vc	48	185	185	185	167	167	167	148	148	189	189	168	232	232	232	232	209	209	209	209	209	185
		fz	0.025	0.045	0.045	0.045	0.041	0.041	0.041	0.036	0.036	0.041	0.041	0.037	0.047	0.047	0.047	0.047	0.042	0.042	0.042	0.042	0.042	0.038
		RPM	15245	49178	49178	49178	44260	44260	44260	39342	39342	42971	42971	38197	49178	49178	49178	49178	44260	44260	44260	44260	44260	39342
		FEED	762	4426	4426	4426	3585	3585	3585	2833	2833	3558	3558	2811	4623	4623	4623	4623	3718	3718	3718	3718	3718	2990
		Ap	0.004	0.020	0.018	0.018	0.016	0.014	0.014	0.014	0.013	0.019	0.017	0.017	0.026	0.026	0.026	0.023	0.020	0.020	0.020	0.018	0.018	0.018
H	38.1	Vc	48	185	185	185	167	167	167	148	148	189	189	168	232	232	232	232	209	209	209	209	209	185
		fz	0.025	0.045	0.045	0.045	0.041	0.041	0.041	0.036	0.036	0.041	0.041	0.037	0.047	0.047	0.047	0.047	0.042	0.042	0.042	0.042	0.042	0.038
		RPM	15245	49178	49178	49178	44260	44260	44260	39342	39342	42971	42971	38197	49178	49178	49178	49178	44260	44260	44260	44260	44260	39342
		FEED	762	4426	4426	4426	3585	3585	3585	2833	2833	3558	3558	2811	4623	4623	4623	4623	3718	3718	3718	3718	3718	2990
		Ap	0.004	0.020	0.018	0.018	0.016	0.014	0.014	0.014	0.013	0.019	0.017	0.017	0.026	0.026	0.026	0.023	0.020	0.020	0.020	0.018	0.018	0.018
	38.2	Vc	43	165	165	165	148	148	148	132	132	172	172	153	211	211	211	211	190	190	190	190	190	169
		fz	0.025	0.045	0.045	0.045	0.041	0.041	0.041	0.036	0.036	0.041	0.041	0.037	0.047	0.047	0.047	0.047	0.042	0.042	0.042	0.042	0.042	0.038
		RPM	13770	43714	43714	43714	39343	39343	39343	34971	34971	39084	39084	34742	44807	44807	44807	44807	40326	40326	40326	40326	40326	35846
		FEED	689	3934	3934	3934	3226	3226	3226	2518	2518	3205	3205	2571	4212	4212	4212	4212	3387	3387	3387	3387	3387	2724
		Ap	0.004	0.020	0.018	0.018	0.016	0.014	0.014	0.014	0.013	0.019	0.017	0.017	0.026	0.026	0.026	0.023	0.020	0.020	0.020	0.018	0.018	0.018
	39.1	Vc	39	149	149	149	134	134	134	119	119	147	147	130	180	180	180	180	162	162	162	162	162	144
		fz	0.023	0.039	0.039	0.039	0.035	0.035	0.035	0.031	0.031	0.037	0.037	0.033	0.042	0.042	0.042	0.042	0.038	0.038	0.038	0.038	0.038	0.034
		RPM	12295	39616	39616	39616	35654	35654	35654	31693	31693	33354	33354	29648	38250	38250	38250	38250	34425	34425	34425	34425	34425	30600
		FEED	566	3090	3090	3090	2496	2496	2496	1965	1965	2468	2468	1957	3213	3213	3213	3213	2616	2616	2616	2616	2616	2081
		Ap	0.004	0.019	0.017	0.017	0.015	0.013	0.013	0.013	0.012	0.018	0.016	0.016	0.024	0.024	0.024	0.022	0.019	0.019	0.019	0.017	0.017	0.017
	39.2	Vc	34	134	134	134	121	121	121	107	107	130	130	115	160	160	160	160	144	144	144	144	144	128
		fz	0.022	0.040	0.040	0.040	0.036	0.036	0.036	0.032	0.032	0.037	0.037	0.033	0.041	0.041	0.041	0.041	0.037	0.037	0.037	0.037	0.037	0.033
		RPM	10819	35519	35519	35519	31967	31967	31967	28415	28415	29466	29466	26192	33879	33879	33879	33879	30491	30491	30491	30491	30491	27103
		FEED	476	2842	2842	2842	2302	2302	2302	1819	1819	2180	2180	1729	2778	2778	2778	2778	2256	2256	2256	2256	2256	1789
		Ap	0.004	0.019	0.017	0.017	0.015	0.013	0.013	0.013	0.012	0.018	0.016	0.016	0.024	0.024	0.024	0.022	0.019	0.019	0.019	0.017	0.017	0.017
	39.3	Vc	34	118	118	118	107	107	107	95	95	117	117	104	144	144	144	144	130	130	130	130	130	115
		fz	0.020	0.038	0.038	0.038	0.034	0.034	0.034	0.030	0.030	0.035	0.035	0.031	0.039	0.039	0.039	0.039	0.035	0.035	0.035	0.035	0.035	0.031
		RPM	10819	31420	31420	31420	28278	28278	28278	25136	25136	26601	26601	23646	30600	30600	30600	30600	27540	27540	27540	27540	27540	24480
		FEED	433	2388	2388	2388	1923	1923	1923	1508	1508	1862	1862	1466	2387	2387	2387	2387	1928	1928	1928	1928	1928	1518
		Ap	0.003	0.016	0.014	0.014	0.012	0.011	0.011	0.011	0.010	0.015	0.013	0.013	0.020	0.020	0.020	0.018	0.016	0.016	0.016	0.014	0.014	0.014
	40	Vc	48	185	185	185	167	167	167	148	148	189	189	168	232	232	232	232	209	209	209	209	209	185
		fz	0.025	0.045	0.045	0.045	0.041	0.041	0.041	0.036	0.036	0.041	0.041	0.037	0.047	0.047	0.047	0.047	0.042	0.042	0.042	0.042	0.042	0.038
		RPM	15245	49178	49178	49178	44260	44260	44260	39342	39342	42971	42971	38197	49178	49178	49178	49178	44260	44260	44260	44260	44260	39342
		FEED	762	4426	4426	4426	3585	3585	3585	2833	2833	3558	3558	2811	4623	4623	4623	4623	3718	3718	3718	3718	3718	2990
		Ap	0.004	0.020	0.018	0.018	0.016	0.014	0.014	0.014	0.013	0.019	0.017	0.017	0.026	0.026	0.026	0.023	0.020	0.020	0.020	0.018	0.018	0.018
	41	Vc	43	165	165	165	148	148	148	132	132	172	172	153	211	211	211	211	190	190	190	190	190	169
		fz	0.025	0.045	0.045	0.045	0.041	0.041	0.041	0.036	0.036	0.041	0.041	0.037	0.047	0.047	0.047	0.047	0.042	0.042	0.042	0.042	0.042	0.038
		RPM	13770	43714	43714	43714	39343	39343	39343	34971	34971	39084	39084	34742	44807	44807	44807	44807	40326	40326	40326	40326	40326	35846
		FEED	689	3934	3934	3934	3226	3226	3226	2518	2518	3205	3205	2571	4212	4212	4212	4212	3387	3387	3387	3387	3387	2724
		Ap	0.004	0.020	0.018	0.018	0.016	0.014	0.014	0.014	0.013	0.019	0.017	0.017	0.026	0.026	0.026	0.023	0.020	0.020	0.020	0.018	0.018	0.018

▶ NEXT PAGE



X1-EH END MILLS

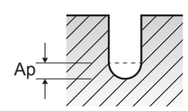
RECOMMENDED CUTTING CONDITIONS

HPI91, HPI92 SERIES — 2 FLUTE BALL NOSE for RIB PROCESSING

Vc = m/min.
fz = mm/tooth
RPM = rev./min.
FEED = mm/min.
Ap = mm
LBS = Length Below Shank

ISO	VDI 3323	Para-meter	Diameter (Ø)																					
			1.5	1.5	1.5	1.5	1.5	1.6	1.6	1.6	1.6	2	2	2	2	2	2	2	2	2	2	2	2	2
			LBS	18	20	22	25	30	8	12	16	20	3	4	6	8	10	12	13	14	16	18	20	22
P	5	Vc	194	194	194	145	145	258	232	232	206	319	319	319	319	319	287	287	287	287	287	287	255
		fz	0.043	0.043	0.043	0.038	0.038	0.055	0.050	0.050	0.044	0.057	0.057	0.057	0.057	0.057	0.051	0.051	0.051	0.051	0.051	0.051	0.046
		RPM	41092	41092	41092	30819	30819	51228	46105	46105	40982	50818	50818	50818	50818	50818	45736	45736	45736	45736	45736	45736	40654
		FEED	3534	3534	3534	2342	2342	5635	4611	4611	3606	5793	5793	5793	5793	5793	4665	4665	4665	4665	4665	4665	3740
		Ap	0.021	0.020	0.020	0.015	0.015	0.029	0.026	0.022	0.022	0.040	0.040	0.040	0.036	0.036	0.032	0.032	0.032	0.032	0.028	0.028	0.028
	8-9	Vc	194	194	194	145	145	258	232	232	206	319	319	319	319	319	287	287	287	287	287	287	255
		fz	0.043	0.043	0.043	0.038	0.038	0.055	0.050	0.050	0.044	0.057	0.057	0.057	0.057	0.057	0.051	0.051	0.051	0.051	0.051	0.051	0.046
		RPM	41092	41092	41092	30819	30819	51228	46105	46105	40982	50818	50818	50818	50818	50818	45736	45736	45736	45736	45736	45736	40654
		FEED	3534	3534	3534	2342	2342	5635	4611	4611	3606	5793	5793	5793	5793	5793	4665	4665	4665	4665	4665	4665	3740
		Ap	0.021	0.020	0.020	0.015	0.015	0.029	0.026	0.022	0.022	0.040	0.040	0.040	0.036	0.036	0.032	0.032	0.032	0.032	0.028	0.028	0.028
	11.1	Vc	194	194	194	145	145	258	232	232	206	319	319	319	319	319	287	287	287	287	287	287	255
		fz	0.043	0.043	0.043	0.038	0.038	0.055	0.050	0.050	0.044	0.057	0.057	0.057	0.057	0.057	0.051	0.051	0.051	0.051	0.051	0.051	0.046
		RPM	41092	41092	41092	30819	30819	51228	46105	46105	40982	50818	50818	50818	50818	50818	45736	45736	45736	45736	45736	45736	40654
		FEED	3534	3534	3534	2342	2342	5635	4611	4611	3606	5793	5793	5793	5793	5793	4665	4665	4665	4665	4665	4665	3740
		Ap	0.021	0.020	0.020	0.015	0.015	0.029	0.026	0.022	0.022	0.040	0.040	0.040	0.036	0.036	0.032	0.032	0.032	0.032	0.028	0.028	0.028
	11.2	Vc	185	185	185	139	139	247	222	222	198	309	309	309	309	309	278	278	278	278	278	278	247
		fz	0.038	0.038	0.038	0.033	0.033	0.048	0.043	0.043	0.038	0.050	0.050	0.050	0.050	0.050	0.045	0.045	0.045	0.045	0.045	0.045	0.040
		RPM	39342	39342	39342	29507	29507	49178	44260	44260	39342	49178	49178	49178	49178	49178	44260	44260	44260	44260	44260	44260	39342
		FEED	2990	2990	2990	1947	1947	4721	3806	3806	2990	4918	4918	4918	4918	4918	3983	3983	3983	3983	3983	3983	3147
		Ap	0.018	0.017	0.017	0.013	0.013	0.024	0.022	0.019	0.019	0.034	0.034	0.034	0.031	0.031	0.027	0.027	0.027	0.027	0.024	0.024	0.024
H	38.1	Vc	185	185	185	139	139	247	222	222	198	309	309	309	309	309	278	278	278	278	278	278	247
		fz	0.038	0.038	0.038	0.033	0.033	0.048	0.043	0.043	0.038	0.050	0.050	0.050	0.050	0.050	0.045	0.045	0.045	0.045	0.045	0.045	0.040
		RPM	39342	39342	39342	29507	29507	49178	44260	44260	39342	49178	49178	49178	49178	49178	44260	44260	44260	44260	44260	44260	39342
		FEED	2990	2990	2990	1947	1947	4721	3806	3806	2990	4918	4918	4918	4918	4918	3983	3983	3983	3983	3983	3983	3147
		Ap	0.018	0.017	0.017	0.013	0.013	0.024	0.022	0.019	0.019	0.034	0.034	0.034	0.031	0.031	0.027	0.027	0.027	0.027	0.024	0.024	0.024
	38.2	Vc	169	169	169	127	127	225	202	202	180	258	258	258	258	258	232	232	232	232	232	232	206
		fz	0.038	0.038	0.038	0.033	0.033	0.048	0.043	0.043	0.038	0.050	0.050	0.050	0.050	0.050	0.045	0.045	0.045	0.045	0.045	0.045	0.040
		RPM	35846	35846	35846	26884	26884	44671	40204	40204	35737	40983	40983	40983	40983	40983	36885	36885	36885	36885	36885	36885	32786
		FEED	2724	2724	2724	1774	1774	4288	3458	3458	2716	4098	4098	4098	4098	4098	3320	3320	3320	3320	3320	3320	2623
		Ap	0.018	0.017	0.017	0.013	0.013	0.024	0.022	0.019	0.019	0.034	0.034	0.034	0.031	0.031	0.027	0.027	0.027	0.027	0.024	0.024	0.024
	39.1	Vc	144	144	144	108	108	192	172	172	153	227	227	227	227	227	204	204	204	204	204	204	181
		fz	0.034	0.034	0.034	0.029	0.029	0.043	0.039	0.039	0.034	0.045	0.045	0.045	0.045	0.045	0.041	0.041	0.041	0.041	0.041	0.041	0.036
		RPM	30600	30600	30600	22950	22950	38114	34303	34303	30491	36064	36064	36064	36064	36064	32458	32458	32458	32458	32458	32458	28851
		FEED	2081	2081	2081	1331	1331	3278	2676	2676	2073	3246	3246	3246	3246	3246	2662	2662	2662	2662	2662	2662	2077
		Ap	0.017	0.016	0.016	0.012	0.012	0.023	0.020	0.018	0.018	0.032	0.032	0.032	0.029	0.029	0.026	0.026	0.026	0.026	0.022	0.022	0.022
	39.2	Vc	128	128	128	96	96	170	153	153	136	206	206	206	206	206	185	185	185	185	185	185	165
		fz	0.033	0.033	0.033	0.029	0.029	0.043	0.039	0.039	0.034	0.044	0.044	0.044	0.044	0.044	0.040	0.040	0.040	0.040	0.040	0.040	0.035
		RPM	27103	27103	27103	20327	20327	33811	30430	30430	27049	32786	32786	32786	32786	32786	29507	29507	29507	29507	29507	29507	26229
		FEED	1789	1789	1789	1179	1179	2908	2374	2374	1839	2885	2885	2885	2885	2885	2361	2361	2361	2361	2361	2361	1836
		Ap	0.017	0.016	0.016	0.012	0.012	0.023	0.020	0.018	0.018	0.032	0.032	0.032	0.029	0.029	0.026	0.026	0.026	0.026	0.022	0.022	0.022
	39.3	Vc	115	115	115	87	87	153	138	138	123	185	185	185	185	185	167	167	167	167	167	167	148
		fz	0.031	0.031	0.031	0.027	0.027	0.039	0.035	0.035	0.031	0.040	0.040	0.040	0.040	0.040	0.036	0.036	0.036	0.036	0.036	0.036	0.032
		RPM	24480	24480	24480	18360	18360	30532	27479	27479	24426	29507	29507	29507	29507	29507	26556	26556	26556	26556	26556	26556	23606
		FEED	1518	1518	1518	991	991	2381	1924	1924	1514	2361	2361	2361	2361	2361	1912	1912	1912	1912	1912	1912	1511
		Ap	0.014	0.013	0.013	0.010	0.010	0.019	0.017	0.015	0.015	0.026	0.026	0.026	0.023	0.023	0.021	0.021	0.021	0.021	0.018	0.018	0.018
	40	Vc	185	185	185	139	139	247	222	222	198	309	309	309	309	309	278	278	278	278	278	278	247
		fz	0.038	0.038	0.038	0.033	0.033	0.048	0.043	0.043	0.038	0.050	0.050	0.050	0.050	0.050	0.045	0.045	0.045	0.045	0.045	0.045	0.040
		RPM	39342	39342	39342	29507	29507	49178	44260	44260	39342	49178	49178	49178	49178	49178	44260	44260	44260	44260	44260	44260	39342
		FEED	2990	2990	2990	1947	1947	4721	3806	3806	2990	4918	4918	4918	4918	4918	3983	3983	3983	3983	3983	3983	3147
		Ap	0.018	0.017	0.017	0.013	0.013	0.024	0.022	0.019	0.019	0.034	0.034	0.034	0.031	0.031	0.027	0.027	0.027	0.027	0.024	0.024	0.024
	41	Vc	169	169	169	127	127	225	202	202	180	258	258	258	258	258	232	232	232	232	232	232	206
		fz	0.038	0.038	0.038	0.033	0.033	0.048	0.043	0.043	0.038	0.050	0.050	0.050	0.050	0.050	0.045	0.045	0.045	0.045	0.045	0.045	0.040
		RPM	35846	35846	35846	26884	26884	44671	40204	40204	35737	40983	40983	40983	40983	40983	36885	36885	36885	36885	36885	36885	32786
		FEED	2724	2724	2724	1774	1774	4288	3458	3458	2716	4098	4098	4098	4098	4098	3320	3320	3320	3320	3320	3320	2623
		Ap	0.018	0.017	0.017	0.013	0.013	0.024	0.022	0.019	0.019	0.034	0.034	0.034	0.031	0.031	0.027	0.027	0.027	0.027	0.024	0.024	0.024

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X1-EH END MILLS

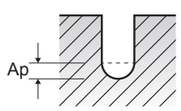
RECOMMENDED CUTTING CONDITIONS

HPI91, HPI92 SERIES — 2 FLUTE BALL NOSE for RIB PROCESSING

Vc = m/min.
fz = mm/tooth
RPM = rev./min.
FEED = mm/min.
Ap = mm
LBS = Length Below Shank

ISO	VDI 3323	Para-meter	Diameter (Ø)																					
			2	2	2	2	2	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	3	3	3	3	3	3	3	3	3
			LBS	25	30	35	40	50	6	8	10	15	20	25	30	35	6	8	10	12	14	15	16	20	25
P	5	Vc	255	255	192	192	96	320	320	320	288	288	288	256	256	319	319	319	319	319	319	287	287	287
		fz	0.046	0.046	0.040	0.040	0.034	0.074	0.074	0.074	0.066	0.066	0.066	0.059	0.059	0.091	0.091	0.091	0.091	0.091	0.091	0.082	0.082	0.082
		RPM	40654	40654	30491	30491	15245	40685	40685	40685	36617	36617	36617	32548	32548	33879	33879	33879	33879	33879	33879	30491	30491	30491
		FEED	3740	3740	2439	2439	1037	6021	6021	6021	4833	4833	4833	3841	3841	6166	6166	6166	6166	6166	6166	5001	5001	5001
		Ap	0.028	0.026	0.020	0.020	0.010	0.050	0.045	0.045	0.040	0.040	0.035	0.035	0.033	0.060	0.060	0.054	0.054	0.054	0.054	0.048	0.048	0.042
	8-9	Vc	255	255	192	192	96	320	320	320	288	288	288	256	256	319	319	319	319	319	319	287	287	287
		fz	0.046	0.046	0.040	0.040	0.034	0.074	0.074	0.074	0.066	0.066	0.066	0.059	0.059	0.091	0.091	0.091	0.091	0.091	0.091	0.082	0.082	0.082
		RPM	40654	40654	30491	30491	15245	40685	40685	40685	36617	36617	36617	32548	32548	33879	33879	33879	33879	33879	33879	30491	30491	30491
		FEED	3740	3740	2439	2439	1037	6021	6021	6021	4833	4833	4833	3841	3841	6166	6166	6166	6166	6166	6166	5001	5001	5001
		Ap	0.028	0.026	0.020	0.020	0.010	0.050	0.045	0.045	0.040	0.040	0.035	0.035	0.033	0.060	0.060	0.054	0.054	0.054	0.054	0.048	0.048	0.042
	11.1	Vc	255	255	192	192	96	320	320	320	288	288	288	256	256	319	319	319	319	319	319	287	287	287
		fz	0.046	0.046	0.040	0.040	0.034	0.074	0.074	0.074	0.066	0.066	0.066	0.059	0.059	0.091	0.091	0.091	0.091	0.091	0.091	0.082	0.082	0.082
		RPM	40654	40654	30491	30491	15245	40685	40685	40685	36617	36617	36617	32548	32548	33879	33879	33879	33879	33879	33879	30491	30491	30491
		FEED	3740	3740	2439	2439	1037	6021	6021	6021	4833	4833	4833	3841	3841	6166	6166	6166	6166	6166	6166	5001	5001	5001
		Ap	0.028	0.026	0.020	0.020	0.010	0.050	0.045	0.045	0.040	0.040	0.035	0.035	0.033	0.060	0.060	0.054	0.054	0.054	0.054	0.048	0.048	0.042
	11.2	Vc	247	247	185	185	93	309	309	309	278	278	278	247	247	309	309	309	309	309	309	278	278	278
		fz	0.040	0.040	0.035	0.035	0.030	0.066	0.066	0.066	0.059	0.059	0.059	0.053	0.053	0.083	0.083	0.083	0.083	0.083	0.083	0.075	0.075	0.075
		RPM	39342	39342	29507	29507	14753	39295	39295	39295	35366	35366	35366	31436	31436	32786	32786	32786	32786	32786	32786	29507	29507	29507
		FEED	3147	3147	2065	2065	885	5187	5187	5187	4173	4173	4173	3332	3332	5442	5442	5442	5442	5442	5442	4426	4426	4426
		Ap	0.024	0.022	0.017	0.017	0.009	0.043	0.038	0.038	0.034	0.034	0.030	0.030	0.028	0.051	0.051	0.046	0.046	0.046	0.046	0.041	0.041	0.036
H	38.1	Vc	247	247	185	185	93	309	309	309	278	278	278	247	247	309	309	309	309	309	309	278	278	278
		fz	0.040	0.040	0.035	0.035	0.030	0.066	0.066	0.066	0.059	0.059	0.059	0.053	0.053	0.083	0.083	0.083	0.083	0.083	0.083	0.075	0.075	0.075
		RPM	39342	39342	29507	29507	14753	39295	39295	39295	35366	35366	35366	31436	31436	32786	32786	32786	32786	32786	32786	29507	29507	29507
		FEED	3147	3147	2065	2065	885	5187	5187	5187	4173	4173	4173	3332	3332	5442	5442	5442	5442	5442	5442	4426	4426	4426
		Ap	0.024	0.022	0.017	0.017	0.009	0.043	0.038	0.038	0.034	0.034	0.030	0.030	0.028	0.051	0.051	0.046	0.046	0.046	0.046	0.041	0.041	0.036
	38.2	Vc	206	206	155	155	77	257	257	257	232	232	232	206	206	258	258	258	258	258	258	232	232	232
		fz	0.040	0.040	0.035	0.035	0.030	0.063	0.063	0.063	0.056	0.056	0.056	0.050	0.050	0.075	0.075	0.075	0.075	0.075	0.075	0.068	0.068	0.068
		RPM	32786	32786	24590	24590	12295	32754	32754	32754	29479	29479	29479	26203	26203	27322	27322	27322	27322	27322	27322	24590	24590	24590
		FEED	2623	2623	1721	1721	738	4127	4127	4127	3302	3302	3302	2620	2620	4098	4098	4098	4098	4098	4098	3344	3344	3344
		Ap	0.024	0.022	0.017	0.017	0.009	0.043	0.038	0.038	0.034	0.034	0.030	0.030	0.028	0.051	0.051	0.046	0.046	0.046	0.046	0.041	0.041	0.036
	39.1	Vc	181	181	136	136	68	227	227	227	204	204	204	181	181	227	227	227	227	227	227	204	204	204
		fz	0.036	0.036	0.032	0.032	0.027	0.056	0.056	0.056	0.050	0.050	0.050	0.045	0.045	0.067	0.067	0.067	0.067	0.067	0.067	0.060	0.060	0.060
		RPM	28851	28851	21638	21638	10819	28840	28840	28840	25956	25956	25956	23072	23072	24043	24043	24043	24043	24043	24043	21639	21639	21639
		FEED	2077	2077	1385	1385	584	3230	3230	3230	2596	2596	2596	2076	2076	3222	3222	3222	3222	3222	3222	2597	2597	2597
		Ap	0.022	0.021	0.016	0.016	0.008	0.040	0.036	0.036	0.032	0.032	0.028	0.028	0.026	0.048	0.048	0.043	0.043	0.043	0.043	0.038	0.038	0.034
	39.2	Vc	165	165	124	124	62	206	206	206	186	186	186	165	165	206	206	206	206	206	206	185	185	185
		fz	0.035	0.035	0.031	0.031	0.026	0.055	0.055	0.055	0.050	0.050	0.050	0.044	0.044	0.067	0.067	0.067	0.067	0.067	0.067	0.060	0.060	0.060
		RPM	26229	26229	19672	19672	9836	26265	26265	26265	23639	23639	23639	21012	21012	21858	21858	21858	21858	21858	21858	19672	19672	19672
		FEED	1836	1836	1220	1220	511	2889	2889	2889	2364	2364	2364	1849	1849	2929	2929	2929	2929	2929	2929	2361	2361	2361
		Ap	0.022	0.021	0.016	0.016	0.008	0.040	0.036	0.036	0.032	0.032	0.028	0.028	0.026	0.048	0.048	0.043	0.043	0.043	0.043	0.038	0.038	0.034
	39.3	Vc	148	148	111	111	56	185	185	185	167	167	167	148	148	185	185	185	185	185	185	167	167	167
		fz	0.032	0.032	0.028	0.028	0.024	0.051	0.051	0.051	0.045	0.045	0.045	0.040	0.040	0.061	0.061	0.061	0.061	0.061	0.061	0.055	0.055	0.055
		RPM	23606	23606	17704	17704	8852	23587	23587	23587	21228	21228	21228	18870	18870	19672	19672	19672	19672	19672	19672	17705	17705	17705
		FEED	1511	1511	991	991	425	2406	2406	2406	1911	1911	1911	1510	1510	2400	2400	2400	2400	2400	2400	1948	1948	1948
		Ap	0.018	0.017	0.013	0.013	0.007	0.033	0.029	0.029	0.026	0.026	0.023	0.023	0.021	0.039	0.039	0.035	0.035	0.035	0.035	0.031	0.031	0.027
	40	Vc	247	247	185	185	93	309	309	309	278	278	278	247	247	309	309	309	309	309	309	278	278	278
		fz	0.040	0.040	0.035	0.035	0.030	0.066	0.066	0.066	0.059	0.059	0.059	0.053	0.053	0.083	0.083	0.083	0.083	0.083	0.083	0.075	0.075	0.075
		RPM	39342	39342	29507	29507	14753	39295	39295	39295	35366	35366	35366	31436	31436	32786	32786	32786	32786	32786	32786	29507	29507	29507
		FEED	3147	3147	2065	2065	885	5187	5187	5187	4173	4173	4173	3332	3332	5442	5442	5442	5442	5442	5442	4426	4426	4426
		Ap	0.024	0.022	0.017	0.017	0.009	0.043	0.038	0.038	0.034	0.034	0.030	0.030	0.028	0.051	0.051	0.046	0.046	0.046	0.046	0.041	0.041	0.036
	41	Vc	206	206	155	155	77	257	257	257	232	232	232	206	206	258	258	258	258	258	258	232	232	232
		fz	0.040	0.040	0.035	0.035	0.030	0.063	0.063	0.063	0.056	0.056	0.056	0.050	0.050	0.075	0.075	0.075	0.075	0.075	0.075	0.068	0.068	0.068
		RPM	32786	32786	24590	24590	12295	32754	32754	32754	29479	29479	29479	26203	26203	27322	27322	27322	27322	27322	27322	24590	24590	24590
		FEED	2623	2623	1721	1721	738	4127	4127	4127	3302	3302	3302	2620	2620	4098	4098	4098	4098	4098	4098	3344	3344	3344
		Ap	0.024	0.022	0.017	0.017	0.009	0.043	0.038	0.038	0.034	0.034	0.030	0.030	0.028	0.051	0.051	0.046	0.046	0.046	0.046	0.041	0.041	0.036

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X1-EH END MILLS

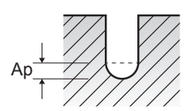
RECOMMENDED CUTTING CONDITIONS

HPI91, HPI92 SERIES — 2 FLUTE BALL NOSE for RIB PROCESSING

Vc = m/min.
fz = mm/tooth
RPM = rev./min.
FEED = mm/min.
Ap = mm
LBS = Length Below Shank

ISO	VDI 3323	Para-meter	Diameter (Ø)																					
			3	3	3	3	3.5	3.5	3.5	3.5	3.5	3.5	3.5	4	4	4	4	4	4	4	4	4	4	4
			LBS	30	35	40	50	15	20	25	30	35	40	45	8	10	12	14	15	20	25	30	35	40
P	5	Vc	287	255	255	192	324	292	292	292	292	260	260	324	324	324	324	324	324	292	292	292	292
		fz	0.082	0.073	0.073	0.064	0.105	0.094	0.094	0.094	0.094	0.084	0.084	0.120	0.120	0.120	0.120	0.120	0.120	0.108	0.108	0.108	0.108
		RPM	30491	27103	27103	20327	29510	26559	26559	26559	26559	23608	23608	25819	25819	25819	25819	25819	25819	23237	23237	23237	23237
		FEED	5001	3957	3957	2602	6197	4993	4993	4993	4993	3966	3966	6197	6197	6197	6197	6197	6197	5019	5019	5019	5019
		Ap	0.042	0.042	0.039	0.030	0.063	0.056	0.056	0.049	0.049	0.049	0.049	0.080	0.080	0.080	0.072	0.072	0.072	0.064	0.064	0.056	0.056
	8-9	Vc	287	255	255	192	324	292	292	292	292	260	260	324	324	324	324	324	324	292	292	292	292
		fz	0.082	0.073	0.073	0.064	0.105	0.094	0.094	0.094	0.094	0.084	0.084	0.120	0.120	0.120	0.120	0.120	0.120	0.108	0.108	0.108	0.108
		RPM	30491	27103	27103	20327	29510	26559	26559	26559	26559	23608	23608	25819	25819	25819	25819	25819	25819	23237	23237	23237	23237
		FEED	5001	3957	3957	2602	6197	4993	4993	4993	4993	3966	3966	6197	6197	6197	6197	6197	6197	5019	5019	5019	5019
		Ap	0.042	0.042	0.039	0.030	0.063	0.056	0.056	0.049	0.049	0.049	0.049	0.080	0.080	0.080	0.072	0.072	0.072	0.064	0.064	0.056	0.056
	11.1	Vc	287	255	255	192	324	292	292	292	292	260	260	324	324	324	324	324	324	292	292	292	292
		fz	0.082	0.073	0.073	0.064	0.105	0.094	0.094	0.094	0.094	0.084	0.084	0.120	0.120	0.120	0.120	0.120	0.120	0.108	0.108	0.108	0.108
		RPM	30491	27103	27103	20327	29510	26559	26559	26559	26559	23608	23608	25819	25819	25819	25819	25819	25819	23237	23237	23237	23237
		FEED	5001	3957	3957	2602	6197	4993	4993	4993	4993	3966	3966	6197	6197	6197	6197	6197	6197	5019	5019	5019	5019
		Ap	0.042	0.042	0.039	0.030	0.063	0.056	0.056	0.049	0.049	0.049	0.049	0.080	0.080	0.080	0.072	0.072	0.072	0.064	0.064	0.056	0.056
	11.2	Vc	278	247	247	185	309	278	278	278	278	247	247	309	309	309	309	309	309	278	278	278	278
		fz	0.075	0.066	0.066	0.058	0.097	0.087	0.087	0.087	0.087	0.078	0.078	0.111	0.111	0.111	0.111	0.111	0.111	0.100	0.100	0.100	0.100
		RPM	29507	26229	26229	19672	28068	25261	25261	25261	25261	22454	22454	24589	24589	24589	24589	24589	24589	22130	22130	22130	22130
		FEED	4426	3462	3462	2282	5445	4395	4395	4395	4395	3503	3503	5459	5459	5459	5459	5459	5459	4426	4426	4426	4426
		Ap	0.036	0.036	0.033	0.026	0.054	0.048	0.048	0.042	0.042	0.042	0.042	0.068	0.068	0.068	0.061	0.061	0.061	0.054	0.054	0.048	0.048
H	38.1	Vc	278	247	247	185	309	278	278	278	278	247	247	309	309	309	309	309	309	278	278	278	278
		fz	0.075	0.066	0.066	0.058	0.097	0.087	0.087	0.087	0.087	0.078	0.078	0.111	0.111	0.111	0.111	0.111	0.111	0.100	0.100	0.100	0.100
		RPM	29507	26229	26229	19672	28068	25261	25261	25261	25261	22454	22454	24589	24589	24589	24589	24589	24589	22130	22130	22130	22130
		FEED	4426	3462	3462	2282	5445	4395	4395	4395	4395	3503	3503	5459	5459	5459	5459	5459	5459	4426	4426	4426	4426
		Ap	0.036	0.036	0.033	0.026	0.054	0.048	0.048	0.042	0.042	0.042	0.042	0.068	0.068	0.068	0.061	0.061	0.061	0.054	0.054	0.048	0.048
	38.2	Vc	232	206	206	155	258	232	232	232	232	206	206	257	257	257	257	257	257	232	232	232	232
		fz	0.068	0.060	0.060	0.053	0.087	0.079	0.079	0.079	0.079	0.070	0.070	0.100	0.100	0.100	0.100	0.100	0.100	0.090	0.090	0.090	0.090
		RPM	24590	21858	21858	16393	23433	21090	21090	21090	21090	18746	18746	20491	20491	20491	20491	20491	20491	18442	18442	18442	18442
		FEED	3344	2623	2623	1738	4077	3332	3332	3332	3332	2624	2624	4098	4098	4098	4098	4098	4098	3320	3320	3320	3320
		Ap	0.036	0.036	0.033	0.026	0.054	0.048	0.048	0.042	0.042	0.042	0.042	0.068	0.068	0.068	0.061	0.061	0.061	0.054	0.054	0.048	0.048
	39.1	Vc	204	181	181	136	227	204	204	204	204	181	181	227	227	227	227	227	227	204	204	204	204
		fz	0.060	0.054	0.054	0.047	0.079	0.071	0.071	0.071	0.071	0.063	0.063	0.090	0.090	0.090	0.090	0.090	0.090	0.081	0.081	0.081	0.081
		RPM	21639	19234	19234	14426	20600	18540	18540	18540	18540	16480	16480	18032	18032	18032	18032	18032	18032	16229	16229	16229	16229
		FEED	2597	2077	2077	1356	3255	2633	2633	2633	2633	2076	2076	3246	3246	3246	3246	3246	3246	2629	2629	2629	2629
		Ap	0.034	0.034	0.031	0.024	0.050	0.045	0.045	0.039	0.039	0.039	0.039	0.064	0.064	0.064	0.058	0.058	0.058	0.051	0.051	0.045	0.045
	39.2	Vc	185	165	165	124	206	186	186	186	186	165	165	206	206	206	206	206	206	185	185	185	185
		fz	0.060	0.054	0.054	0.047	0.078	0.070	0.070	0.070	0.070	0.062	0.062	0.088	0.088	0.088	0.088	0.088	0.088	0.079	0.079	0.079	0.079
		RPM	19672	17486	17486	13115	18746	16871	16871	16871	16871	14997	14997	16392	16392	16392	16392	16392	16392	14753	14753	14753	14753
		FEED	2361	1888	1888	1233	2924	2362	2362	2362	2362	1860	1860	2885	2885	2885	2885	2885	2885	2331	2331	2331	2331
		Ap	0.034	0.034	0.031	0.024	0.050	0.045	0.045	0.039	0.039	0.039	0.039	0.064	0.064	0.064	0.058	0.058	0.058	0.051	0.051	0.045	0.045
	39.3	Vc	167	148	148	111	186	167	167	167	167	149	149	185	185	185	185	185	185	167	167	167	167
		fz	0.055	0.049	0.049	0.043	0.070	0.063	0.063	0.063	0.063	0.056	0.056	0.079	0.079	0.079	0.079	0.079	0.079	0.071	0.071	0.071	0.071
		RPM	17705	15738	15738	11803	16892	15203	15203	15203	15203	13514	13514	14754	14754	14754	14754	14754	14754	13279	13279	13279	13279
		FEED	1948	1542	1542	1015	2365	1916	1916	1916	1916	1514	1514	2331	2331	2331	2331	2331	2331	1886	1886	1886	1886
		Ap	0.027	0.027	0.025	0.020	0.041	0.036	0.036	0.032	0.032	0.032	0.032	0.052	0.052	0.052	0.047	0.047	0.047	0.042	0.042	0.036	0.036
	40	Vc	278	247	247	185	309	278	278	278	278	247	247	309	309	309	309	309	309	278	278	278	278
		fz	0.075	0.066	0.066	0.058	0.097	0.087	0.087	0.087	0.087	0.078	0.078	0.111	0.111	0.111	0.111	0.111	0.111	0.100	0.100	0.100	0.100
		RPM	29507	26229	26229	19672	28068	25261	25261	25261	25261	22454	22454	24589	24589	24589	24589	24589	24589	22130	22130	22130	22130
		FEED	4426	3462	3462	2282	5445	4395	4395	4395	4395	3503	3503	5459	5459	5459	5459	5459	5459	4426	4426	4426	4426
		Ap	0.036	0.036	0.033	0.026	0.054	0.048	0.048	0.042	0.042	0.042	0.042	0.068	0.068	0.068	0.061	0.061	0.061	0.054	0.054	0.048	0.048
	41	Vc	232	206	206	155	258	232	232	232	232	206	206	257	257	257	257	257	257	232	232	232	232
		fz	0.068	0.060	0.060	0.053	0.087	0.079	0.079	0.079	0.079	0.070	0.070	0.100	0.100	0.100	0.100	0.100	0.100	0.090	0.090	0.090	0.090
		RPM	24590	21858	21858	16393	23433	21090	21090	21090	21090	18746	18746	20491	20491	20491	20491	20491	20491	18442	18442	18442	18442
		FEED	3344	2623	2623	1738	4077	3332	3332	3332	3332	2624	2624	4098	4098	4098	4098	4098	4098	3320	3320	3320	3320
		Ap	0.036	0.036	0.033	0.026	0.054	0.048	0.048	0.042	0.042	0.042	0.042	0.068	0.068	0.068	0.061	0.061	0.061	0.054	0.054	0.048	0.048

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CARBIDE
HSS
i-Xmill END MILLS
X-1EH END MILLS
4G MILL END MILLS
X-POWER PRO END MILLS
TitaNox-POWER END MILLS
V7 PLUS END MILLS
ALU-CUT END MILLS
K-2 END MILLS
GENERAL CARBIDE END MILLS

X1-EH END MILLS

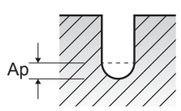
RECOMMENDED CUTTING CONDITIONS

HPI91, HPI92 SERIES — 2 FLUTE BALL NOSE for RIB PROCESSING

Vc = m/min.
fz = mm/tooth
RPM = rev./min.
FEED = mm/min.
Ap = mm
LBS = Length Below Shank

ISO	VDI 3323	Para-meter	Diameter (Ø)																					
			4	4	4	5	5	5	5	5	5	5	6	6	6	6	6	6	6	6	6	7	7	7
			LBS	45	50	61.1	10	12	15	20	25	30	40	10	15	20	25	30	35	40	50	60	40	45	60
P	5	Vc	260	260	195	299	299	299	299	299	269	269	268	268	268	268	268	241	241	241	241	255	255	255
		fz	0.096	0.096	0.084	0.156	0.156	0.156	0.156	0.156	0.140	0.140	0.174	0.174	0.174	0.174	0.174	0.157	0.157	0.157	0.157	0.162	0.162	0.162
		RPM	20655	20655	15491	19016	19016	19016	19016	19016	17114	17114	14207	14207	14207	14207	14207	12786	12786	12786	12786	11588	11588	11588
		FEED	3966	3966	2602	5933	5933	5933	5933	5933	4792	4792	4944	4944	4944	4944	4944	4015	4015	4015	4015	3755	3755	3755
		Ap	0.056	0.056	0.052	0.100	0.100	0.100	0.090	0.090	0.080	0.080	0.120	0.120	0.108	0.108	0.108	0.096	0.096	0.084	0.084	0.112	0.112	0.098
	8-9	Vc	260	260	195	299	299	299	299	299	269	269	268	268	268	268	268	241	241	241	241	255	255	255
		fz	0.096	0.096	0.084	0.156	0.156	0.156	0.156	0.156	0.140	0.140	0.174	0.174	0.174	0.174	0.174	0.157	0.157	0.157	0.157	0.162	0.162	0.162
		RPM	20655	20655	15491	19016	19016	19016	19016	19016	17114	17114	14207	14207	14207	14207	14207	12786	12786	12786	12786	11588	11588	11588
		FEED	3966	3966	2602	5933	5933	5933	5933	5933	4792	4792	4944	4944	4944	4944	4944	4015	4015	4015	4015	3755	3755	3755
		Ap	0.056	0.056	0.052	0.100	0.100	0.100	0.090	0.090	0.080	0.080	0.120	0.120	0.108	0.108	0.108	0.096	0.096	0.084	0.084	0.112	0.112	0.098
	11.1	Vc	260	260	195	299	299	299	299	299	269	269	268	268	268	268	268	241	241	241	241	255	255	255
		fz	0.096	0.096	0.084	0.156	0.156	0.156	0.156	0.156	0.140	0.140	0.174	0.174	0.174	0.174	0.174	0.157	0.157	0.157	0.157	0.162	0.162	0.162
		RPM	20655	20655	15491	19016	19016	19016	19016	19016	17114	17114	14207	14207	14207	14207	14207	12786	12786	12786	12786	11588	11588	11588
		FEED	3966	3966	2602	5933	5933	5933	5933	5933	4792	4792	4944	4944	4944	4944	4944	4015	4015	4015	4015	3755	3755	3755
		Ap	0.056	0.056	0.052	0.100	0.100	0.100	0.090	0.090	0.080	0.080	0.120	0.120	0.108	0.108	0.108	0.096	0.096	0.084	0.084	0.112	0.112	0.098
	11.2	Vc	247	247	185	288	288	288	288	288	260	260	263	263	263	263	263	236	236	236	236	246	246	246
		fz	0.089	0.089	0.078	0.138	0.138	0.138	0.138	0.138	0.124	0.124	0.153	0.153	0.153	0.153	0.153	0.138	0.138	0.138	0.138	0.143	0.143	0.143
		RPM	19671	19671	14753	18360	18360	18360	18360	18360	16524	16524	13934	13934	13934	13934	13934	12541	12541	12541	12541	11171	11171	11171
		FEED	3501	3501	2301	5067	5067	5067	5067	5067	4098	4098	4264	4264	4264	4264	4264	3461	3461	3461	3461	3195	3195	3195
		Ap	0.048	0.048	0.044	0.085	0.085	0.085	0.077	0.077	0.068	0.068	0.102	0.102	0.092	0.092	0.092	0.082	0.082	0.071	0.071	0.095	0.095	0.083
H	38.1	Vc	247	247	185	288	288	288	288	288	260	260	263	263	263	263	263	236	236	236	236	246	246	246
		fz	0.089	0.089	0.078	0.138	0.138	0.138	0.138	0.138	0.124	0.124	0.153	0.153	0.153	0.153	0.153	0.138	0.138	0.138	0.138	0.143	0.143	0.143
		RPM	19671	19671	14753	18360	18360	18360	18360	18360	16524	16524	13934	13934	13934	13934	13934	12541	12541	12541	12541	11171	11171	11171
		FEED	3501	3501	2301	5067	5067	5067	5067	5067	4098	4098	4264	4264	4264	4264	4264	3461	3461	3461	3461	3195	3195	3195
		Ap	0.048	0.048	0.044	0.085	0.085	0.085	0.077	0.077	0.068	0.068	0.102	0.102	0.092	0.092	0.092	0.082	0.082	0.071	0.071	0.095	0.095	0.083
	38.2	Vc	206	206	155	242	242	242	242	242	218	218	211	211	211	211	211	190	190	190	190	199	199	199
		fz	0.080	0.080	0.070	0.125	0.125	0.125	0.125	0.125	0.113	0.113	0.141	0.141	0.141	0.141	0.141	0.127	0.127	0.127	0.127	0.133	0.133	0.133
		RPM	16393	16393	12295	15410	15410	15410	15410	15410	13869	13869	11202	11202	11202	11202	11202	10082	10082	10082	10082	9048	9048	9048
		FEED	2623	2623	1721	3853	3853	3853	3853	3853	3134	3134	3159	3159	3159	3159	3159	2561	2561	2561	2561	2407	2407	2407
		Ap	0.048	0.048	0.044	0.085	0.085	0.085	0.077	0.077	0.068	0.068	0.102	0.102	0.092	0.092	0.092	0.082	0.082	0.071	0.071	0.095	0.095	0.083
	39.1	Vc	181	181	136	216	216	216	216	216	195	195	196	196	196	196	196	176	176	176	176	180	180	180
		fz	0.072	0.072	0.063	0.113	0.113	0.113	0.113	0.113	0.102	0.102	0.125	0.125	0.125	0.125	0.125	0.113	0.113	0.113	0.113	0.118	0.118	0.118
		RPM	14426	14426	10819	13770	13770	13770	13770	13770	12393	12393	10382	10382	10382	10382	10382	9344	9344	9344	9344	8204	8204	8204
		FEED	2077	2077	1363	3112	3112	3112	3112	3112	2528	2528	2596	2596	2596	2596	2596	2112	2112	2112	2112	1936	1936	1936
		Ap	0.045	0.045	0.042	0.080	0.080	0.080	0.072	0.072	0.064	0.064	0.096	0.096	0.086	0.086	0.086	0.077	0.077	0.067	0.067	0.090	0.090	0.078
	39.2	Vc	165	165	124	185	185	185	185	185	167	167	170	170	170	170	170	153	153	153	153	158	158	158
		fz	0.070	0.070	0.062	0.111	0.111	0.111	0.111	0.111	0.100	0.100	0.122	0.122	0.122	0.122	0.122	0.110	0.110	0.110	0.110	0.115	0.115	0.115
		RPM	13114	13114	9835	11803	11803	11803	11803	11803	10623	10623	9017	9017	9017	9017	9017	8115	8115	8115	8115	7185	7185	7185
		FEED	1836	1836	1220	2620	2620	2620	2620	2620	2125	2125	2200	2200	2200	2200	2200	1785	1785	1785	1785	1653	1653	1653
		Ap	0.045	0.045	0.042	0.080	0.080	0.080	0.072	0.072	0.064	0.064	0.096	0.096	0.086	0.086	0.086	0.077	0.077	0.067	0.067	0.090	0.090	0.078
	39.3	Vc	148	148	111	170	170	170	170	170	153	153	155	155	155	155	155	139	139	139	139	148	148	148
		fz	0.063	0.063	0.055	0.100	0.100	0.100	0.100	0.100	0.090	0.090	0.109	0.109	0.109	0.109	0.109	0.098	0.098	0.098	0.098	0.102	0.102	0.102
		RPM	11803	11803	8852	10819	10819	10819	10819	10819	9737	9737	8197	8197	8197	8197	8197	7377	7377	7377	7377	6731	6731	6731
		FEED	1487	1487	974	2164	2164	2164	2164	2164	1753	1753	1787	1787	1787	1787	1787	1446	1446	1446	1446	1373	1373	1373
		Ap	0.036	0.036	0.034	0.065	0.065	0.065	0.059	0.059	0.052	0.052	0.078	0.078	0.070	0.070	0.070	0.062	0.062	0.055	0.055	0.073	0.073	0.064
	40	Vc	247	247	185	288	288	288	288	288	260	260	263	263	263	263	263	236	236	236	236	246	246	246
		fz	0.089	0.089	0.078	0.138	0.138	0.138	0.138	0.138	0.124	0.124	0.153	0.153	0.153	0.153	0.153	0.138	0.138	0.138	0.138	0.143	0.143	0.143
		RPM	19671	19671	14753	18360	18360	18360	18360	18360	16524	16524	13934	13934	13934	13934	13934	12541	12541	12541	12541	11171	11171	11171
		FEED	3501	3501	2301	5067	5067	5067	5067	5067	4098	4098	4264	4264	4264	4264	4264	3461	3461	3461	3461	3195	3195	3195
		Ap	0.048	0.048	0.044	0.085	0.085	0.085	0.077	0.077	0.068	0.068	0.102	0.102	0.092	0.092	0.092	0.082	0.082	0.071	0.071	0.095	0.095	0.083
	41	Vc	206	206	155	242	242	242	242	242	218	218	211	211	211	211	211	190	190	190	190	199	199	199
		fz	0.080	0.080	0.070	0.125	0.125	0.125	0.125	0.125	0.113	0.113	0.141	0.141	0.141	0.141	0.141	0.127	0.127	0.127	0.127	0.133	0.133	0.133
		RPM	16393	16393	12295	15410	15410	15410	15410	15410	13869	13869	11202	11202	11202	11202	11202	10082	10082	10082	10082	9048	9048	9048
		FEED	2623	2623	1721	3853	3853	3853	3853	3853	3134	3134	3159	3159	3159	3159	3159	2561	2561	2561	2561	2407	2407	2407
		Ap	0.048	0.048	0.044	0.085	0.085	0.085	0.077	0.077	0.068	0.068	0.102	0.102	0.092	0.092	0.092	0.082	0.082	0.071	0.071	0.095	0.095	0.083

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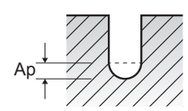
X1-EH END MILLS

RECOMMENDED CUTTING CONDITIONS

HPI91, HPI92 SERIES — 2 FLUTE BALL NOSE for RIB PROCESSING

Vc = m/min.
fz = mm/tooth
RPM = rev./min.
FEED = mm/min.
Ap = mm
LBS = Length Below Shank

ISO	VDI 3323	Para-meter	Diameter (Ø)																					
			8	8	8	8	8	8	8	8	10	10	10	10	10	10	10	12	12	12	12			
			LBS	35	50	55	60	70	80	98	120	35	55	60	65	75	86	120	60	80	106	120		
P	5	Vc	288	260	260	260	260	260	231	231	299	269	269	269	269	269	239	268	241	241	241			
		fz	0.189	0.170	0.170	0.170	0.170	0.170	0.151	0.151	0.199	0.179	0.179	0.179	0.179	0.179	0.159	0.212	0.191	0.191	0.191			
		RPM	11475	10328	10328	10328	10328	10328	9180	9180	9508	8557	8557	8557	8557	8557	7606	7104	6394	6394	6394			
		FEED	4338	3512	3512	3512	3512	3512	2772	2772	3784	3063	3063	3063	3063	3063	2419	3012	2443	2443	2443			
		Ap	0.144	0.128	0.128	0.128	0.112	0.112	0.112	0.104	0.180	0.160	0.160	0.160	0.160	0.140	0.140	0.216	0.192	0.168	0.168			
	8-9	Vc	288	260	260	260	260	260	231	231	299	269	269	269	269	269	239	268	241	241	241			
		fz	0.189	0.170	0.170	0.170	0.170	0.170	0.151	0.151	0.199	0.179	0.179	0.179	0.179	0.179	0.159	0.212	0.191	0.191	0.191			
		RPM	11475	10328	10328	10328	10328	10328	9180	9180	9508	8557	8557	8557	8557	8557	7606	7104	6394	6394	6394			
		FEED	4338	3512	3512	3512	3512	3512	2772	2772	3784	3063	3063	3063	3063	3063	2419	3012	2443	2443	2443			
		Ap	0.144	0.128	0.128	0.128	0.112	0.112	0.112	0.104	0.180	0.160	0.160	0.160	0.160	0.140	0.140	0.216	0.192	0.168	0.168			
	11.1	Vc	288	260	260	260	260	260	231	231	299	269	269	269	269	269	239	268	241	241	241			
		fz	0.189	0.170	0.170	0.170	0.170	0.170	0.151	0.151	0.199	0.179	0.179	0.179	0.179	0.179	0.159	0.212	0.191	0.191	0.191			
		RPM	11475	10328	10328	10328	10328	10328	9180	9180	9508	8557	8557	8557	8557	8557	7606	7104	6394	6394	6394			
		FEED	4338	3512	3512	3512	3512	3512	2772	2772	3784	3063	3063	3063	3063	3063	2419	3012	2443	2443	2443			
		Ap	0.144	0.128	0.128	0.128	0.112	0.112	0.112	0.104	0.180	0.160	0.160	0.160	0.160	0.140	0.140	0.216	0.192	0.168	0.168			
	11.2	Vc	278	250	250	250	250	250	222	222	288	260	260	260	260	260	231	257	232	232	232			
		fz	0.164	0.148	0.148	0.148	0.148	0.148	0.131	0.131	0.174	0.157	0.157	0.157	0.157	0.157	0.139	0.187	0.168	0.168	0.168			
		RPM	11065	9959	9959	9959	9959	9959	8852	8852	9180	8262	8262	8262	8262	8262	7344	6830	6147	6147	6147			
		FEED	3629	2948	2948	2948	2948	2948	2319	2319	3195	2594	2594	2594	2594	2594	2042	2554	2065	2065	2065			
		Ap	0.122	0.109	0.109	0.109	0.095	0.095	0.095	0.088	0.153	0.136	0.136	0.136	0.136	0.119	0.119	0.184	0.163	0.143	0.143			
H	38.1	Vc	278	250	250	250	250	250	222	222	288	260	260	260	260	260	231	257	232	232	232			
		fz	0.164	0.148	0.148	0.148	0.148	0.148	0.131	0.131	0.174	0.157	0.157	0.157	0.157	0.157	0.139	0.187	0.168	0.168	0.168			
		RPM	11065	9959	9959	9959	9959	9959	8852	8852	9180	8262	8262	8262	8262	8262	7344	6830	6147	6147	6147			
		FEED	3629	2948	2948	2948	2948	2948	2319	2319	3195	2594	2594	2594	2594	2594	2042	2554	2065	2065	2065			
		Ap	0.122	0.109	0.109	0.109	0.095	0.095	0.095	0.088	0.153	0.136	0.136	0.136	0.136	0.119	0.119	0.184	0.163	0.143	0.143			
	38.2	Vc	232	209	209	209	209	209	185	185	242	218	218	218	218	218	194	216	195	195	195			
		fz	0.150	0.135	0.135	0.135	0.135	0.135	0.120	0.120	0.160	0.144	0.144	0.144	0.144	0.144	0.128	0.170	0.153	0.153	0.153			
		RPM	9221	8299	8299	8299	8299	8299	7377	7377	7704	6934	6934	6934	6934	6934	6163	5737	5163	5163	5163			
		FEED	2766	2241	2241	2241	2241	2241	1770	1770	2465	1997	1997	1997	1997	1997	1578	1951	1580	1580	1580			
		Ap	0.122	0.109	0.109	0.109	0.095	0.095	0.095	0.088	0.153	0.136	0.136	0.136	0.136	0.119	0.119	0.184	0.163	0.143	0.143			
	39.1	Vc	206	185	185	185	185	185	165	165	211	190	190	190	190	190	169	196	176	176	176			
		fz	0.134	0.121	0.121	0.121	0.121	0.121	0.107	0.107	0.144	0.130	0.130	0.130	0.130	0.130	0.115	0.155	0.140	0.140	0.140			
		RPM	8197	7377	7377	7377	7377	7377	6558	6558	6721	6049	6049	6049	6049	6049	5377	5191	4672	4672	4672			
		FEED	2197	1785	1785	1785	1785	1785	1403	1403	1936	1573	1573	1573	1573	1573	1237	1609	1308	1308	1308			
		Ap	0.115	0.102	0.102	0.102	0.090	0.090	0.090	0.083	0.144	0.128	0.128	0.128	0.128	0.112	0.112	0.173	0.154	0.134	0.134			
	39.2	Vc	180	162	162	162	162	162	144	144	185	167	167	167	167	167	148	170	153	153	153			
		fz	0.132	0.119	0.119	0.119	0.119	0.119	0.106	0.106	0.142	0.128	0.128	0.128	0.128	0.128	0.114	0.142	0.128	0.128	0.128			
		RPM	7172	6455	6455	6455	6455	6455	5738	5738	5902	5312	5312	5312	5312	5312	4722	4508	4057	4057	4057			
		FEED	1893	1536	1536	1536	1536	1536	1216	1216	1676	1360	1360	1360	1360	1360	1077	1280	1039	1039	1039			
		Ap	0.115	0.102	0.102	0.102	0.090	0.090	0.090	0.083	0.144	0.128	0.128	0.128	0.128	0.112	0.112	0.173	0.154	0.134	0.134			
	39.3	Vc	170	153	153	153	153	153	136	136	170	153	153	153	153	153	136	154	139	139	139			
		fz	0.119	0.107	0.107	0.107	0.107	0.107	0.095	0.095	0.130	0.117	0.117	0.117	0.117	0.117	0.104	0.131	0.118	0.118	0.118			
		RPM	6762	6086	6086	6086	6086	6086	5410	5410	5410	4869	4869	4869	4869	4869	4328	4098	3688	3688	3688			
		FEED	1609	1302	1302	1302	1302	1302	1028	1028	1407	1139	1139	1139	1139	1139	900	1074	870	870	870			
		Ap	0.094	0.083	0.083	0.083	0.073	0.073	0.073	0.068	0.117	0.104	0.104	0.104	0.104	0.091	0.091	0.140	0.125	0.109	0.109			
	40	Vc	278	250	250	250	250	250	222	222	288	260	260	260	260	260	231	257	232	232	232			
		fz	0.164	0.148	0.148	0.148	0.148	0.148	0.131	0.131	0.174	0.157	0.157	0.157	0.157	0.157	0.139	0.187	0.168	0.168	0.168			
		RPM	11065	9959	9959	9959	9959	9959	8852	8852	9180	8262	8262	8262	8262	8262	7344	6830	6147	6147	6147			
		FEED	3629	2948	2948	2948	2948	2948	2319	2319	3195	2594	2594	2594	2594	2594	2042	2554	2065	2065	2065			
		Ap	0.122	0.109	0.109	0.109	0.095	0.095	0.095	0.088	0.153	0.136	0.136	0.136	0.136	0.119	0.119	0.184	0.163	0.143	0.143			
	41	Vc	232	209	209	209	209	209	185	185	242	218	218	218	218	218	194	216	195	195	195			
		fz	0.150	0.135	0.135	0.135	0.135	0.135	0.120	0.120	0.160	0.144	0.144	0.144	0.144	0.144	0.128	0.170	0.153	0.153	0.153			
		RPM	9221	8299	8299	8299	8299	8299	7377	7377	7704	6934	6934	6934	6934	6934	6163	5737	5163	5163	5163			
		FEED	2766	2241	2241	2241	2241	2241	1770	1770	2465	1997	1997	1997	1997	1997	1578	1951	1580	1580	1580			
		Ap	0.122	0.109	0.109	0.109	0.095	0.095	0.095	0.088	0.153	0.136	0.136	0.136	0.136	0.119	0.119	0.184	0.163	0.143	0.143			



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ALU-CUT END MILLS
K-2 END MILLS
GENERAL CARBIDE END MILLS

X1-EH END MILLS

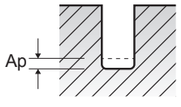
RECOMMENDED CUTTING CONDITIONS

HPI89 SERIES 2 FLUTE CORNER RADIUS for RIB PROCESSING

Vc = m/min.
fz = mm/tooth
RPM = rev./min.
FEED = mm/min.
Ap = mm
LBS = Length Below Shank

ISO	VDI 3323	Material Description	Slotting	Parameter	Diameter (Ø)																	
			Ae		0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.4	0.4	0.4	0.4	0.4	0.4	0.5	0.5	0.5
				LBS	0.5	1	1.5	2	1	1.5	2	2.5	3	1	1.5	2	2.5	3	4	1	2	3
P	5	Non-alloy steel	1.0D	Vc	31	31	28	28	46	46	42	42	42	67	67	67	60	60	60	82	82	74
				fz	0.001	0.001	0.001	0.001	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.004	0.004	0.004
				RPM	49178	49178	44260	44260	49178	49178	44260	44260	44260	53277	53277	53277	47949	47949	47949	52458	52458	47212
				FEED	98	98	89	89	197	197	177	177	177	213	213	213	192	192	192	420	420	378
				Ap	0.010	0.009	0.008	0.007	0.014	0.014	0.012	0.011	0.011	0.020	0.018	0.018	0.016	0.016	0.014	0.025	0.023	0.020
	8~9	Low alloy steel	1.0D	Vc	31	31	28	28	46	46	42	42	42	67	67	67	60	60	60	82	82	74
				fz	0.001	0.001	0.001	0.001	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.004	0.004	0.004
				RPM	49178	49178	44260	44260	49178	49178	44260	44260	44260	53277	53277	53277	47949	47949	47949	52458	52458	47212
				FEED	98	98	89	89	197	197	177	177	177	213	213	213	192	192	192	420	420	378
				Ap	0.010	0.009	0.008	0.007	0.014	0.014	0.012	0.011	0.011	0.020	0.018	0.018	0.016	0.016	0.014	0.025	0.023	0.020
	11.1	High alloyed steel, and tool steel	1.0D	Vc	31	31	28	28	46	46	42	42	42	67	67	67	60	60	60	82	82	74
				fz	0.001	0.001	0.001	0.001	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.004	0.004	0.004
				RPM	49178	49178	44260	44260	49178	49178	44260	44260	44260	53277	53277	53277	47949	47949	47949	52458	52458	47212
				FEED	98	98	89	89	197	197	177	177	177	213	213	213	192	192	192	420	420	378
				Ap	0.010	0.009	0.008	0.007	0.014	0.014	0.012	0.011	0.011	0.020	0.018	0.018	0.016	0.016	0.014	0.025	0.023	0.020
	11.2		1.0D	Vc	31	31	28	28	41	41	37	37	37	57	57	57	51	51	51	72	72	65
				fz	0.001	0.001	0.001	0.001	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.003	0.003	0.003
				RPM	49178	49178	44260	44260	43714	43714	39343	39343	39343	45081	45081	45081	40573	40573	40573	45900	45900	41310
				FEED	98	98	89	89	175	175	157	157	157	180	180	180	162	162	162	275	275	248
				Ap	0.009	0.008	0.007	0.006	0.011	0.011	0.010	0.009	0.009	0.017	0.015	0.015	0.014	0.014	0.012	0.021	0.019	0.017
H	38.1	Hardened steel	1.0D	Vc	31	31	28	28	41	41	37	37	37	57	57	57	51	51	51	72	72	65
				fz	0.001	0.001	0.001	0.001	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.003	0.003	0.003
				RPM	49178	49178	44260	44260	43714	43714	39343	39343	39343	45081	45081	45081	40573	40573	40573	45900	45900	41310
				FEED	98	98	89	89	175	175	157	157	157	180	180	180	162	162	162	275	275	248
				Ap	0.009	0.008	0.007	0.006	0.011	0.011	0.010	0.009	0.009	0.017	0.015	0.015	0.014	0.014	0.012	0.021	0.019	0.017
	38.2		1.0D	Vc	26	26	23	23	41	41	37	37	37	52	52	52	46	46	46	67	67	60
				fz	0.001	0.001	0.001	0.001	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.003	0.003	0.003
				RPM	40983	40983	36885	36885	43714	43714	39343	39343	39343	40983	40983	40983	36885	36885	36885	42621	42621	38359
				FEED	82	82	74	74	87	87	79	79	79	164	164	164	148	148	148	256	256	230
				Ap	0.009	0.008	0.007	0.006	0.011	0.011	0.010	0.009	0.009	0.017	0.015	0.015	0.014	0.014	0.012	0.021	0.019	0.017
	39.1		1.0D	Vc	21	21	19	19	31	31	28	28	28	41	41	41	37	37	37	52	52	46
				fz	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.002	0.002	0.002
				RPM	32786	32786	29507	29507	32786	32786	29507	29507	29507	32786	32786	32786	29507	29507	29507	32786	32786	29507
				FEED	66	66	59	59	66	66	59	59	59	66	66	66	59	59	59	131	131	118
				Ap	0.008	0.007	0.006	0.006	0.011	0.011	0.010	0.008	0.008	0.016	0.014	0.014	0.013	0.013	0.011	0.020	0.018	0.016
	39.2		1.0D	Vc	21	21	19	19	26	26	23	23	23	31	31	31	28	28	28	41	41	37
				fz	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.002	0.002	0.002
				RPM	32786	32786	29507	29507	27322	27322	24590	24590	24590	24589	24589	24589	22130	22130	22130	26229	26229	23606
				FEED	66	66	59	59	55	55	49	49	49	49	49	49	44	44	44	105	105	94
				Ap	0.008	0.007	0.006	0.006	0.011	0.011	0.010	0.008	0.008	0.016	0.014	0.014	0.013	0.013	0.011	0.020	0.018	0.016
	39.3		1.0D	Vc	21	21	19	19	21	21	19	19	19	26	26	26	23	23	23	31	31	28
				fz	0.009	0.009	0.008	0.008	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.002	0.002	0.001
				RPM	32786	32786	29507	29507	21858	21858	19672	19672	19672	20491	20491	20491	18442	18442	18442	19672	19672	17705
				FEED	590	590	472	472	44	44	39	39	39	41	41	41	37	37	37	79	79	35
				Ap	0.007	0.006	0.005	0.005	0.009	0.009	0.008	0.007	0.007	0.013	0.012	0.012	0.010	0.010	0.009	0.016	0.015	0.013
	40	Chilled Cast Iron	1.0D	Vc	31	31	28	28	41	41	37	37	37	57	57	57	51	51	51	72	72	65
				fz	0.001	0.001	0.001	0.001	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.003	0.003	0.003
				RPM	49178	49178	44260	44260	43714	43714	39343	39343	39343	45081	45081	45081	40573	40573	40573	45900	45900	41310
				FEED	98	98	89	89	175	175	157	157	157	180	180	180	162	162	162	275	275	248
				Ap	0.009	0.008	0.007	0.006	0.011	0.011	0.010	0.009	0.009	0.017	0.015	0.015	0.014	0.014	0.012	0.021	0.019	0.017
	41	Hardened Cast Iron	1.0D	Vc	26	26	23	23	41	41	37	37	37	52	52	52	46	46	46	67	67	60
				fz	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.002	0.002	0.002	0.002	0.002	0.002	0.003	0.003	0.003
				RPM	40983	40983	36885	36885	43714	43714	39343	39343	39343	40983	40983	40983	36885	36885	36885	42621	42621	38359
				FEED	82	82	74	74	87	87	79	79	79	164	164	164	148	148	148	256	256	230
				Ap	0.009	0.008	0.007	0.006	0.011	0.011	0.010	0.009	0.009	0.017	0.015	0.015	0.014	0.014	0.012	0.021	0.019	0.017

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GENERAL CARBIDE END MILLS

X1-EH END MILLS

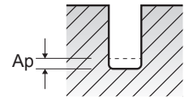
RECOMMENDED CUTTING CONDITIONS

HPI89 SERIES 2 FLUTE CORNER RADIUS for RIB PROCESSING

Vc = m/min.
fz = mm/tooth
RPM = rev./min.
FEED = mm/min.
Ap = mm
LBS = Length Below Shank

ISO	VDI 3323	Material Description	Parameter	Diameter (Ø)																		
				0.5	0.5	0.5	0.6	0.6	0.6	0.6	0.6	0.7	0.7	0.7	0.8	0.8	0.8	0.8	0.8	0.9	0.9	1	1	1	1
			LBS	4	5	6	2	4	6	8	10	2	4	6	2	4	6	8	12	4	8	4	6	8	10
P	5	Non-alloy steel	Vc	74	74	66	98	88	88	78	59	113	102	102	129	129	116	116	103	144	130	154	139	139	139
			fz	0.004	0.004	0.003	0.005	0.005	0.005	0.004	0.004	0.006	0.005	0.005	0.006	0.006	0.005	0.005	0.005	0.007	0.006	0.010	0.009	0.009	0.009
			RPM	47212	47212	41966	51911	46720	46720	41529	31147	51569	46412	46412	51228	51228	46105	46105	40982	51000	45900	49178	44260	44260	44260
			FEED	378	378	252	519	467	467	332	249	619	464	464	615	615	461	461	410	714	551	984	797	797	797
			Ap	0.020	0.018	0.018	0.027	0.024	0.021	0.018	0.015	0.035	0.028	0.025	0.040	0.036	0.032	0.028	0.024	0.041	0.032	0.045	0.040	0.040	0.035
	8~9	Low alloy steel	Vc	74	74	66	98	88	88	78	59	113	102	102	129	129	116	116	103	144	130	154	139	139	139
			fz	0.004	0.004	0.003	0.005	0.005	0.005	0.004	0.004	0.006	0.005	0.005	0.006	0.006	0.005	0.005	0.005	0.007	0.006	0.010	0.009	0.009	0.009
			RPM	47212	47212	41966	51911	46720	46720	41529	31147	51569	46412	46412	51228	51228	46105	46105	40982	51000	45900	49178	44260	44260	44260
			FEED	378	378	252	519	467	467	332	249	619	464	464	615	615	461	461	410	714	551	984	797	797	797
			Ap	0.020	0.018	0.018	0.027	0.024	0.021	0.018	0.015	0.035	0.028	0.025	0.040	0.036	0.032	0.028	0.024	0.041	0.032	0.045	0.040	0.040	0.035
	11.1	High alloyed steel, and tool steel	Vc	74	74	66	98	88	88	78	59	113	102	102	129	129	116	116	103	144	130	154	139	139	139
			fz	0.004	0.004	0.003	0.005	0.005	0.005	0.004	0.004	0.006	0.005	0.005	0.006	0.006	0.005	0.005	0.005	0.007	0.006	0.010	0.009	0.009	0.009
			RPM	47212	47212	41966	51911	46720	46720	41529	31147	51569	46412	46412	51228	51228	46105	46105	40982	51000	45900	49178	44260	44260	44260
			FEED	378	378	252	519	467	467	332	249	619	464	464	615	615	461	461	410	714	551	984	797	797	797
			Ap	0.020	0.018	0.018	0.027	0.024	0.021	0.018	0.015	0.035	0.028	0.025	0.040	0.036	0.032	0.028	0.024	0.041	0.032	0.045	0.040	0.040	0.035
	11.2		Vc	65	65	58	88	79	79	70	53	93	84	84	103	103	93	93	82	113	102	124	111	111	111
			fz	0.003	0.003	0.002	0.004	0.004	0.004	0.003	0.003	0.005	0.005	0.005	0.006	0.006	0.005	0.005	0.005	0.007	0.006	0.008	0.007	0.007	0.007
			RPM	41310	41310	36720	46447	41802	41802	37158	27868	42230	38007	38007	40983	40983	36885	36885	32786	40072	36065	39343	35409	35409	35409
			FEED	248	248	147	372	334	334	223	167	422	380	380	492	492	369	369	328	561	433	629	496	496	496
			Ap	0.017	0.015	0.015	0.023	0.020	0.018	0.015	0.013	0.030	0.024	0.021	0.034	0.031	0.027	0.024	0.020	0.034	0.027	0.038	0.034	0.034	0.030
H	38.1	Hardened steel	Vc	65	65	58	88	79	79	70	53	93	84	84	103	103	93	93	82	113	102	124	111	111	111
			fz	0.003	0.003	0.002	0.004	0.004	0.004	0.003	0.003	0.005	0.005	0.005	0.006	0.006	0.005	0.005	0.005	0.007	0.006	0.008	0.007	0.007	0.007
			RPM	41310	41310	36720	46447	41802	41802	37158	27868	42230	38007	38007	40983	40983	36885	36885	32786	40072	36065	39343	35409	35409	35409
			FEED	248	248	147	372	334	334	223	167	422	380	380	492	492	369	369	328	561	433	629	496	496	496
			Ap	0.017	0.015	0.015	0.023	0.020	0.018	0.015	0.013	0.030	0.024	0.021	0.034	0.031	0.027	0.024	0.020	0.034	0.027	0.038	0.034	0.034	0.030
	38.2		Vc	60	60	54	77	70	70	62	46	77	69	69	77	77	70	70	62	82	74	82	74	74	74
			fz	0.003	0.003	0.002	0.004	0.004	0.004	0.003	0.003	0.005	0.004	0.004	0.005	0.005	0.005	0.005	0.004	0.006	0.005	0.007	0.006	0.006	0.006
			RPM	38359	38359	34097	40983	36885	36885	32786	24590	35020	31518	31518	30737	30737	27663	27663	24590	29143	26229	26229	23606	23606	23606
			FEED	230	230	136	328	295	295	197	148	350	252	252	307	307	277	277	197	350	262	367	283	283	283
			Ap	0.017	0.015	0.015	0.023	0.020	0.018	0.015	0.013	0.030	0.024	0.021	0.034	0.031	0.027	0.024	0.020	0.034	0.027	0.038	0.034	0.034	0.030
	39.1		Vc	46	46	41	57	51	51	45	34	62	56	56	67	67	60	60	54	67	60	67	60	60	60
			fz	0.002	0.002	0.002	0.003	0.003	0.003	0.002	0.002	0.004	0.003	0.003	0.004	0.004	0.004	0.004	0.003	0.005	0.005	0.005	0.005	0.005	0.005
			RPM	29507	29507	26229	30053	27048	27048	24042	18032	28335	25502	25502	26639	26639	23975	23975	21311	23679	21311	21311	19180	19180	19180
			FEED	118	118	105	180	162	162	96	72	227	153	153	213	213	192	192	128	237	213	213	192	192	192
			Ap	0.016	0.014	0.014	0.022	0.019	0.017	0.014	0.012	0.028	0.022	0.020	0.032	0.029	0.026	0.022	0.019	0.032	0.025	0.036	0.032	0.032	0.028
	39.2		Vc	37	37	33	46	42	42	37	28	46	42	42	51	51	46	46	41	52	46	51	46	46	46
			fz	0.002	0.002	0.001	0.002	0.002	0.002	0.002	0.001	0.003	0.002	0.002	0.003	0.003	0.003	0.003	0.002	0.004	0.004	0.004	0.004	0.004	0.004
			RPM	23606	23606	20983	24589	22130	22130	19671	14753	21115	19004	19004	20491	20491	18442	18442	16393	18215	16394	16392	14753	14753	14753
			FEED	94	94	42	98	89	89	79	30	127	76	76	123	123	111	111	66	146	131	131	118	118	118
			Ap	0.016	0.014	0.014	0.022	0.019	0.017	0.014	0.012	0.028	0.022	0.020	0.032	0.029	0.026	0.022	0.019	0.032	0.025	0.036	0.032	0.032	0.028
	39.3		Vc	28	28	25	41	37	37	33	25	42	38	38	41	41	37	37	33	41	37	41	37	37	37
			fz	0.001	0.001	0.001	0.002	0.002	0.002	0.002	0.001	0.002	0.002	0.002	0.003	0.003	0.002	0.002	0.002	0.003	0.003	0.003	0.003	0.003	0.003
			RPM	17705	17705	15738	21858	19672	19672	17486	13115	18952	17057	17057	16392	16392	14753	14753	13114	14571	13114	13114	11803	11803	11803
			FEED	35	35	31	87	79	79	70	26	76	68	68	98	98	59	59	52	87	79	79	71	71	71
			Ap	0.013	0.011	0.011	0.018	0.016	0.014	0.012	0.010	0.023	0.018	0.016	0.026	0.023	0.021	0.018	0.016	0.026	0.020	0.029	0.026	0.026	0.023
	40	Chilled Cast Iron	Vc	65	65	58	88	79	79	70	53	93	84	84	103	103	93	93	82	113	102	124	111	111	111
			fz	0.003	0.003	0.002	0.004	0.004	0.004	0.003	0.003	0.005	0.005	0.005	0.006	0.006	0.005	0.005	0.005	0.007	0.006	0.008	0.007	0.007	0.007
			RPM	41310	41310	36720	46447	41802	41802	37158	27868	42230	38007	38007	40983	40983	36885	36885	32786	40072	36065	39343	35409	35409	35409
			FEED	248	248	147	372	334	334	223	167	422	380	380	492	492	369	369	328	561	433	629	496	496	496
			Ap	0.017	0.015	0.015	0.023	0.020	0.018	0.015	0.013	0.030	0.024	0.021	0.034	0.031	0.027	0.024	0.020	0.034	0.027	0.038	0.034	0.034	0.030
	41	Hardened Cast Iron	Vc	60	60	54	77	70	70	62	46	77	69	69	77	77	70	70	62	82	74	82	74	74	74
			fz	0.003	0.003	0.002	0.004	0.004	0.004	0.003	0.003	0.005	0.004	0.004	0.005	0.005	0.005	0.005	0.004	0.006	0.005	0.007	0.006	0.006	0.006
			RPM	38359	38359	34097	40983	36885	36885	32786	24590	35020	31518	31518	30737	30737	27663	27663	24590	29143	26229	26229	23606	23606	23606
			FEED	230	230	136	328	295	295	197	148	350	252	252	307	307	277	277	197	350	262	367	283	283	283
			Ap	0.017	0.015	0.015	0.023	0.020	0.018	0.015	0.013	0.030	0.024	0.021	0.034	0.031	0.027	0.024	0.020	0.034	0.027	0.038	0.034	0.034	0.030

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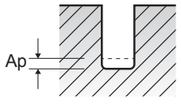
X1-EH END MILLS

RECOMMENDED CUTTING CONDITIONS

HPI89 SERIES — 2 FLUTE CORNER RADIUS for RIB PROCESSING

Vc = m/min.
fz = mm/tooth
RPM = rev./min.
FEED = mm/min.
Ap = mm
LBS = Length Below Shank

ISO	VDI 3323	Para-meter	Diameter (Ø)																				
			1	1	1	1.5	1.5	1.5	1.5	1.5	2	2	2	2	2	2	2	3	3	3	3	3	3
		LBS	12	16	20	4	8	12	15	20	6	8	12	16	20	25	30	8	12	16	20	30	35
P	5	Vc	124	93	93	196	176	176	176	157	216	216	195	195	195	173	173	211	211	190	190	190	169
		fz	0.008	0.007	0.007	0.011	0.010	0.010	0.010	0.009	0.013	0.013	0.012	0.012	0.012	0.010	0.010	0.019	0.019	0.017	0.017	0.017	0.015
		RPM	39342	29507	29507	41581	37423	37423	37423	33265	34426	34426	30983	30983	30983	27541	27541	22404	22404	20164	20164	20164	17923
		FEED	629	413	413	915	748	748	748	599	895	895	744	744	744	551	551	851	851	686	686	686	538
		Ap	0.035	0.030	0.025	0.075	0.060	0.060	0.053	0.045	0.100	0.090	0.080	0.080	0.070	0.070	0.060	0.150	0.135	0.120	0.120	0.105	0.105
	8~9	Vc	124	93	93	196	176	176	176	157	216	216	195	195	195	173	173	211	211	190	190	190	169
		fz	0.008	0.007	0.007	0.011	0.010	0.010	0.010	0.009	0.013	0.013	0.012	0.012	0.012	0.010	0.010	0.019	0.019	0.017	0.017	0.017	0.015
		RPM	39342	29507	29507	41581	37423	37423	37423	33265	34426	34426	30983	30983	30983	27541	27541	22404	22404	20164	20164	20164	17923
		FEED	629	413	413	915	748	748	748	599	895	895	744	744	744	551	551	851	851	686	686	686	538
		Ap	0.035	0.030	0.025	0.075	0.060	0.060	0.053	0.045	0.100	0.090	0.080	0.080	0.070	0.070	0.060	0.150	0.135	0.120	0.120	0.105	0.105
	11.1	Vc	124	93	93	196	176	176	176	157	216	216	195	195	195	173	173	211	211	190	190	190	169
		fz	0.008	0.007	0.007	0.011	0.010	0.010	0.010	0.009	0.013	0.013	0.012	0.012	0.012	0.010	0.010	0.019	0.019	0.017	0.017	0.017	0.015
		RPM	39342	29507	29507	41581	37423	37423	37423	33265	34426	34426	30983	30983	30983	27541	27541	22404	22404	20164	20164	20164	17923
		FEED	629	413	413	915	748	748	748	599	895	895	744	744	744	551	551	851	851	686	686	686	538
		Ap	0.035	0.030	0.025	0.075	0.060	0.060	0.053	0.045	0.100	0.090	0.080	0.080	0.070	0.070	0.060	0.150	0.135	0.120	0.120	0.105	0.105
	11.2	Vc	99	74	74	154	139	139	139	123	170	170	153	153	153	136	136	170	170	153	153	153	136
		fz	0.006	0.006	0.006	0.010	0.009	0.009	0.009	0.008	0.013	0.013	0.012	0.012	0.012	0.010	0.010	0.020	0.020	0.018	0.018	0.018	0.016
		RPM	31474	23606	23606	32754	29479	29479	29479	26203	27049	27049	24344	24344	24344	21639	21639	18032	18032	16229	16229	16229	14426
		FEED	378	283	283	655	531	531	531	419	703	703	584	584	584	433	433	721	721	584	584	584	462
		Ap	0.030	0.026	0.021	0.064	0.051	0.051	0.045	0.038	0.085	0.077	0.068	0.068	0.060	0.060	0.051	0.128	0.115	0.102	0.102	0.089	0.089
H	38.1	Vc	99	74	74	154	139	139	139	123	170	170	153	153	153	136	136	170	170	153	153	153	136
		fz	0.006	0.006	0.006	0.010	0.009	0.009	0.009	0.008	0.013	0.013	0.012	0.012	0.012	0.010	0.010	0.020	0.020	0.018	0.018	0.018	0.016
		RPM	31474	23606	23606	32754	29479	29479	29479	26203	27049	27049	24344	24344	24344	21639	21639	18032	18032	16229	16229	16229	14426
		FEED	378	283	283	655	531	531	531	419	703	703	584	584	584	433	433	721	721	584	584	584	462
		Ap	0.030	0.026	0.021	0.064	0.051	0.051	0.045	0.038	0.085	0.077	0.068	0.068	0.060	0.060	0.051	0.128	0.115	0.102	0.102	0.089	0.089
	38.2	Vc	66	49	49	103	93	93	93	83	113	113	102	102	102	91	91	113	113	102	102	102	91
		fz	0.006	0.005	0.005	0.009	0.008	0.008	0.008	0.007	0.012	0.012	0.011	0.011	0.011	0.010	0.010	0.018	0.018	0.016	0.016	0.016	0.014
		RPM	20983	15737	15737	21939	19745	19745	19745	17551	18032	18032	16229	16229	16229	14426	14426	12021	12021	10819	10819	10819	9617
		FEED	252	157	157	395	316	316	316	246	433	433	357	357	357	289	289	433	433	346	346	346	269
		Ap	0.030	0.026	0.021	0.064	0.051	0.051	0.045	0.038	0.085	0.077	0.068	0.068	0.060	0.060	0.051	0.128	0.115	0.102	0.102	0.089	0.089
	39.1	Vc	54	40	40	83	74	74	74	66	93	93	83	83	83	74	74	93	93	83	83	83	74
		fz	0.004	0.004	0.004	0.007	0.006	0.006	0.006	0.005	0.009	0.009	0.008	0.008	0.008	0.007	0.007	0.014	0.014	0.013	0.013	0.013	0.011
		RPM	17049	12787	12787	17510	15759	15759	15759	14008	14754	14754	13279	13279	13279	11803	11803	9835	9835	8852	8852	8852	7868
		FEED	136	102	102	245	189	189	189	140	266	266	212	212	212	165	165	275	275	230	230	230	173
		Ap	0.028	0.024	0.020	0.060	0.048	0.048	0.042	0.036	0.080	0.072	0.064	0.064	0.056	0.056	0.048	0.120	0.108	0.096	0.096	0.084	0.084
	39.2	Vc	41	31	31	62	56	56	56	50	72	72	65	65	65	58	58	72	72	65	65	65	58
		fz	0.003	0.003	0.003	0.006	0.005	0.005	0.005	0.004	0.007	0.007	0.006	0.006	0.006	0.006	0.006	0.011	0.011	0.010	0.010	0.010	0.009
		RPM	13114	9835	9835	13184	11866	11866	11866	10547	11475	11475	10328	10328	10328	9180	9180	7650	7650	6885	6885	6885	6120
		FEED	79	59	59	158	119	119	119	84	161	161	124	124	124	110	110	168	168	138	138	138	110
		Ap	0.028	0.024	0.020	0.060	0.048	0.048	0.042	0.036	0.080	0.072	0.064	0.064	0.056	0.056	0.048	0.120	0.108	0.096	0.096	0.084	0.084
	39.3	Vc	33	25	25	52	47	47	47	42	62	62	56	56	56	49	49	62	62	56	56	56	49
		fz	0.003	0.002	0.002	0.005	0.004	0.004	0.004	0.004	0.006	0.006	0.005	0.005	0.005	0.005	0.005	0.009	0.009	0.008	0.008	0.008	0.007
		RPM	10491	7868	7868	11021	9919	9919	9919	8817	9835	9835	8852	8852	8852	7868	7868	6557	6557	5901	5901	5901	5246
		FEED	63	31	31	110	79	79	79	71	118	118	89	89	89	79	79	118	118	94	94	94	73
		Ap	0.023	0.020	0.016	0.049	0.039	0.039	0.034	0.029	0.065	0.059	0.052	0.052	0.046	0.046	0.039	0.098	0.088	0.078	0.078	0.068	0.068
	40	Vc	99	74	74	154	139	139	139	123	170	170	153	153	153	136	136	170	170	153	153	153	136
		fz	0.006	0.006	0.006	0.010	0.009	0.009	0.009	0.008	0.013	0.013	0.012	0.012	0.012	0.010	0.010	0.020	0.020	0.018	0.018	0.018	0.016
		RPM	31474	23606	23606	32754	29479	29479	29479	26203	27049	27049	24344	24344	24344	21639	21639	18032	18032	16229	16229	16229	14426
		FEED	378	283	283	655	531	531	531	419	703	703	584	584	584	433	433	721	721	584	584	584	462
		Ap	0.030	0.026	0.021	0.064	0.051	0.051	0.045	0.038	0.085	0.077	0.068	0.068	0.060	0.060	0.051	0.128	0.115	0.102	0.102	0.089	0.089
	41	Vc	66	49	49	103	93	93	93	83	113	113	102	102	102	91	91	113	113	102	102	102	91
		fz	0.006	0.005	0.005	0.009	0.008	0.008	0.008	0.007	0.012	0.012	0.011	0.011	0.011	0.010	0.010	0.018	0.018	0.016	0.016	0.016	0.014
		RPM	20983	15737	15737	21939	19745	19745	19745	17551	18032	18032	16229	16229	16229	14426	14426	12021	12021	10819	10819	10819	9617
		FEED	252	157	157	395	316	316	316	246	433	433	357	357	357	289	289	433	433	346	346	346	269
		Ap	0.030	0.026	0.021	0.064	0.051	0.051	0.045	0.038	0.085	0.077	0.068	0.068	0.060	0.060	0.051	0.128	0.115	0.102	0.102	0.089	0.089



CARBIDE
HSS
i-Xmill END MILLS
X-1EH END MILLS
4G MILL END MILLS
X-POWER PRO END MILLS
TitaNox-POWER END MILLS
V7 PLUS END MILLS
ALU-CUT END MILLS
K-2 END MILLS
GENERAL CARBIDE END MILLS

X1-EH END MILLS

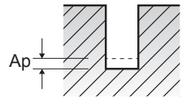
RECOMMENDED CUTTING CONDITIONS

HPI88 SERIES — 2 FLUTE for RIB PROCESSING

Vc = m/min.
fz = mm/tooth
RPM = rev./min.
FEED = mm/min.
Ap = mm
LBS = Length Below Shank

ISO	VDI 3323	Material Description	Slotting	Para-meter	Diameter (Ø)																		
					0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.4	0.4	0.4	0.4	0.4	0.4
			Ae	LBS	0.5	0.75	1	1.5	2	2.5	3	1	1.5	2	2.5	3	1	1.5	2	2.5	3	3.5
P	5	Non-alloy steel	1.0D	Vc	31	31	31	28	28	25	25	46	46	42	42	42	67	67	67	60	60	60
				fz	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002
				RPM	49178	49178	49178	44260	44260	39342	39342	49178	49178	44260	44260	44260	53277	53277	53277	47949	47949	47949
				FEED	98	98	98	89	89	79	79	197	197	177	177	177	213	213	213	192	192	192
				Ap	0.010	0.009	0.009	0.008	0.007	0.007	0.006	0.014	0.014	0.012	0.011	0.011	0.020	0.018	0.018	0.016	0.016	0.014
	8~9	Low alloy steel	1.0D	Vc	31	31	31	28	28	25	25	46	46	42	42	42	67	67	67	60	60	60
				fz	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002
				RPM	49178	49178	49178	44260	44260	39342	39342	49178	49178	44260	44260	44260	53277	53277	53277	47949	47949	47949
				FEED	98	98	98	89	89	79	79	197	197	177	177	177	213	213	213	192	192	192
				Ap	0.010	0.009	0.009	0.008	0.007	0.007	0.006	0.014	0.014	0.012	0.011	0.011	0.020	0.018	0.018	0.016	0.016	0.014
	11.1	High alloyed steel, and tool steel	1.0D	Vc	31	31	31	28	28	25	25	46	46	42	42	42	67	67	67	60	60	60
				fz	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002
				RPM	49178	49178	49178	44260	44260	39342	39342	49178	49178	44260	44260	44260	53277	53277	53277	47949	47949	47949
				FEED	98	98	98	89	89	79	79	197	197	177	177	177	213	213	213	192	192	192
				Ap	0.010	0.009	0.009	0.008	0.007	0.007	0.006	0.014	0.014	0.012	0.011	0.011	0.020	0.018	0.018	0.016	0.016	0.014
	11.2		1.0D	Vc	31	31	31	28	28	25	25	41	41	37	37	37	57	57	57	51	51	51
				fz	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002
				RPM	49178	49178	49178	44260	44260	39342	39342	43714	43714	39343	39343	39343	45081	45081	45081	40573	40573	40573
				FEED	98	98	98	89	89	79	79	175	175	157	157	157	180	180	180	162	162	162
				Ap	0.009	0.008	0.008	0.007	0.006	0.006	0.005	0.011	0.011	0.010	0.009	0.009	0.017	0.015	0.015	0.014	0.014	0.012
H	38.1		1.0D	Vc	31	31	31	28	28	25	25	41	41	37	37	37	57	57	57	51	51	51
				fz	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002
				RPM	49178	49178	49178	44260	44260	39342	39342	43714	43714	39343	39343	39343	45081	45081	45081	40573	40573	40573
				FEED	98	98	98	89	89	79	79	175	175	157	157	157	180	180	180	162	162	162
				Ap	0.009	0.008	0.008	0.007	0.006	0.006	0.005	0.011	0.011	0.010	0.009	0.009	0.017	0.015	0.015	0.014	0.014	0.012
	38.2		1.0D	Vc	26	26	26	23	23	21	21	41	41	37	37	37	52	52	52	46	46	46
				fz	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.002	0.002	0.002	0.002	0.002	0.002
				RPM	40983	40983	40983	36885	36885	32786	32786	43714	43714	39343	39343	39343	40983	40983	40983	36885	36885	36885
				FEED	82	82	82	74	74	66	66	87	87	79	79	79	164	164	164	148	148	148
				Ap	0.009	0.008	0.008	0.007	0.006	0.006	0.005	0.011	0.011	0.010	0.009	0.009	0.017	0.015	0.015	0.014	0.014	0.012
	39.1	Hardened steel	1.0D	Vc	21	21	21	19	19	16	16	31	31	28	28	28	41	41	41	37	37	37
				fz	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001
				RPM	32786	32786	32786	29507	29507	26229	26229	32786	32786	29507	29507	29507	32786	32786	32786	29507	29507	29507
				FEED	66	66	66	59	59	52	52	66	66	59	59	59	66	66	66	59	59	59
				Ap	0.008	0.007	0.007	0.006	0.006	0.006	0.005	0.011	0.011	0.010	0.008	0.008	0.016	0.014	0.014	0.013	0.013	0.011
	39.2		1.0D	Vc	21	21	21	19	19	16	16	26	26	23	23	23	31	31	31	28	28	28
				fz	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001
				RPM	32786	32786	32786	29507	29507	26229	26229	27322	27322	24590	24590	24590	24589	24589	24589	22130	22130	22130
				FEED	66	66	66	59	59	52	52	55	55	49	49	49	49	49	49	44	44	44
				Ap	0.008	0.007	0.007	0.006	0.006	0.006	0.005	0.011	0.011	0.010	0.008	0.008	0.016	0.014	0.014	0.013	0.013	0.011
	39.3		1.0D	Vc	21	21	21	19	19	16	16	21	21	19	19	19	26	26	26	23	23	23
				fz	0.009	0.009	0.009	0.008	0.008	0.007	0.007	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001
				RPM	32786	32786	32786	29507	29507	26229	26229	21858	21858	19672	19672	19672	20491	20491	20491	18442	18442	18442
				FEED	590	590	590	472	472	367	367	44	44	39	39	39	41	41	41	37	37	37
				Ap	0.007	0.006	0.006	0.005	0.005	0.005	0.004	0.009	0.009	0.008	0.007	0.007	0.013	0.012	0.012	0.010	0.010	0.009
	40	Chilled Cast Iron	1.0D	Vc	31	31	31	28	28	25	25	41	41	37	37	37	57	57	57	51	51	51
				fz	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002
				RPM	49178	49178	49178	44260	44260	39342	39342	43714	43714	39343	39343	39343	45081	45081	45081	40573	40573	40573
				FEED	98	98	98	89	89	79	79	175	175	157	157	157	180	180	180	162	162	162
				Ap	0.009	0.008	0.008	0.007	0.006	0.006	0.005	0.011	0.011	0.010	0.009	0.009	0.017	0.015	0.015	0.014	0.014	0.012
	41	Hardened Cast Iron	1.0D	Vc	26	26	26	23	23	21	21	41	41	37	37	37	52	52	52	46	46	46
				fz	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.002	0.002	0.002	0.002	0.002	0.002
				RPM	40983	40983	40983	36885	36885	32786	32786	43714	43714	39343	39343	39343	40983	40983	40983	36885	36885	36885
				FEED	82	82	82	74	74	66	66	87	87	79	79	79	164	164	164	148	148	148
				Ap	0.009	0.008	0.008	0.007	0.006	0.006	0.005	0.011	0.011	0.010	0.009	0.009	0.017	0.015	0.015	0.014	0.014	0.012

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X1-EH END MILLS

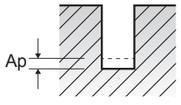
RECOMMENDED CUTTING CONDITIONS

Vc = m/min.
fz = mm/tooth
RPM = rev./min.
FEED = mm/min.
Ap = mm
LBS = Length Below Shank

HPI88 SERIES 2 FLUTE SQUARE for RIB PROCESSING

ISO	VDI 3323	Para-meter	Diameter (Ø)																				
			0.4	0.4	0.4	0.4	0.4	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.6	0.6
		LBS	4	5	6	8	10	1	1.5	2	2.5	3	3.5	4	4.5	5	6	7	8	9	10	1.5	2
P	5	Vc	60	54	54	40	20	82	82	82	82	74	74	74	74	74	66	66	49	49	49	98	98
		fz	0.002	0.002	0.002	0.001	0.001	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.003	0.003	0.003	0.003	0.003	0.005	0.005
		RPM	47949	42622	42622	31966	15983	52458	52458	52458	52458	47212	47212	47212	47212	47212	41966	41966	31475	31475	31475	51911	51911
		FEED	192	170	170	64	32	420	420	420	420	378	378	378	378	378	252	252	189	189	189	519	519
		Ap	0.014	0.014	0.012	0.010	0.008	0.025	0.025	0.023	0.023	0.020	0.020	0.020	0.018	0.018	0.018	0.015	0.015	0.013	0.013	0.030	0.027
	8~9	Vc	60	54	54	40	20	82	82	82	82	74	74	74	74	74	66	66	49	49	49	98	98
		fz	0.002	0.002	0.002	0.001	0.001	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.003	0.003	0.003	0.003	0.003	0.005	0.005
		RPM	47949	42622	42622	31966	15983	52458	52458	52458	52458	47212	47212	47212	47212	47212	41966	41966	31475	31475	31475	51911	51911
		FEED	192	170	170	64	32	420	420	420	420	378	378	378	378	378	252	252	189	189	189	519	519
		Ap	0.014	0.014	0.012	0.010	0.008	0.025	0.025	0.023	0.023	0.020	0.020	0.020	0.018	0.018	0.018	0.015	0.015	0.013	0.013	0.030	0.027
	11.1	Vc	60	54	54	40	20	82	82	82	82	74	74	74	74	74	66	66	49	49	49	98	98
		fz	0.002	0.002	0.002	0.001	0.001	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.003	0.003	0.003	0.003	0.003	0.005	0.005
		RPM	47949	42622	42622	31966	15983	52458	52458	52458	52458	47212	47212	47212	47212	47212	41966	41966	31475	31475	31475	51911	51911
		FEED	192	170	170	64	32	420	420	420	420	378	378	378	378	378	252	252	189	189	189	519	519
		Ap	0.014	0.014	0.012	0.010	0.008	0.025	0.025	0.023	0.023	0.020	0.020	0.020	0.018	0.018	0.018	0.015	0.015	0.013	0.013	0.030	0.027
	11.2	Vc	51	45	45	34	17	72	72	72	72	65	65	65	65	65	58	58	43	43	43	88	88
		fz	0.002	0.002	0.002	0.001	0.001	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.002	0.002	0.002	0.002	0.002	0.004	0.004
		RPM	40573	36065	36065	27049	13524	45900	45900	45900	45900	41310	41310	41310	41310	41310	36720	36720	27540	27540	27540	46447	46447
		FEED	162	144	144	54	27	275	275	275	275	248	248	248	248	248	147	147	110	110	110	372	372
		Ap	0.012	0.012	0.010	0.009	0.007	0.021	0.021	0.019	0.019	0.017	0.017	0.017	0.015	0.015	0.015	0.013	0.013	0.011	0.011	0.026	0.023
H	38.1	Vc	51	45	45	34	17	72	72	72	72	65	65	65	65	65	58	58	43	43	43	88	88
		fz	0.002	0.002	0.002	0.001	0.001	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.002	0.002	0.002	0.002	0.002	0.004	0.004
		RPM	40573	36065	36065	27049	13524	45900	45900	45900	45900	41310	41310	41310	41310	41310	36720	36720	27540	27540	27540	46447	46447
		FEED	162	144	144	54	27	275	275	275	275	248	248	248	248	248	147	147	110	110	110	372	372
		Ap	0.012	0.012	0.010	0.009	0.007	0.021	0.021	0.019	0.019	0.017	0.017	0.017	0.015	0.015	0.015	0.013	0.013	0.011	0.011	0.026	0.023
	38.2	Vc	46	41	41	31	15	67	67	67	67	60	60	60	60	60	54	54	40	40	40	77	77
		fz	0.002	0.002	0.002	0.001	0.001	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.002	0.002	0.002	0.002	0.002	0.004	0.004
		RPM	36885	32786	32786	24590	12295	42621	42621	42621	42621	38359	38359	38359	38359	38359	34097	34097	25573	25573	25573	40983	40983
		FEED	148	131	131	49	25	256	256	256	256	230	230	230	230	230	136	136	102	102	102	328	328
		Ap	0.012	0.012	0.010	0.009	0.007	0.021	0.021	0.019	0.019	0.017	0.017	0.017	0.015	0.015	0.015	0.013	0.013	0.011	0.011	0.026	0.023
	39.1	Vc	37	33	33	25	12	52	52	52	52	46	46	46	46	46	41	41	31	31	31	57	57
		fz	0.001	0.001	0.001	0.001	0.001	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.001	0.001	0.001	0.003	0.003
		RPM	29507	26229	26229	19672	9836	32786	32786	32786	32786	29507	29507	29507	29507	29507	26229	26229	19672	19672	19672	30053	30053
		FEED	59	52	52	39	20	131	131	131	131	118	118	118	118	118	105	105	39	39	39	180	180
		Ap	0.011	0.011	0.010	0.008	0.006	0.020	0.020	0.018	0.018	0.016	0.016	0.016	0.014	0.014	0.014	0.012	0.012	0.010	0.010	0.024	0.022
	39.2	Vc	28	25	25	19	9	41	41	41	41	37	37	37	37	37	33	33	25	25	25	46	46
		fz	0.001	0.001	0.001	0.001	0.001	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.001	0.001	0.001	0.001	0.001	0.002	0.002
		RPM	22130	19671	19671	14753	7377	26229	26229	26229	26229	23606	23606	23606	23606	23606	20983	20983	15737	15737	15737	24589	24589
		FEED	44	39	39	30	15	105	105	105	105	94	94	94	94	94	42	42	31	31	31	98	98
		Ap	0.011	0.011	0.010	0.008	0.006	0.020	0.020	0.018	0.018	0.016	0.016	0.016	0.014	0.014	0.014	0.012	0.012	0.010	0.010	0.024	0.022
	39.3	Vc	23	21	21	15	8	31	31	31	31	28	28	28	28	28	25	25	19	19	19	41	41
		fz	0.001	0.001	0.001	0.001	0.001	0.002	0.002	0.002	0.002	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.002	0.002
		RPM	18442	16393	16393	12295	6147	19672	19672	19672	19672	17705	17705	17705	17705	17705	15738	15738	11803	11803	11803	21858	21858
		FEED	37	33	33	25	12	79	79	79	79	35	35	35	35	35	31	31	24	24	24	87	87
		Ap	0.009	0.009	0.008	0.007	0.005	0.016	0.016	0.015	0.015	0.013	0.013	0.013	0.011	0.011	0.011	0.010	0.010	0.008	0.008	0.020	0.018
	40	Vc	51	45	45	34	17	72	72	72	72	65	65	65	65	65	58	58	43	43	43	88	88
		fz	0.002	0.002	0.002	0.001	0.001	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.002	0.002	0.002	0.002	0.002	0.004	0.004
		RPM	40573	36065	36065	27049	13524	45900	45900	45900	45900	41310	41310	41310	41310	41310	36720	36720	27540	27540	27540	46447	46447
		FEED	162	144	144	54	27	275	275	275	275	248	248	248	248	248	147	147	110	110	110	372	372
		Ap	0.012	0.012	0.010	0.009	0.007	0.021	0.021	0.019	0.019	0.017	0.017	0.017	0.015	0.015	0.015	0.013	0.013	0.011	0.011	0.026	0.023
	41	Vc	46	41	41	31	15	67	67	67	67	60	60	60	60	60	54	54	40	40	40	77	77
		fz	0.002	0.002	0.002	0.001	0.001	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.002	0.002	0.002	0.002	0.002	0.004	0.004
		RPM	36885	32786	32786	24590	12295	42621	42621	42621	42621	38359	38359	38359	38359	38359	34097	34097	25573	25573	25573	40983	40983
		FEED	148	131	131	49	25	256	256	256	256	230	230	230	230	230	136	136	102	102	102	328	328
		Ap	0.012	0.012	0.010	0.009	0.007	0.021	0.021	0.019	0.019	0.017	0.017	0.017	0.015	0.015	0.015	0.013	0.013	0.011	0.011	0.026	0.023

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X1-EH END MILLS

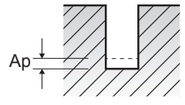
RECOMMENDED CUTTING CONDITIONS

Vc = m/min.
fz = mm/tooth
RPM = rev./min.
FEED = mm/min.
Ap = mm
LBS = Length Below Shank

HPI88 SERIES 2 FLUTE SQUARE for RIB PROCESSING

ISO	VDI 3323	Para-meter	Diameter (Ø)																				
			0.6	0.6	0.6	0.6	0.7	0.7	0.7	0.7	0.7	0.8	0.8	0.8	0.8	0.8	0.8	0.8	1	1	1	1
		LBS	3	4	5	6	2	4	6	8	10	3	4	5	6	8	10	12	2	3	4	5
P	5	Vc	98	88	88	88	113	102	102	91	91	129	129	116	116	116	103	103	154	154	154	154
		fz	0.005	0.005	0.005	0.005	0.006	0.005	0.005	0.004	0.004	0.006	0.006	0.005	0.005	0.005	0.005	0.005	0.010	0.010	0.010	0.010
		RPM	51911	46720	46720	46720	51569	46412	46412	41255	41255	51228	51228	46105	46105	46105	40982	40982	49178	49178	49178	49178
		FEED	519	467	467	467	619	464	464	330	330	615	615	461	461	461	410	410	984	984	984	984
		Ap	0.027	0.024	0.021	0.021	0.035	0.028	0.025	0.025	0.021	0.036	0.036	0.032	0.032	0.028	0.028	0.024	0.050	0.050	0.045	0.045
	8~9	Vc	98	88	88	88	113	102	102	91	91	129	129	116	116	116	103	103	154	154	154	154
		fz	0.005	0.005	0.005	0.005	0.006	0.005	0.005	0.004	0.004	0.006	0.006	0.005	0.005	0.005	0.005	0.005	0.010	0.010	0.010	0.010
		RPM	51911	46720	46720	46720	51569	46412	46412	41255	41255	51228	51228	46105	46105	46105	40982	40982	49178	49178	49178	49178
		FEED	519	467	467	467	619	464	464	330	330	615	615	461	461	461	410	410	984	984	984	984
		Ap	0.027	0.024	0.021	0.021	0.035	0.028	0.025	0.025	0.021	0.036	0.036	0.032	0.032	0.028	0.028	0.024	0.050	0.050	0.045	0.045
	11.1	Vc	98	88	88	88	113	102	102	91	91	129	129	116	116	116	103	103	154	154	154	154
		fz	0.005	0.005	0.005	0.005	0.006	0.005	0.005	0.004	0.004	0.006	0.006	0.005	0.005	0.005	0.005	0.005	0.010	0.010	0.010	0.010
		RPM	51911	46720	46720	46720	51569	46412	46412	41255	41255	51228	51228	46105	46105	46105	40982	40982	49178	49178	49178	49178
		FEED	519	467	467	467	619	464	464	330	330	615	615	461	461	461	410	410	984	984	984	984
		Ap	0.027	0.024	0.021	0.021	0.035	0.028	0.025	0.025	0.021	0.036	0.036	0.032	0.032	0.028	0.028	0.024	0.050	0.050	0.045	0.045
	11.2	Vc	88	79	79	79	93	84	84	74	74	103	103	93	93	93	82	82	124	124	124	124
		fz	0.004	0.004	0.004	0.004	0.005	0.005	0.005	0.004	0.004	0.006	0.006	0.005	0.005	0.005	0.005	0.005	0.008	0.008	0.008	0.008
		RPM	46447	41802	41802	41802	42230	38007	38007	33784	33784	40983	40983	36885	36885	36885	32786	32786	39343	39343	39343	39343
		FEED	372	334	334	334	422	380	380	270	270	492	492	369	369	369	328	328	629	629	629	629
		Ap	0.023	0.020	0.018	0.018	0.030	0.024	0.021	0.021	0.018	0.031	0.031	0.027	0.027	0.024	0.024	0.020	0.043	0.043	0.038	0.038
H	38.1	Vc	88	79	79	79	93	84	84	74	74	103	103	93	93	93	82	82	124	124	124	124
		fz	0.004	0.004	0.004	0.004	0.005	0.005	0.005	0.004	0.004	0.006	0.006	0.005	0.005	0.005	0.005	0.005	0.008	0.008	0.008	0.008
		RPM	46447	41802	41802	41802	42230	38007	38007	33784	33784	40983	40983	36885	36885	36885	32786	32786	39343	39343	39343	39343
		FEED	372	334	334	334	422	380	380	270	270	492	492	369	369	369	328	328	629	629	629	629
		Ap	0.023	0.020	0.018	0.018	0.030	0.024	0.021	0.021	0.018	0.031	0.031	0.027	0.027	0.024	0.024	0.020	0.043	0.043	0.038	0.038
	38.2	Vc	77	70	70	70	77	69	69	62	62	77	77	70	70	70	62	62	82	82	82	82
		fz	0.004	0.004	0.004	0.004	0.005	0.004	0.004	0.004	0.004	0.005	0.005	0.005	0.005	0.005	0.004	0.004	0.007	0.007	0.007	0.007
		RPM	40983	36885	36885	36885	35020	31518	31518	28016	28016	30737	30737	27663	27663	27663	24590	24590	26229	26229	26229	26229
		FEED	328	295	295	295	350	252	252	224	224	307	307	277	277	277	197	197	367	367	367	367
		Ap	0.023	0.020	0.018	0.018	0.030	0.024	0.021	0.021	0.018	0.031	0.031	0.027	0.027	0.024	0.024	0.020	0.043	0.043	0.038	0.038
	39.1	Vc	57	51	51	51	62	56	56	50	50	67	67	60	60	60	54	54	67	67	67	67
		fz	0.003	0.003	0.003	0.003	0.004	0.003	0.003	0.003	0.003	0.004	0.004	0.004	0.004	0.004	0.003	0.003	0.005	0.005	0.005	0.005
		RPM	30053	27048	27048	27048	28335	25502	25502	22668	22668	26639	26639	23975	23975	23975	21311	21311	21311	21311	21311	21311
		FEED	180	162	162	162	227	153	153	136	136	213	213	192	192	192	128	128	213	213	213	213
		Ap	0.022	0.019	0.017	0.017	0.028	0.022	0.020	0.020	0.017	0.029	0.029	0.026	0.026	0.022	0.022	0.019	0.040	0.040	0.036	0.036
	39.2	Vc	46	42	42	42	46	42	42	37	37	51	51	46	46	46	41	41	51	51	51	51
		fz	0.002	0.002	0.002	0.002	0.003	0.002	0.002	0.002	0.002	0.003	0.003	0.003	0.003	0.003	0.002	0.002	0.004	0.004	0.004	0.004
		RPM	24589	22130	22130	22130	21115	19004	19004	16892	16892	20491	20491	18442	18442	18442	16393	16393	16392	16392	16392	16392
		FEED	98	89	89	89	127	76	76	68	68	123	123	111	111	111	66	66	131	131	131	131
		Ap	0.022	0.019	0.017	0.017	0.028	0.022	0.020	0.020	0.017	0.029	0.029	0.026	0.026	0.022	0.022	0.019	0.040	0.040	0.036	0.036
	39.3	Vc	41	37	37	37	42	38	38	33	33	41	41	37	37	37	33	33	41	41	41	41
		fz	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.003	0.003	0.002	0.002	0.002	0.002	0.002	0.003	0.003	0.003	0.003
		RPM	21858	19672	19672	19672	18952	17057	17057	15162	15162	16392	16392	14753	14753	14753	13114	13114	13114	13114	13114	13114
		FEED	87	79	79	79	76	68	68	61	61	98	98	59	59	59	52	52	79	79	79	79
		Ap	0.018	0.016	0.014	0.014	0.023	0.018	0.016	0.016	0.014	0.023	0.023	0.021	0.021	0.018	0.018	0.016	0.033	0.033	0.029	0.029
	40	Vc	88	79	79	79	93	84	84	74	74	103	103	93	93	93	82	82	124	124	124	124
		fz	0.004	0.004	0.004	0.004	0.005	0.005	0.005	0.004	0.004	0.006	0.006	0.005	0.005	0.005	0.005	0.005	0.008	0.008	0.008	0.008
		RPM	46447	41802	41802	41802	42230	38007	38007	33784	33784	40983	40983	36885	36885	36885	32786	32786	39343	39343	39343	39343
		FEED	372	334	334	334	422	380	380	270	270	492	492	369	369	369	328	328	629	629	629	629
		Ap	0.023	0.020	0.018	0.018	0.030	0.024	0.021	0.021	0.018	0.031	0.031	0.027	0.027	0.024	0.024	0.020	0.043	0.043	0.038	0.038
	41	Vc	77	70	70	70	77	69	69	62	62	77	77	70	70	70	62	62	82	82	82	82
		fz	0.004	0.004	0.004	0.004	0.005	0.004	0.004	0.004	0.004	0.005	0.005	0.005	0.005	0.005	0.004	0.004	0.007	0.007	0.007	0.007
		RPM	40983	36885	36885	36885	35020	31518	31518	28016	28016	30737	30737	27663	27663	27663	24590	24590	26229	26229	26229	26229
		FEED	328	295	295	295	350	252	252	224	224	307	307	277	277	277	197	197	367	367	367	367
		Ap	0.023	0.020	0.018	0.018	0.030	0.024	0.021	0.021	0.018	0.031	0.031	0.027	0.027	0.024	0.024	0.020	0.043	0.043	0.038	0.038

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CARBIDE
HSS
i-Xmill END MILLS
X-1EH END MILLS
4G MILL END MILLS
X-POWER PRO END MILLS
TitaNox-POWER END MILLS
V7 PLUS END MILLS
ALU-CUT END MILLS
K-2 END MILLS
GENERAL CARBIDE END MILLS

X1-EH END MILLS

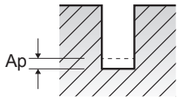
RECOMMENDED CUTTING CONDITIONS

HPI88 SERIES — 2 FLUTE SQUARE for RIB PROCESSING

Vc = m/min.
fz = mm/tooth
RPM = rev./min.
FEED = mm/min.
Ap = mm
LBS = Length Below Shank

ISO	VDI 3323	Para-meter	Diameter (Ø)																				
			1	1	1	1	1	1	1	1	1	1	1	1.2	1.2	1.2	1.2	1.2	1.4	1.4	1.5	1.5	1.5
		LBS	6	7	8	9	10	12	14	16	18	20	22	6	8	10	12	16	6	12	4	6	8
P	5	Vc	139	139	139	139	139	124	124	93	93	93	46	170	153	153	153	136	185	167	196	196	176
		fz	0.009	0.009	0.009	0.009	0.009	0.008	0.008	0.007	0.007	0.007	0.006	0.011	0.009	0.009	0.009	0.008	0.011	0.010	0.011	0.011	0.010
		RPM	44260	44260	44260	44260	44260	39342	39342	29507	29507	29507	14753	45081	40573	40573	40573	36065	42154	37939	41581	41581	37423
		FEED	797	797	797	797	797	629	629	413	413	413	177	992	730	730	730	577	927	759	915	915	748
		Ap	0.040	0.040	0.040	0.035	0.035	0.035	0.030	0.030	0.025	0.025	0.020	0.054	0.048	0.042	0.042	0.036	0.063	0.049	0.075	0.068	0.060
	8~9	Vc	139	139	139	139	139	124	124	93	93	93	46	170	153	153	153	136	185	167	196	196	176
		fz	0.009	0.009	0.009	0.009	0.009	0.008	0.008	0.007	0.007	0.007	0.006	0.011	0.009	0.009	0.009	0.008	0.011	0.010	0.011	0.011	0.010
		RPM	44260	44260	44260	44260	44260	39342	39342	29507	29507	29507	14753	45081	40573	40573	40573	36065	42154	37939	41581	41581	37423
		FEED	797	797	797	797	797	629	629	413	413	413	177	992	730	730	730	577	927	759	915	915	748
		Ap	0.040	0.040	0.040	0.035	0.035	0.035	0.030	0.030	0.025	0.025	0.020	0.054	0.048	0.042	0.042	0.036	0.063	0.049	0.075	0.068	0.060
	11.1	Vc	139	139	139	139	139	124	124	93	93	93	46	170	153	153	153	136	185	167	196	196	176
		fz	0.009	0.009	0.009	0.009	0.009	0.008	0.008	0.007	0.007	0.007	0.006	0.011	0.009	0.009	0.009	0.008	0.011	0.010	0.011	0.011	0.010
		RPM	44260	44260	44260	44260	44260	39342	39342	29507	29507	29507	14753	45081	40573	40573	40573	36065	42154	37939	41581	41581	37423
		FEED	797	797	797	797	797	629	629	413	413	413	177	992	730	730	730	577	927	759	915	915	748
		Ap	0.040	0.040	0.040	0.035	0.035	0.035	0.030	0.030	0.025	0.025	0.020	0.054	0.048	0.042	0.042	0.036	0.063	0.049	0.075	0.068	0.060
	11.2	Vc	111	111	111	111	111	99	99	74	74	74	37	139	125	125	125	111	144	130	154	154	139
		fz	0.007	0.007	0.007	0.007	0.007	0.006	0.006	0.006	0.006	0.006	0.005	0.009	0.008	0.008	0.008	0.007	0.010	0.009	0.010	0.010	0.009
		RPM	35409	35409	35409	35409	35409	31474	31474	23606	23606	23606	11803	36884	33196	33196	33196	29507	32786	29507	32754	32754	29479
		FEED	496	496	496	496	496	378	378	283	283	283	118	664	538	538	538	425	662	536	655	655	531
		Ap	0.034	0.034	0.034	0.030	0.030	0.030	0.026	0.026	0.021	0.021	0.017	0.046	0.041	0.036	0.036	0.031	0.054	0.042	0.064	0.057	0.051
H	38.1	Vc	111	111	111	111	111	99	99	74	74	74	37	139	125	125	125	111	144	130	154	154	139
		fz	0.007	0.007	0.007	0.007	0.007	0.006	0.006	0.006	0.006	0.006	0.005	0.009	0.008	0.008	0.008	0.007	0.010	0.009	0.010	0.010	0.009
		RPM	35409	35409	35409	35409	35409	31474	31474	23606	23606	23606	11803	36884	33196	33196	33196	29507	32786	29507	32754	32754	29479
		FEED	496	496	496	496	496	378	378	283	283	283	118	664	538	538	538	425	662	536	655	655	531
		Ap	0.034	0.034	0.034	0.030	0.030	0.030	0.026	0.026	0.021	0.021	0.017	0.046	0.041	0.036	0.036	0.031	0.054	0.042	0.064	0.057	0.051
	38.2	Vc	74	74	74	74	74	66	66	49	49	49	25	93	83	83	83	74	98	88	103	103	93
		fz	0.006	0.006	0.006	0.006	0.006	0.006	0.006	0.005	0.005	0.005	0.004	0.008	0.007	0.007	0.007	0.006	0.009	0.008	0.009	0.009	0.008
		RPM	23606	23606	23606	23606	23606	20983	20983	15737	15737	15737	7869	24589	22130	22130	22130	19671	22248	20023	21939	21939	19745
		FEED	283	283	283	283	283	252	252	157	157	157	63	393	310	310	310	236	400	320	395	395	316
		Ap	0.034	0.034	0.034	0.030	0.030	0.030	0.026	0.026	0.021	0.021	0.017	0.046	0.041	0.036	0.036	0.031	0.054	0.042	0.064	0.057	0.051
	39.1	Vc	60	60	60	60	60	54	54	40	40	40	20	75	68	68	68	60	77	70	83	83	74
		fz	0.005	0.005	0.005	0.005	0.005	0.004	0.004	0.004	0.004	0.004	0.003	0.006	0.005	0.005	0.005	0.005	0.007	0.006	0.007	0.007	0.006
		RPM	19180	19180	19180	19180	19180	17049	17049	12787	12787	12787	6393	19945	17951	17951	17951	15956	17564	15808	17510	17510	15759
		FEED	192	192	192	192	192	136	136	102	102	102	38	239	180	180	180	160	246	190	245	245	189
		Ap	0.032	0.032	0.032	0.028	0.028	0.028	0.024	0.024	0.020	0.020	0.016	0.043	0.038	0.034	0.034	0.029	0.050	0.039	0.060	0.054	0.048
	39.2	Vc	46	46	46	46	46	41	41	31	31	31	15	57	51	51	51	45	60	54	62	62	56
		fz	0.004	0.004	0.004	0.004	0.004	0.003	0.003	0.003	0.003	0.003	0.002	0.005	0.005	0.005	0.005	0.004	0.005	0.005	0.006	0.006	0.005
		RPM	14753	14753	14753	14753	14753	13114	13114	9835	9835	9835	4918	15027	13524	13524	13524	12022	13583	12225	13184	13184	11866
		FEED	118	118	118	118	118	79	79	59	59	59	20	150	135	135	135	96	136	122	158	158	119
		Ap	0.032	0.032	0.032	0.028	0.028	0.028	0.024	0.024	0.020	0.020	0.016	0.043	0.038	0.034	0.034	0.029	0.050	0.039	0.060	0.054	0.048
	39.3	Vc	37	37	37	37	37	33	33	25	25	25	12	46	42	42	42	37	49	44	52	52	47
		fz	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.002	0.002	0.002	0.002	0.004	0.004	0.004	0.004	0.003	0.005	0.004	0.005	0.005	0.004
		RPM	11803	11803	11803	11803	11803	10491	10491	7868	7868	7868	3934	12295	11066	11066	11066	9836	11241	10117	11021	11021	9919
		FEED	71	71	71	71	71	63	63	31	31	31	16	98	89	89	89	59	112	81	110	110	79
		Ap	0.026	0.026	0.026	0.023	0.023	0.023	0.020	0.020	0.016	0.016	0.013	0.035	0.031	0.027	0.027	0.023	0.041	0.032	0.049	0.044	0.039
	40	Vc	111	111	111	111	111	99	99	74	74	74	37	139	125	125	125	111	144	130	154	154	139
		fz	0.007	0.007	0.007	0.007	0.007	0.006	0.006	0.006	0.006	0.006	0.005	0.009	0.008	0.008	0.008	0.007	0.010	0.009	0.010	0.010	0.009
		RPM	35409	35409	35409	35409	35409	31474	31474	23606	23606	23606	11803	36884	33196	33196	33196	29507	32786	29507	32754	32754	29479
		FEED	496	496	496	496	496	378	378	283	283	283	118	664	538	538	538	425	662	536	655	655	531
		Ap	0.034	0.034	0.034	0.030	0.030	0.030	0.026	0.026	0.021	0.021	0.017	0.046	0.041	0.036	0.036	0.031	0.054	0.042	0.064	0.057	0.051
	41	Vc	74	74	74	74	74	66	66	49	49	49	25	93	83	83	83	74	98	88	103	103	93
		fz	0.006	0.006	0.006	0.006	0.006	0.006	0.006	0.005	0.005	0.005	0.004	0.008	0.007	0.007	0.007	0.006	0.009	0.008	0.009	0.009	0.008
		RPM	23606	23606	23606	23606	23606	20983	20983	15737	15737	15737	7869	24589	22130	22130	22130	19671	22248	20023	21939	21939	19745
		FEED	283	283	283	283	283	252	252	157	157	157	63	393	310	310	310	236	400	320	395	395	316
		Ap	0.034	0.034	0.034	0.030	0.030	0.030	0.026	0.026	0.021	0.021	0.017	0.046	0.041	0.036	0.036	0.031	0.054	0.042	0.064	0.057	0.051

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X1-EH END MILLS

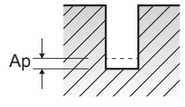
RECOMMENDED CUTTING CONDITIONS

HPI88 SERIES — 2 FLUTE SQUARE for RIB PROCESSING

Vc = m/min.
fz = mm/tooth
RPM = rev./min.
FEED = mm/min.
Ap = mm
LBS = Length Below Shank

ISO	VDI 3323	Para-meter	Diameter (Ø)																				
			1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.6	1.6	1.8	1.8	1.8	1.8	1.8	1.8	1.8	2	2
		LBS	10	12	14	16	18	20	25	30	35	6	8	6	8	10	12	14	16	18	4	6
P	5	Vc	176	176	176	157	157	157	118	118	59	201	201	226	226	203	203	203	203	203	216	216
		fz	0.010	0.010	0.010	0.009	0.009	0.009	0.008	0.008	0.007	0.012	0.012	0.012	0.012	0.010	0.010	0.010	0.010	0.010	0.013	0.013
		RPM	37423	37423	37423	33265	33265	33265	24949	24949	12474	39958	39958	39958	39958	35962	35962	35962	35962	35962	34426	34426
		FEED	748	748	748	599	599	599	399	399	175	959	959	959	959	719	719	719	719	719	895	895
		Ap	0.060	0.060	0.053	0.053	0.053	0.045	0.038	0.038	0.030	0.072	0.072	0.081	0.081	0.072	0.072	0.072	0.063	0.063	0.100	0.100
	8~9	Vc	176	176	176	157	157	157	118	118	59	201	201	226	226	203	203	203	203	203	216	216
		fz	0.010	0.010	0.010	0.009	0.009	0.009	0.008	0.008	0.007	0.012	0.012	0.012	0.012	0.010	0.010	0.010	0.010	0.010	0.013	0.013
		RPM	37423	37423	37423	33265	33265	33265	24949	24949	12474	39958	39958	39958	39958	35962	35962	35962	35962	35962	34426	34426
		FEED	748	748	748	599	599	599	399	399	175	959	959	959	959	719	719	719	719	719	895	895
		Ap	0.060	0.060	0.053	0.053	0.053	0.045	0.038	0.038	0.030	0.072	0.072	0.081	0.081	0.072	0.072	0.072	0.063	0.063	0.100	0.100
	11.1	Vc	176	176	176	157	157	157	118	118	59	201	201	226	226	203	203	203	203	203	216	216
		fz	0.010	0.010	0.010	0.009	0.009	0.009	0.008	0.008	0.007	0.012	0.012	0.012	0.012	0.010	0.010	0.010	0.010	0.010	0.013	0.013
		RPM	37423	37423	37423	33265	33265	33265	24949	24949	12474	39958	39958	39958	39958	35962	35962	35962	35962	35962	34426	34426
		FEED	748	748	748	599	599	599	399	399	175	959	959	959	959	719	719	719	719	719	895	895
		Ap	0.060	0.060	0.053	0.053	0.053	0.045	0.038	0.038	0.030	0.072	0.072	0.081	0.081	0.072	0.072	0.072	0.063	0.063	0.100	0.100
	11.2	Vc	139	139	139	123	123	123	93	93	46	161	161	181	181	163	163	163	163	163	170	170
		fz	0.009	0.009	0.009	0.008	0.008	0.008	0.007	0.007	0.006	0.010	0.010	0.010	0.010	0.009	0.009	0.009	0.009	0.009	0.013	0.013
		RPM	29479	29479	29479	26203	26203	26203	19652	19652	9826	31966	31966	31966	31966	28769	28769	28769	28769	28769	27049	27049
		FEED	531	531	531	419	419	419	275	275	118	639	639	639	639	518	518	518	518	518	703	703
		Ap	0.051	0.051	0.045	0.045	0.045	0.038	0.032	0.032	0.026	0.061	0.061	0.069	0.069	0.061	0.061	0.061	0.054	0.054	0.085	0.085
H	38.1	Vc	139	139	139	123	123	123	93	93	46	161	161	181	181	163	163	163	163	163	170	170
		fz	0.009	0.009	0.009	0.008	0.008	0.008	0.007	0.007	0.006	0.010	0.010	0.010	0.010	0.009	0.009	0.009	0.009	0.009	0.013	0.013
		RPM	29479	29479	29479	26203	26203	26203	19652	19652	9826	31966	31966	31966	31966	28769	28769	28769	28769	28769	27049	27049
		FEED	531	531	531	419	419	419	275	275	118	639	639	639	639	518	518	518	518	518	703	703
		Ap	0.051	0.051	0.045	0.045	0.045	0.038	0.032	0.032	0.026	0.061	0.061	0.069	0.069	0.061	0.061	0.061	0.054	0.054	0.085	0.085
	38.2	Vc	93	93	93	83	83	83	62	62	31	106	106	119	119	107	107	107	107	107	113	113
		fz	0.008	0.008	0.008	0.007	0.007	0.007	0.006	0.006	0.005	0.010	0.010	0.010	0.010	0.009	0.009	0.009	0.009	0.009	0.012	0.012
		RPM	19745	19745	19745	17551	17551	17551	13163	13163	6582	21106	21106	21106	21106	18995	18995	18995	18995	18995	18032	18032
		FEED	316	316	316	246	246	246	158	158	66	422	422	422	422	342	342	342	342	342	433	433
		Ap	0.051	0.051	0.045	0.045	0.045	0.038	0.032	0.032	0.026	0.061	0.061	0.069	0.069	0.061	0.061	0.061	0.054	0.054	0.085	0.085
	39.1	Vc	74	74	74	66	66	66	50	50	25	85	85	96	96	87	87	87	87	87	93	93
		fz	0.006	0.006	0.006	0.005	0.005	0.005	0.005	0.005	0.004	0.007	0.007	0.007	0.007	0.006	0.006	0.006	0.006	0.006	0.009	0.009
		RPM	15759	15759	15759	14008	14008	14008	10506	10506	5253	17007	17007	17007	17007	15306	15306	15306	15306	15306	14754	14754
		FEED	189	189	189	140	140	140	105	105	42	238	238	238	238	184	184	184	184	184	266	266
		Ap	0.048	0.048	0.042	0.042	0.042	0.036	0.030	0.030	0.024	0.058	0.058	0.065	0.065	0.058	0.058	0.058	0.050	0.050	0.080	0.080
	39.2	Vc	56	56	56	50	50	50	37	37	19	65	65	73	73	66	66	66	66	66	72	72
		fz	0.005	0.005	0.005	0.004	0.004	0.004	0.004	0.004	0.003	0.006	0.006	0.006	0.006	0.005	0.005	0.005	0.005	0.005	0.007	0.007
		RPM	11866	11866	11866	10547	10547	10547	7910	7910	3955	12910	12910	12910	12910	11619	11619	11619	11619	11619	11475	11475
		FEED	119	119	119	84	84	84	63	63	24	155	155	155	155	116	116	116	116	116	161	161
		Ap	0.048	0.048	0.042	0.042	0.042	0.036	0.030	0.030	0.024	0.058	0.058	0.065	0.065	0.058	0.058	0.058	0.050	0.050	0.080	0.080
	39.3	Vc	47	47	47	42	42	42	31	31	16	55	55	61	61	55	55	55	55	55	62	62
		fz	0.004	0.004	0.004	0.004	0.004	0.004	0.003	0.003	0.003	0.005	0.005	0.005	0.005	0.004	0.004	0.004	0.004	0.004	0.006	0.006
		RPM	9919	9919	9919	8817	8817	8817	6613	6613	3306	10860	10860	10860	10860	9774	9774	9774	9774	9774	9835	9835
		FEED	79	79	79	71	71	71	40	40	20	109	109	109	109	78	78	78	78	78	118	118
		Ap	0.039	0.039	0.034	0.034	0.034	0.029	0.024	0.024	0.020	0.047	0.047	0.053	0.053	0.047	0.047	0.047	0.041	0.041	0.065	0.065
	40	Vc	139	139	139	123	123	123	93	93	46	161	161	181	181	163	163	163	163	163	170	170
		fz	0.009	0.009	0.009	0.008	0.008	0.008	0.007	0.007	0.006	0.010	0.010	0.010	0.010	0.009	0.009	0.009	0.009	0.009	0.013	0.013
		RPM	29479	29479	29479	26203	26203	26203	19652	19652	9826	31966	31966	31966	31966	28769	28769	28769	28769	28769	27049	27049
		FEED	531	531	531	419	419	419	275	275	118	639	639	639	639	518	518	518	518	518	703	703
		Ap	0.051	0.051	0.045	0.045	0.045	0.038	0.032	0.032	0.026	0.061	0.061	0.069	0.069	0.061	0.061	0.061	0.054	0.054	0.085	0.085
	41	Vc	93	93	93	83	83	83	62	62	31	106	106	119	119	107	107	107	107	107	113	113
		fz	0.008	0.008	0.008	0.007	0.007	0.007	0.006	0.006	0.005	0.010	0.010	0.010	0.010	0.009	0.009	0.009	0.009	0.009	0.012	0.012
		RPM	19745	19745	19745	17551	17551	17551	13163	13163	6582	21106	21106	21106	21106	18995	18995	18995	18995	18995	18032	18032
		FEED	316	316	316	246	246	246	158	158	66	422	422	422	422	342	342	342	342	342	433	433
		Ap	0.051	0.051	0.045	0.045	0.045	0.038	0.032	0.032	0.026	0.061	0.061	0.069	0.069	0.061	0.061	0.061	0.054	0.054	0.085	0.085

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CARBIDE
HSS
i-Xmill END MILLS
X-1EH END MILLS
4G MILL END MILLS
X-POWER PRO END MILLS
TitaNox-POWER END MILLS
V7 PLUS END MILLS
ALU-CUT END MILLS
K-2 END MILLS
GENERAL CARBIDE END MILLS

X1-EH END MILLS

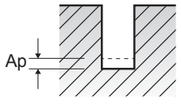
RECOMMENDED CUTTING CONDITIONS

HPI88 SERIES — 2 FLUTE SQUARE for RIB PROCESSING

Vc = m/min.
fz = mm/tooth
RPM = rev./min.
FEED = mm/min.
Ap = mm
LBS = Length Below Shank

ISO	VDI 3323	Para-meter	Diameter (Ø)																				
			2	2	2	2	2	2	2	2	2	2	2	2.5	2.5	2.5	2.5	2.5	2.5	2.5	3	3
		LBS	8	10	12	14	16	18	20	25	30	35	40	50	8	12	16	20	30	40	50	8	12
P	5	Vc	216	216	195	195	195	195	195	173	173	130	130	65	217	217	195	195	173	130	130	211	211
		fz	0.013	0.013	0.012	0.012	0.012	0.012	0.012	0.010	0.010	0.009	0.009	0.008	0.016	0.016	0.014	0.014	0.013	0.011	0.011	0.019	0.019
		RPM	34426	34426	30983	30983	30983	30983	30983	27541	27541	20656	20656	10328	27604	27604	24844	24844	22083	16562	16562	22404	22404
		FEED	895	895	744	744	744	744	744	551	551	372	372	165	883	883	696	696	574	364	364	851	851
		Ap	0.090	0.090	0.080	0.080	0.080	0.070	0.070	0.070	0.060	0.050	0.050	0.040	0.113	0.113	0.100	0.100	0.088	0.075	0.063	0.150	0.135
	8~9	Vc	216	216	195	195	195	195	195	173	173	130	130	65	217	217	195	195	173	130	130	211	211
		fz	0.013	0.013	0.012	0.012	0.012	0.012	0.012	0.010	0.010	0.009	0.009	0.008	0.016	0.016	0.014	0.014	0.013	0.011	0.011	0.019	0.019
		RPM	34426	34426	30983	30983	30983	30983	30983	27541	27541	20656	20656	10328	27604	27604	24844	24844	22083	16562	16562	22404	22404
		FEED	895	895	744	744	744	744	744	551	551	372	372	165	883	883	696	696	574	364	364	851	851
		Ap	0.090	0.090	0.080	0.080	0.080	0.070	0.070	0.070	0.060	0.050	0.050	0.040	0.113	0.113	0.100	0.100	0.088	0.075	0.063	0.150	0.135
	11.1	Vc	216	216	195	195	195	195	195	173	173	130	130	65	217	217	195	195	173	130	130	211	211
		fz	0.013	0.013	0.012	0.012	0.012	0.012	0.012	0.010	0.010	0.009	0.009	0.008	0.016	0.016	0.014	0.014	0.013	0.011	0.011	0.019	0.019
		RPM	34426	34426	30983	30983	30983	30983	30983	27541	27541	20656	20656	10328	27604	27604	24844	24844	22083	16562	16562	22404	22404
		FEED	895	895	744	744	744	744	744	551	551	372	372	165	883	883	696	696	574	364	364	851	851
		Ap	0.090	0.090	0.080	0.080	0.080	0.070	0.070	0.070	0.060	0.050	0.050	0.040	0.113	0.113	0.100	0.100	0.088	0.075	0.063	0.150	0.135
	11.2	Vc	170	170	153	153	153	153	153	136	136	102	102	51	170	170	153	153	136	102	102	170	170
		fz	0.013	0.013	0.012	0.012	0.012	0.012	0.012	0.010	0.010	0.009	0.009	0.008	0.017	0.017	0.015	0.015	0.013	0.012	0.012	0.020	0.020
		RPM	27049	27049	24344	24344	24344	24344	24344	21639	21639	16229	16229	8115	21630	21630	19467	19467	17304	12978	12978	18032	18032
		FEED	703	703	584	584	584	584	584	433	433	292	292	130	735	735	584	584	450	311	311	721	721
		Ap	0.077	0.077	0.068	0.068	0.068	0.060	0.060	0.060	0.051	0.043	0.043	0.034	0.096	0.096	0.085	0.085	0.074	0.064	0.053	0.128	0.115
H	38.1	Vc	170	170	153	153	153	153	153	136	136	102	102	51	170	170	153	153	136	102	102	170	170
		fz	0.013	0.013	0.012	0.012	0.012	0.012	0.012	0.010	0.010	0.009	0.009	0.008	0.017	0.017	0.015	0.015	0.013	0.012	0.012	0.020	0.020
		RPM	27049	27049	24344	24344	24344	24344	24344	21639	21639	16229	16229	8115	21630	21630	19467	19467	17304	12978	12978	18032	18032
		FEED	703	703	584	584	584	584	584	433	433	292	292	130	735	735	584	584	450	311	311	721	721
		Ap	0.077	0.077	0.068	0.068	0.068	0.060	0.060	0.060	0.051	0.043	0.043	0.034	0.096	0.096	0.085	0.085	0.074	0.064	0.053	0.128	0.115
	38.2	Vc	113	113	102	102	102	102	102	91	91	68	68	34	113	113	102	102	91	68	68	113	113
		fz	0.012	0.012	0.011	0.011	0.011	0.011	0.011	0.010	0.010	0.008	0.008	0.007	0.015	0.015	0.014	0.014	0.012	0.011	0.011	0.018	0.018
		RPM	18032	18032	16229	16229	16229	16229	16229	14426	14426	10819	10819	5410	14420	14420	12978	12978	11536	8652	8652	12021	12021
		FEED	433	433	357	357	357	357	357	289	289	173	173	76	433	433	363	363	277	190	190	433	433
		Ap	0.077	0.077	0.068	0.068	0.068	0.060	0.060	0.060	0.051	0.043	0.043	0.034	0.096	0.096	0.085	0.085	0.074	0.064	0.053	0.128	0.115
	39.1	Vc	93	93	83	83	83	83	83	74	74	56	56	28	93	93	84	84	74	56	56	93	93
		fz	0.009	0.009	0.008	0.008	0.008	0.008	0.008	0.007	0.007	0.006	0.006	0.005	0.011	0.011	0.010	0.010	0.009	0.008	0.008	0.014	0.014
		RPM	14754	14754	13279	13279	13279	13279	13279	11803	11803	8852	8852	4426	11845	11845	10661	10661	9476	7107	7107	9835	9835
		FEED	266	266	212	212	212	212	212	165	165	106	106	44	261	261	213	213	171	114	114	275	275
		Ap	0.072	0.072	0.064	0.064	0.064	0.056	0.056	0.056	0.048	0.040	0.040	0.032	0.090	0.090	0.080	0.080	0.070	0.060	0.050	0.120	0.108
	39.2	Vc	72	72	65	65	65	65	65	58	58	43	43	22	72	72	65	65	58	43	43	72	72
		fz	0.007	0.007	0.006	0.006	0.006	0.006	0.006	0.006	0.006	0.005	0.005	0.004	0.009	0.009	0.008	0.008	0.007	0.006	0.006	0.011	0.011
		RPM	11475	11475	10328	10328	10328	10328	10328	9180	9180	6885	6885	3443	9167	9167	8250	8250	7334	5500	5500	7650	7650
		FEED	161	161	124	124	124	124	124	110	110	69	69	28	165	165	132	132	103	66	66	168	168
		Ap	0.072	0.072	0.064	0.064	0.064	0.056	0.056	0.056	0.048	0.040	0.040	0.032	0.090	0.090	0.080	0.080	0.070	0.060	0.050	0.120	0.108
	39.3	Vc	62	62	56	56	56	56	56	49	49	37	37	19	62	62	56	56	50	37	37	62	62
		fz	0.006	0.006	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.004	0.004	0.004	0.008	0.008	0.007	0.007	0.006	0.005	0.005	0.009	0.009
		RPM	9835	9835	8852	8852	8852	8852	8852	7868	7868	5901	5901	2951	7931	7931	7138	7138	6345	4759	4759	6557	6557
		FEED	118	118	89	89	89	89	89	79	79	47	47	24	127	127	100	100	76	48	48	118	118
		Ap	0.059	0.059	0.052	0.052	0.052	0.046	0.046	0.046	0.039	0.033	0.033	0.026	0.073	0.073	0.065	0.065	0.057	0.049	0.041	0.098	0.088
	40	Vc	170	170	153	153	153	153	153	136	136	102	102	51	170	170	153	153	136	102	102	170	170
		fz	0.013	0.013	0.012	0.012	0.012	0.012	0.012	0.010	0.010	0.009	0.009	0.008	0.017	0.017	0.015	0.015	0.013	0.012	0.012	0.020	0.020
		RPM	27049	27049	24344	24344	24344	24344	24344	21639	21639	16229	16229	8115	21630	21630	19467	19467	17304	12978	12978	18032	18032
		FEED	703	703	584	584	584	584	584	433	433	292	292	130	735	735	584	584	450	311	311	721	721
		Ap	0.077	0.077	0.068	0.068	0.068	0.060	0.060	0.060	0.051	0.043	0.043	0.034	0.096	0.096	0.085	0.085	0.074	0.064	0.053	0.128	0.115
	41	Vc	113	113	102	102	102	102	102	91	91	68	68	34	113	113	102	102	91	68	68	113	113
		fz	0.012	0.012	0.011	0.011	0.011	0.011	0.011	0.010	0.010	0.008	0.008	0.007	0.015	0.015	0.014	0.014	0.012	0.011	0.011	0.018	0.018
		RPM	18032	18032	16229	16229	16229	16229	16229	14426	14426	10819	10819	5410	14420	14420	12978	12978	11536	8652	8652	12021	12021
		FEED	433	433	357	357	357	357	357	289	289	173	173	76	433	433	363	363	277	190	190	433	433
		Ap	0.077	0.077	0.068	0.068	0.068	0.060	0.060	0.060	0.051	0.043	0.043	0.034	0.096	0.096	0.085	0.085	0.074	0.064	0.053	0.128	0.115

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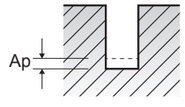
X1-EH END MILLS

RECOMMENDED CUTTING CONDITIONS

HPI88 SERIES — 2 FLUTE SQUARE for RIB PROCESSING

Vc = m/min.
fz = mm/tooth
RPM = rev./min.
FEED = mm/min.
Ap = mm
LBS = Length Below Shank

ISO	VDI 3323	Para-meter	Diameter (Ø)																				
			3	3	3	3	4	4	4	4	4	4	5	5	5	5	6	6	6	6			
		LBS	16	20	25	30	12	16	20	30	40	50	20	30	40	50	20	30	40	50			
P	5	Vc	190	190	190	190	216	216	216	195	195	173	252	227	227	227	252	252	227	227			
		fz	0.017	0.017	0.017	0.017	0.026	0.026	0.026	0.023	0.023	0.021	0.032	0.029	0.029	0.029	0.036	0.036	0.032	0.032			
		RPM	20164	20164	20164	20164	17212	17212	17212	15491	15491	13770	16065	14459	14459	14459	13388	13388	12049	12049			
		FEED	686	686	686	686	895	895	895	713	713	578	1028	839	839	839	964	964	771	771			
		Ap	0.120	0.120	0.105	0.105	0.200	0.180	0.180	0.160	0.140	0.140	0.225	0.200	0.200	0.175	0.270	0.270	0.240	0.210			
	8~9	Vc	190	190	190	190	216	216	216	195	195	173	252	227	227	227	252	252	227	227			
		fz	0.017	0.017	0.017	0.017	0.026	0.026	0.026	0.023	0.023	0.021	0.032	0.029	0.029	0.029	0.036	0.036	0.032	0.032			
		RPM	20164	20164	20164	20164	17212	17212	17212	15491	15491	13770	16065	14459	14459	14459	13388	13388	12049	12049			
		FEED	686	686	686	686	895	895	895	713	713	578	1028	839	839	839	964	964	771	771			
		Ap	0.120	0.120	0.105	0.105	0.200	0.180	0.180	0.160	0.140	0.140	0.225	0.200	0.200	0.175	0.270	0.270	0.240	0.210			
	11.1	Vc	190	190	190	190	216	216	216	195	195	173	252	227	227	227	252	252	227	227			
		fz	0.017	0.017	0.017	0.017	0.026	0.026	0.026	0.023	0.023	0.021	0.032	0.029	0.029	0.029	0.036	0.036	0.032	0.032			
		RPM	20164	20164	20164	20164	17212	17212	17212	15491	15491	13770	16065	14459	14459	14459	13388	13388	12049	12049			
		FEED	686	686	686	686	895	895	895	713	713	578	1028	839	839	839	964	964	771	771			
		Ap	0.120	0.120	0.105	0.105	0.200	0.180	0.180	0.160	0.140	0.140	0.225	0.200	0.200	0.175	0.270	0.270	0.240	0.210			
	11.2	Vc	153	153	153	153	170	170	170	153	153	136	201	181	181	181	201	201	181	181			
		fz	0.018	0.018	0.018	0.018	0.027	0.027	0.027	0.024	0.024	0.022	0.032	0.029	0.029	0.029	0.037	0.037	0.033	0.033			
		RPM	16229	16229	16229	16229	13524	13524	13524	12172	12172	10819	12786	11507	11507	11507	10655	10655	9590	9590			
		FEED	584	584	584	584	730	730	730	584	584	476	818	667	667	667	788	788	633	633			
		Ap	0.102	0.102	0.089	0.089	0.170	0.153	0.153	0.136	0.119	0.119	0.191	0.170	0.170	0.149	0.230	0.230	0.204	0.179			
H	38.1	Vc	153	153	153	153	170	170	170	153	153	136	201	181	181	181	201	201	181	181			
		fz	0.018	0.018	0.018	0.018	0.027	0.027	0.027	0.024	0.024	0.022	0.032	0.029	0.029	0.029	0.037	0.037	0.033	0.033			
		RPM	16229	16229	16229	16229	13524	13524	13524	12172	12172	10819	12786	11507	11507	11507	10655	10655	9590	9590			
		FEED	584	584	584	584	730	730	730	584	584	476	818	667	667	667	788	788	633	633			
		Ap	0.102	0.102	0.089	0.089	0.170	0.153	0.153	0.136	0.119	0.119	0.191	0.170	0.170	0.149	0.230	0.230	0.204	0.179			
	38.2	Vc	102	102	102	102	113	113	113	102	102	91	134	121	121	121	134	134	121	121			
		fz	0.016	0.016	0.016	0.016	0.025	0.025	0.025	0.023	0.023	0.020	0.030	0.027	0.027	0.027	0.035	0.035	0.032	0.032			
		RPM	10819	10819	10819	10819	9017	9017	9017	8115	8115	7214	8524	7672	7672	7672	7104	7104	6394	6394			
		FEED	346	346	346	346	451	451	451	373	373	289	511	414	414	414	497	497	409	409			
		Ap	0.102	0.102	0.089	0.089	0.170	0.153	0.153	0.136	0.119	0.119	0.191	0.170	0.170	0.149	0.230	0.230	0.204	0.179			
	39.1	Vc	83	83	83	83	93	93	93	83	83	74	103	93	93	93	103	103	93	93			
		fz	0.013	0.013	0.013	0.013	0.019	0.019	0.019	0.017	0.017	0.015	0.022	0.020	0.020	0.020	0.026	0.026	0.023	0.023			
		RPM	8852	8852	8852	8852	7377	7377	7377	6639	6639	5902	6557	5901	5901	5901	5464	5464	4918	4918			
		FEED	230	230	230	230	280	280	280	226	226	177	289	236	236	236	284	284	226	226			
		Ap	0.096	0.096	0.084	0.084	0.160	0.144	0.144	0.128	0.112	0.112	0.180	0.160	0.160	0.140	0.216	0.216	0.192	0.168			
	39.2	Vc	65	65	65	65	72	72	72	65	65	58	82	74	74	74	82	82	74	74			
		fz	0.010	0.010	0.010	0.010	0.015	0.015	0.015	0.014	0.014	0.012	0.018	0.016	0.016	0.016	0.021	0.021	0.019	0.019			
		RPM	6885	6885	6885	6885	5737	5737	5737	5163	5163	4590	5246	4721	4721	4721	4371	4371	3934	3934			
		FEED	138	138	138	138	172	172	172	145	145	110	189	151	151	151	184	184	149	149			
		Ap	0.096	0.096	0.084	0.084	0.160	0.144	0.144	0.128	0.112	0.112	0.180	0.160	0.160	0.140	0.216	0.216	0.192	0.168			
	39.3	Vc	56	56	56	56	62	62	62	56	56	49	72	65	65	65	72	72	65	65			
		fz	0.008	0.008	0.008	0.008	0.012	0.012	0.012	0.011	0.011	0.010	0.015	0.013	0.013	0.013	0.018	0.018	0.016	0.016			
		RPM	5901	5901	5901	5901	4918	4918	4918	4426	4426	3934	4590	4131	4131	4131	3825	3825	3443	3443			
		FEED	94	94	94	94	118	118	118	97	97	79	138	107	107	107	138	138	110	110			
		Ap	0.078	0.078	0.068	0.068	0.130	0.117	0.117	0.104	0.091	0.091	0.146	0.130	0.130	0.114	0.176	0.176	0.156	0.137			
	40	Vc	153	153	153	153	170	170	170	153	153	136	201	181	181	181	201	201	181	181			
		fz	0.018	0.018	0.018	0.018	0.027	0.027	0.027	0.024	0.024	0.022	0.032	0.029	0.029	0.029	0.037	0.037	0.033	0.033			
		RPM	16229	16229	16229	16229	13524	13524	13524	12172	12172	10819	12786	11507	11507	11507	10655	10655	9590	9590			
		FEED	584	584	584	584	730	730	730	584	584	476	818	667	667	667	788	788	633	633			
		Ap	0.102	0.102	0.089	0.089	0.170	0.153	0.153	0.136	0.119	0.119	0.191	0.170	0.170	0.149	0.230	0.230	0.204	0.179			
	41	Vc	102	102	102	102	113	113	113	102	102	91	134	121	121	121	134	134	121	121			
		fz	0.016	0.016	0.016	0.016	0.025	0.025	0.025	0.023	0.023	0.020	0.030	0.027	0.027	0.027	0.035	0.035	0.032	0.032			
		RPM	10819	10819	10819	10819	9017	9017	9017	8115	8115	7214	8524	7672	7672	7672	7104	7104	6394	6394			
		FEED	346	346	346	346	451	451	451	373	373	289	511	414	414	414	497	497	409	409			
		Ap	0.102	0.102	0.089	0.089	0.170	0.153	0.153	0.136	0.119	0.119	0.191	0.170	0.170	0.149	0.230	0.230	0.204	0.179			



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Global Cutting Tool Leader **YG-1**



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YG

Leading Through Innovation



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

SELECTION GUIDE

MILLING TOOLS

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High Speed Cutting
for Pre-Hardened Steels up to HRc55

Please visit globalyg1.com/mat for material search

◎ : Excellent ○ : Good

Recommended cutting conditions : p.C188

SERIES	SEMD98	SEM846	SEM846	SEMD99
FLUTE	2	2	2	2
HELIX ANGLE	30°	30°	30°	30°
CUTTING EDGE SHAPE	BALL NOSE	BALL NOSE	BALL NOSE	CORNER RADIUS
SIZE MIN	R0.05	R0.05	R0.25	D0.2
SIZE MAX	R12.5	R6.0	R1.0	D20.0
PAGE	C82	C88	C98	C101
	-	EXTENDED NECK	EXTENDED NECK (6mm Shank)	-
	Y-Coating	Y-Coating	Y-Coating	Y-Coating



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		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		Ni or Co Based	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	Hardened steel		Hardened	550	55	○	○	○	○
	39			Hardened	630	60				
	40	Chilled Cast Iron		Cast	400	42	◎	◎	◎	◎
	41	Hardened Cast Iron		Hardened	550	55	○	○	○	○

SERIES	SEME61	SEME01	SEME64	SEME35	SEME35	SEME35	SEME70	SEM845	SEME36	SEME71	SEME72	SEME73	SEME75
FLUTE	2	4	4	2	2	2	2	2	4	4	4	4	6
HELIX ANGLE	30°	27°/30° (MULTIPLE HELIX)	27°/30° (MULTIPLE HELIX)	30°	30°	30°	30°	30°	27°/30° (MULTIPLE HELIX)	35°/38° (MULTIPLE HELIX)	30°	30°	45°
CUTTING EDGE SHAPE	CORNER RADIUS	CORNER RADIUS	CORNER RADIUS	SQUARE	SQUARE	SQUARE	SQUARE	SQUARE	SQUARE	SQUARE	SQUARE	SQUARE	SQUARE
SIZE MIN	D0.2	D1.0	D1.0	D0.1	D0.1	D0.1	D1.0	D0.1	D0.8	D1.0	D1.0	D1.0	D6.0
SIZE MAX	D20.0	D20.0	D20.0	D25.0	D4.0	D3.0	D25.0	D12.0	D25.0	D20.0	D25.0	D12.0	D20.0
PAGE	C109	C128	C135	C150	C153	C154	C155	C161	C170	C172	C176	C182	C187
	EXTENDED NECK	-	EXTENDED NECK	-	4mm Shank	3mm Shank	LONG LENGTH	EXTENDED NECK	-	Sharp Corner Removal	LONG LENGTH	EXTENDED 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



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◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	4		
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◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	8		
◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	9		
○	○	○	○	○	○	○	○	○	○	○	○	○	10		
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								○				○	12		
								○				○	13	M	
				○	○	○		○	○	○		○	14		
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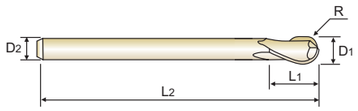
4G MILL END MILLS

PLAIN SHANK **SEMD98** SERIES

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

▶ New coating and tool geometry applied resulting outstanding cutting abilities and wear resistance.
▶ With its unique ball nose geometry and cutting edges the cutting force has decreased, also increasing wear resistance.
▶ Excellent performance when cutting prehardened steels, up to HRc55 which are used for molds & dies.





CARBIDE | 2 | 30° | R ±0.005 | R ±0.010 | PLAIN | Y Coating | p.C188-C189

R0.05~R3 R3.25~R12.5

Unit : mm

EDP No.	Radius of Ball Nose	Mill Diameter	Shank Diameter	Length of Cut	Overall Length	Remark
	R	D1	D2	L1	L2	
SEMD98001SE	R0.05	**0.1**	4	0.1	40	Short
SEMD98001E	R0.05	**0.1**	4	0.2	40	Regular
SEMD980013SE	R0.05	**0.1**	3	0.2	40	3mm Shank
SEMD980015SE	R0.075	**0.15**	4	0.15	40	Short
SEMD980015E	R0.075	**0.15**	4	0.3	40	Regular
SEMD9800153SE	R0.075	**0.15**	3	0.3	40	3mm Shank
SEMD98002SE	R0.1	**0.2**	4	0.2	40	Short
SEMD98002E	R0.1	**0.2**	4	0.4	40	Regular
SEMD980023SE	R0.1	**0.2**	3	0.4	40	3mm Shank
SEMD98003SE	R0.15	**0.3**	4	0.3	40	Short
SEMD98003E	R0.15	**0.3**	4	0.6	40	Regular
SEMD980033SE	R0.15	**0.3**	3	0.6	40	3mm Shank
SEMD98004SE	R0.2	**0.4**	4	0.4	40	Short
SEMD98004E	R0.2	**0.4**	4	0.8	40	Regular
SEMD980043SE	R0.2	**0.4**	3	0.8	40	3mm Shank
SEMD98005SE	R0.25	**0.5**	4	0.5	40	Short
SEMD98005S6SE	R0.25	**0.5**	6	0.8	40	-
SEMD98005E	R0.25	**0.5**	4	1.0	40	Regular
SEMD980053SE	R0.25	**0.5**	3	1.0	40	3mm Shank
SEMD98006SE	R0.3	**0.6**	4	0.6	40	Short
SEMD98006E	R0.3	**0.6**	4	1.2	40	Regular
SEMD980063SE	R0.3	**0.6**	3	1.2	40	3mm Shank
SEMD98007SE	R0.35	**0.7**	4	0.7	40	Short
SEMD98007E	R0.35	**0.7**	4	1.4	40	Regular

▶ NEXT PAGE

Size	RadiusTolerance (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					
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																		○		◎	○

CARBIDE
HSS
i-Xmill END MILLS
X-1EH END MILLS
4G MILL END MILLS
X-POWER PRO END MILLS
TitaNox-POWER END MILLS
V7 PLUS END MILLS
ALU-CUT END MILLS
GENERAL CARBIDE END MILLS

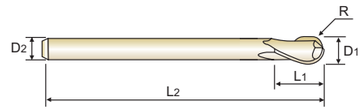
4G MILL END MILLS

PLAIN SHANK SEMD98 SERIES

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

▶ New coating and tool geometry applied resulting outstanding cutting abilities and wear resistance.
▶ With its unique ball nose geometry and cutting edges the cutting force has decreased, also increasing wear resistance.
▶ Excellent performance when cutting prehardened steels, up to HRc55 which are used for molds & dies.





CARBIDE | 2 | 30° | R ±0.005 | R ±0.010 | PLAIN | Y Coating | p.C188-C189

R0.05~R3 R3.25~R12.5

Unit : mm

EDP No.	Radius of Ball Nose	Mill Diameter	Shank Diameter	Length of Cut	Overall Length	Remark
	R	D1	D2	L1	L2	
SEMD980073SE	R0.35	**0.7**	3	1.4	40	3mm Shank
SEMD98008SE	R0.4	**0.8**	4	0.8	40	Short
SEMD98008E	R0.4	**0.8**	4	1.6	40	Regular
SEMD980083SE	R0.4	**0.8**	3	1.6	40	3mm Shank
SEMD98009SE	R0.45	**0.9**	4	0.9	40	Short
SEMD98009E	R0.45	**0.9**	4	1.8	40	Regular
SEMD980093SE	R0.45	**0.9**	3	1.8	40	3mm Shank
SEMD98010040E	R0.5	**1.0**	6	1.5	40	Short
SEMD980103SE	R0.5	**1.0**	3	2.5	50	3mm Shank
SEMD98010S4SE	R0.5	**1.0**	4	1.5	40	-
SEMD980104SE	R0.5	**1.0**	4	2.5	50	Regular
SEMD98010E	R0.5	**1.0**	6	2.5	50	Regular
SEMD98010070E	R0.5	**1.0**	6	2.5	70	Long
SEMD98010100E	R0.5	**1.0**	6	2.5	100	Long
SEMD98012040E	R0.6	**1.2**	6	2	40	Short
SEMD980123SE	R0.6	**1.2**	3	3	50	3mm Shank
SEMD980124SE	R0.6	**1.2**	4	3	50	Regular
SEMD98012E	R0.6	**1.2**	6	3	50	Regular
SEMD98012070E	R0.6	**1.2**	6	3	70	Long
SEMD98012100E	R0.6	**1.2**	6	3	100	Long
SEMD98015040E	R0.75	**1.5**	6	2.5	40	Short
SEMD980153SE	R0.75	**1.5**	3	4	50	3mm Shank
SEMD980154SE	R0.75	**1.5**	4	4	50	Regular
SEMD98015E	R0.75	**1.5**	6	4	50	Regular

▶ NEXT PAGE

Size	RadiusTolerance (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					
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																		○		◎	○

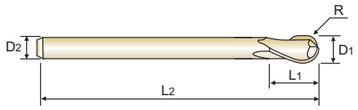
4G MILL END MILLS

PLAIN SHANK **SEMD98** SERIES

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

▶ New coating and tool geometry applied resulting outstanding cutting abilities and wear resistance.
▶ With its unique ball nose geometry and cutting edges the cutting force has decreased, also increasing wear resistance.
▶ Excellent performance when cutting prehardened steels, up to HRc55 which are used for molds & dies.





CARBIDE | 2 | 30° | R ±0.005 | R ±0.010 | PLAIN | Y Coating | p.C188-C189

R0.05~R3 R3.25~R12.5

Unit : mm

EDP No.	Radius of Ball Nose	Mill Diameter	Shank Diameter	Length of Cut	Overall Length	Remark
	R	D1	D2	L1	L2	
SEMD98015070E	R0.75	1.5	6	4	70	Long
SEMD98015100E	R0.75	1.5	6	4	100	Long
SEMD98020040E	R1.0	2.0	6	3	40	Short
SEMD980203SE	R1.0	2.0	3	5	50	3mm Shank
SEMD980204SE	R1.0	2.0	4	5	50	Regular
SEMD98020E	R1.0	2.0	6	5	50	Regular
SEMD98020080E	R1.0	2.0	6	5	80	Long
SEMD98020100E	R1.0	2.0	6	5	100	Long
SEMD98025040E	R1.25	2.5	6	4	40	Short
SEMD980253SE	R1.25	2.5	3	6	60	3mm Shank
SEMD980254SE	R1.25	2.5	4	6	60	Regular
SEMD98025E	R1.25	2.5	6	6	60	Regular
SEMD98025080E	R1.25	2.5	6	6	80	Long
SEMD98025100E	R1.25	2.5	6	6	100	Long
SEMD98030040E	R1.5	3.0	6	4.5	40	Short
SEMD980303SE	R1.5	3.0	3	6	60	3mm Shank
SEMD980304SE	R1.5	3.0	4	6	60	Regular
SEMD98030E	R1.5	3.0	6	6	60	Regular
SEMD98030080E	R1.5	3.0	6	6	80	Long
SEMD98030100E	R1.5	3.0	6	6	100	Long
SEMD98035E	R1.75	3.5	6	8	70	-
SEMD98040050E	R2.0	4.0	6	6	50	Short
SEMD980404SE	R2.0	4.0	4	8	70	Regular
SEMD98040E	R2.0	4.0	6	8	70	Regular

▶ NEXT PAGE

Size	RadiusTolerance (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																			
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																		○		◎	○

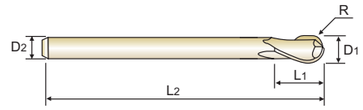
4G MILL END MILLS

PLAIN SHANK **SEMD98** SERIES

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

▶ New coating and tool geometry applied resulting outstanding cutting abilities and wear resistance.
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CARBIDE | 2 | 30° | R ±0.005 | R ±0.010 | PLAIN | Y Coating | p.C188-C189

R0.05~R3 R3.25~R12.5

Unit : mm

EDP No.	Radius of Ball Nose	Mill Diameter	Shank Diameter	Length of Cut	Overall Length	Remark
	R	D1	D2	L1	L2	
SEMD980401004SE	R2.0	4.0	4	8	100	Long
SEMD980401204SE	R2.0	4.0	4	8	120	Long
SEMD98040100E	R2.0	4.0	6	8	100	Long
SEMD98040120E	R2.0	4.0	6	8	120	Long
SEMD98045E	R2.25	4.5	6	9	80	-
SEMD98050060E	R2.5	5.0	6	7.5	60	Short
SEMD98050E	R2.5	5.0	6	10	80	Regular
SEMD980505SE	R2.5	5.0	5	10	80	5mmShank
SEMD98055E	R2.75	5.5	6	11	90	-
SEMD98060050E	R3.0	6.0	6	9	50	Short
SEMD98060060E	R3.0	6.0	6	9	60	Short
SEMD98060080E	R3.0	6.0	6	9	80	Short
SEMD98060E	R3.0	6.0	6	12	90	Regular
SEMD98060110E	R3.0	6.0	6	12	110	Long
SEMD98060130E	R3.0	6.0	6	12	130	Long
SEMD98060150E	R3.0	6.0	6	12	150	Long
SEMD98065E	R3.25	6.5	8	13	90	-
SEMD98070E	R3.5	7.0	8	14	90	-
SEMD98080050E	R4.0	8.0	8	12	50	Short
SEMD98080060E	R4.0	8.0	8	12	60	Short
SEMD98080080E	R4.0	8.0	8	12	80	Short
SEMD98080090E	R4.0	8.0	8	12	90	Short
SEMD98080E	R4.0	8.0	8	14	100	Regular
SEMD98080130E	R4.0	8.0	8	14	130	Long

▶ NEXT PAGE

Size	RadiusTolerance (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																			
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																		○		◎	○

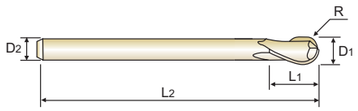
4G MILL END MILLS

PLAIN SHANK **SEMD98** SERIES

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

▶ New coating and tool geometry applied resulting outstanding cutting abilities and wear resistance.
▶ With its unique ball nose geometry and cutting edges the cutting force has decreased, also increasing wear resistance.
▶ Excellent performance when cutting prehardened steels, up to HRc55 which are used for molds & dies.





CARBIDE | 2 | 30° | R ±0.005 | R ±0.010 | PLAIN | Y Coating | p.C188-C189

R0.05~R3 R3.25~R12.5

Unit : mm

EDP No.	Radius of Ball Nose	Mill Diameter	Shank Diameter	Length of Cut	Overall Length	Remark
	R	D1	D2	L1	L2	
SEMD98080150E	R4.0	**8.0**	8	14	150	Long
SEMD98085E	R4.25	**8.5**	10	16	100	-
SEMD98090E	R4.5	**9.0**	10	18	100	-
SEMD98100050E	R5.0	**10.0**	10	15	50	Short
SEMD98100060E	R5.0	**10.0**	10	15	60	Short
SEMD98100080E	R5.0	**10.0**	10	15	80	Short
SEMD98100090E	R5.0	**10.0**	10	15	90	Short
SEMD98100E	R5.0	**10.0**	10	18	100	Regular
SEMD98100130E	R5.0	**10.0**	10	18	130	Long
SEMD98100150E	R5.0	**10.0**	10	18	150	Long
SEMD98100180E	R5.0	**10.0**	10	18	180	Long
SEMD98100200E	R5.0	**10.0**	10	18	200	Long
SEMD98110E	R5.5	**11.0**	12	20	100	-
SEMD98120060E	R6.0	**12.0**	12	18	60	Short
SEMD98120080E	R6.0	**12.0**	12	18	80	Short
SEMD98120090E	R6.0	**12.0**	12	18	90	Short
SEMD98120100E	R6.0	**12.0**	12	18	100	Short
SEMD98120E	R6.0	**12.0**	12	22	110	Regular
SEMD98120130E	R6.0	**12.0**	12	22	130	Long
SEMD98120150E	R6.0	**12.0**	12	22	150	Long
SEMD98120180E	R6.0	**12.0**	12	22	180	Long
SEMD98120200E	R6.0	**12.0**	12	22	200	Long
SEMD98130E	R6.5	**13.0**	12	24	100	-
SEMD98140E	R7.0	**14.0**	12	26	100	Regular

▶ NEXT PAGE

Size	RadiusTolerance (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																			
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																		○		◎	○

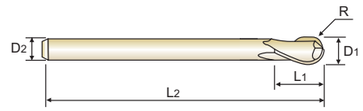
4G MILL END MILLS

PLAIN SHANK **SEMD98** SERIES

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

▶ New coating and tool geometry applied resulting outstanding cutting abilities and wear resistance.
▶ With its unique ball nose geometry and cutting edges the cutting force has decreased, also increasing wear resistance.
▶ Excellent performance when cutting prehardened steels, up to HRc55 which are used for molds & dies.





CARBIDE | 2 | 30° | R ±0.005 | R ±0.010 | PLAIN | Y Coating | p.C188-C189

R0.05~R3 R3.25~R12.5

Unit : mm

EDP No.	Radius of Ball Nose	Mill Diameter	Shank Diameter	Length of Cut	Overall Length	Remark
	R	D1	D2	L1	L2	
SEMD9814014SE	R7.0	**14.0**	14	26	100	-
SEMD9814016SE	R7.0	**14.0**	16	26	100	-
SEMD98150E	R7.5	**15.0**	16	28	140	-
SEMD98160100E	R8.0	**16.0**	16	24	100	Short
SEMD98160130E	R8.0	**16.0**	16	24	130	Short
SEMD98160E	R8.0	**16.0**	16	30	150	Regular
SEMD98160180E	R8.0	**16.0**	16	30	180	Long
SEMD98160200E	R8.0	**16.0**	16	30	200	Long
SEMD98180E	R9.0	**18.0**	16	34	150	Regular
SEMD9818018SE	R9.0	**18.0**	18	34	150	-
SEMD98200100E	R10.0	**20.0**	20	30	100	Short
SEMD98200130E	R10.0	**20.0**	20	30	130	Short
SEMD98200E	R10.0	**20.0**	20	38	150	Regular
SEMD98200200E	R10.0	**20.0**	20	38	200	Long
SEMD98250120E	R12.5	**25.0**	25	50	120	Short
SEMD98250E	R12.5	**25.0**	25	50	180	Regular

Size	RadiusTolerance (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																			
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																		○		◎	○

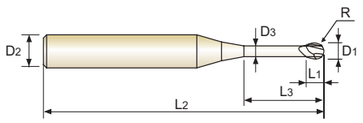
4G MILL END MILLS

PLAIN SHANK **SEM846** SERIES

CARBIDE, 2 FLUTE BALL NOSE with EXTENDED NECK

▶ New coating and tool geometry applied resulting outstanding cutting abilities and wear resistance.
▶ With its unique ball nose geometry and cutting edges the cutting force has decreased, also increasing wear resistance.
▶ Excellent performance when cutting prehardened steels, up to HRc55 which are used for molds & dies.





CARBIDE | 2 | 30° | R ±0.005 | R ±0.010 | PLAIN | Y Coating | p.C190-C201

R0.05~R3 R4~R6

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
SEM846001002E	R0.05	**0.1**	4	0.1	0.2	40	0.085
SEM846001003E	R0.05	**0.1**	4	0.1	0.3	40	0.085
SEM846001005E	R0.05	**0.1**	4	0.1	0.5	40	0.085
SEM84600101E	R0.05	**0.1**	4	0.1	1	40	0.085
SEM846002005E	R0.1	**0.2**	4	0.2	0.5	40	0.17
SEM84600201E	R0.1	**0.2**	4	0.2	1	40	0.17
SEM846002015E	R0.1	**0.2**	4	0.2	1.5	40	0.17
SEM84600202E	R0.1	**0.2**	4	0.2	2	40	0.17
SEM84600203E	R0.1	**0.2**	4	0.2	3	40	0.17
SEM84600301E	R0.15	**0.3**	4	0.3	1	40	0.27
SEM846003015E	R0.15	**0.3**	4	0.3	1.5	40	0.27
SEM84600302E	R0.15	**0.3**	4	0.3	2	40	0.27
SEM846003025E	R0.15	**0.3**	4	0.3	2.5	40	0.27
SEM84600303E	R0.15	**0.3**	4	0.3	3	40	0.27
SEM84600304E	R0.15	**0.3**	4	0.3	4	40	0.27
SEM84600305E	R0.15	**0.3**	4	0.3	5	40	0.27
SEM84600401E	R0.2	**0.4**	4	0.4	1	40	0.37
SEM846004015E	R0.2	**0.4**	4	0.4	1.5	40	0.37
SEM84600402E	R0.2	**0.4**	4	0.4	2	40	0.37
SEM846004025E	R0.2	**0.4**	4	0.4	2.5	40	0.37
SEM84600403E	R0.2	**0.4**	4	0.4	3	40	0.37
SEM84600404E	R0.2	**0.4**	4	0.4	4	40	0.37
SEM84600405E	R0.2	**0.4**	4	0.4	5	40	0.37
SEM84600406E	R0.2	**0.4**	4	0.4	6	40	0.37

▶ NEXT PAGE

Size	RadiusTolerance (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																			
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																		○		◎	○

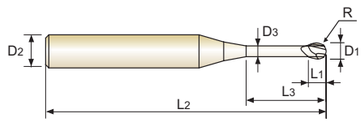
4G MILL END MILLS

PLAIN SHANK SEM846 SERIES

CARBIDE, 2 FLUTE BALL NOSE with EXTENDED NECK

▶ New coating and tool geometry applied resulting outstanding cutting abilities and wear resistance.
▶ With its unique ball nose geometry and cutting edges the cutting force has decreased, also increasing wear resistance.
▶ Excellent performance when cutting prehardened steels, up to HRc55 which are used for molds & dies.





CARBIDE | 2 | 30° | R ±0.005 | R ±0.010 | PLAIN | Y Coating | p.C190-C201

R0.05~R3 R4~R6

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
SEM84600408E	R0.2	**0.4**	4	0.4	8	40	0.37
SEM84600410E	R0.2	**0.4**	4	0.4	10	40	0.37
SEM84600501E	R0.25	**0.5**	4	0.5	1	45	0.45
SEM846005015E	R0.25	**0.5**	4	0.5	1.5	45	0.45
SEM84600502E	R0.25	**0.5**	4	0.5	2	45	0.45
SEM846005025E	R0.25	**0.5**	4	0.5	2.5	45	0.45
SEM84600503E	R0.25	**0.5**	4	0.5	3	45	0.45
SEM84600504E	R0.25	**0.5**	4	0.5	4	45	0.45
SEM84600505E	R0.25	**0.5**	4	0.5	5	45	0.45
SEM84600506E	R0.25	**0.5**	4	0.5	6	45	0.45
SEM84600508E	R0.25	**0.5**	4	0.5	8	45	0.45
SEM84600510E	R0.25	**0.5**	4	0.5	10	45	0.45
SEM84600512E	R0.25	**0.5**	4	0.5	12	45	0.45
SEM84600514E	R0.25	**0.5**	4	0.5	14	45	0.45
SEM84600516E	R0.25	**0.5**	4	0.5	16	45	0.45
SEM84600601E	R0.3	**0.6**	4	0.6	1	45	0.55
SEM84600602E	R0.3	**0.6**	4	0.6	2	45	0.55
SEM84600603E	R0.3	**0.6**	4	0.6	3	45	0.55
SEM84600604E	R0.3	**0.6**	4	0.6	4	45	0.55
SEM84600605E	R0.3	**0.6**	4	0.6	5	45	0.55
SEM84600606E	R0.3	**0.6**	4	0.6	6	45	0.55
SEM84600608E	R0.3	**0.6**	4	0.6	8	45	0.55
SEM84600610E	R0.3	**0.6**	4	0.6	10	45	0.55
SEM84600612E	R0.3	**0.6**	4	0.6	12	45	0.55

▶ NEXT PAGE

Size	RadiusTolerance (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																			
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																		○		◎	○

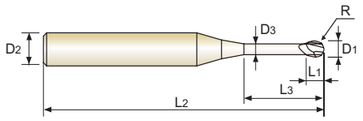
4G MILL END MILLS

PLAIN SHANK **SEM846** SERIES

CARBIDE, 2 FLUTE BALL NOSE with EXTENDED NECK

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CARBIDE | 2 | 30° | R ±0.005 | R ±0.010 | PLAIN | Y Coating | p.C190-C201

R0.05~R3 R4~R6

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
SEM84600614E	R0.3	**0.6**	4	0.6	14	45	0.55
SEM84600616E	R0.3	**0.6**	4	0.6	16	45	0.55
SEM84600702E	R0.35	**0.7**	4	0.7	2	45	0.65
SEM84600704E	R0.35	**0.7**	4	0.7	4	45	0.65
SEM84600706E	R0.35	**0.7**	4	0.7	6	45	0.65
SEM84600708E	R0.35	**0.7**	4	0.7	8	45	0.65
SEM84600710E	R0.35	**0.7**	4	0.7	10	45	0.65
SEM84600712E	R0.35	**0.7**	4	0.7	12	45	0.65
SEM84600801E	R0.4	**0.8**	4	0.8	1	45	0.75
SEM84600802E	R0.4	**0.8**	4	0.8	2	45	0.75
SEM84600803E	R0.4	**0.8**	4	0.8	3	45	0.75
SEM84600804E	R0.4	**0.8**	4	0.8	4	45	0.75
SEM84600805E	R0.4	**0.8**	4	0.8	5	45	0.75
SEM84600806E	R0.4	**0.8**	4	0.8	6	45	0.75
SEM84600808E	R0.4	**0.8**	4	0.8	8	45	0.75
SEM84600810E	R0.4	**0.8**	4	0.8	10	45	0.75
SEM84600812E	R0.4	**0.8**	4	0.8	12	45	0.75
SEM84600814E	R0.4	**0.8**	4	0.8	14	45	0.75
SEM84600816E	R0.4	**0.8**	4	0.8	16	45	0.75
SEM84600820E	R0.4	**0.8**	4	0.8	20	45	0.75
SEM84600904E	R0.45	**0.9**	4	0.9	4	45	0.85
SEM84600906E	R0.45	**0.9**	4	0.9	6	45	0.85
SEM84600908E	R0.45	**0.9**	4	0.9	8	45	0.85
SEM84600910E	R0.45	**0.9**	4	0.9	10	45	0.85

▶ NEXT PAGE

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

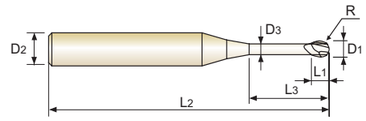
◎ : Excellent ○ : Good

ISO	P																			
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																		○		◎	○

4G MILL END MILLS
PLAIN SHANK SEM846 SERIES
CARBIDE, 2 FLUTE BALL NOSE with EXTENDED NECK
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CARBIDE | 2 | 30° | R ±0.005 | R ±0.010 | PLAIN | Y Coating | p.C190-C201
R0.05~R3 R4~R6
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
SEM84601002E	R0.5	**1.0**	4	1	2	50	0.95
SEM84601003E	R0.5	**1.0**	4	1	3	50	0.95
SEM84601004E	R0.5	**1.0**	4	1	4	50	0.95
SEM84601005E	R0.5	**1.0**	4	1	5	50	0.95
SEM84601006E	R0.5	**1.0**	4	1	6	50	0.95
SEM84601007E	R0.5	**1.0**	4	1	7	50	0.95
SEM84601008E	R0.5	**1.0**	4	1	8	50	0.95
SEM84601009E	R0.5	**1.0**	4	1	9	50	0.95
SEM84601010E	R0.5	**1.0**	4	1	10	50	0.95
SEM84601012E	R0.5	**1.0**	4	1	12	50	0.95
SEM84601014E	R0.5	**1.0**	4	1	14	50	0.95
SEM84601016E	R0.5	**1.0**	4	1	16	50	0.95
SEM84601018E	R0.5	**1.0**	4	1	18	50	0.95
SEM84601020E	R0.5	**1.0**	4	1	20	50	0.95
SEM84601022E	R0.5	**1.0**	4	1	22	60	0.95
SEM84601026E	R0.5	**1.0**	4	1	26	60	0.95
SEM84601030E	R0.5	**1.0**	4	1	30	70	0.95
SEM84601040E	R0.5	**1.0**	4	1	40	80	0.95
SEM84601050E	R0.5	**1.0**	4	1	50	100	0.95
SEM84601204E	R0.6	**1.2**	4	1.2	4	50	1.15
SEM84601206E	R0.6	**1.2**	4	1.2	6	50	1.15
SEM84601208E	R0.6	**1.2**	4	1.2	8	50	1.15
SEM84601210E	R0.6	**1.2**	4	1.2	10	50	1.15
SEM84601212E	R0.6	**1.2**	4	1.2	12	50	1.15

▶ NEXT PAGE

Size	RadiusTolerance (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																			
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																		○		◎	○

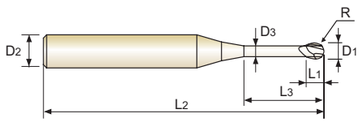
4G MILL END MILLS

PLAIN SHANK **SEM846** SERIES

CARBIDE, 2 FLUTE BALL NOSE with EXTENDED NECK

▶ New coating and tool geometry applied resulting outstanding cutting abilities and wear resistance.
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CARBIDE | 2 | 30° | R ±0.005 | R ±0.010 | PLAIN | Y Coating | p.C190-C201

R0.05~R3 R4~R6

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
SEM84601216E	R0.6	**1.2**	4	1.2	16	50	1.15
SEM84601220E	R0.6	**1.2**	4	1.2	20	50	1.15
SEM84601226E	R0.6	**1.2**	4	1.2	26	60	1.15
SEM84601406E	R0.7	**1.4**	4	1.4	6	50	1.35
SEM84601408E	R0.7	**1.4**	4	1.4	8	50	1.35
SEM84601410E	R0.7	**1.4**	4	1.4	10	50	1.35
SEM84601412E	R0.7	**1.4**	4	1.4	12	50	1.35
SEM84601416E	R0.7	**1.4**	4	1.4	16	50	1.35
SEM84601503E	R0.75	**1.5**	4	1.5	3	50	1.45
SEM84601504E	R0.75	**1.5**	4	1.5	4	50	1.45
SEM84601505E	R0.75	**1.5**	4	1.5	5	50	1.45
SEM84601506E	R0.75	**1.5**	4	1.5	6	50	1.45
SEM84601507E	R0.75	**1.5**	4	1.5	7	50	1.45
SEM84601508E	R0.75	**1.5**	4	1.5	8	50	1.45
SEM84601510E	R0.75	**1.5**	4	1.5	10	50	1.45
SEM84601512E	R0.75	**1.5**	4	1.5	12	50	1.45
SEM84601514E	R0.75	**1.5**	4	1.5	14	50	1.45
SEM84601516E	R0.75	**1.5**	4	1.5	16	50	1.45
SEM84601518E	R0.75	**1.5**	4	1.5	18	50	1.45
SEM84601520E	R0.75	**1.5**	4	1.5	20	50	1.45
SEM84601522E	R0.75	**1.5**	4	1.5	22	60	1.45
SEM84601526E	R0.75	**1.5**	4	1.5	26	60	1.45
SEM84601530E	R0.75	**1.5**	4	1.5	30	70	1.45
SEM84601535E	R0.75	**1.5**	4	1.5	35	70	1.45

▶ NEXT PAGE

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

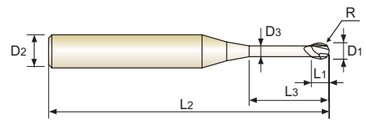
◎ : Excellent ○ : Good

ISO	P																			
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																		○		◎	○

4G MILL END MILLS
PLAIN SHANK SEM846 SERIES
CARBIDE, 2 FLUTE BALL NOSE with EXTENDED NECK
▶ New coating and tool geometry applied resulting outstanding cutting abilities and wear resistance.
▶ With its unique ball nose geometry and cutting edges the cutting force has decreased, also increasing wear resistance.
▶ Excellent performance when cutting prehardened steels, up to HRc55 which are used for molds & dies.





CARBIDE | 2 | 30° | R ±0.005 | R ±0.010 | PLAIN | Y Coating | p.C190-C201
R0.05~R3 R4~R6
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
SEM84601540E	R0.75	**1.5**	4	1.5	40	80	1.45
SEM84601604E	R0.8	**1.6**	4	1.6	4	50	1.55
SEM84601606E	R0.8	**1.6**	4	1.6	6	50	1.55
SEM84601608E	R0.8	**1.6**	4	1.6	8	50	1.55
SEM84601610E	R0.8	**1.6**	4	1.6	10	50	1.55
SEM84601612E	R0.8	**1.6**	4	1.6	12	50	1.55
SEM84601616E	R0.8	**1.6**	4	1.6	16	50	1.55
SEM84601620E	R0.8	**1.6**	4	1.6	20	50	1.55
SEM84601804E	R0.9	**1.8**	4	1.8	4	50	1.75
SEM84601806E	R0.9	**1.8**	4	1.8	6	50	1.75
SEM84601808E	R0.9	**1.8**	4	1.8	8	50	1.75
SEM84601810E	R0.9	**1.8**	4	1.8	10	50	1.75
SEM84601812E	R0.9	**1.8**	4	1.8	12	50	1.75
SEM84601816E	R0.9	**1.8**	4	1.8	16	50	1.75
SEM84601820E	R0.9	**1.8**	4	1.8	20	50	1.75
SEM84602004E	R1.0	**2.0**	4	2	4	50	1.95
SEM84602006E	R1.0	**2.0**	4	2	6	50	1.95
SEM84602008E	R1.0	**2.0**	4	2	8	50	1.95
SEM84602010E	R1.0	**2.0**	4	2	10	50	1.95
SEM84602012E	R1.0	**2.0**	4	2	12	50	1.95
SEM84602014E	R1.0	**2.0**	4	2	14	50	1.95
SEM84602016E	R1.0	**2.0**	4	2	16	50	1.95
SEM84602018E	R1.0	**2.0**	4	2	18	50	1.95
SEM84602020E	R1.0	**2.0**	4	2	20	50	1.95

▶ NEXT PAGE

Size	RadiusTolerance (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																			
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																		○		◎	○

CARBIDE
HSS
i-Xmill END MILLS
X-1EH END MILLS
4G MILL END MILLS
X-POWER PRO END MILLS
TitaNox-POWER END MILLS
V7 PLUS END MILLS
ALU-CUT END MILLS
K-2 END MILLS
GENERAL CARBIDE END MILLS

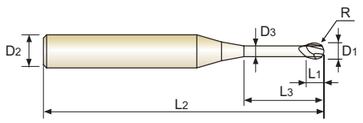
4G MILL END MILLS

PLAIN SHANK **SEM846** SERIES

CARBIDE, 2 FLUTE BALL NOSE with EXTENDED NECK

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CARBIDE | 2 | 30° | R ±0.005 | R ±0.010 | PLAIN | Y Coating | p.C190-C201

R0.05~R3 R4~R6

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
SEM84602022E	R1.0	**2.0**	4	2	22	60	1.95
SEM84602026E	R1.0	**2.0**	4	2	26	60	1.95
SEM84602030E	R1.0	**2.0**	4	2	30	70	1.95
SEM84602035E	R1.0	**2.0**	4	2	35	70	1.95
SEM84602040E	R1.0	**2.0**	4	2	40	80	1.95
SEM84602045E	R1.0	**2.0**	4	2	45	90	1.95
SEM84602050E	R1.0	**2.0**	4	2	50	100	1.95
SEM84602060E	R1.0	**2.0**	4	2	60	110	1.95
SEM84602508E	R1.25	**2.5**	4	2.5	8	50	2.40
SEM84602510E	R1.25	**2.5**	4	2.5	10	50	2.40
SEM84602512E	R1.25	**2.5**	4	2.5	12	50	2.40
SEM84602516E	R1.25	**2.5**	4	2.5	16	50	2.40
SEM84602520E	R1.25	**2.5**	4	2.5	20	50	2.40
SEM84602522E	R1.25	**2.5**	4	2.5	22	60	2.40
SEM84602526E	R1.25	**2.5**	4	2.5	26	60	2.40
SEM84602530E	R1.25	**2.5**	4	2.5	30	70	2.40
SEM84602535E	R1.25	**2.5**	4	2.5	35	70	2.40
SEM84602540E	R1.25	**2.5**	4	2.5	40	80	2.40
SEM84602545E	R1.25	**2.5**	4	2.5	45	90	2.40
SEM84602550E	R1.25	**2.5**	4	2.5	50	100	2.40
SEM84603006E	R1.5	**3.0**	6	3	6	50	2.85
SEM84603008E	R1.5	**3.0**	6	3	8	50	2.85
SEM84603010E	R1.5	**3.0**	6	3	10	50	2.85
SEM84603012E	R1.5	**3.0**	6	3	12	50	2.85

▶ NEXT PAGE

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

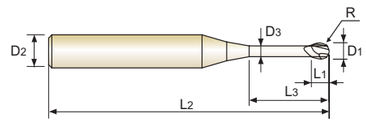
◎ : Excellent ○ : Good

ISO	P																			
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																		○		◎	○

4G MILL END MILLS
PLAIN SHANK SEM846 SERIES
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CARBIDE | 2 | 30° | R ±0.005 | R ±0.010 | PLAIN | Y Coating | p.C190-C201
R0.05~R3 R4~R6
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
SEM84603014E	R1.5	**3.0**	6	3	14	60	2.85
SEM84603015E	R1.5	**3.0**	6	3	15	60	2.85
SEM84603016E	R1.5	**3.0**	6	3	16	60	2.85
SEM84603018E	R1.5	**3.0**	6	3	18	60	2.85
SEM84603020E	R1.5	**3.0**	6	3	20	60	2.85
SEM84603022E	R1.5	**3.0**	6	3	22	65	2.85
SEM84603026E	R1.5	**3.0**	6	3	26	65	2.85
SEM84603030E	R1.5	**3.0**	6	3	30	70	2.85
SEM84603035E	R1.5	**3.0**	6	3	35	70	2.85
SEM84603040E	R1.5	**3.0**	6	3	40	80	2.85
SEM84603045E	R1.5	**3.0**	6	3	45	90	2.85
SEM84603050E	R1.5	**3.0**	6	3	50	100	2.85
SEM84603060E	R1.5	**3.0**	6	3	60	100	2.85
SEM84604008E	R2.0	**4.0**	6	4	8	50	3.85
SEM84604010E	R2.0	**4.0**	6	4	10	50	3.85
SEM84604012E	R2.0	**4.0**	6	4	12	50	3.85
SEM84604014E	R2.0	**4.0**	6	4	14	60	3.85
SEM84604016E	R2.0	**4.0**	6	4	16	60	3.85
SEM84604018E	R2.0	**4.0**	6	4	18	60	3.85
SEM84604020E	R2.0	**4.0**	6	4	20	60	3.85
SEM84604022E	R2.0	**4.0**	6	4	22	65	3.85
SEM84604026E	R2.0	**4.0**	6	4	26	65	3.85
SEM84604030E	R2.0	**4.0**	6	4	30	70	3.85
SEM84604035E	R2.0	**4.0**	6	4	35	70	3.85

▶ NEXT PAGE

Size	RadiusTolerance (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																			
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																		○		◎	○

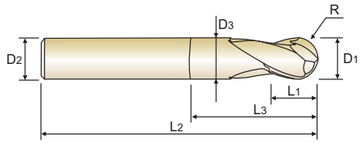
4G MILL END MILLS

PLAIN SHANK **SEM846** SERIES

CARBIDE, 2 FLUTE BALL NOSE with EXTENDED NECK

▶ New coating and tool geometry applied resulting outstanding cutting abilities and wear resistance.
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CARBIDE | 2 | 30° | R ±0.005 | R ±0.010 | PLAIN | Y Coating | p.C190-C201

R0.05~R3 R4~R6

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
SEM84604040E	R2.0	**4.0**	6	4	40	80	3.85
SEM84604045E	R2.0	**4.0**	6	4	45	90	3.85
SEM84604050E	R2.0	**4.0**	6	4	50	100	3.85
SEM84604055E	R2.0	**4.0**	6	4	55	100	3.85
SEM84604060E	R2.0	**4.0**	6	4	60	100	3.85
SEM84605015E	R2.5	**5.0**	6	6	15	60	4.85
SEM84605020E	R2.5	**5.0**	6	6	20	60	4.85
SEM84605026E	R2.5	**5.0**	6	6	26	65	4.85
SEM84605030E	R2.5	**5.0**	6	6	30	70	4.85
SEM84605035E	R2.5	**5.0**	6	6	35	70	4.85
SEM84605040E	R2.5	**5.0**	6	6	40	80	4.85
SEM84605045E	R2.5	**5.0**	6	6	45	90	4.85
SEM84605050E	R2.5	**5.0**	6	6	50	100	4.85
SEM84605055E	R2.5	**5.0**	6	6	55	100	4.85
SEM84605060E	R2.5	**5.0**	6	6	60	100	4.85
SEM84606020E	R3.0	**6.0**	6	8	20	60	5.85
SEM84606030E	R3.0	**6.0**	6	8	30	60	5.85
SEM84606020090E	R3.0	**6.0**	6	12	20	90	5.85
SEM84606030090E	R3.0	**6.0**	6	12	30	90	5.85
SEM84608025E	R4.0	**8.0**	8	10	25	70	7.70
SEM84608035E	R4.0	**8.0**	8	10	35	70	7.70
SEM84608025100E	R4.0	**8.0**	8	14	25	100	7.70
SEM84608035100E	R4.0	**8.0**	8	14	35	100	7.70
SEM84610030E	R5.0	**10.0**	10	12	30	75	9.70

▶ NEXT PAGE

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

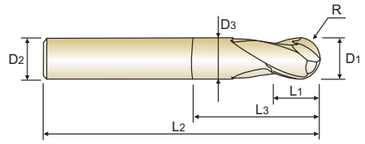
◎ : Excellent ○ : Good

ISO	P																			
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																		○		◎	○

4G MILL END MILLS
PLAIN SHANK SEM846 SERIES
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CARBIDE | 2 | 30° | R ±0.005 | R ±0.010 | PLAIN | Y Coating | p.C190-C201

R0.05~R3 R4~R6

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
SEM84610040E	R5.0	**10.0**	10	12	40	75	9.70
SEM84610030100E	R5.0	**10.0**	10	18	30	100	9.70
SEM84610040100E	R5.0	**10.0**	10	18	40	100	9.70
SEM84612032E	R6.0	**12.0**	12	14	32	80	11.70
SEM84612045E	R6.0	**12.0**	12	14	45	80	11.70
SEM84612032110E	R6.0	**12.0**	12	22	32	110	11.70
SEM84612045110E	R6.0	**12.0**	12	22	45	110	11.70

Size	RadiusTolerance (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																			
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																		○		◎	○

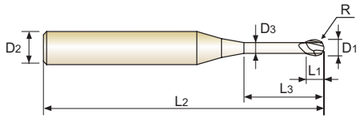
4G MILL END MILLS

PLAIN SHANK **SEM846** SERIES

CARBIDE, 2 FLUTE BALL NOSE with EXTENDED NECK (6mm shank)

- ▶ New coating and tool geometry applied resulting outstanding cutting abilities and wear resistance.
- ▶ With its unique ball nose geometry and cutting edges the cutting force has decreased, also increasing wear resistance.
- ▶ Excellent performance when cutting prehardened steels, up to HRc55 which are used for molds & dies.





CARBIDE | 2 | 30° | R ±0.005 | PLAIN | Y Coating | p.C190-C201

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
SEM846005016SE	R0.25	**0.5**	6	0.5	1	45	0.45
SEM846005026SE	R0.25	**0.5**	6	0.5	2	45	0.45
SEM846005046SE	R0.25	**0.5**	6	0.5	4	45	0.45
SEM846006016SE	R0.3	**0.6**	6	0.6	1	45	0.55
SEM846006026SE	R0.3	**0.6**	6	0.6	2	45	0.55
SEM846006036SE	R0.3	**0.6**	6	0.6	3	45	0.55
SEM846006046SE	R0.3	**0.6**	6	0.6	4	45	0.55
SEM846006056SE	R0.3	**0.6**	6	0.6	5	45	0.55
SEM846006066SE	R0.3	**0.6**	6	0.6	6	45	0.55
SEM846006086SE	R0.3	**0.6**	6	0.6	8	45	0.55
SEM846006106SE	R0.3	**0.6**	6	0.6	10	45	0.55
SEM846006126SE	R0.3	**0.6**	6	0.6	12	45	0.55
SEM846006146SE	R0.3	**0.6**	6	0.6	14	45	0.55
SEM846006166SE	R0.3	**0.6**	6	0.6	16	45	0.55
SEM846008016SE	R0.4	**0.8**	6	0.8	1	45	0.75
SEM846008026SE	R0.4	**0.8**	6	0.8	2	45	0.75
SEM846008036SE	R0.4	**0.8**	6	0.8	3	45	0.75
SEM846008046SE	R0.4	**0.8**	6	0.8	4	45	0.75
SEM846008056SE	R0.4	**0.8**	6	0.8	5	45	0.75
SEM846008066SE	R0.4	**0.8**	6	0.8	6	45	0.75
SEM846008086SE	R0.4	**0.8**	6	0.8	8	45	0.75
SEM846008106SE	R0.4	**0.8**	6	0.8	10	45	0.75
SEM846008126SE	R0.4	**0.8**	6	0.8	12	45	0.75
SEM846008146SE	R0.4	**0.8**	6	0.8	14	45	0.75

▶ NEXT PAGE

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

◎ : 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																		○		◎	○

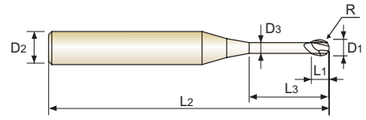
4G MILL END MILLS

PLAIN SHANK SEM846 SERIES

CARBIDE, 2 FLUTE BALL NOSE with EXTENDED NECK (6mm shank)

▶ New coating and tool geometry applied resulting outstanding cutting abilities and wear resistance.
▶ With its unique ball nose geometry and cutting edges the cutting force has decreased, also increasing wear resistance.
▶ Excellent performance when cutting prehardened steels, up to HRc55 which are used for molds & dies.





CARBIDE | 2 | 30° | R ±0.005 | PLAIN | Y Coating | p.C190-C201

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
SEM846008166SE	R0.4	**0.8**	6	0.8	16	45	0.75
SEM846008206SE	R0.4	**0.8**	6	0.8	20	45	0.75
SEM846010026SE	R0.5	**1.0**	6	1	2	50	0.95
SEM846010036SE	R0.5	**1.0**	6	1	3	50	0.95
SEM846010046SE	R0.5	**1.0**	6	1	4	50	0.95
SEM846010056SE	R0.5	**1.0**	6	1	5	50	0.95
SEM846010066SE	R0.5	**1.0**	6	1	6	50	0.95
SEM846010076SE	R0.5	**1.0**	6	1	7	50	0.95
SEM846010086SE	R0.5	**1.0**	6	1	8	50	0.95
SEM846010096SE	R0.5	**1.0**	6	1	9	50	0.95
SEM846010106SE	R0.5	**1.0**	6	1	10	50	0.95
SEM846010126SE	R0.5	**1.0**	6	1	12	50	0.95
SEM846010146SE	R0.5	**1.0**	6	1	14	50	0.95
SEM846010166SE	R0.5	**1.0**	6	1	16	50	0.95
SEM846010186SE	R0.5	**1.0**	6	1	18	50	0.95
SEM846010206SE	R0.5	**1.0**	6	1	20	50	0.95
SEM846010226SE	R0.5	**1.0**	6	1	22	60	0.95
SEM846010266SE	R0.5	**1.0**	6	1	26	60	0.95
SEM846010306SE	R0.5	**1.0**	6	1	30	70	0.95
SEM846015036SE	R0.75	**1.5**	6	1.5	3	50	1.45
SEM846015046SE	R0.75	**1.5**	6	1.5	4	50	1.45
SEM846015066SE	R0.75	**1.5**	6	1.5	6	50	1.45
SEM846015086SE	R0.75	**1.5**	6	1.5	8	50	1.45
SEM846015106SE	R0.75	**1.5**	6	1.5	10	50	1.45

▶ NEXT PAGE

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

◎ : 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																		○		◎	○

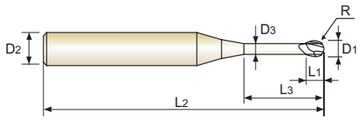
4G MILL END MILLS

PLAIN SHANK **SEM846** SERIES

CARBIDE, 2 FLUTE BALL NOSE with EXTENDED NECK (6mm shank)

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CARBIDE | 2 | 30° | R ±0.005 | PLAIN | Y Coating | p.C190-C201

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
SEM846015126SE	R0.75	1.5	6	1.5	12	50	1.45
SEM846015146SE	R0.75	1.5	6	1.5	14	50	1.45
SEM846015166SE	R0.75	1.5	6	1.5	16	50	1.45
SEM846015186SE	R0.75	1.5	6	1.5	18	50	1.45
SEM846015206SE	R0.75	1.5	6	1.5	20	50	1.45
SEM846015226SE	R0.75	1.5	6	1.5	22	60	1.45
SEM846015266SE	R0.75	1.5	6	1.5	26	60	1.45
SEM846015306SE	R0.75	1.5	6	1.5	30	70	1.45
SEM846015356SE	R0.75	1.5	6	1.5	35	70	1.45
SEM846015406SE	R0.75	1.5	6	1.5	40	80	1.45
SEM846020046SE	R1.0	2.0	6	2	4	50	1.95
SEM846020066SE	R1.0	2.0	6	2	6	50	1.95
SEM846020086SE	R1.0	2.0	6	2	8	50	1.95
SEM846020106SE	R1.0	2.0	6	2	10	50	1.95
SEM846020126SE	R1.0	2.0	6	2	12	50	1.95
SEM846020146SE	R1.0	2.0	6	2	14	50	1.95
SEM846020166SE	R1.0	2.0	6	2	16	50	1.95
SEM846020186SE	R1.0	2.0	6	2	18	50	1.95
SEM846020206SE	R1.0	2.0	6	2	20	50	1.95
SEM846020226SE	R1.0	2.0	6	2	22	60	1.95
SEM846020266SE	R1.0	2.0	6	2	26	60	1.95
SEM846020306SE	R1.0	2.0	6	2	30	70	1.95
SEM846020356SE	R1.0	2.0	6	2	35	70	1.95
SEM846020406SE	R1.0	2.0	6	2	40	80	1.95
SEM846020456SE	R1.0	2.0	6	2	45	90	1.95
SEM846020506SE	R1.0	2.0	6	2	50	100	1.95

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

◎ : 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																		○		◎	○

4G MILL END MILLS

PLAIN SHANK **SEMD99** SERIES

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

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





CARBIDE | 2 | 30° | R ±0.010 | R ±0.015 | PLAIN | Y Coating | p.C202-C203

Ø0.2~Ø6 Ø7~Ø20

Unit : mm

EDP No.	Corner Radius	Mill Diameter	Shank Diameter	Length of Cut	Overall Length	Remark
	R	D1	D2	L1	L2	
SEMD99002002E	R0.02	0.2	4	0.4	40	-
SEMD99002005E	R0.05	0.2	4	0.4	40	-
SEMD99003002E	R0.02	0.3	4	0.6	40	-
SEMD99003005E	R0.05	0.3	4	0.6	40	-
SEMD99004005E	R0.05	0.4	4	0.8	40	-
SEMD9900401E	R0.1	0.4	4	0.8	40	-
SEMD99005005E	R0.05	0.5	4	1	40	-
SEMD9900501E	R0.1	0.5	4	1	40	-
SEMD99006005E	R0.05	0.6	4	1.2	40	-
SEMD9900601E	R0.1	0.6	4	1.2	40	-
SEMD9900602E	R0.2	0.6	4	1.2	40	-
SEMD99007005E	R0.05	0.7	4	1.4	40	-
SEMD9900701E	R0.1	0.7	4	1.4	40	-
SEMD9900702E	R0.2	0.7	4	1.4	40	-
SEMD99008005E	R0.05	0.8	4	1.6	40	-
SEMD9900801E	R0.1	0.8	4	1.6	40	-
SEMD9900802E	R0.2	0.8	4	1.6	40	-
SEMD99009005E	R0.05	0.9	4	1.8	40	-
SEMD9900901E	R0.1	0.9	4	1.8	40	-
SEMD990100054SE	R0.05	1.0	4	2.5	50	4mm Shank
SEMD99010014SE	R0.1	1.0	4	2.5	50	4mm Shank
SEMD99010024SE	R0.2	1.0	4	2.5	50	4mm Shank
SEMD99010034SE	R0.3	1.0	4	2.5	50	4mm Shank
SEMD99010005E	R0.05	1.0	6	2.5	50	-

▶ NEXT PAGE

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					
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																		○		◎	○

4G MILL END MILLS

PLAIN SHANK **SEMD99** SERIES

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

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





CARBIDE | 2 | 30° | R ±0.010 | R ±0.015 | PLAIN | Y Coating | p.C202-C203

Ø0.2~Ø6 Ø7~Ø20

Unit : mm

EDP No.	Corner Radius	Mill Diameter	Shank Diameter	Length of Cut	Overall Length	Remark
	R	D_1	D_2	L_1	L_2	
SEMD9901001E	R0.1	**1.0**	6	2.5	50	-
SEMD9901002E	R0.2	**1.0**	6	2.5	50	-
SEMD9901003E	R0.3	**1.0**	6	2.5	50	-
SEMD990120054SE	R0.05	**1.2**	4	3	50	4mm Shank
SEMD99012014SE	R0.1	**1.2**	4	3	50	4mm Shank
SEMD99012024SE	R0.2	**1.2**	4	3	50	4mm Shank
SEMD99012034SE	R0.3	**1.2**	4	3	50	4mm Shank
SEMD99012005E	R0.05	**1.2**	6	3	50	-
SEMD9901201E	R0.1	**1.2**	6	3	50	-
SEMD9901202E	R0.2	**1.2**	6	3	50	-
SEMD9901203E	R0.3	**1.2**	6	3	50	-
SEMD990150054SE	R0.05	**1.5**	4	4	50	-
SEMD99015014SE	R0.1	**1.5**	4	4	50	4mm Shank
SEMD99015024SE	R0.2	**1.5**	4	4	50	4mm Shank
SEMD99015034SE	R0.3	**1.5**	4	4	50	4mm Shank
SEMD99015054SE	R0.5	**1.5**	4	4	50	4mm Shank
SEMD99015005E	R0.05	**1.5**	6	4	50	-
SEMD9901501E	R0.1	**1.5**	6	4	50	-
SEMD9901502E	R0.2	**1.5**	6	4	50	-
SEMD9901503E	R0.3	**1.5**	6	4	50	-
SEMD9901505E	R0.5	**1.5**	6	4	50	-
SEMD99020014SE	R0.1	**2.0**	4	6	50	4mm Shank
SEMD99020024SE	R0.2	**2.0**	4	6	50	4mm Shank
SEMD99020034SE	R0.3	**2.0**	4	6	50	4mm Shank

▶ NEXT PAGE

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																			
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																		○		◎	○

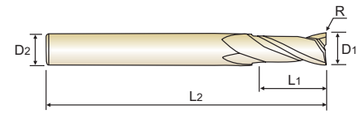
4G MILL END MILLS

PLAIN SHANK SEMD99 SERIES

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

▶ New coating and tool geometry applied resulting outstanding cutting abilities and wear resistance.
▶ Excellent for cutting prehardened steels, carbon steels, alloy steels of molds and dies, up to HRc55 and machine parts.
▶ Available in short, regular and long shank end mills.
▶ Available with various corner radius end mills, from 0.02mm to 5.0mm corner radius.





CARBIDE | 2 | 30° | R ±0.010 | R ±0.015 | PLAIN | Y Coating | p.C202-C203

Ø0.2~Ø6 Ø7~Ø20

Unit : mm

EDP No.	Corner Radius	Mill Diameter	Shank Diameter	Length of Cut	Overall Length	Remark
	R	D_1	D_2	L_1	L_2	
SEMD99020054SE	R0.5	**2.0**	4	6	50	4mm Shank
SEMD9902001E	R0.1	**2.0**	6	6	50	-
SEMD9902002E	R0.2	**2.0**	6	6	50	-
SEMD9902003E	R0.3	**2.0**	6	6	50	-
SEMD9902005E	R0.5	**2.0**	6	6	50	-
SEMD99025014SE	R0.1	**2.5**	4	7	60	4mm Shank
SEMD99025024SE	R0.2	**2.5**	4	7	60	4mm Shank
SEMD99025034SE	R0.3	**2.5**	4	7	60	4mm Shank
SEMD99025054SE	R0.5	**2.5**	4	7	60	4mm Shank
SEMD9902501E	R0.1	**2.5**	6	7	60	-
SEMD9902502E	R0.2	**2.5**	6	7	60	-
SEMD9902503E	R0.3	**2.5**	6	7	60	-
SEMD9902505E	R0.5	**2.5**	6	7	60	-
SEMD9903001E	R0.1	**3.0**	6	8	60	-
SEMD9903002E	R0.2	**3.0**	6	8	60	-
SEMD9903003E	R0.3	**3.0**	6	8	60	-
SEMD9903005E	R0.5	**3.0**	6	8	60	-
SEMD9903010E	R1.0	**3.0**	6	8	60	-
SEMD9903501E	R0.1	**3.5**	6	10	70	-
SEMD9903502E	R0.2	**3.5**	6	10	70	-
SEMD9903503E	R0.3	**3.5**	6	10	70	-
SEMD9903505E	R0.5	**3.5**	6	10	70	-
SEMD99040014SE	R0.1	**4.0**	4	10	70	4mm Shank
SEMD99040024SE	R0.2	**4.0**	4	10	70	4mm Shank

▶ NEXT PAGE

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																			
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																		○		◎	○

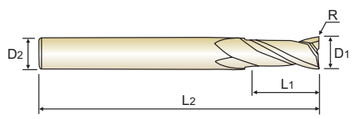
4G MILL END MILLS

PLAIN SHANK **SEMD99** SERIES

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

- ▶ New coating and tool geometry applied resulting outstanding cutting abilities and wear resistance.
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- ▶ Available in short, regular and long shank end mills.
- ▶ Available with various corner radius end mills, from 0.02mm to 5.0mm corner radius.





CARBIDE | 2 | 30° | R ±0.010 | R ±0.015 | PLAIN | Y Coating | p.C202-C203

Ø0.2~Ø6 Ø7~Ø20

Unit : mm

EDP No.	Corner Radius	Mill Diameter	Shank Diameter	Length of Cut	Overall Length	Remark
	R	D1	D2	L1	L2	
SEMD99040034SE	R0.3	4.0	4	10	70	4mm Shank
SEMD99040054SE	R0.5	4.0	4	10	70	4mm Shank
SEMD99040104SE	R1.0	4.0	4	10	70	4mm Shank
SEMD990400011004SE	R0.1	4.0	4	10	100	4mm Shank
SEMD990400021004SE	R0.2	4.0	4	10	100	4mm Shank
SEMD990400031004SE	R0.3	4.0	4	10	100	4mm Shank
SEMD990400051004SE	R0.5	4.0	4	10	100	4mm Shank
SEMD990400101004SE	R1.0	4.0	4	10	100	4mm Shank
SEMD9904001E	R0.1	4.0	6	10	70	Regular
SEMD9904002E	R0.2	4.0	6	10	70	Regular
SEMD9904003E	R0.3	4.0	6	10	70	Regular
SEMD9904005E	R0.5	4.0	6	10	70	Regular
SEMD9904010E	R1.0	4.0	6	10	70	Regular
SEMD9904501E	R0.1	4.5	6	11	80	-
SEMD9904502E	R0.2	4.5	6	11	80	-
SEMD9904503E	R0.3	4.5	6	11	80	-
SEMD9904505E	R0.5	4.5	6	11	80	-
SEMD9905001E	R0.1	5.0	6	13	90	-
SEMD9905002E	R0.2	5.0	6	13	90	-
SEMD9905003E	R0.3	5.0	6	13	90	-
SEMD9905005E	R0.5	5.0	6	13	90	-
SEMD9905010E	R1.0	5.0	6	13	90	-
SEMD9905501E	R0.1	5.5	6	13	90	-
SEMD9905502E	R0.2	5.5	6	13	90	-

▶ NEXT PAGE

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																			
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																		○		◎	○

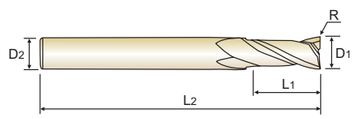
4G MILL END MILLS

PLAIN SHANK SEMD99 SERIES

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CARBIDE | 2 | 30° | R ±0.010 | R ±0.015 | PLAIN | Y Coating | p.C202-C203

Ø0.2~Ø6 Ø7~Ø20

Unit : mm

EDP No.	Corner Radius	Mill Diameter	Shank Diameter	Length of Cut	Overall Length	Remark
	R	D1	D2	L1	L2	
SEMD9905503E	R0.3	5.5	6	13	90	-
SEMD9905505E	R0.5	5.5	6	13	90	-
SEMD9905510E	R1.0	5.5	6	13	90	-
SEMD9906002060E	R0.2	6.0	6	15	60	Short
SEMD9906003060E	R0.3	6.0	6	15	60	Short
SEMD9906005060E	R0.5	6.0	6	15	60	Short
SEMD9906010060E	R1.0	6.0	6	15	60	Short
SEMD9906001E	R0.1	6.0	6	15	90	Regular
SEMD9906002E	R0.2	6.0	6	15	90	Regular
SEMD9906003E	R0.3	6.0	6	15	90	Regular
SEMD9906005E	R0.5	6.0	6	15	90	Regular
SEMD9906010E	R1.0	6.0	6	15	90	Regular
SEMD9906015E	R1.5	6.0	6	15	90	Regular
SEMD9906020E	R2.0	6.0	6	15	90	Regular
SEMD9906005110E	R0.5	6.0	6	15	110	Long
SEMD9906010110E	R1.0	6.0	6	15	110	Long
SEMD9906005130E	R0.5	6.0	6	15	130	Long
SEMD9906010130E	R1.0	6.0	6	15	130	Long
SEMD9907001E	R0.1	7.0	8	16	90	-
SEMD9907002E	R0.2	7.0	8	16	90	-
SEMD9907003E	R0.3	7.0	8	16	90	-
SEMD9907005E	R0.5	7.0	8	16	90	-
SEMD9907010E	R1.0	7.0	8	16	90	-
SEMD9907020E	R2.0	7.0	8	16	90	-

▶ NEXT PAGE

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																			
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																		○		◎	○

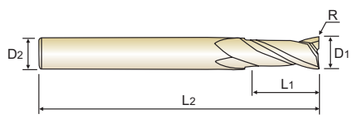
4G MILL END MILLS

PLAIN SHANK **SEMD99** SERIES

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CARBIDE | 2 | 30° | R ±0.010 | R ±0.015 | PLAIN | Y Coating | p.C202-C203

Ø0.2~Ø6 Ø7~Ø20

Unit : mm

EDP No.	Corner Radius	Mill Diameter	Shank Diameter	Length of Cut	Overall Length	Remark
	R	D1	D2	L1	L2	
SEMD9908003070E	R0.3	**8.0**	8	20	70	Short
SEMD9908005070E	R0.5	**8.0**	8	20	70	Short
SEMD9908010070E	R1.0	**8.0**	8	20	70	Short
SEMD9908001E	R0.1	**8.0**	8	20	100	Regular
SEMD9908002E	R0.2	**8.0**	8	20	100	Regular
SEMD9908003E	R0.3	**8.0**	8	20	100	Regular
SEMD9908005E	R0.5	**8.0**	8	20	100	Regular
SEMD9908010E	R1.0	**8.0**	8	20	100	Regular
SEMD9908015E	R1.5	**8.0**	8	20	100	Regular
SEMD9908020E	R2.0	**8.0**	8	20	100	Regular
SEMD9908025E	R2.5	**8.0**	8	20	100	Regular
SEMD9908030E	R3.0	**8.0**	8	20	100	Regular
SEMD9908005120E	R0.5	**8.0**	8	20	120	Long
SEMD9908010120E	R1.0	**8.0**	8	20	120	Long
SEMD9908015150E	R0.5	**8.0**	8	20	150	Long
SEMD9908010150E	R1.0	**8.0**	8	20	150	Long
SEMD9910003075E	R0.3	**10.0**	10	25	75	Short
SEMD9910005075E	R0.5	**10.0**	10	25	75	Short
SEMD9910010075E	R1.0	**10.0**	10	25	75	Short
SEMD9910001E	R0.1	**10.0**	10	25	100	Regular
SEMD9910002E	R0.2	**10.0**	10	25	100	Regular
SEMD9910003E	R0.3	**10.0**	10	25	100	Regular
SEMD9910005E	R0.5	**10.0**	10	25	100	Regular
SEMD9910010E	R1.0	**10.0**	10	25	100	Regular

▶ NEXT PAGE

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																			
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																		○		◎	○

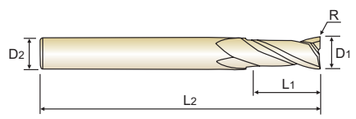
4G MILL END MILLS

PLAIN SHANK SEMD99 SERIES

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CARBIDE | 2 | 30° | R ±0.010 | R ±0.015 | PLAIN | Y Coating | p.C202-C203

Ø0.2~Ø6 Ø7~Ø20

Unit : mm

EDP No.	Corner Radius	Mill Diameter	Shank Diameter	Length of Cut	Overall Length	Remark
	R	D1	D2	L1	L2	
SEMD9910015E	R1.5	**10.0**	10	25	100	Regular
SEMD9910020E	R2.0	**10.0**	10	25	100	Regular
SEMD9910025E	R2.5	**10.0**	10	25	100	Regular
SEMD9910030E	R3.0	**10.0**	10	25	100	Regular
SEMD9910040E	R4.0	**10.0**	10	25	100	Regular
SEMD9910005130E	R0.5	**10.0**	10	25	130	Long
SEMD9910010130E	R1.0	**10.0**	10	25	130	Long
SEMD9910005150E	R0.5	**10.0**	10	25	150	Long
SEMD9910010150E	R1.0	**10.0**	10	25	150	Long
SEMD9911002E	R0.2	**11.0**	12	25	110	-
SEMD9911003E	R0.3	**11.0**	12	25	110	-
SEMD9911005E	R0.5	**11.0**	12	25	110	-
SEMD9911010E	R1.0	**11.0**	12	25	110	-
SEMD9911020E	R2.0	**11.0**	12	25	110	-
SEMD9912003080E	R0.3	**12.0**	12	30	80	Short
SEMD9912005080E	R0.5	**12.0**	12	30	80	Short
SEMD9912010080E	R1.0	**12.0**	12	30	80	Short
SEMD9912001E	R0.1	**12.0**	12	30	110	Regular
SEMD9912002E	R0.2	**12.0**	12	30	110	Regular
SEMD9912003E	R0.3	**12.0**	12	30	110	Regular
SEMD9912005E	R0.5	**12.0**	12	30	110	Regular
SEMD9912010E	R1.0	**12.0**	12	30	110	Regular
SEMD9912015E	R1.5	**12.0**	12	30	110	Regular
SEMD9912020E	R2.0	**12.0**	12	30	110	Regular

▶ NEXT PAGE

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																			
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																		○		◎	○

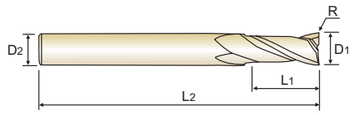
4G MILL END MILLS

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CARBIDE | 2 | 30° | R ±0.010 | R ±0.015 | PLAIN | Y Coating | p.C202-C203

Ø0.2~Ø6 Ø7~Ø20

Unit : mm

EDP No.	Corner Radius	Mill Diameter	Shank Diameter	Length of Cut	Overall Length	Remark
	R	D1	D2	L1	L2	
SEMD9912025E	R2.5	**12.0**	12	30	110	Regular
SEMD9912030E	R3.0	**12.0**	12	30	110	Regular
SEMD9912040E	R4.0	**12.0**	12	30	110	Regular
SEMD9912050E	R5.0	**12.0**	12	30	110	Regular
SEMD9912005130E	R0.5	**12.0**	12	30	130	Long
SEMD9912010130E	R1.0	**12.0**	12	30	130	Long
SEMD9912005150E	R0.5	**12.0**	12	30	150	Long
SEMD9912010150E	R1.0	**12.0**	12	30	150	Long
SEMD9914005E	R0.5	**14.0**	16	35	150	-
SEMD9914010E	R1.0	**14.0**	16	35	150	-
SEMD9914020E	R2.0	**14.0**	16	35	150	-
SEMD9916005E	R0.5	**16.0**	16	32	150	-
SEMD9916010E	R1.0	**16.0**	16	32	150	-
SEMD9916015E	R1.5	**16.0**	16	32	150	-
SEMD9916020E	R2.0	**16.0**	16	32	150	-
SEMD9920005E	R0.5	**20.0**	20	38	150	-
SEMD9920010E	R1.0	**20.0**	20	38	150	-
SEMD9920015E	R1.5	**20.0**	20	38	150	-
SEMD9920020E	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						
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																		○		◎	○

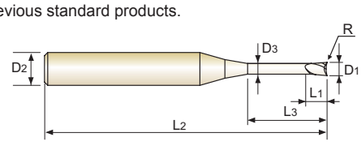
4G MILL END MILLS

PLAIN SHANK **SEME61** SERIES

CARBIDE, 2 FLUTE CORNER RADIUS with EXTENDED 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.
- ▶ 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. 2.0mm corner radius.
- ▶ Available more various effective length and overall length end mills than previous standard products.





CARBIDE | 2 | 30° | R ±0.010 | R ±0.015 | PLAIN | Y Coating | p.C204-C211

Ø0.2~Ø6 Ø7~Ø20

Unit : mm

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	
SEME61002002005E	R0.02	**0.2**	4	0.3	0.5	40	0.17	-
SEME6100200201E	R0.02	**0.2**	4	0.3	1	40	0.17	-
SEME61002002015E	R0.02	**0.2**	4	0.3	1.5	40	0.17	-
SEME6100200202E	R0.02	**0.2**	4	0.3	2	40	0.17	-
SEME61002005005E	R0.05	**0.2**	4	0.3	0.5	40	0.17	-
SEME6100200501E	R0.05	**0.2**	4	0.3	1	40	0.17	-
SEME61002005015E	R0.05	**0.2**	4	0.3	1.5	40	0.17	-
SEME6100200502E	R0.05	**0.2**	4	0.3	2	40	0.17	-
SEME61003005015SE	R0.05	**0.3**	4	0.25	1.5	40	0.27	-
SEME6100300201E	R0.02	**0.3**	4	0.5	1	40	0.27	-
SEME6100300202E	R0.02	**0.3**	4	0.5	2	40	0.27	-
SEME6100300203E	R0.02	**0.3**	4	0.5	3	40	0.27	-
SEME6100300501E	R0.05	**0.3**	4	0.5	1	40	0.27	-
SEME6100300502E	R0.05	**0.3**	4	0.5	2	40	0.27	-
SEME6100300503E	R0.05	**0.3**	4	0.5	3	40	0.27	-
SEME6100300502S6SE	R0.05	**0.3**	6	0.25	2	40	0.27	
SEME6100400501E	R0.05	**0.4**	4	0.6	1	40	0.37	-
SEME61004005015E	R0.05	**0.4**	4	0.6	1.5	40	0.37	-
SEME6100400502E	R0.05	**0.4**	4	0.6	2	40	0.37	-
SEME61004005025E	R0.05	**0.4**	4	0.6	2.5	40	0.37	-
SEME6100400503E	R0.05	**0.4**	4	0.6	3	40	0.37	-
SEME6100400504E	R0.05	**0.4**	4	0.6	4	40	0.37	-
SEME610040101E	R0.1	**0.4**	4	0.6	1	40	0.37	-
SEME6100401015E	R0.1	**0.4**	4	0.6	1.5	40	0.37	-

▶ NEXT PAGE

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						
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																		○		◎	○

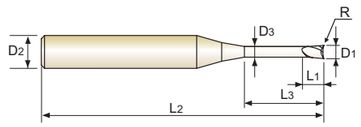
4G MILL END MILLS

PLAIN SHANK **SEME61** SERIES

CARBIDE, 2 FLUTE CORNER RADIUS with EXTENDED 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.
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- ▶ Available various corner radius end mills, from min. 0.02mm corner radius to max. 2.0mm corner radius.
- ▶ Available more various effective length and overall length end mills than previous standard products.





CARBIDE | 2 | 30° | R ±0.010 | R ±0.015 | PLAIN | Y Coating | p.C204-C211

Ø0.2~Ø6 Ø7~Ø20

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	Remark
SEME610040102E	R0.1	**0.4**	4	0.6	2	40	0.37	-
SEME6100401025E	R0.1	**0.4**	4	0.6	2.5	40	0.37	-
SEME610040103E	R0.1	**0.4**	4	0.6	3	40	0.37	-
SEME610040104E	R0.1	**0.4**	4	0.6	4	40	0.37	-
SEME6100500501E	R0.05	**0.5**	4	0.7	1	45	0.45	-
SEME61005005015E	R0.05	**0.5**	4	0.7	1.5	45	0.45	-
SEME6100500502E	R0.05	**0.5**	4	0.7	2	45	0.45	-
SEME61005005025E	R0.05	**0.5**	4	0.7	2.5	45	0.45	-
SEME6100500503E	R0.05	**0.5**	4	0.7	3	45	0.45	-
SEME6100500504E	R0.05	**0.5**	4	0.7	4	45	0.45	-
SEME6100500505E	R0.05	**0.5**	4	0.7	5	45	0.45	-
SEME6100500506E	R0.05	**0.5**	4	0.7	6	45	0.45	-
SEME6100500504S6SE	R0.05	**0.5**	6	0.4	4	45	0.45	-
SEME610050101E	R0.1	**0.5**	4	0.7	1	45	0.45	-
SEME6100501015E	R0.1	**0.5**	4	0.7	1.5	45	0.45	-
SEME610050102E	R0.1	**0.5**	4	0.7	2	45	0.45	-
SEME6100501025E	R0.1	**0.5**	4	0.7	2.5	45	0.45	-
SEME610050103E	R0.1	**0.5**	4	0.7	3	45	0.45	-
SEME610050104E	R0.1	**0.5**	4	0.7	4	45	0.45	-
SEME610050105E	R0.1	**0.5**	4	0.7	5	45	0.45	-
SEME610050106E	R0.1	**0.5**	4	0.7	6	45	0.45	-
SEME610050102S6SE	R0.1	**0.5**	6	0.4	2	45	0.45	-
SEME610050104S6SE	R0.1	**0.5**	6	0.4	4	45	0.45	-
SEME6100600502E	R0.05	**0.6**	4	0.9	2	45	0.55	-

▶ NEXT PAGE

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																			
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																		○		◎	○

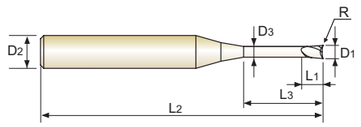
4G MILL END MILLS

PLAIN SHANK SEME61 SERIES

CARBIDE, 2 FLUTE CORNER RADIUS with EXTENDED 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.
▶ 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. 2.0mm corner radius.
▶ Available more various effective length and overall length end mills than previous standard products.





CARBIDE | 2 | 30° | R ±0.010 | R ±0.015 | PLAIN | Y Coating | p.C204-C211

Ø0.2~Ø6 Ø7~Ø20

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	Remark
SEME6100600503E	R0.05	**0.6**	4	0.9	3	45	0.55	-
SEME6100600504E	R0.05	**0.6**	4	0.9	4	45	0.55	-
SEME6100600506E	R0.05	**0.6**	4	0.9	6	45	0.55	-
SEME6100600508E	R0.05	**0.6**	4	0.9	8	45	0.55	-
SEME6100600510E	R0.05	**0.6**	4	0.9	10	45	0.55	-
SEME610060102E	R0.1	**0.6**	4	0.9	2	45	0.55	-
SEME610060103E	R0.1	**0.6**	4	0.9	3	45	0.55	-
SEME610060104E	R0.1	**0.6**	4	0.9	4	45	0.55	-
SEME610060106E	R0.1	**0.6**	4	0.9	6	45	0.55	-
SEME610060108E	R0.1	**0.6**	4	0.9	8	45	0.55	-
SEME610060110E	R0.1	**0.6**	4	0.9	10	45	0.55	-
SEME610060202E	R0.2	**0.6**	4	0.9	2	45	0.55	-
SEME610060203E	R0.2	**0.6**	4	0.9	3	45	0.55	-
SEME610060204E	R0.2	**0.6**	4	0.9	4	45	0.55	-
SEME610060206E	R0.2	**0.6**	4	0.9	6	45	0.55	-
SEME610060208E	R0.2	**0.6**	4	0.9	8	45	0.55	-
SEME610060210E	R0.2	**0.6**	4	0.9	10	45	0.55	-
SEME6100700502E	R0.05	**0.7**	4	1.2	2	45	0.65	-
SEME6100700504E	R0.05	**0.7**	4	1.2	4	45	0.65	-
SEME6100700506E	R0.05	**0.7**	4	1.2	6	45	0.65	-
SEME6100700508E	R0.05	**0.7**	4	1.2	8	45	0.65	-
SEME6100700510E	R0.05	**0.7**	4	1.2	10	45	0.65	-
SEME610070102E	R0.1	**0.7**	4	1.2	2	45	0.65	-
SEME610070104E	R0.1	**0.7**	4	1.2	4	45	0.65	-

▶ NEXT PAGE

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																			
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																		○		◎	○

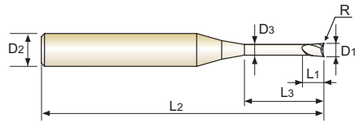
4G MILL END MILLS

PLAIN SHANK **SEME61** SERIES

CARBIDE, 2 FLUTE CORNER RADIUS with EXTENDED NECK

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CARBIDE | 2 | 30° | R ±0.010 | R ±0.015 | PLAIN | Y Coating | p.C204-C211

Ø0.2~Ø6 Ø7~Ø20

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	Remark
SEME610070106E	R0.1	**0.7**	4	1.2	6	45	0.65	-
SEME610070108E	R0.1	**0.7**	4	1.2	8	45	0.65	-
SEME610070110E	R0.1	**0.7**	4	1.2	10	45	0.65	-
SEME610070202E	R0.2	**0.7**	4	1.2	2	45	0.65	-
SEME610070204E	R0.2	**0.7**	4	1.2	4	45	0.65	-
SEME610070206E	R0.2	**0.7**	4	1.2	6	45	0.65	-
SEME610070208E	R0.2	**0.7**	4	1.2	8	45	0.65	-
SEME610070210E	R0.2	**0.7**	4	1.2	10	45	0.65	-
SEME6100800502E	R0.05	**0.8**	4	1.2	2	45	0.75	-
SEME6100800503E	R0.05	**0.8**	4	1.2	3	45	0.75	-
SEME6100800504E	R0.05	**0.8**	4	1.2	4	45	0.75	-
SEME6100800506E	R0.05	**0.8**	4	1.2	6	45	0.75	-
SEME6100800508E	R0.05	**0.8**	4	1.2	8	45	0.75	-
SEME6100800510E	R0.05	**0.8**	4	1.2	10	45	0.75	-
SEME610080102E	R0.1	**0.8**	4	1.2	2	45	0.75	-
SEME610080103E	R0.1	**0.8**	4	1.2	3	45	0.75	-
SEME610080104E	R0.1	**0.8**	4	1.2	4	45	0.75	-
SEME610080106E	R0.1	**0.8**	4	1.2	6	45	0.75	-
SEME610080108E	R0.1	**0.8**	4	1.2	8	45	0.75	-
SEME610080110E	R0.1	**0.8**	4	1.2	10	45	0.75	-
SEME610080202E	R0.2	**0.8**	4	1.2	2	45	0.75	-
SEME610080203E	R0.2	**0.8**	4	1.2	3	45	0.75	-
SEME610080204E	R0.2	**0.8**	4	1.2	4	45	0.75	-
SEME610080206E	R0.2	**0.8**	4	1.2	6	45	0.75	-

▶ NEXT PAGE

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																			
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																		○		◎	○

CARBIDE
HSS
i-Xmill END MILLS
X-1EH END MILLS
4G MILL END MILLS
X-POWER PRO END MILLS
TitaNox-POWER END MILLS
V7 PLUS END MILLS
ALU-CUT END MILLS
K-2 END MILLS
GENERAL CARBIDE END MILLS

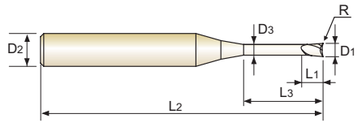
4G MILL END MILLS

PLAIN SHANK **SEME61** SERIES

CARBIDE, 2 FLUTE CORNER RADIUS with EXTENDED 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.
- ▶ 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. 2.0mm corner radius.
- ▶ Available more various effective length and overall length end mills than previous standard products.





CARBIDE | 2 | 30° | R ±0.010 | R ±0.015 | PLAIN | Y Coating | p.C204-C211

Ø0.2~Ø6 Ø7~Ø20

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	Remark
SEME610080208E	R0.2	**0.8**	4	1.2	8	45	0.75	-
SEME610080210E	R0.2	**0.8**	4	1.2	10	45	0.75	-
SEME6101000503E	R0.05	**1.0**	4	1.5	3	50	0.95	-
SEME6101000504E	R0.05	**1.0**	4	1.5	4	50	0.95	-
SEME6101000505E	R0.05	**1.0**	4	1.5	5	50	0.95	
SEME6101000506E	R0.05	**1.0**	4	1.5	6	50	0.95	-
SEME6101000508E	R0.05	**1.0**	4	1.5	8	50	0.95	-
SEME6101000510E	R0.05	**1.0**	4	1.5	10	50	0.95	-
SEME6101000512E	R0.05	**1.0**	4	1.5	12	50	0.95	-
SEME6101000514E	R0.05	**1.0**	4	1.5	14	50	0.95	-
SEME6101000516E	R0.05	**1.0**	4	1.5	16	50	0.95	-
SEME6101000520E	R0.05	**1.0**	4	1.5	20	50	0.95	-
SEME610100103E	R0.1	**1.0**	4	1.5	3	50	0.95	-
SEME610100104E	R0.1	**1.0**	4	1.5	4	50	0.95	-
SEME610100105E	R0.1	**1.0**	4	1.5	5	50	0.95	-
SEME610100106E	R0.1	**1.0**	4	1.5	6	50	0.95	-
SEME610100108E	R0.1	**1.0**	4	1.5	8	50	0.95	-
SEME610100110E	R0.1	**1.0**	4	1.5	10	50	0.95	-
SEME610100112E	R0.1	**1.0**	4	1.5	12	50	0.95	-
SEME610100114E	R0.1	**1.0**	4	1.5	14	50	0.95	-
SEME610100116E	R0.1	**1.0**	4	1.5	16	50	0.95	-
SEME610100120E	R0.1	**1.0**	4	1.5	20	50	0.95	-
SEME610100203E	R0.2	**1.0**	4	1.5	3	50	0.95	-
SEME610100204E	R0.2	**1.0**	4	1.5	4	50	0.95	-

▶ NEXT PAGE

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																			
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																		○		◎	○

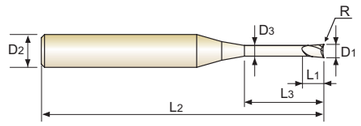
4G MILL END MILLS

PLAIN SHANK **SEME61** SERIES

CARBIDE, 2 FLUTE CORNER RADIUS with EXTENDED 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.
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- Available more various effective length and overall length end mills than previous standard products.





CARBIDE | 2 | 30° | R ±0.010 | R ±0.015 | PLAIN | Y Coating | p.C204-C211

Ø0.2~Ø6 Ø7~Ø20

Unit : mm

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	
SEME610100205E	R0.2	1.0	4	1.5	5	50	0.95	
SEME610100206E	R0.2	1.0	4	1.5	6	50	0.95	-
SEME610100208E	R0.2	1.0	4	1.5	8	50	0.95	-
SEME610100210E	R0.2	1.0	4	1.5	10	50	0.95	-
SEME610100212E	R0.2	1.0	4	1.5	12	50	0.95	-
SEME610100214E	R0.2	1.0	4	1.5	14	50	0.95	-
SEME610100216E	R0.2	1.0	4	1.5	16	50	0.95	-
SEME610100220E	R0.2	1.0	4	1.5	20	50	0.95	-
SEME610100303E	R0.3	1.0	4	1.5	3	50	0.95	-
SEME610100304E	R0.3	1.0	4	1.5	4	50	0.95	-
SEME610100306E	R0.3	1.0	4	1.5	6	50	0.95	-
SEME610100308E	R0.3	1.0	4	1.5	8	50	0.95	-
SEME610100310E	R0.3	1.0	4	1.5	10	50	0.95	-
SEME610100312E	R0.3	1.0	4	1.5	12	50	0.95	-
SEME610100314E	R0.3	1.0	4	1.5	14	50	0.95	-
SEME610100316E	R0.3	1.0	4	1.5	16	50	0.95	-
SEME610100320E	R0.3	1.0	4	1.5	20	50	0.95	-
SEME6101200503E	R0.05	1.2	4	1.8	3	50	1.15	-
SEME6101200504E	R0.05	1.2	4	1.8	4	50	1.15	-
SEME6101200506E	R0.05	1.2	4	1.8	6	50	1.15	-
SEME6101200508E	R0.05	1.2	4	1.8	8	50	1.15	-
SEME6101200510E	R0.05	1.2	4	1.8	10	50	1.15	-
SEME6101200512E	R0.05	1.2	4	1.8	12	50	1.15	-
SEME6101200516E	R0.05	1.2	4	1.8	16	50	1.15	-

▶ NEXT PAGE

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																			
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																		○		◎	○

CARBIDE
HSS
i-Xmill END MILLS
X-1EH END MILLS
4G MILL END MILLS
X-POWER PRO END MILLS
TitaNox-POWER END MILLS
V7 PLUS END MILLS
ALU-CUT END MILLS
K-2 END MILLS
GENERAL CARBIDE END MILLS

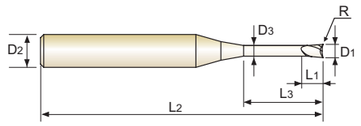
4G MILL END MILLS

PLAIN SHANK **SEME61** SERIES

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CARBIDE | 2 | 30° | R ±0.010 | R ±0.015 | PLAIN | Y Coating | p.C204-C211

Ø0.2~Ø6 Ø7~Ø20

Unit : mm

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	
SEME6101200520E	R0.05	1.2	4	1.8	20	50	1.15	-
SEME610120103E	R0.1	1.2	4	1.8	3	50	1.15	-
SEME610120104E	R0.1	1.2	4	1.8	4	50	1.15	-
SEME610120106E	R0.1	1.2	4	1.8	6	50	1.15	-
SEME610120108E	R0.1	1.2	4	1.8	8	50	1.15	-
SEME610120110E	R0.1	1.2	4	1.8	10	50	1.15	-
SEME610120112E	R0.1	1.2	4	1.8	12	50	1.15	-
SEME610120116E	R0.1	1.2	4	1.8	16	50	1.15	-
SEME610120120E	R0.1	1.2	4	1.8	20	50	1.15	-
SEME610120203E	R0.2	1.2	4	1.8	3	50	1.15	-
SEME610120204E	R0.2	1.2	4	1.8	4	50	1.15	-
SEME610120206E	R0.2	1.2	4	1.8	6	50	1.15	-
SEME610120208E	R0.2	1.2	4	1.8	8	50	1.15	-
SEME610120210E	R0.2	1.2	4	1.8	10	50	1.15	-
SEME610120212E	R0.2	1.2	4	1.8	12	50	1.15	-
SEME610120216E	R0.2	1.2	4	1.8	16	50	1.15	-
SEME610120220E	R0.2	1.2	4	1.8	20	50	1.15	-
SEME610120303E	R0.3	1.2	4	1.8	3	50	1.15	-
SEME610120304E	R0.3	1.2	4	1.8	4	50	1.15	-
SEME610120306E	R0.3	1.2	4	1.8	6	50	1.15	-
SEME610120308E	R0.3	1.2	4	1.8	8	50	1.15	-
SEME610120310E	R0.3	1.2	4	1.8	10	50	1.15	-
SEME610120312E	R0.3	1.2	4	1.8	12	50	1.15	-
SEME610120316E	R0.3	1.2	4	1.8	16	50	1.15	-

▶ NEXT PAGE

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																			
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																		○		◎	○

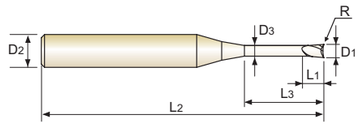
4G MILL END MILLS

PLAIN SHANK **SEME61** SERIES

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CARBIDE | 2 | 30° | R ±0.010 | R ±0.015 | PLAIN | Y Coating | p.C204-C211

Ø0.2~Ø6 Ø7~Ø20

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	Remark
SEME610120320E	R0.3	1.2	4	1.8	20	50	1.15	-
SEME6101500504E	R0.05	1.5	4	2.3	4	50	1.45	-
SEME6101500506E	R0.05	1.5	4	2.3	6	50	1.45	-
SEME6101500508E	R0.05	1.5	4	2.3	8	50	1.45	-
SEME6101500510E	R0.05	1.5	4	2.3	10	50	1.45	-
SEME6101500512E	R0.05	1.5	4	2.3	12	50	1.45	-
SEME6101500514E	R0.05	1.5	4	2.3	14	50	1.45	-
SEME6101500516E	R0.05	1.5	4	2.3	16	50	1.45	-
SEME6101500520E	R0.05	1.5	4	2.3	20	50	1.45	-
SEME6101500522E	R0.05	1.5	4	2.3	22	60	1.45	-
SEME6101500526E	R0.05	1.5	4	2.3	26	60	1.45	-
SEME610150104E	R0.1	1.5	4	2.3	4	50	1.45	-
SEME610150106E	R0.1	1.5	4	2.3	6	50	1.45	-
SEME610150108E	R0.1	1.5	4	2.3	8	50	1.45	-
SEME610150110E	R0.1	1.5	4	2.3	10	50	1.45	-
SEME610150112E	R0.1	1.5	4	2.3	12	50	1.45	-
SEME610150114E	R0.1	1.5	4	2.3	14	50	1.45	-
SEME610150116E	R0.1	1.5	4	2.3	16	50	1.45	-
SEME610150120E	R0.1	1.5	4	2.3	20	50	1.45	-
SEME610150122E	R0.1	1.5	4	2.3	22	60	1.45	-
SEME610150126E	R0.1	1.5	4	2.3	26	60	1.45	-
SEME610150204E	R0.2	1.5	4	2.3	4	50	1.45	-
SEME610150206E	R0.2	1.5	4	2.3	6	50	1.45	-
SEME610150208E	R0.2	1.5	4	2.3	8	50	1.45	-

▶ NEXT PAGE

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																			
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																		○		◎	○

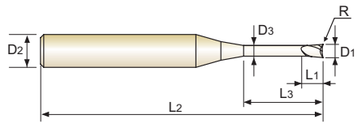
4G MILL END MILLS

PLAIN SHANK SEME61 SERIES

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- ▶ 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.
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- ▶ Available more various effective length and overall length end mills than previous standard products.





CARBIDE | 2 | 30° | R ±0.010 | R ±0.015 | PLAIN | Y Coating | p.C204-C211

Ø0.2~Ø6 Ø7~Ø20

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	Remark
SEME610150210E	R0.2	1.5	4	2.3	10	50	1.45	-
SEME610150212E	R0.2	1.5	4	2.3	12	50	1.45	-
SEME610150214E	R0.2	1.5	4	2.3	14	50	1.45	-
SEME610150216E	R0.2	1.5	4	2.3	16	50	1.45	-
SEME610150220E	R0.2	1.5	4	2.3	20	50	1.45	-
SEME610150222E	R0.2	1.5	4	2.3	22	60	1.45	-
SEME610150226E	R0.2	1.5	4	2.3	26	60	1.45	-
SEME610150304E	R0.3	1.5	4	2.3	4	50	1.45	-
SEME610150306E	R0.3	1.5	4	2.3	6	50	1.45	-
SEME610150308E	R0.3	1.5	4	2.3	8	50	1.45	-
SEME610150310E	R0.3	1.5	4	2.3	10	50	1.45	-
SEME610150312E	R0.3	1.5	4	2.3	12	50	1.45	-
SEME610150314E	R0.3	1.5	4	2.3	14	50	1.45	-
SEME610150316E	R0.3	1.5	4	2.3	16	50	1.45	-
SEME610150320E	R0.3	1.5	4	2.3	20	50	1.45	-
SEME610150322E	R0.3	1.5	4	2.3	22	60	1.45	-
SEME610150326E	R0.3	1.5	4	2.3	26	60	1.45	-
SEME610150504E	R0.5	1.5	4	2.3	4	50	1.45	-
SEME610150506E	R0.5	1.5	4	2.3	6	50	1.45	-
SEME610150508E	R0.5	1.5	4	2.3	8	50	1.45	-
SEME610150510E	R0.5	1.5	4	2.3	10	50	1.45	-
SEME610150512E	R0.5	1.5	4	2.3	12	50	1.45	-
SEME610150514E	R0.5	1.5	4	2.3	14	50	1.45	-
SEME610150516E	R0.5	1.5	4	2.3	16	50	1.45	-

▶ NEXT PAGE

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																			
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				
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																		○		◎	○

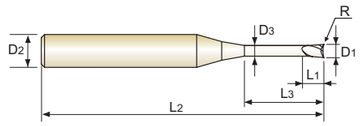
4G MILL END MILLS

PLAIN SHANK **SEME61** SERIES

CARBIDE, 2 FLUTE CORNER RADIUS with EXTENDED 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.
- ▶ 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. 2.0mm corner radius.
- ▶ Available more various effective length and overall length end mills than previous standard products.





CARBIDE | 2 | 30° | R ±0.010 | R ±0.015 | PLAIN | Y Coating | p.C204-C211

Ø0.2~Ø6 Ø7~Ø20

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	Remark
SEME610150520E	R0.5	1.5	4	2.3	20	50	1.45	-
SEME610150522E	R0.5	1.5	4	2.3	22	60	1.45	-
SEME610150526E	R0.5	1.5	4	2.3	26	60	1.45	-
SEME610200106E	R0.1	2.0	4	3	6	50	1.95	-
SEME610200108E	R0.1	2.0	4	3	8	50	1.95	-
SEME610200110E	R0.1	2.0	4	3	10	50	1.95	-
SEME610200112E	R0.1	2.0	4	3	12	50	1.95	-
SEME610200114E	R0.1	2.0	4	3	14	50	1.95	-
SEME610200116E	R0.1	2.0	4	3	16	50	1.95	-
SEME610200120E	R0.1	2.0	4	3	20	50	1.95	-
SEME610200122E	R0.1	2.0	4	3	22	60	1.95	-
SEME610200126E	R0.1	2.0	4	3	26	60	1.95	-
SEME610200130E	R0.1	2.0	4	3	30	70	1.95	-
SEME610200206E	R0.2	2.0	4	3	6	50	1.95	-
SEME610200208E	R0.2	2.0	4	3	8	50	1.95	-
SEME610200210E	R0.2	2.0	4	3	10	50	1.95	-
SEME610200212E	R0.2	2.0	4	3	12	50	1.95	-
SEME610200214E	R0.2	2.0	4	3	14	50	1.95	-
SEME610200216E	R0.2	2.0	4	3	16	50	1.95	-
SEME610200220E	R0.2	2.0	4	3	20	50	1.95	-
SEME610200222E	R0.2	2.0	4	3	22	60	1.95	-
SEME610200226E	R0.2	2.0	4	3	26	60	1.95	-
SEME610200230E	R0.2	2.0	4	3	30	70	1.95	-
SEME610200306E	R0.3	2.0	4	3	6	50	1.95	-

▶ NEXT PAGE

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																			
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																		○		◎	○

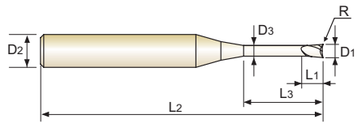
4G MILL END MILLS

PLAIN SHANK SEME61 SERIES

CARBIDE, 2 FLUTE CORNER RADIUS with EXTENDED NECK

- ▶ Due to new coating and new tool geometry, outstanding cutting ability and wear resistance.
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CARBIDE | 2 | 30° | R ±0.010 | R ±0.015 | PLAIN | Y Coating | p.C204-C211

Ø0.2~Ø6 Ø7~Ø20

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	Remark
SEME610200308E	R0.3	2.0	4	3	8	50	1.95	-
SEME610200310E	R0.3	2.0	4	3	10	50	1.95	-
SEME610200312E	R0.3	2.0	4	3	12	50	1.95	-
SEME610200314E	R0.3	2.0	4	3	14	50	1.95	-
SEME610200316E	R0.3	2.0	4	3	16	50	1.95	-
SEME610200320E	R0.3	2.0	4	3	20	50	1.95	-
SEME610200322E	R0.3	2.0	4	3	22	60	1.95	-
SEME610200326E	R0.3	2.0	4	3	26	60	1.95	-
SEME610200330E	R0.3	2.0	4	3	30	70	1.95	-
SEME610200506E	R0.5	2.0	4	3	6	50	1.95	-
SEME610200508E	R0.5	2.0	4	3	8	50	1.95	-
SEME610200510E	R0.5	2.0	4	3	10	50	1.95	-
SEME610200512E	R0.5	2.0	4	3	12	50	1.95	-
SEME610200514E	R0.5	2.0	4	3	14	50	1.95	-
SEME610200516E	R0.5	2.0	4	3	16	50	1.95	-
SEME610200520E	R0.5	2.0	4	3	20	50	1.95	-
SEME610200522E	R0.5	2.0	4	3	22	60	1.95	-
SEME610200526E	R0.5	2.0	4	3	26	60	1.95	-
SEME610200530E	R0.5	2.0	4	3	30	70	1.95	-
SE5E6102005086SE	R0.5	2.0	6	3	8	50	1.95	
SEME610250108E	R0.1	2.5	4	4	8	50	2.40	-
SEME610250110E	R0.1	2.5	4	4	10	50	2.40	-
SEME610250112E	R0.1	2.5	4	4	12	50	2.40	-
SEME610250114E	R0.1	2.5	4	4	14	50	2.40	-

▶ NEXT PAGE

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																			
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																		○		◎	○

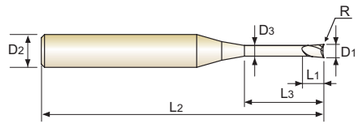
4G MILL END MILLS

PLAIN SHANK **SEME61** SERIES

CARBIDE, 2 FLUTE CORNER RADIUS with EXTENDED 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.
- 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. 2.0mm corner radius.
- Available more various effective length and overall length end mills than previous standard products.





CARBIDE | 2 | 30° | R ±0.010 | R ±0.015 | PLAIN | Y Coating | p.C204-C211

Ø0.2~Ø6 Ø7~Ø20

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	Remark
SEME610250116E	R0.1	2.5	4	4	16	50	2.40	-
SEME610250120E	R0.1	2.5	4	4	20	50	2.40	-
SEME610250126E	R0.1	2.5	4	4	26	60	2.40	-
SEME610250130E	R0.1	2.5	4	4	30	70	2.40	-
SEME610250208E	R0.2	2.5	4	4	8	50	2.40	-
SEME610250210E	R0.2	2.5	4	4	10	50	2.40	-
SEME610250212E	R0.2	2.5	4	4	12	50	2.40	-
SEME610250214E	R0.2	2.5	4	4	14	50	2.40	-
SEME610250216E	R0.2	2.5	4	4	16	50	2.40	-
SEME610250220E	R0.2	2.5	4	4	20	50	2.40	-
SEME610250226E	R0.2	2.5	4	4	26	60	2.40	-
SEME610250230E	R0.2	2.5	4	4	30	70	2.40	-
SEME610250308E	R0.3	2.5	4	4	8	50	2.40	-
SEME610250310E	R0.3	2.5	4	4	10	50	2.40	-
SEME610250312E	R0.3	2.5	4	4	12	50	2.40	-
SEME610250314E	R0.3	2.5	4	4	14	50	2.40	-
SEME610250316E	R0.3	2.5	4	4	16	50	2.40	-
SEME610250320E	R0.3	2.5	4	4	20	50	2.40	-
SEME610250326E	R0.3	2.5	4	4	26	60	2.40	-
SEME610250330E	R0.3	2.5	4	4	30	70	2.40	-
SEME610250508E	R0.5	2.5	4	4	8	50	2.40	-
SEME610250510E	R0.5	2.5	4	4	10	50	2.40	-
SEME610250512E	R0.5	2.5	4	4	12	50	2.40	-
SEME610250514E	R0.5	2.5	4	4	14	50	2.40	-

▶ NEXT PAGE

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																			
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																		○		◎	○

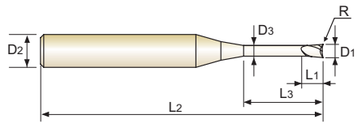
4G MILL END MILLS

PLAIN SHANK SEME61 SERIES

CARBIDE, 2 FLUTE CORNER RADIUS with EXTENDED NECK

- Due to new coating and new tool geometry, outstanding cutting ability and wear resistance.
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CARBIDE | 2 | 30° | R ±0.010 | R ±0.015 | PLAIN | Y Coating | p.C204-C211

Ø0.2~Ø6 Ø7~Ø20

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	Remark
SEME610250516E	R0.5	2.5	4	4	16	50	2.40	-
SEME610250520E	R0.5	2.5	4	4	20	50	2.40	-
SEME610250526E	R0.5	2.5	4	4	26	60	2.40	-
SEME610250530E	R0.5	2.5	4	4	30	70	2.40	-
SEME610300108E	R0.1	3.0	6	4.5	8	50	2.85	-
SEME610300110E	R0.1	3.0	6	4.5	10	50	2.85	-
SEME610300112E	R0.1	3.0	6	4.5	12	50	2.85	-
SEME610300114E	R0.1	3.0	6	4.5	14	60	2.85	-
SEME610300116E	R0.1	3.0	6	4.5	16	60	2.85	-
SEME610300120E	R0.1	3.0	6	4.5	20	60	2.85	-
SEME610300126E	R0.1	3.0	6	4.5	26	65	2.85	-
SEME610300130E	R0.1	3.0	6	4.5	30	70	2.85	-
SEME610300135E	R0.1	3.0	6	4.5	35	70	2.85	-
SEME610300140E	R0.1	3.0	6	4.5	40	80	2.85	-
SEME610300208E	R0.2	3.0	6	4.5	8	50	2.85	-
SEME610300210E	R0.2	3.0	6	4.5	10	50	2.85	-
SEME610300212E	R0.2	3.0	6	4.5	12	50	2.85	-
SEME610300214E	R0.2	3.0	6	4.5	14	60	2.85	-
SEME610300216E	R0.2	3.0	6	4.5	16	60	2.85	-
SEME610300220E	R0.2	3.0	6	4.5	20	60	2.85	-
SEME610300226E	R0.2	3.0	6	4.5	26	65	2.85	-
SEME610300230E	R0.2	3.0	6	4.5	30	70	2.85	-
SEME610300235E	R0.2	3.0	6	4.5	35	70	2.85	-
SEME610300240E	R0.2	3.0	6	4.5	40	80	2.85	-

▶ NEXT PAGE

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																			
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																		○		◎	○

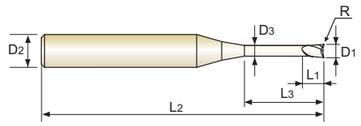
4G MILL END MILLS

PLAIN SHANK **SEME61** SERIES

CARBIDE, 2 FLUTE CORNER RADIUS with EXTENDED 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.
- ▶ 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. 2.0mm corner radius.
- ▶ Available more various effective length and overall length end mills than previous standard products.





CARBIDE | 2 | 30° | R ±0.010 | R ±0.015 | PLAIN | Y Coating | p.C204-C211

Ø0.2~Ø6 Ø7~Ø20

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	Remark
SEME610300308E	R0.3	3.0	6	4.5	8	50	2.85	-
SEME610300310E	R0.3	3.0	6	4.5	10	50	2.85	-
SEME610300312E	R0.3	3.0	6	4.5	12	50	2.85	-
SEME610300314E	R0.3	3.0	6	4.5	14	60	2.85	-
SEME610300316E	R0.3	3.0	6	4.5	16	60	2.85	-
SEME610300320E	R0.3	3.0	6	4.5	20	60	2.85	-
SEME610300326E	R0.3	3.0	6	4.5	26	65	2.85	-
SEME610300330E	R0.3	3.0	6	4.5	30	70	2.85	-
SEME610300335E	R0.3	3.0	6	4.5	35	70	2.85	-
SEME610300340E	R0.3	3.0	6	4.5	40	80	2.85	-
SEME610300508E	R0.5	3.0	6	4.5	8	50	2.85	-
SEME610300510E	R0.5	3.0	6	4.5	10	50	2.85	-
SEME610300512E	R0.5	3.0	6	4.5	12	50	2.85	-
SEME610300514E	R0.5	3.0	6	4.5	14	60	2.85	-
SEME610300516E	R0.5	3.0	6	4.5	16	60	2.85	-
SEME610300520E	R0.5	3.0	6	4.5	20	60	2.85	-
SEME610300526E	R0.5	3.0	6	4.5	26	65	2.85	-
SEME610300530E	R0.5	3.0	6	4.5	30	70	2.85	-
SEME610300535E	R0.5	3.0	6	4.5	35	70	2.85	-
SEME610300540E	R0.5	3.0	6	4.5	40	80	2.85	-
SEME610301008E	R1.0	3.0	6	4.5	8	50	2.85	-
SEME610301010E	R1.0	3.0	6	4.5	10	50	2.85	-
SEME610301012E	R1.0	3.0	6	4.5	12	50	2.85	-
SEME610301014E	R1.0	3.0	6	4.5	14	60	2.85	-

▶ NEXT PAGE

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																			
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																		○		◎	○

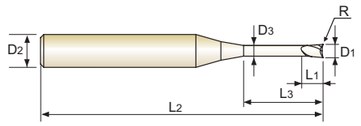
4G MILL END MILLS

PLAIN SHANK SEME61 SERIES

CARBIDE, 2 FLUTE CORNER RADIUS with EXTENDED 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.
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▶ Available more various effective length and overall length end mills than previous standard products.





CARBIDE | 2 | 30° | R ±0.010 | R ±0.015 | PLAIN | Y Coating | p.C204-C211

Ø0.2~Ø6 Ø7~Ø20

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	Remark
SEME610301016E	R1.0	3.0	6	4.5	16	60	2.85	-
SEME610301020E	R1.0	3.0	6	4.5	20	60	2.85	-
SEME610301026E	R1.0	3.0	6	4.5	26	65	2.85	-
SEME610301030E	R1.0	3.0	6	4.5	30	70	2.85	-
SEME610301035E	R1.0	3.0	6	4.5	35	70	2.85	-
SEME610301040E	R1.0	3.0	6	4.5	40	80	2.85	-
SEME610400110E	R0.1	4.0	6	6	10	50	3.85	-
SEME610400112E	R0.1	4.0	6	6	12	50	3.85	-
SEME610400114E	R0.1	4.0	6	6	14	60	3.85	-
SEME610400116E	R0.1	4.0	6	6	16	60	3.85	-
SEME610400120E	R0.1	4.0	6	6	20	60	3.85	-
SEME610400126E	R0.1	4.0	6	6	26	65	3.85	-
SEME610400130E	R0.1	4.0	6	6	30	70	3.85	-
SEME610400135E	R0.1	4.0	6	6	35	70	3.85	-
SEME610400140E	R0.1	4.0	6	6	40	80	3.85	-
SEME610400145E	R0.1	4.0	6	6	45	90	3.85	-
SEME610400150E	R0.1	4.0	6	6	50	100	3.85	-
SEME610400210E	R0.2	4.0	6	6	10	50	3.85	-
SEME610400212E	R0.2	4.0	6	6	12	50	3.85	-
SEME610400214E	R0.2	4.0	6	6	14	60	3.85	-
SEME610400216E	R0.2	4.0	6	6	16	60	3.85	-
SEME610400220E	R0.2	4.0	6	6	20	60	3.85	-
SEME610400226E	R0.2	4.0	6	6	26	65	3.85	-
SEME610400230E	R0.2	4.0	6	6	30	70	3.85	-

▶ NEXT PAGE

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																			
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																		○		◎	○

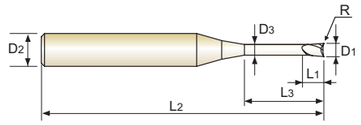
4G MILL END MILLS

PLAIN SHANK **SEME61** SERIES

CARBIDE, 2 FLUTE CORNER RADIUS with EXTENDED 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.
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- ▶ Available more various effective length and overall length end mills than previous standard products.





CARBIDE | 2 | 30° | R ±0.010 | R ±0.015 | PLAIN | Y Coating | p.C204-C211

Unit : mm

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	
SEME610400235E	R0.2	4.0	6	6	35	70	3.85	-
SEME610400240E	R0.2	4.0	6	6	40	80	3.85	-
SEME610400245E	R0.2	4.0	6	6	45	90	3.85	-
SEME610400250E	R0.2	4.0	6	6	50	100	3.85	-
SEME610400310E	R0.3	4.0	6	6	10	50	3.85	-
SEME610400312E	R0.3	4.0	6	6	12	50	3.85	-
SEME610400314E	R0.3	4.0	6	6	14	50	3.85	-
SEME610400316E	R0.3	4.0	6	6	16	50	3.85	-
SEME610400320E	R0.3	4.0	6	6	20	50	3.85	-
SEME610400326E	R0.3	4.0	6	6	26	65	3.85	-
SEME610400330E	R0.3	4.0	6	6	30	70	3.85	-
SEME610400335E	R0.3	4.0	6	6	35	70	3.85	-
SEME610400340E	R0.3	4.0	6	6	40	80	3.85	-
SEME610400345E	R0.3	4.0	6	6	45	90	3.85	-
SEME610400350E	R0.3	4.0	6	6	50	100	3.85	-
SEME610400510E	R0.5	4.0	6	6	10	50	3.85	-
SEME610400512E	R0.5	4.0	6	6	12	50	3.85	-
SEME610400514E	R0.5	4.0	6	6	14	60	3.85	-
SEME610400516E	R0.5	4.0	6	6	16	60	3.85	-
SEME610400520E	R0.5	4.0	6	6	20	60	3.85	-
SEME610400526E	R0.5	4.0	6	6	26	65	3.85	-
SEME610400530E	R0.5	4.0	6	6	30	70	3.85	-
SEME610400535E	R0.5	4.0	6	6	35	70	3.85	-
SEME610400540E	R0.5	4.0	6	6	40	80	3.85	-

▶ NEXT PAGE

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	

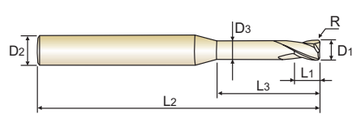
◎ : Excellent ○ : Good

ISO	P																			
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																		○		◎	○

4G MILL END MILLS
PLAIN SHANK SEME61 SERIES
CARBIDE, 2 FLUTE CORNER RADIUS with EXTENDED 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.
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▶ Available more various effective length and overall length end mills than previous standard products.





CARBIDE | 2 | 30° | R ±0.010 | R ±0.015 | PLAIN | Y Coating | p.C204-C211

Unit : mm

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	
SEME610400545E	R0.5	4.0	6	6	45	90	3.85	-
SEME610400550E	R0.5	4.0	6	6	50	100	3.85	-
SEME610401010E	R1.0	4.0	6	6	10	50	3.85	-
SEME610401012E	R1.0	4.0	6	6	12	50	3.85	-
SEME610401014E	R1.0	4.0	6	6	14	60	3.85	-
SEME610401016E	R1.0	4.0	6	6	16	60	3.85	-
SEME610401020E	R1.0	4.0	6	6	20	60	3.85	-
SEME610401026E	R1.0	4.0	6	6	26	65	3.85	-
SEME610401030E	R1.0	4.0	6	6	30	70	3.85	-
SEME610401035E	R1.0	4.0	6	6	35	70	3.85	-
SEME610401040E	R1.0	4.0	6	6	40	80	3.85	-
SEME610401045E	R1.0	4.0	6	6	45	90	3.85	-
SEME610401050E	R1.0	4.0	6	6	50	100	3.85	-
SEME6105001E	R0.1	5.0	6	8	15	60	4.85	-
SEME6105002E	R0.2	5.0	6	8	15	60	4.85	-
SEME6105003E	R0.3	5.0	6	8	15	60	4.85	-
SEME6105005E	R0.5	5.0	6	8	15	60	4.85	-
SEME6105010E	R1.0	5.0	6	8	15	60	4.85	-
SEME6105015E	R1.5	5.0	6	8	15	60	4.85	-
SEME6105020E	R2.0	5.0	6	8	15	60	4.85	-
SEME6106001E	R0.1	6.0	6	9	20	60	5.85	Regular
SEME6106002E	R0.2	6.0	6	9	20	60	5.85	Regular
SEME6106003E	R0.3	6.0	6	9	20	60	5.85	Regular
SEME6106005E	R0.5	6.0	6	9	20	60	5.85	Regular

▶ NEXT PAGE

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																			
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																		○		◎	○

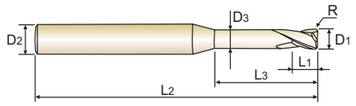
4G MILL END MILLS

PLAIN SHANK **SEME61** SERIES

CARBIDE, 2 FLUTE CORNER RADIUS with EXTENDED 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.
- ▶ 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. 2.0mm corner radius.
- ▶ Available more various effective length and overall length end mills than previous standard products.





CARBIDE | 2 | 30° | R ±0.010 | R ±0.015 | PLAIN | Y Coating | p.C204-C211

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	Remark
SEME6106010E	R1.0	6.0	6	9	20	60	5.85	Regular
SEME6106015E	R1.5	6.0	6	9	20	60	5.85	Regular
SEME6106020E	R2.0	6.0	6	9	20	60	5.85	Regular
SEME6106003090E	R0.3	6.0	6	15	30	90	5.85	Long
SEME610600524E	R0.5	6.0	6	9	24	90	5.85	-
SEME6106005090E	R0.5	6.0	6	15	30	90	5.85	Long
SEME6106010090E	R1.0	6.0	6	15	30	90	5.85	Long
SEME6108001E	R0.1	8.0	8	12	25	70	7.70	Regular
SEME6108002E	R0.2	8.0	8	12	25	70	7.70	Regular
SEME6108003E	R0.3	8.0	8	12	25	70	7.70	Regular
SEME6108005E	R0.5	8.0	8	12	25	70	7.70	Regular
SEME6108010E	R1.0	8.0	8	12	25	70	7.70	Regular
SEME6108015E	R1.5	8.0	8	12	25	70	7.70	Regular
SEME6108020E	R2.0	8.0	8	12	25	70	7.70	Regular
SEME6108003100E	R0.3	8.0	8	20	35	100	7.70	Long
SEME6108005100E	R0.5	8.0	8	20	35	100	7.70	Long
SEME6108010100E	R1.0	8.0	8	20	35	100	7.70	Long
SEME6110001E	R0.1	10.0	10	15	30	75	9.70	Regular
SEME6110002E	R0.2	10.0	10	15	30	75	9.70	Regular
SEME6110003E	R0.3	10.0	10	15	30	75	9.70	Regular
SEME6110005E	R0.5	10.0	10	15	30	75	9.70	Regular
SEME6110010E	R1.0	10.0	10	15	30	75	9.70	Regular
SEME6110015E	R1.5	10.0	10	15	30	75	9.70	Regular
SEME6110020E	R2.0	10.0	10	15	30	75	9.70	Regular

▶ NEXT PAGE

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																			
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																		○		◎	○

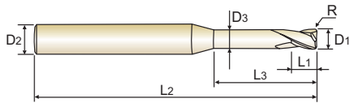
4G MILL END MILLS

PLAIN SHANK SEME61 SERIES

CARBIDE, 2 FLUTE CORNER RADIUS with EXTENDED 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.
- ▶ 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. 2.0mm corner radius.
- ▶ Available more various effective length and overall length end mills than previous standard products.





CARBIDE | 2 | 30° | R ±0.010 | R ±0.015 | PLAIN | Y Coating | p.C204-C211

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	Remark
SEME6110003100E	R0.3	10.0	10	25	40	100	9.70	Long
SEME6110005100E	R0.5	10.0	10	25	40	100	9.70	Long
SEME6110010100E	R1.0	10.0	10	25	40	100	9.70	Long
SEME6112002E	R0.2	12.0	12	18	32	80	11.70	Regular
SEME6112003E	R0.3	12.0	12	18	32	80	11.70	Regular
SEME6112005E	R0.5	12.0	12	18	32	80	11.70	Regular
SEME6112010E	R1.0	12.0	12	18	32	80	11.70	Regular
SEME6112015E	R1.5	12.0	12	18	32	80	11.70	Regular
SEME6112020E	R2.0	12.0	12	18	32	80	11.70	Regular
SEME6112003110E	R0.3	12.0	12	30	50	110	11.70	Long
SEME6112005110E	R0.5	12.0	12	30	50	110	11.70	Long
SEME6112010110E	R1.0	12.0	12	30	50	110	11.70	Long
SEME6116005E	R0.5	16.0	16	20	35	100	15.70	Regular
SEME6116010E	R1.0	16.0	16	20	35	100	15.70	Regular
SEME6116005150E	R0.5	16.0	16	35	50	150	15.70	Long
SEME6116010150E	R1.0	16.0	16	35	50	150	15.70	Long
SEME6120005E	R0.5	20.0	20	25	40	100	19.70	Regular
SEME6120010E	R1.0	20.0	20	25	40	100	19.70	Regular
SEME6120005150E	R0.5	20.0	20	40	55	150	19.70	Long
SEME6120010150E	R1.0	20.0	20	40	55	150	19.70	Long

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																			
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																		○		◎	○

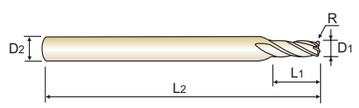
4G MILL END MILLS

PLAIN SHANK **SEME01** SERIES

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

- ▶ New coating and tool geometry applied resulting outstanding cutting abilities and wear resistance.
- ▶ Excellent performance when cutting prehardened steels, up to HRc55 which are used for molds & dies.
- ▶ Multiple Helix for 3.0mm and over 3.0mm diameter endmills minimizing vibration and decreasing wear in cutting.
- ▶ Available in short, regular and long shank end mills.





CARBIDE | 4 | 27°/30° | R ±0.02 | PLAIN | Y Coating | p.C212-C213

D<Ø3, 30˚ HELIX

Unit : mm

EDP No.	Corner Radius R	Mill Diameter D1	Shank Diameter D2	Length of Cut L1	Overall Length L2	Remark
SEME010100054SE	R0.05	**1.0**	4	2.5	50	4mm Shank
SEME01010014SE	R0.1	**1.0**	4	2.5	50	4mm Shank
SEME01010024SE	R0.2	**1.0**	4	2.5	50	4mm Shank
SEME01010034SE	R0.3	**1.0**	4	2.5	50	4mm Shank
SEME01010005E	R0.05	**1.0**	6	2.5	50	-
SEME0101001E	R0.1	**1.0**	6	2.5	50	-
SEME0101002E	R0.2	**1.0**	6	2.5	50	-
SEME0101003E	R0.3	**1.0**	6	2.5	50	-
SEME010120054SE	R0.05	**1.2**	4	3	50	4mm Shank
SEME01012014SE	R0.1	**1.2**	4	3	50	4mm Shank
SEME01012024SE	R0.2	**1.2**	4	3	50	4mm Shank
SEME01012034SE	R0.3	**1.2**	4	3	50	4mm Shank
SEME01012005E	R0.05	**1.2**	6	3	50	-
SEME0101201E	R0.1	**1.2**	6	3	50	-
SEME0101202E	R0.2	**1.2**	6	3	50	-
SEME0101203E	R0.3	**1.2**	6	3	50	-
SEME010150054SE	R0.05	**1.5**	4	4	50	4mm Shank
SEME01015014SE	R0.1	**1.5**	4	4	50	4mm Shank
SEME01015024SE	R0.2	**1.5**	4	4	50	4mm Shank
SEME01015034SE	R0.3	**1.5**	4	4	50	4mm Shank
SEME01015054SE	R0.5	**1.5**	4	4	50	4mm Shank
SEME01015005E	R0.05	**1.5**	6	4	50	-
SEME0101501E	R0.1	**1.5**	6	4	50	-
SEME0101502E	R0.2	**1.5**	6	4	50	-

▶ NEXT PAGE

Corner Radius Tolerance (mm)	Mill Dia.Tolerance (mm)	Shank Dia.Tolerance
± 0.02	0 ~ - 0.03	h5

◎ : Excellent ○ : Good

ISO	P																			
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																		○		◎	○

CARBIDE
HSS
i-Xmill END MILLS
X-1EH END MILLS
4G MILL END MILLS
X-POWER PRO END MILLS
TitaNox-POWER END MILLS
V7 PLUS END MILLS
ALU-CUT END MILLS
K-2 END MILLS
GENERAL CARBIDE END MILLS

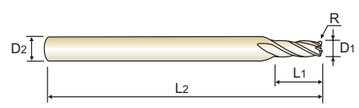
4G MILL END MILLS

PLAIN SHANK **SEME01** SERIES

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

- ▶ New coating and tool geometry applied resulting outstanding cutting abilities and wear resistance.
- ▶ Excellent performance when cutting prehardened steels, up to HRc55 which are used for molds & dies.
- ▶ Multiple Helix for 3.0mm and over 3.0mm diameter endmills minimizing vibration and decreasing wear in cutting.
- ▶ Available in short, regular and long shank end mills.





CARBIDE | 4 | 27°/30° | R ±0.02 | PLAIN | Y Coating | p.C212-C213

D<Ø3, 30˚ HELIX

Unit : mm

EDP No.	Corner Radius R	Mill Diameter D1	Shank Diameter D2	Length of Cut L1	Overall Length L2	Remark
SEME0101503E	R0.3	**1.5**	6	4	50	-
SEME0101505E	R0.5	**1.5**	6	4	50	-
SEME01020014SE	R0.1	**2.0**	4	6	50	4mm Shank
SEME01020024SE	R0.2	**2.0**	4	6	50	4mm Shank
SEME01020034SE	R0.3	**2.0**	4	6	50	4mm Shank
SEME01020054SE	R0.5	**2.0**	4	6	50	4mm Shank
SEME0102001E	R0.1	**2.0**	6	6	50	-
SEME0102002E	R0.2	**2.0**	6	6	50	-
SEME0102003E	R0.3	**2.0**	6	6	50	-
SEME0102005E	R0.5	**2.0**	6	6	50	-
SEME01025014SE	R0.1	**2.5**	4	7	60	4mm Shank
SEME01025024SE	R0.2	**2.5**	4	7	60	4mm Shank
SEME01025034SE	R0.3	**2.5**	4	7	60	4mm Shank
SEME01025054SE	R0.5	**2.5**	4	7	60	4mm Shank
SEME0102501E	R0.1	**2.5**	6	7	60	-
SEME0102502E	R0.2	**2.5**	6	7	60	-
SEME0102503E	R0.3	**2.5**	6	7	60	-
SEME0102505E	R0.5	**2.5**	6	7	60	-
SEME0103001E	R0.1	**3.0**	6	8	60	-
SEME0103002E	R0.2	**3.0**	6	8	60	-
SEME0103003E	R0.3	**3.0**	6	8	60	-
SEME0103005E	R0.5	**3.0**	6	8	60	-
SEME0103010E	R1.0	**3.0**	6	8	60	-
SEME0103501E	R0.1	**3.5**	6	10	70	-

▶ NEXT PAGE

Corner Radius Tolerance (mm)	Mill Dia.Tolerance (mm)	Shank Dia.Tolerance
± 0.02	0 ~ - 0.03	h5

◎ : Excellent ○ : Good

ISO	P																			
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																		○		◎	○

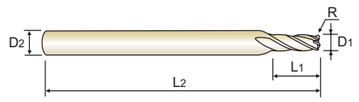
4G MILL END MILLS

PLAIN SHANK **SEME01** SERIES

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

- ▶ New coating and tool geometry applied resulting outstanding cutting abilities and wear resistance.
- ▶ Excellent performance when cutting prehardened steels, up to HRc55 which are used for molds & dies.
- ▶ Multiple Helix for 3.0mm and over 3.0mm diameter endmills minimizing vibration and decreasing wear in cutting.
- ▶ Available in short, regular and long shank end mills.





CARBIDE | 4 | 27°/30° | R ±0.02 | PLAIN | Y Coating | p.C212-C213

D<Ø3, 30˚ HELIX

Unit : mm

EDP No.	Corner Radius R	Mill Diameter D1	Shank Diameter D2	Length of Cut L1	Overall Length L2	Remark
SEME0103502E	R0.2	3.5	6	10	70	-
SEME0103503E	R0.3	3.5	6	10	70	-
SEME0103505E	R0.5	3.5	6	10	70	-
SEME01040014SE	R0.1	4.0	4	10	70	4mm Shank
SEME01040024SE	R0.2	4.0	4	10	70	4mm Shank
SEME01040034SE	R0.3	4.0	4	10	70	4mm Shank
SEME01040054SE	R0.5	4.0	4	10	70	4mm Shank
SEME01040104SE	R1.0	4.0	4	10	70	4mm Shank
SEME01040011004SE	R0.1	4.0	4	10	100	4mm Shank
SEME01040021004SE	R0.2	4.0	4	10	100	4mm Shank
SEME01040031004SE	R0.3	4.0	4	10	100	4mm Shank
SEME01040051004SE	R0.5	4.0	4	10	100	4mm Shank
SEME01040101004SE	R1.0	4.0	4	10	100	4mm Shank
SEME0104001E	R0.1	4.0	6	10	70	Regular
SEME0104002E	R0.2	4.0	6	10	70	Regular
SEME0104003E	R0.3	4.0	6	10	70	Regular
SEME0104005E	R0.5	4.0	6	10	70	Regular
SEME0104010E	R1.0	4.0	6	10	70	Regular
SEME0104501E	R0.1	4.5	6	11	80	-
SEME0104502E	R0.2	4.5	6	11	80	-
SEME0104503E	R0.3	4.5	6	11	80	-
SEME0104505E	R0.5	4.5	6	11	80	-
SEME0105001E	R0.1	5.0	6	13	90	-
SEME0105002E	R0.2	5.0	6	13	90	-

▶ NEXT PAGE

Corner Radius Tolerance (mm)	Mill Dia.Tolerance (mm)	Shank Dia.Tolerance
± 0.02	0 ~ - 0.03	h5

◎ : Excellent ○ : Good

ISO	P																			
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																		○		◎	○

CARBIDE
HSS
i-Xmill END MILLS
X-1EH END MILLS
4G MILL END MILLS
X-POWER PRO END MILLS
TitaNox-POWER END MILLS
V7 PLUS END MILLS
ALU-CUT END MILLS
K-2 END MILLS
GENERAL CARBIDE END MILLS

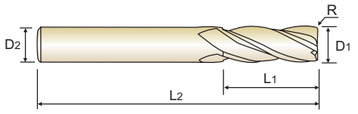
4G MILL END MILLS

PLAIN SHANK **SEME01** SERIES

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

- ▶ New coating and tool geometry applied resulting outstanding cutting abilities and wear resistance.
- ▶ Excellent performance when cutting prehardened steels, up to HRc55 which are used for molds & dies.
- ▶ Multiple Helix for 3.0mm and over 3.0mm diameter endmills minimizing vibration and decreasing wear in cutting.
- ▶ Available in short, regular and long shank end mills.





CARBIDE | 4 | 27°/30° | R ±0.02 | PLAIN | Y Coating | p.C212-C213

D<Ø3, 30˚ HELIX

Unit : mm

EDP No.	Corner Radius R	Mill Diameter D1	Shank Diameter D2	Length of Cut L1	Overall Length L2	Remark
SEME0105003E	R0.3	5.0	6	13	90	-
SEME0105005E	R0.5	5.0	6	13	90	-
SEME0105010E	R1.0	5.0	6	13	90	-
SEME0105501E	R0.1	5.5	6	13	90	-
SEME0105502E	R0.2	5.5	6	13	90	-
SEME0105503E	R0.3	5.5	6	13	90	-
SEME0105505E	R0.5	5.5	6	13	90	-
SEME0105510E	R1.0	5.5	6	13	90	-
SEME0106001060E	R0.1	6.0	6	15	60	Short
SEME0106002060E	R0.2	6.0	6	15	60	Short
SEME0106001E	R0.1	6.0	6	15	90	Regular
SEME0106002E	R0.2	6.0	6	15	90	Regular
SEME0106003E	R0.3	6.0	6	15	90	Regular
SEME0106005E	R0.5	6.0	6	15	90	Regular
SEME0106010E	R1.0	6.0	6	15	90	Regular
SEME0106015E	R1.5	6.0	6	15	90	Regular
SEME0106020E	R2.0	6.0	6	15	90	Regular
SEME0106005110E	R0.5	6.0	6	15	110	Long
SEME0106010110E	R1.0	6.0	6	15	110	Long
SEME0106005130E	R0.5	6.0	6	15	130	Long
SEME0106010130E	R1.0	6.0	6	15	130	Long
SEME0107001E	R0.1	7.0	8	16	90	-
SEME0107002E	R0.2	7.0	8	16	90	-
SEME0107003E	R0.3	7.0	8	16	90	-

▶ NEXT PAGE

Corner Radius Tolerance (mm)	Mill Dia.Tolerance (mm)	Shank Dia.Tolerance
± 0.02	0 ~ - 0.03	h5

◎ : Excellent ○ : Good

ISO	P																			
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																		○		◎	○

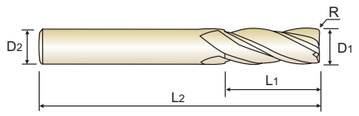
4G MILL END MILLS

PLAIN SHANK **SEME01** SERIES

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

- ▶ New coating and tool geometry applied resulting outstanding cutting abilities and wear resistance.
- ▶ Excellent performance when cutting prehardened steels, up to HRc55 which are used for molds & dies.
- ▶ Multiple Helix for 3.0mm and over 3.0mm diameter endmills minimizing vibration and decreasing wear in cutting.
- ▶ Available in short, regular and long shank end mills.





CARBIDE | 4 | 27°/30° | R ±0.02 | PLAIN | Y Coating | p.C212-C213

D<Ø3, 30˚ HELIX

Unit : mm

EDP No.	Corner Radius R	Mill Diameter D1	Shank Diameter D2	Length of Cut L1	Overall Length L2	Remark
SEME0107005E	R0.5	**7.0**	8	16	90	-
SEME0107010E	R1.0	**7.0**	8	16	90	-
SEME0107020E	R2.0	**7.0**	8	16	90	-
SEME0108003070E	R0.3	**8.0**	8	20	70	Short
SEME0108005070E	R0.5	**8.0**	8	20	70	Short
SEME0108010070E	R1.0	**8.0**	8	20	70	Short
SEME0108001E	R0.1	**8.0**	8	20	100	Regular
SEME0108002E	R0.2	**8.0**	8	20	100	Regular
SEME0108003E	R0.3	**8.0**	8	20	100	Regular
SEME0108005E	R0.5	**8.0**	8	20	100	Regular
SEME0108010E	R1.0	**8.0**	8	20	100	Regular
SEME0108015E	R1.5	**8.0**	8	20	100	Regular
SEME0108020E	R2.0	**8.0**	8	20	100	Regular
SEME0108025E	R2.5	**8.0**	8	20	100	Regular
SEME0108030E	R3.0	**8.0**	8	20	100	Regular
SEME0108005120E	R0.5	**8.0**	8	20	120	Long
SEME0108010120E	R1.0	**8.0**	8	20	120	Long
SEME0108005150E	R0.5	**8.0**	8	20	150	Long
SEME0108010150E	R1.0	**8.0**	8	20	150	Long
SEME0110003075E	R0.3	**10.0**	10	25	75	Short
SEME0110005075E	R0.5	**10.0**	10	25	75	Short
SEME0110010075E	R1.0	**10.0**	10	25	75	Short
SEME0110001E	R0.1	**10.0**	10	25	100	Regular
SEME0110002E	R0.2	**10.0**	10	25	100	Regular

▶ NEXT PAGE

Corner Radius Tolerance (mm)	Mill Dia.Tolerance (mm)	Shank Dia.Tolerance
± 0.02	0 ~ - 0.03	h5

◎ : Excellent ○ : Good

ISO	P																			
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																		○		◎	○

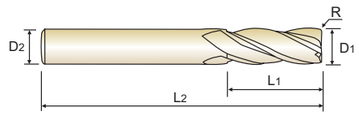
4G MILL END MILLS

PLAIN SHANK SEME01 SERIES

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

▶ New coating and tool geometry applied resulting outstanding cutting abilities and wear resistance.
▶ Excellent performance when cutting prehardened steels, up to HRc55 which are used for molds & dies.
▶ Multiple Helix for 3.0mm and over 3.0mm diameter endmills minimizing vibration and decreasing wear in cutting.
▶ Available in short, regular and long shank end mills.





CARBIDE | 4 | 27°/30° | R ±0.02 | PLAIN | Y Coating | p.C212-C213

D<Ø3, 30˚ HELIX

Unit : mm

EDP No.	Corner Radius R	Mill Diameter D1	Shank Diameter D2	Length of Cut L1	Overall Length L2	Remark
SEME0110003E	R0.3	**10.0**	10	25	100	Regular
SEME0110005E	R0.5	**10.0**	10	25	100	Regular
SEME0110010E	R1.0	**10.0**	10	25	100	Regular
SEME0110015E	R1.5	**10.0**	10	25	100	Regular
SEME0110020E	R2.0	**10.0**	10	25	100	Regular
SEME0110025E	R2.5	**10.0**	10	25	100	Regular
SEME0110030E	R3.0	**10.0**	10	25	100	Regular
SEME0110040E	R4.0	**10.0**	10	25	100	Regular
SEME0110005130E	R0.5	**10.0**	10	22	130	Long
SEME0110010130E	R1.0	**10.0**	10	22	130	Long
SEME0110005150E	R0.5	**10.0**	10	22	150	Long
SEME0110010150E	R1.0	**10.0**	10	22	150	Long
SEME0111002E	R0.2	**11.0**	12	25	110	-
SEME0111003E	R0.3	**11.0**	12	25	110	-
SEME0111005E	R0.5	**11.0**	12	25	110	-
SEME0111010E	R1.0	**11.0**	12	25	110	-
SEME0111020E	R2.0	**11.0**	12	25	110	-
SEME0112003080E	R0.3	**12.0**	12	30	80	Short
SEME0112005080E	R0.5	**12.0**	12	30	80	Short
SEME0112010080E	R1.0	**12.0**	12	30	80	Short
SEME0112001E	R0.1	**12.0**	12	30	110	Regular
SEME0112002E	R0.2	**12.0**	12	30	110	Regular
SEME0112003E	R0.3	**12.0**	12	30	110	Regular
SEME0112005E	R0.5	**12.0**	12	30	110	Regular

▶ NEXT PAGE

Corner Radius Tolerance (mm)	Mill Dia.Tolerance (mm)	Shank Dia.Tolerance
± 0.02	0 ~ - 0.03	h5

◎ : Excellent ○ : Good

ISO	P																			
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																		○		◎	○

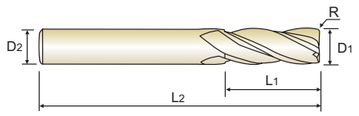
4G MILL END MILLS

PLAIN SHANK **SEME01** SERIES

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

- ▶ New coating and tool geometry applied resulting outstanding cutting abilities and wear resistance.
- ▶ Excellent performance when cutting prehardened steels, up to HRc55 which are used for molds & dies.
- ▶ Multiple Helix for 3.0mm and over 3.0mm diameter endmills minimizing vibration and decreasing wear in cutting.
- ▶ Available in short, regular and long shank end mills.





CARBIDE | 4 | 27°/30° | R ±0.02 | PLAIN | Y Coating | p.C212-C213

D<Ø3, 30˚ HELIX

Unit : mm

EDP No.	Corner Radius	Mill Diameter	Shank Diameter	Length of Cut	Overall Length	Remark
	R	D1	D2	L1	L2	
SEME0112010E	R1.0	**12.0**	12	30	110	Regular
SEME0112015E	R1.5	**12.0**	12	30	110	Regular
SEME0112020E	R2.0	**12.0**	12	30	110	Regular
SEME0112025E	R2.5	**12.0**	12	30	110	Regular
SEME0112030E	R3.0	**12.0**	12	30	110	Regular
SEME0112040E	R4.0	**12.0**	12	30	110	Regular
SEME0112050E	R5.0	**12.0**	12	30	110	Regular
SEME0112005130E	R0.5	**12.0**	12	30	130	Long
SEME0112010130E	R1.0	**12.0**	12	30	130	Long
SEME0112005150E	R0.5	**12.0**	12	30	150	Long
SEME0112010150E	R1.0	**12.0**	12	30	150	Long
SEME0114005E	R0.5	**14.0**	16	35	150	-
SEME0114010E	R1.0	**14.0**	16	35	150	-
SEME0114020E	R2.0	**14.0**	16	35	150	-
SEME0116005E	R0.5	**16.0**	16	32	150	-
SEME0116010E	R1.0	**16.0**	16	32	150	-
SEME0116015E	R1.5	**16.0**	16	32	150	-
SEME0116020E	R2.0	**16.0**	16	32	150	-
SEME0120005E	R0.5	**20.0**	20	38	150	-
SEME0120010E	R1.0	**20.0**	20	38	150	-
SEME0120015E	R1.5	**20.0**	20	38	150	-
SEME0120020E	R2.0	**20.0**	20	38	150	-

Corner Radius Tolerance (mm)	Mill Dia.Tolerance (mm)	Shank Dia.Tolerance
± 0.02	0 ~ - 0.03	h5

◎ : Excellent ○ : Good

ISO	P																			
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																		○		◎	○

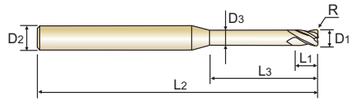
4G MILL END MILLS

PLAIN SHANK **SEME64** SERIES

CARBIDE, 4 FLUTE MULTIPLE HELIX CORNER RADIUS with EXTENDED NECK

- ▶ New coating and tool geometry applied resulting outstanding cutting abilities and wear resistance.
- ▶ Excellent performance when cutting prehardened steels, up to HRc55 which are used for molds & dies.
- ▶Multiple Helix for 3.0mm and over 3.0mm diameter endmills minimizing vibration and decreasing wear in cutting.





CARBIDE | 4 | 27°/30° | R ±0.02 | PLAIN | Y Coating | p.C214-C217

D<Ø3, 30˚ HELIX

Unit : mm

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	
SEME6401000503E	R0.05	**1.0**	4	1.5	3	50	0.95	-
SEME6401000504E	R0.05	**1.0**	4	1.5	4	50	0.95	-
SEME6401000506E	R0.05	**1.0**	4	1.5	6	50	0.95	-
SEME6401000508E	R0.05	**1.0**	4	1.5	8	50	0.95	-
SEME6401000510E	R0.05	**1.0**	4	1.5	10	50	0.95	-
SEME6401000512E	R0.05	**1.0**	4	1.5	12	50	0.95	-
SEME6401000514E	R0.05	**1.0**	4	1.5	14	50	0.95	-
SEME6401000516E	R0.05	**1.0**	4	1.5	16	50	0.95	-
SEME6401000520E	R0.05	**1.0**	4	1.5	20	50	0.95	-
SEME640100103E	R0.1	**1.0**	4	1.5	3	50	0.95	-
SEME640100104E	R0.1	**1.0**	4	1.5	4	50	0.95	-
SEME640100106E	R0.1	**1.0**	4	1.5	6	50	0.95	-
SEME640100108E	R0.1	**1.0**	4	1.5	8	50	0.95	-
SEME640100110E	R0.1	**1.0**	4	1.5	10	50	0.95	-
SEME640100112E	R0.1	**1.0**	4	1.5	12	50	0.95	-
SEME640100114E	R0.1	**1.0**	4	1.5	14	50	0.95	-
SEME640100116E	R0.1	**1.0**	4	1.5	16	50	0.95	-
SEME640100120E	R0.1	**1.0**	4	1.5	20	50	0.95	-
SEME640100203E	R0.2	**1.0**	4	1.5	3	50	0.95	-
SEME640100204E	R0.2	**1.0**	4	1.5	4	50	0.95	-
SEME640100206E	R0.2	**1.0**	4	1.5	6	50	0.95	-
SEME640100208E	R0.2	**1.0**	4	1.5	8	50	0.95	-
SEME640100210E	R0.2	**1.0**	4	1.5	10	50	0.95	-
SEME640100212E	R0.2	**1.0**	4	1.5	12	50	0.95	-

▶ NEXT PAGE

Corner Radius Tolerance (mm)	Mill Dia.Tolerance (mm)	Shank Dia.Tolerance
± 0.02	0 ~ - 0.03	h5

◎ : Excellent ○ : Good

ISO	P																			
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																		○		◎	○

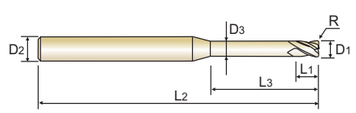
4G MILL END MILLS

PLAIN SHANK **SEME64** SERIES

CARBIDE, 4 FLUTE MULTIPLE HELIX CORNER RADIUS with EXTENDED NECK

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▶Multiple Helix for 3.0mm and over 3.0mm diameter endmills minimizing vibration and decreasing wear in cutting.





CARBIDE | 4 | 27°/30° | R ±0.02 | PLAIN | Y Coating | p.C214-C217

D<Ø3, 30° HELIX

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	Remark
SEME640100214E	R0.2	1.0	4	1.5	14	50	0.95	-
SEME640100216E	R0.2	1.0	4	1.5	16	50	0.95	-
SEME640100220E	R0.2	1.0	4	1.5	20	50	0.95	-
SEME640100303E	R0.3	1.0	4	1.5	3	50	0.95	-
SEME640100304E	R0.3	1.0	4	1.5	4	50	0.95	-
SEME640100306E	R0.3	1.0	4	1.5	6	50	0.95	-
SEME640100308E	R0.3	1.0	4	1.5	8	50	0.95	-
SEME640100310E	R0.3	1.0	4	1.5	10	50	0.95	-
SEME640100312E	R0.3	1.0	4	1.5	12	50	0.95	-
SEME640100314E	R0.3	1.0	4	1.5	14	50	0.95	-
SEME640100316E	R0.3	1.0	4	1.5	16	50	0.95	-
SEME640100320E	R0.3	1.0	4	1.5	20	50	0.95	-
SEME6401200503E	R0.05	1.2	4	1.8	3	50	1.15	-
SEME6401200504E	R0.05	1.2	4	1.8	4	50	1.15	-
SEME6401200506E	R0.05	1.2	4	1.8	6	50	1.15	-
SEME6401200508E	R0.05	1.2	4	1.8	8	50	1.15	-
SEME6401200510E	R0.05	1.2	4	1.8	10	50	1.15	-
SEME6401200512E	R0.05	1.2	4	1.8	12	50	1.15	-
SEME6401200516E	R0.05	1.2	4	1.8	16	50	1.15	-
SEME6401200520E	R0.05	1.2	4	1.8	20	50	1.15	-
SEME640120103E	R0.1	1.2	4	1.8	3	50	1.15	-
SEME640120104E	R0.1	1.2	4	1.8	4	50	1.15	-
SEME640120106E	R0.1	1.2	4	1.8	6	50	1.15	-
SEME640120108E	R0.1	1.2	4	1.8	8	50	1.15	-

▶ NEXT PAGE

Corner Radius Tolerance (mm)	Mill Dia.Tolerance (mm)	Shank Dia.Tolerance
± 0.02	0 ~ - 0.03	h5

◎ : Excellent ○ : Good

ISO	P																			
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																		○		◎	○

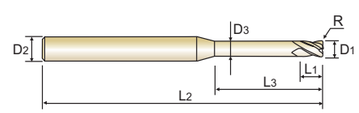
4G MILL END MILLS

PLAIN SHANK SEME64 SERIES

CARBIDE, 4 FLUTE MULTIPLE HELIX CORNER RADIUS with EXTENDED NECK

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CARBIDE | 4 | 27°/30° | R ±0.02 | PLAIN | Y Coating | p.C214-C217

D<Ø3, 30° HELIX

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	Remark
SEME640120110E	R0.1	1.2	4	1.8	10	50	1.15	-
SEME640120112E	R0.1	1.2	4	1.8	12	50	1.15	-
SEME640120116E	R0.1	1.2	4	1.8	16	50	1.15	-
SEME640120120E	R0.1	1.2	4	1.8	20	50	1.15	-
SEME640120203E	R0.2	1.2	4	1.8	3	50	1.15	-
SEME640120204E	R0.2	1.2	4	1.8	4	50	1.15	-
SEME640120206E	R0.2	1.2	4	1.8	6	50	1.15	-
SEME640120208E	R0.2	1.2	4	1.8	8	50	1.15	-
SEME640120210E	R0.2	1.2	4	1.8	10	50	1.15	-
SEME640120212E	R0.2	1.2	4	1.8	12	50	1.15	-
SEME640120216E	R0.2	1.2	4	1.8	16	50	1.15	-
SEME640120220E	R0.2	1.2	4	1.8	20	50	1.15	-
SEME640120303E	R0.3	1.2	4	1.8	3	50	1.15	-
SEME640120304E	R0.3	1.2	4	1.8	4	50	1.15	-
SEME640120306E	R0.3	1.2	4	1.8	6	50	1.15	-
SEME640120308E	R0.3	1.2	4	1.8	8	50	1.15	-
SEME640120310E	R0.3	1.2	4	1.8	10	50	1.15	-
SEME640120312E	R0.3	1.2	4	1.8	12	50	1.15	-
SEME640120316E	R0.3	1.2	4	1.8	16	50	1.15	-
SEME640120320E	R0.3	1.2	4	1.8	20	50	1.15	-
SEME6401500504E	R0.05	1.5	4	2.3	4	50	1.45	-
SEME6401500506E	R0.05	1.5	4	2.3	6	50	1.45	-
SEME6401500508E	R0.05	1.5	4	2.3	8	50	1.45	-
SEME6401500510E	R0.05	1.5	4	2.3	10	50	1.45	-

▶ NEXT PAGE

Corner Radius Tolerance (mm)	Mill Dia.Tolerance (mm)	Shank Dia.Tolerance
± 0.02	0 ~ - 0.03	h5

◎ : Excellent ○ : Good

ISO	P																			
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																		○		◎	○

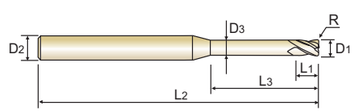
4G MILL END MILLS

PLAIN SHANK **SEME64** SERIES

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CARBIDE | 4 | 27°/30° | R ±0.02 | PLAIN | Y Coating

D<Ø3, 30° HELIX

p.C214-C217

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	Remark
SEME6401500512E	R0.05	1.5	4	2.3	12	50	1.45	-
SEME6401500514E	R0.05	1.5	4	2.3	14	50	1.45	-
SEME6401500516E	R0.05	1.5	4	2.3	16	50	1.45	-
SEME6401500520E	R0.05	1.5	4	2.3	20	50	1.45	-
SEME6401500522E	R0.05	1.5	4	2.3	22	60	1.45	-
SEME6401500526E	R0.05	1.5	4	2.3	26	60	1.45	-
SEME640150104E	R0.1	1.5	4	2.3	4	50	1.45	-
SEME640150106E	R0.1	1.5	4	2.3	6	50	1.45	-
SEME640150108E	R0.1	1.5	4	2.3	8	50	1.45	-
SEME640150110E	R0.1	1.5	4	2.3	10	50	1.45	-
SEME640150112E	R0.1	1.5	4	2.3	12	50	1.45	-
SEME640150114E	R0.1	1.5	4	2.3	14	50	1.45	-
SEME640150116E	R0.1	1.5	4	2.3	16	50	1.45	-
SEME640150118E	R0.1	1.5	4	2.3	18	50	1.45	
SEME640150120E	R0.1	1.5	4	2.3	20	50	1.45	-
SEME640150122E	R0.1	1.5	4	2.3	22	60	1.45	-
SEME640150126E	R0.1	1.5	4	2.3	26	60	1.45	-
SEME640150204E	R0.2	1.5	4	2.3	4	50	1.45	-
SEME640150206E	R0.2	1.5	4	2.3	6	50	1.45	-
SEME640150208E	R0.2	1.5	4	2.3	8	50	1.45	-
SEME640150210E	R0.2	1.5	4	2.3	10	50	1.45	-
SEME640150212E	R0.2	1.5	4	2.3	12	50	1.45	-
SEME640150214E	R0.2	1.5	4	2.3	14	50	1.45	-
SEME640150216E	R0.2	1.5	4	2.3	16	50	1.45	-

▶ NEXT PAGE

Corner Radius Tolerance (mm)	Mill Dia.Tolerance (mm)	Shank Dia.Tolerance
± 0.02	0 ~ - 0.03	h5

◎ : Excellent ○ : Good

ISO	P																			
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																		○		◎	○

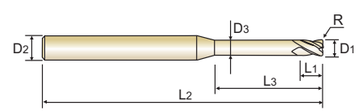
4G MILL END MILLS

PLAIN SHANK SEME64 SERIES

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CARBIDE | 4 | 27°/30° | R ±0.02 | PLAIN | Y Coating

D<Ø3, 30° HELIX

p.C214-C217

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	Remark
SEME640150220E	R0.2	1.5	4	2.3	20	50	1.45	-
SEME640150222E	R0.2	1.5	4	2.3	22	60	1.45	-
SEME640150226E	R0.2	1.5	4	2.3	26	60	1.45	-
SEME640150304E	R0.3	1.5	4	2.3	4	50	1.45	-
SEME640150306E	R0.3	1.5	4	2.3	6	50	1.45	-
SEME640150308E	R0.3	1.5	4	2.3	8	50	1.45	-
SEME640150310E	R0.3	1.5	4	2.3	10	50	1.45	-
SEME640150312E	R0.3	1.5	4	2.3	12	50	1.45	-
SEME640150314E	R0.3	1.5	4	2.3	14	50	1.45	-
SEME640150316E	R0.3	1.5	4	2.3	16	50	1.45	-
SEME640150320E	R0.3	1.5	4	2.3	20	50	1.45	-
SEME640150322E	R0.3	1.5	4	2.3	22	60	1.45	-
SEME640150326E	R0.3	1.5	4	2.3	26	60	1.45	-
SEME640150504E	R0.5	1.5	4	2.3	4	50	1.45	-
SEME640150506E	R0.5	1.5	4	2.3	6	50	1.45	-
SEME640150508E	R0.5	1.5	4	2.3	8	50	1.45	-
SEME640150510E	R0.5	1.5	4	2.3	10	50	1.45	-
SEME640150512E	R0.5	1.5	4	2.3	12	50	1.45	-
SEME640150514E	R0.5	1.5	4	2.3	14	50	1.45	-
SEME640150516E	R0.5	1.5	4	2.3	16	50	1.45	-
SEME640150520E	R0.5	1.5	4	2.3	20	50	1.45	-
SEME640150522E	R0.5	1.5	4	2.3	22	60	1.45	-
SEME640150526E	R0.5	1.5	4	2.3	26	60	1.45	-
SEME640200106E	R0.1	2.0	4	3	6	50	1.95	-

▶ NEXT PAGE

Corner Radius Tolerance (mm)	Mill Dia.Tolerance (mm)	Shank Dia.Tolerance
± 0.02	0 ~ - 0.03	h5

◎ : Excellent ○ : Good

ISO	P																			
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																		○		◎	○

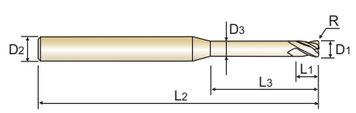
4G MILL END MILLS

PLAIN SHANK **SEME64** SERIES

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CARBIDE | 4 | 27°/30° | R ±0.02 | PLAIN | Y Coating | p.C214-C217

D<Ø3, 30° HELIX

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	Remark
SEME640200108E	R0.1	2.0	4	3	8	50	1.95	-
SEME640200110E	R0.1	2.0	4	3	10	50	1.95	-
SEME640200112E	R0.1	2.0	4	3	12	50	1.95	-
SEME640200114E	R0.1	2.0	4	3	14	50	1.95	-
SEME640200116E	R0.1	2.0	4	3	16	50	1.95	-
SEME640200120E	R0.1	2.0	4	3	20	50	1.95	-
SEME640200122E	R0.1	2.0	4	3	22	60	1.95	-
SEME640200126E	R0.1	2.0	4	3	26	60	1.95	-
SEME640200130E	R0.1	2.0	4	3	30	70	1.95	-
SEME640200206E	R0.2	2.0	4	3	6	50	1.95	-
SEME640200208E	R0.2	2.0	4	3	8	50	1.95	-
SEME640200210E	R0.2	2.0	4	3	10	50	1.95	-
SEME640200212E	R0.2	2.0	4	3	12	50	1.95	-
SEME640200214E	R0.2	2.0	4	3	14	50	1.95	-
SEME640200216E	R0.2	2.0	4	3	16	50	1.95	-
SEME640200220E	R0.2	2.0	4	3	20	50	1.95	-
SEME640200222E	R0.2	2.0	4	3	22	60	1.95	-
SEME640200226E	R0.2	2.0	4	3	26	60	1.95	-
SEME640200230E	R0.2	2.0	4	3	30	70	1.95	-
SEME640200306E	R0.3	2.0	4	3	6	50	1.95	-
SEME640200308E	R0.3	2.0	4	3	8	50	1.95	-
SEME640200310E	R0.3	2.0	4	3	10	50	1.95	-
SEME640200312E	R0.3	2.0	4	3	12	50	1.95	-
SEME640200314E	R0.3	2.0	4	3	14	50	1.95	-

▶ NEXT PAGE

Corner Radius Tolerance (mm)	Mill Dia.Tolerance (mm)	Shank Dia.Tolerance
± 0.02	0 ~ - 0.03	h5

◎ : Excellent ○ : Good

ISO	P																			
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																		○		◎	○

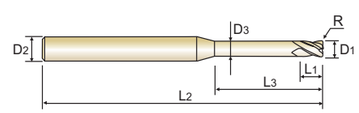
4G MILL END MILLS

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CARBIDE | 4 | 27°/30° | R ±0.02 | PLAIN | Y Coating | p.C214-C217

D<Ø3, 30° HELIX

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	Remark
SEME640200316E	R0.3	2.0	4	3	16	50	1.95	-
SEME640200320E	R0.3	2.0	4	3	20	50	1.95	-
SEME640200322E	R0.3	2.0	4	3	22	60	1.95	-
SEME640200326E	R0.3	2.0	4	3	26	60	1.95	-
SEME640200330E	R0.3	2.0	4	3	30	70	1.95	-
SEME640200506E	R0.5	2.0	4	3	6	50	1.95	-
SEME640200508E	R0.5	2.0	4	3	8	50	1.95	-
SEME640200510E	R0.5	2.0	4	3	10	50	1.95	-
SEME640200512E	R0.5	2.0	4	3	12	50	1.95	-
SEME640200514E	R0.5	2.0	4	3	14	50	1.95	-
SEME640200516E	R0.5	2.0	4	3	16	50	1.95	-
SEME640200520E	R0.5	2.0	4	3	20	50	1.95	-
SEME640200522E	R0.5	2.0	4	3	22	60	1.95	-
SEME640200526E	R0.5	2.0	4	3	26	60	1.95	-
SEME640200530E	R0.5	2.0	4	3	30	70	1.95	-
SEME640250108E	R0.1	2.5	4	4	8	50	2.40	-
SEME640250110E	R0.1	2.5	4	4	10	50	2.40	-
SEME640250112E	R0.1	2.5	4	4	12	50	2.40	-
SEME640250114E	R0.1	2.5	4	4	14	50	2.40	-
SEME640250116E	R0.1	2.5	4	4	16	50	2.40	-
SEME640250120E	R0.1	2.5	4	4	20	50	2.40	-
SEME640250126E	R0.1	2.5	4	4	26	60	2.40	-
SEME640250130E	R0.1	2.5	4	4	30	70	2.40	-
SEME640250208E	R0.2	2.5	4	4	8	50	2.40	-

▶ NEXT PAGE

Corner Radius Tolerance (mm)	Mill Dia.Tolerance (mm)	Shank Dia.Tolerance
± 0.02	0 ~ - 0.03	h5

◎ : Excellent ○ : Good

ISO	P																			
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																		○		◎	○

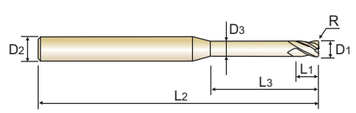
4G MILL END MILLS

PLAIN SHANK **SEME64** SERIES

CARBIDE, 4 FLUTE MULTIPLE HELIX CORNER RADIUS with EXTENDED NECK

▶ New coating and tool geometry applied resulting outstanding cutting abilities and wear resistance.
▶ Excellent performance when cutting prehardened steels, up to HRc55 which are used for molds & dies.
▶Multiple Helix for 3.0mm and over 3.0mm diameter endmills minimizing vibration and decreasing wear in cutting.





CARBIDE | 4 | 27°/30° | R ±0.02 | PLAIN | Y Coating | p.C214-C217

D<Ø3, 30° HELIX

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	Remark
SEME640250210E	R0.2	2.5	4	4	10	50	2.40	-
SEME640250212E	R0.2	2.5	4	4	12	50	2.40	-
SEME640250214E	R0.2	2.5	4	4	14	50	2.40	-
SEME640250216E	R0.2	2.5	4	4	16	50	2.40	-
SEME640250220E	R0.2	2.5	4	4	20	50	2.40	-
SEME640250226E	R0.2	2.5	4	4	26	60	2.40	-
SEME640250230E	R0.2	2.5	4	4	30	70	2.40	-
SEME640250308E	R0.3	2.5	4	4	8	50	2.40	-
SEME640250310E	R0.3	2.5	4	4	10	50	2.40	-
SEME640250312E	R0.3	2.5	4	4	12	50	2.40	-
SEME640250314E	R0.3	2.5	4	4	14	50	2.40	-
SEME640250316E	R0.3	2.5	4	4	16	50	2.40	-
SEME640250320E	R0.3	2.5	4	4	20	50	2.40	-
SEME640250326E	R0.3	2.5	4	4	26	60	2.40	-
SEME640250330E	R0.3	2.5	4	4	30	70	2.40	-
SEME640250508E	R0.5	2.5	4	4	8	50	2.40	-
SEME640250510E	R0.5	2.5	4	4	10	50	2.40	-
SEME640250512E	R0.5	2.5	4	4	12	50	2.40	-
SEME640250514E	R0.5	2.5	4	4	14	50	2.40	-
SEME640250516E	R0.5	2.5	4	4	16	50	2.40	-
SEME640250520E	R0.5	2.5	4	4	20	50	2.40	-
SEME640250526E	R0.5	2.5	4	4	26	60	2.40	-
SEME640250530E	R0.5	2.5	4	4	30	70	2.40	-
SEME640300108E	R0.1	3.0	6	4.5	8	50	2.85	-

▶ NEXT PAGE

Corner Radius Tolerance (mm)	Mill Dia.Tolerance (mm)	Shank Dia.Tolerance
± 0.02	0 ~ - 0.03	h5

◎ : Excellent ○ : Good

ISO	P																			
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																		○		◎	○

CARBIDE
HSS
i-Xmill END MILLS
X-1EH END MILLS
4G MILL END MILLS
X-POWER PRO END MILLS
TitaNox-POWER END MILLS
V7 PLUS END MILLS
ALU-CUT END MILLS
K-2 END MILLS
GENERAL CARBIDE END MILLS

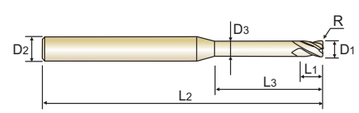
4G MILL END MILLS

PLAIN SHANK SEME64 SERIES

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CARBIDE | 4 | 27°/30° | R ±0.02 | PLAIN | Y Coating | p.C214-C217

D<Ø3, 30° HELIX

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	Remark
SEME640300110E	R0.1	3.0	6	4.5	10	50	2.85	-
SEME640300112E	R0.1	3.0	6	4.5	12	50	2.85	-
SEME640300114E	R0.1	3.0	6	4.5	14	60	2.85	-
SEME640300116E	R0.1	3.0	6	4.5	16	60	2.85	-
SEME640300120E	R0.1	3.0	6	4.5	20	60	2.85	-
SEME640300126E	R0.1	3.0	6	4.5	26	65	2.85	-
SEME640300130E	R0.1	3.0	6	4.5	30	70	2.85	-
SEME640300135E	R0.1	3.0	6	4.5	35	70	2.85	-
SEME640300140E	R0.1	3.0	6	4.5	40	80	2.85	-
SEME640300208E	R0.2	3.0	6	4.5	8	50	2.85	-
SEME640300210E	R0.2	3.0	6	4.5	10	50	2.85	-
SEME640300212E	R0.2	3.0	6	4.5	12	50	2.85	-
SEME640300214E	R0.2	3.0	6	4.5	14	60	2.85	-
SEME640300216E	R0.2	3.0	6	4.5	16	60	2.85	-
SEME640300218E	R0.2	3.0	6	4.5	18	60	2.85	-
SEME640300220E	R0.2	3.0	6	4.5	20	60	2.85	-
SEME640300226E	R0.2	3.0	6	4.5	26	65	2.85	-
SEME640300230E	R0.2	3.0	6	4.5	30	70	2.85	-
SEME640300235E	R0.2	3.0	6	4.5	35	70	2.85	-
SEME640300240E	R0.2	3.0	6	4.5	40	80	2.85	-
SEME640300308E	R0.3	3.0	6	4.5	8	50	2.85	-
SEME640300310E	R0.3	3.0	6	4.5	10	50	2.85	-
SEME640300312E	R0.3	3.0	6	4.5	12	50	2.85	-
SEME640300314E	R0.3	3.0	6	4.5	14	60	2.85	-

▶ NEXT PAGE

Corner Radius Tolerance (mm)	Mill Dia.Tolerance (mm)	Shank Dia.Tolerance
± 0.02	0 ~ - 0.03	h5

◎ : Excellent ○ : Good

ISO	P																			
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																		○		◎	○

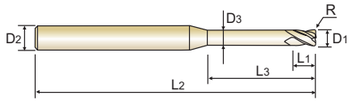
4G MILL END MILLS

PLAIN SHANK **SEME64** SERIES

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CARBIDE | 4 | 27°/30° | R ±0.02 | PLAIN | Y Coating | p.C214-C217

D<Ø3, 30˚ HELIX

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	Remark
SEME640300316E	R0.3	3.0	6	4.5	16	60	2.85	-
SEME640300320E	R0.3	3.0	6	4.5	20	60	2.85	-
SEME640300326E	R0.3	3.0	6	4.5	26	65	2.85	-
SEME640300330E	R0.3	3.0	6	4.5	30	70	2.85	-
SEME640300335E	R0.3	3.0	6	4.5	35	70	2.85	-
SEME640300340E	R0.3	3.0	6	4.5	40	80	2.85	-
SEME640300508E	R0.5	3.0	6	4.5	8	50	2.85	-
SEME640300510E	R0.5	3.0	6	4.5	10	50	2.85	-
SEME640300512E	R0.5	3.0	6	4.5	12	50	2.85	-
SEME640300514E	R0.5	3.0	6	4.5	14	60	2.85	-
SEME640300516E	R0.5	3.0	6	4.5	16	60	2.85	-
SEME640300520E	R0.5	3.0	6	4.5	20	60	2.85	-
SEME640300526E	R0.5	3.0	6	4.5	26	65	2.85	-
SEME640300530E	R0.5	3.0	6	4.5	30	70	2.85	-
SEME640300535E	R0.5	3.0	6	4.5	35	70	2.85	-
SEME640300540E	R0.5	3.0	6	4.5	40	80	2.85	-
SEME640301008E	R1.0	3.0	6	4.5	8	50	2.85	-
SEME640301010E	R1.0	3.0	6	4.5	10	50	2.85	-
SEME640301012E	R1.0	3.0	6	4.5	12	50	2.85	-
SEME640301014E	R1.0	3.0	6	4.5	14	60	2.85	-
SEME640301016E	R1.0	3.0	6	4.5	16	60	2.85	-
SEME640301020E	R1.0	3.0	6	4.5	20	60	2.85	-
SEME640301026E	R1.0	3.0	6	4.5	26	65	2.85	-
SEME640301030E	R1.0	3.0	6	4.5	30	70	2.85	-

▶ NEXT PAGE

Corner Radius Tolerance (mm)	Mill Dia.Tolerance (mm)	Shank Dia.Tolerance
± 0.02	0 ~ - 0.03	h5

◎ : Excellent ○ : Good

ISO	P																			
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																		○		◎	○

CARBIDE
HSS
i-Xmill END MILLS
X-1EH END MILLS
4G MILL END MILLS
X-POWER PRO END MILLS
TitaNox-POWER END MILLS
V7 PLUS END MILLS
ALU-CUT END MILLS
K-2 END MILLS
GENERAL CARBIDE END MILLS

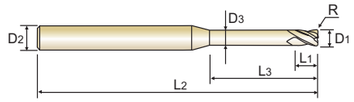
4G MILL END MILLS

PLAIN SHANK **SEME64** SERIES

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CARBIDE | 4 | 27°/30° | R ±0.02 | PLAIN | Y Coating | p.C214-C217

D<Ø3, 30˚ HELIX

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	Remark
SEME640301035E	R1.0	3.0	6	4.5	35	70	2.85	-
SEME640301040E	R1.0	3.0	6	4.5	40	80	2.85	-
SEME640400110E	R0.1	4.0	6	6	10	50	3.85	-
SEME640400112E	R0.1	4.0	6	6	12	50	3.85	-
SEME640400114E	R0.1	4.0	6	6	14	60	3.85	-
SEME640400116E	R0.1	4.0	6	6	16	60	3.85	-
SEME640400120E	R0.1	4.0	6	6	20	60	3.85	-
SEME640400126E	R0.1	4.0	6	6	26	65	3.85	-
SEME640400130E	R0.1	4.0	6	6	30	70	3.85	-
SEME640400135E	R0.1	4.0	6	6	35	70	3.85	-
SEME640400140E	R0.1	4.0	6	6	40	80	3.85	-
SEME640400145E	R0.1	4.0	6	6	45	90	3.85	-
SEME640400150E	R0.1	4.0	6	6	50	100	3.85	-
SEME640400210E	R0.2	4.0	6	6	10	50	3.85	-
SEME640400212E	R0.2	4.0	6	6	12	50	3.85	-
SEME640400214E	R0.2	4.0	6	6	14	60	3.85	-
SEME640400216E	R0.2	4.0	6	6	16	60	3.85	-
SEME640400220E	R0.2	4.0	6	6	20	60	3.85	-
SEME640400224E	R0.2	4.0	6	6	24	65	3.85	-
SEME640400226E	R0.2	4.0	6	6	26	65	3.85	-
SEME640400230E	R0.2	4.0	6	6	30	70	3.85	-
SEME640400235E	R0.2	4.0	6	6	35	70	3.85	-
SEME640400240E	R0.2	4.0	6	6	40	80	3.85	-
SEME640400245E	R0.2	4.0	6	6	45	90	3.85	-

▶ NEXT PAGE

Corner Radius Tolerance (mm)	Mill Dia.Tolerance (mm)	Shank Dia.Tolerance
± 0.02	0 ~ - 0.03	h5

◎ : Excellent ○ : Good

ISO	P																			
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																		○		◎	○

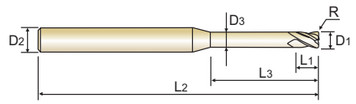
4G MILL END MILLS

PLAIN SHANK **SEME64** SERIES

CARBIDE, 4 FLUTE MULTIPLE HELIX CORNER RADIUS with EXTENDED NECK

▶ New coating and tool geometry applied resulting outstanding cutting abilities and wear resistance.
▶ Excellent performance when cutting prehardened steels, up to HRc55 which are used for molds & dies.
▶Multiple Helix for 3.0mm and over 3.0mm diameter endmills minimizing vibration and decreasing wear in cutting.





CARBIDE | 4 | 27°/30° | R ±0.02 | PLAIN | Y Coating | p.C214-C217

D<Ø3, 30° HELIX

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	Remark
SEME640400250E	R0.2	4.0	6	6	50	100	3.85	-
SEME640400310E	R0.3	4.0	6	6	10	50	3.85	-
SEME640400312E	R0.3	4.0	6	6	12	50	3.85	-
SEME640400314E	R0.3	4.0	6	6	14	60	3.85	-
SEME640400316E	R0.3	4.0	6	6	16	60	3.85	-
SEME640400320E	R0.3	4.0	6	6	20	60	3.85	-
SEME640400326E	R0.3	4.0	6	6	26	65	3.85	-
SEME640400330E	R0.3	4.0	6	6	30	70	3.85	-
SEME640400335E	R0.3	4.0	6	6	35	70	3.85	-
SEME640400340E	R0.3	4.0	6	6	40	80	3.85	-
SEME640400345E	R0.3	4.0	6	6	45	90	3.85	-
SEME640400350E	R0.3	4.0	6	6	50	100	3.85	-
SEME640400510E	R0.5	4.0	6	6	10	50	3.85	-
SEME640400512E	R0.5	4.0	6	6	12	50	3.85	-
SEME640400514E	R0.5	4.0	6	6	14	60	3.85	-
SEME640400516E	R0.5	4.0	6	6	16	60	3.85	-
SEME640400520E	R0.5	4.0	6	6	20	60	3.85	-
SEME640400526E	R0.5	4.0	6	6	26	65	3.85	-
SEME640400530E	R0.5	4.0	6	6	30	70	3.85	-
SEME640400535E	R0.5	4.0	6	6	35	70	3.85	-
SEME640400540E	R0.5	4.0	6	6	40	80	3.85	-
SEME640400545E	R0.5	4.0	6	6	45	90	3.85	-
SEME640400550E	R0.5	4.0	6	6	50	100	3.85	-
SEME640401010E	R1.0	4.0	6	6	10	50	3.85	-

▶ NEXT PAGE

Corner Radius Tolerance (mm)	Mill Dia.Tolerance (mm)	Shank Dia.Tolerance
± 0.02	0 ~ - 0.03	h5

◎ : Excellent ○ : Good

ISO	P																			
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																		○		◎	○

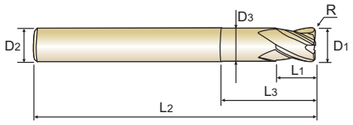
4G MILL END MILLS

PLAIN SHANK SEME64 SERIES

CARBIDE, 4 FLUTE MULTIPLE HELIX CORNER RADIUS with EXTENDED NECK

▶ New coating and tool geometry applied resulting outstanding cutting abilities and wear resistance.
▶ Excellent performance when cutting prehardened steels, up to HRc55 which are used for molds & dies.
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CARBIDE | 4 | 27°/30° | R ±0.02 | PLAIN | Y Coating | p.C214-C217

D<Ø3, 30° HELIX

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	Remark
SEME640401012E	R1.0	4.0	6	6	12	50	3.85	-
SEME640401014E	R1.0	4.0	6	6	14	60	3.85	-
SEME640401016E	R1.0	4.0	6	6	16	60	3.85	-
SEME640401020E	R1.0	4.0	6	6	20	60	3.85	-
SEME640401026E	R1.0	4.0	6	6	26	65	3.85	-
SEME640401030E	R1.0	4.0	6	6	30	70	3.85	-
SEME640401035E	R1.0	4.0	6	6	35	70	3.85	-
SEME640401040E	R1.0	4.0	6	6	40	80	3.85	-
SEME640401045E	R1.0	4.0	6	6	45	90	3.85	-
SEME640401050E	R1.0	4.0	6	6	50	100	3.85	-
SEME6405001E	R0.1	5.0	6	8	15	60	4.85	-
SEME6405002E	R0.2	5.0	6	8	15	60	4.85	-
SEME6405003E	R0.3	5.0	6	8	15	60	4.85	-
SEME6405005E	R0.5	5.0	6	8	15	60	4.85	-
SEME6405010E	R1.0	5.0	6	8	15	60	4.85	-
SEME6405015E	R1.5	5.0	6	8	15	60	4.85	-
SEME6405020E	R2.0	5.0	6	8	15	60	4.85	-
SEME6406001E	R0.1	6.0	6	9	20	60	5.85	Regular
SEME6406002E	R0.2	6.0	6	9	20	60	5.85	Regular
SEME6406003E	R0.3	6.0	6	9	20	60	5.85	Regular
SEME6406005E	R0.5	6.0	6	9	20	60	5.85	Regular
SEME6406010E	R1.0	6.0	6	9	20	60	5.85	Regular
SEME6406015E	R1.5	6.0	6	9	20	60	5.85	Regular
SEME6406020E	R2.0	6.0	6	9	20	60	5.85	Regular

▶ NEXT PAGE

Corner Radius Tolerance (mm)	Mill Dia.Tolerance (mm)	Shank Dia.Tolerance
± 0.02	0 ~ - 0.03	h5

◎ : Excellent ○ : Good

ISO	P																			
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																		○		◎	○

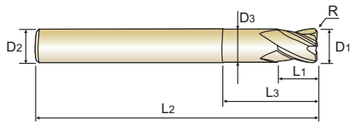
4G MILL END MILLS

PLAIN SHANK **SEME64** SERIES

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CARBIDE | 4 | 27°/30° | R ±0.02 | PLAIN | Y Coating | p.C214-C217

D<Ø3, 30° HELIX

Unit : mm

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	
SEME6406003090E	R0.3	**6.0**	6	15	30	90	5.85	Long
SE5E640600524LE	R0.5	**6.0**	6	9	24	90	5.85	-
SEME6406005090E	R0.5	**6.0**	6	15	30	90	5.85	Long
SEME6406010090E	R1.0	**6.0**	6	15	30	90	5.85	Long
SEME6408001E	R0.1	**8.0**	8	12	25	70	7.70	Regular
SEME6408002E	R0.2	**8.0**	8	12	25	70	7.70	Regular
SEME6408003E	R0.3	**8.0**	8	12	25	70	7.70	Regular
SEME6408005E	R0.5	**8.0**	8	12	25	70	7.70	Regular
SEME6408010E	R1.0	**8.0**	8	12	25	70	7.70	Regular
SEME6408015E	R1.5	**8.0**	8	12	25	70	7.70	Regular
SEME6408020E	R2.0	**8.0**	8	12	25	70	7.70	Regular
SEME6408003100E	R0.3	**8.0**	8	20	35	100	7.70	Long
SEME6408005100E	R0.5	**8.0**	8	20	35	100	7.70	Long
SEME6408010100E	R1.0	**8.0**	8	20	35	100	7.70	Long
SEME6410001E	R0.1	**10.0**	10	15	30	75	9.70	Regular
SEME6410002E	R0.2	**10.0**	10	15	30	75	9.70	Regular
SEME6410003E	R0.3	**10.0**	10	15	30	75	9.70	Regular
SEME6410005E	R0.5	**10.0**	10	15	30	75	9.70	Regular
SEME6410010E	R1.0	**10.0**	10	15	30	75	9.70	Regular
SEME6410015E	R1.5	**10.0**	10	15	30	75	9.70	Regular
SEME6410020E	R2.0	**10.0**	10	15	30	75	9.70	Regular
SEME6410003100E	R0.3	**10.0**	10	25	40	100	9.70	Long
SEME6410005100E	R0.5	**10.0**	10	25	40	100	9.70	Long
SEME6410010100E	R1.0	**10.0**	10	25	40	100	9.70	Long

▶ NEXT PAGE

Corner Radius Tolerance (mm)	Mill Dia.Tolerance (mm)	Shank Dia.Tolerance
± 0.02	0 ~ - 0.03	h5

◎ : Excellent ○ : Good

ISO	P																			
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																		○		◎	○

CARBIDE
HSS
i-Xmill END MILLS
X-1EH END MILLS
4G MILL END MILLS
X-POWER PRO END MILLS
TitaNox-POWER END MILLS
V7 PLUS END MILLS
ALU-CUT END MILLS
K-2 END MILLS
GENERAL CARBIDE END MILLS

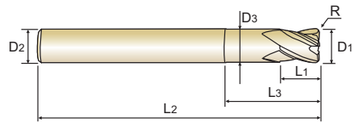
4G MILL END MILLS

PLAIN SHANK **SEME64** SERIES

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CARBIDE | 4 | 27°/30° | R ±0.02 | PLAIN | Y Coating | p.C214-C217

D<Ø3, 30° HELIX

Unit : mm

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	
SEME6412002E	R0.2	**12.0**	12	18	32	80	11.70	Regular
SEME6412003E	R0.3	**12.0**	12	18	32	80	11.70	Regular
SEME6412005E	R0.5	**12.0**	12	18	32	80	11.70	Regular
SEME6412010E	R1.0	**12.0**	12	18	32	80	11.70	Regular
SEME6412015E	R1.5	**12.0**	12	18	32	80	11.70	Regular
SEME6412020E	R2.0	**12.0**	12	18	32	80	11.70	Regular
SEME6412003110E	R0.3	**12.0**	12	30	50	110	11.70	Long
SEME6412005110E	R0.5	**12.0**	12	30	50	110	11.70	Long
SEME6412010110E	R1.0	**12.0**	12	30	50	110	11.70	Long
SEME6416005E	R0.5	**16.0**	16	20	35	100	15.70	Regular
SEME6416010E	R1.0	**16.0**	16	20	35	100	15.70	Regular
SEME6416005150E	R0.5	**16.0**	16	35	50	150	15.70	Long
SEME6416010150E	R1.0	**16.0**	16	35	50	150	15.70	Long
SEME6420005E	R0.5	**20.0**	20	25	40	100	19.70	Regular
SEME6420010E	R1.0	**20.0**	20	25	40	100	19.70	Regular
SEME6420005150E	R0.5	**20.0**	20	40	55	150	19.70	Long
SEME6420010150E	R1.0	**20.0**	20	40	55	150	19.70	Long

Corner Radius Tolerance (mm)	Mill Dia.Tolerance (mm)	Shank Dia.Tolerance
± 0.02	0 ~ - 0.03	h5

◎ : Excellent ○ : Good

ISO	P																			
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																		○		◎	○

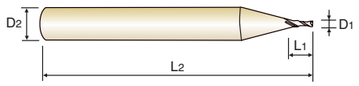
4G MILL END MILLS

PLAIN SHANK **SEME35** SERIES

CARBIDE, 2 FLUTE

▶ New coating and tool geometry applied resulting outstanding cutting abilities and wear resistance.
▶Excellent performance when cutting prehardened steels, up to HRc55 which are used for molds & dies.
▶From a sharp edge geometry at the end tooth, cutting abilities at work process is increased.





CARBIDE | 2 | 30° | PLAIN | Y Coating | p.C218-C221

Unit : mm

EDP No.	Mill Diameter D1	Shank Diameter D2	Length of Cut L1	Overall Length L2
SEME35001E	0.1	4	0.2	40
SEME350015E	0.15	4	0.3	40
SEME35002E	0.2	4	0.4	40
SEME350025E	0.25	4	0.5	40
SEME35003E	0.3	4	0.6	40
SEME350035E	0.35	4	0.7	40
SEME35004E	0.4	4	0.8	40
SEME350045E	0.45	4	0.9	40
SEME35005E	0.5	4	1.0	40
SEME350055E	0.55	4	1.1	40
SEME35006E	0.6	4	1.2	40
SEME350065E	0.65	4	1.3	40
SEME35007E	0.7	4	1.4	40
SEME350075E	0.75	4	1.5	40
SEME35008E	0.8	4	1.6	40
SEME350085E	0.85	4	1.7	40
SEME35009E	0.9	4	1.8	40
SEME350095E	0.95	4	2	40
SEME35010E	1.0	6	2.5	50
SEME35012E	1.2	6	3	50
SEME35015E	1.5	6	4	50
SEME35020E	2.0	6	6	50
SEME35025E	2.5	6	7	50
SEME35030E	3.0	6	8	50

▶ 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	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																		○		◎	○		

CARBIDE
HSS
i-Xmill END MILLS
X-1EH END MILLS
4G MILL END MILLS
X-POWER PRO END MILLS
TitaNox-POWER END MILLS
V7 PLUS END MILLS
ALU-CUT END MILLS
K-2 END MILLS
GENERAL CARBIDE END MILLS

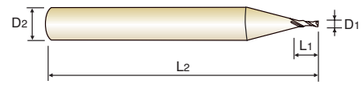
4G MILL END MILLS

PLAIN SHANK **SEME35** SERIES

CARBIDE, 2 FLUTE

▶ New coating and tool geometry applied resulting outstanding cutting abilities and wear resistance.
▶Excellent performance when cutting prehardened steels, up to HRc55 which are used for molds & dies.
▶From a sharp edge geometry at the end tooth, cutting abilities at work process is increased.





CARBIDE | 2 | 30° | PLAIN | Y Coating | p.C218-C221

Unit : mm

EDP No.	Mill Diameter D1	Shank Diameter D2	Length of Cut L1	Overall Length L2
SEME35035E	3.5	6	10	50
SEME35040E	4.0	6	10	50
SEME35045E	4.5	6	14	50
SEME35050E	5.0	6	15	60
SEME35055E	5.5	6	15	60
SEME35060E	6.0	6	15	60
SEME35065E	6.5	8	18	60
SEME35070E	7.0	8	20	60
SEME35075E	7.5	8	20	60
SEME35080E	8.0	8	20	70
SEME35085E	8.5	10	22	70
SEME35090E	9.0	10	22	70
SEME35095E	9.5	10	24	70
SEME35100E	10.0	10	25	75
SEME35105E	10.5	12	26	75
SEME35110E	11.0	12	30	75
SEME35115E	11.5	12	30	80
SEME35120E	12.0	12	30	80
SEME35130E	13.0	12	35	100
SEME3514012SE	14.0	12	35	100
SEME3514014SE	14.0	14	35	100
SEME35140E	14.0	16	35	100
SEME35150E	15.0	16	38	100
SEME35160E	16.0	16	40	100

▶ 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	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													
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																		○		◎	○		

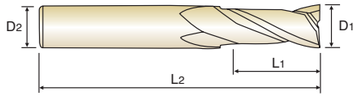
4G MILL END MILLS

PLAIN SHANK **SEME35** SERIES

CARBIDE, 2 FLUTE

▶ New coating and tool geometry applied resulting outstanding cutting abilities and wear resistance.
▶Excellent performance when cutting prehardened steels, up to HRc55 which are used for molds & dies.
▶From a sharp edge geometry at the end tooth, cutting abilities at work process is increased.





CARBIDE | 2 | 30° | PLAIN | Y Coating | p.C218-C221

Unit : mm

EDP No.	Mill Diameter D1	Shank Diameter D2	Length of Cut L1	Overall Length L2
SEME35170E	17.0	16	42	100
SEME35180E	18.0	16	45	100
SEME3518018SE	18.0	18	45	100
SEME35190E	19.0	20	45	100
SEME35200E	20.0	20	45	100
SEME35210E	21.0	20	45	100
SEME35220E	22.0	20	45	100
SEME35230E	23.0	25	50	120
SEME35240E	24.0	25	50	120
SEME35250E	25.0	25	50	120

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

◎ : Excellent ○ : Good

ISO	P																			
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																		○		◎	○

CARBIDE
HSS
i-Xmill END MILLS
X-1EH END MILLS
4G MILL END MILLS
X-POWER PRO END MILLS
TitaNox-POWER END MILLS
V7 PLUS END MILLS
ALU-CUT END MILLS
K-2 END MILLS
GENERAL CARBIDE END MILLS

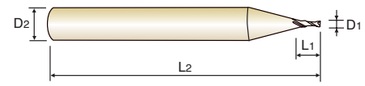
4G MILL END MILLS

PLAIN SHANK **SEME35** SERIES

CARBIDE, 2 FLUTE (4mm Shank)

▶ New coating and tool geometry applied resulting outstanding cutting abilities and wear resistance.
▶Excellent performance when cutting prehardened steels, up to HRc55 which are used for molds & dies.
▶From a sharp edge geometry at the end tooth, cutting abilities at work process is increased.





CARBIDE | 2 | 30° | PLAIN | Y Coating | p.C218-C221

Unit : mm

EDP No.	Mill Diameter D1	Shank Diameter D2	Length of Cut L1	Overall Length L2
SEME350104SE	1.0	4	2.5	50
SEME350114SE	1.1	4	3	50
SEME350124SE	1.2	4	3	50
SEME350134SE	1.3	4	3	50
SEME350144SE	1.4	4	4	50
SEME350154SE	1.5	4	4	50
SEME350164SE	1.6	4	4	50
SEME350174SE	1.7	4	4	50
SEME350184SE	1.8	4	5	50
SEME350194SE	1.9	4	5	50
SEME350204SE	2.0	4	6	50
SEME350214SE	2.1	4	6	50
SEME350224SE	2.2	4	6	50
SEME350234SE	2.3	4	6	50
SEME350244SE	2.4	4	6	50
SEME350254SE	2.5	4	8	50
SEME350264SE	2.6	4	8	50
SEME350274SE	2.7	4	8	50
SEME350284SE	2.8	4	8	50
SEME350294SE	2.9	4	8	50
SEME350304SE	3.0	4	8	50
SEME350354SE	3.5	4	10	50
SEME350404SE	4.0	4	10	50
SEME350404S080E	4.0	4	10	80

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

◎ : Excellent ○ : Good

ISO	P																			
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																		○		◎	○

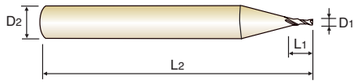
4G MILL END MILLS

PLAIN SHANK **SEME35** SERIES

CARBIDE, 2 FLUTE (3mm Shank)

▶ New coating and tool geometry applied resulting outstanding cutting abilities and wear resistance.
▶Excellent performance when cutting prehardened steels, up to HRc55 which are used for molds & dies.
▶From a sharp edge geometry at the end tooth, cutting abilities at work process is increased.





CARBIDE | 2 | 30° | PLAIN | Y Coating | p.C218-C221

Unit : mm

EDP No.	Mill Diameter D1	Shank Diameter D2	Length of Cut L1	Overall Length L2
SEME350013SE	0.1	3	0.2	40
SEME350023SE	0.2	3	0.4	40
SEME350033SE	0.3	3	0.6	40
SEME350043SE	0.4	3	0.8	40
SEME350053SE	0.5	3	1.0	40
SEME350063SE	0.6	3	1.2	40
SEME350073SE	0.7	3	1.4	40
SEME350083SE	0.8	3	1.6	40
SEME350093SE	0.9	3	1.8	40
SEME350103SE	1.0	3	2.5	50
SEME350123SE	1.2	3	3	50
SEME350153SE	1.5	3	4	50
SEME350203SE	2.0	3	6	50
SEME350253SE	2.5	3	7	50
SEME350303SE	3.0	3	8	50

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

◎ : Excellent ○ : Good

ISO	P																			
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																		○		◎	○

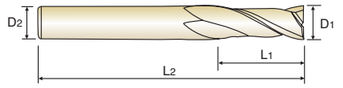
4G MILL END MILLS

PLAIN SHANK **SEME70** SERIES

CARBIDE, 2 FLUTE LONG LENGTH

▶ New coating and tool geometry applied resulting outstanding cutting abilities and wear resistance.
▶Excellent performance when cutting prehardened steels, up to HRc55 which are used for molds & dies.
▶ Available in various lengths of cut and also overall lengths.





CARBIDE | 2 | 30° | PLAIN | Y Coating | p.C222-C227

Unit : mm

EDP No.	Mill Diameter D1	Shank Diameter D2	Length of Cut L1	Overall Length L2
SEME7001003E	1.0	6	3	60
SEME7001004E	1.0	6	4	60
SEME7001005E	1.0	6	5	60
SEME7001006E	1.0	6	6	60
SEME7001007E	1.0	6	7	60
SEME7001008E	1.0	6	8	60
SEME7001010E	1.0	6	10	60
SEME7001012E	1.0	6	12	60
SEME7001204E	1.2	6	4	60
SEME7001206E	1.2	6	6	60
SEME7001208E	1.2	6	8	60
SEME7001210E	1.2	6	10	60
SEME7001212E	1.2	6	12	60
SEME7001506E	1.5	6	6	60
SEME7001508E	1.5	6	8	60
SEME7001510E	1.5	6	10	60
SEME7001512E	1.5	6	12	60
SEME7001514E	1.5	6	14	60
SEME7001516E	1.5	6	16	60
SEME7002008E	2.0	6	8	60
SEME7002010E	2.0	6	10	60
SEME7002012E	2.0	6	12	60
SEME7002014E	2.0	6	14	60
SEME7002016E	2.0	6	16	60

▶ NEXT PAGE

Mill Dia.Tolerance (mm)	Shank Dia.Tolerance
0 ~ - 0.03	h5

◎ : Excellent ○ : Good

ISO	P																			
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																		○		◎	○

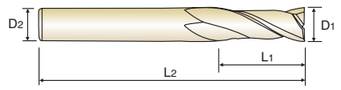
4G MILL END MILLS

PLAIN SHANK **SEME70** SERIES

CARBIDE, 2 FLUTE LONG LENGTH

▶ New coating and tool geometry applied resulting outstanding cutting abilities and wear resistance.
▶Excellent performance when cutting prehardened steels, up to HRc55 which are used for molds & dies.
▶ Available in various lengths of cut and also overall lengths.





CARBIDE | 2 | 30° | PLAIN | Y Coating | p.C222-C227

Unit : mm

EDP No.	Mill Diameter D1	Shank Diameter D2	Length of Cut L1	Overall Length L2
SEME7002510E	2.5	6	10	60
SEME7002512E	2.5	6	12	60
SEME7002516E	2.5	6	16	60
SEME7002520E	2.5	6	20	60
SEME7002526E	2.5	6	26	60
SEME70030163SE	3.0	3	16	100
SEME7003010E	3.0	6	10	70
SEME7003012E	3.0	6	12	70
SEME7003014E	3.0	6	14	70
SEME7003016E	3.0	6	16	70
SEME7003020E	3.0	6	20	70
SEME7003026E	3.0	6	26	70
SEME7003030E	3.0	6	30	70
SEME70040204SE	4.0	4	20	100
SEME7004012E	4.0	6	12	70
SEME7004016E	4.0	6	16	70
SEME7004020E	4.0	6	20	70
SEME7004026E	4.0	6	26	70
SEME7004030E	4.0	6	30	70
SEME7005020E	5.0	6	20	70
SEME7005025E	5.0	6	25	70
SEME70050251OOE	5.0	6	25	100
SEME7005030E	5.0	6	30	80
SEME7005035E	5.0	6	35	90

▶ NEXT PAGE

Mill Dia.Tolerance (mm)	Shank Dia.Tolerance
0 ~ - 0.03	h5

◎ : Excellent ○ : Good

ISO	P																			
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																		○		◎	○

CARBIDE
HSS
i-Xmill END MILLS
X-1EH END MILLS
4G MILL END MILLS
X-POWER PRO END MILLS
TitaNox-POWER END MILLS
V7 PLUS END MILLS
ALU-CUT END MILLS
K-2 END MILLS
GENERAL CARBIDE END MILLS

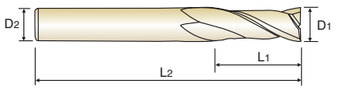
4G MILL END MILLS

PLAIN SHANK **SEME70** SERIES

CARBIDE, 2 FLUTE LONG LENGTH

▶ New coating and tool geometry applied resulting outstanding cutting abilities and wear resistance.
▶Excellent performance when cutting prehardened steels, up to HRc55 which are used for molds & dies.
▶ Available in various lengths of cut and also overall lengths.





CARBIDE | 2 | 30° | PLAIN | Y Coating | p.C222-C227

Unit : mm

EDP No.	Mill Diameter D1	Shank Diameter D2	Length of Cut L1	Overall Length L2
SEME7005040E	5.0	6	40	100
SEME7006015E	6.0	6	15	60
SEME7006015080E	6.0	6	15	80
SEME7006020E	6.0	6	20	70
SEME70060200900E	6.0	6	20	90
SEME7006025E	6.0	6	25	75
SEME7006030E	6.0	6	30	80
SEME7006030100E	6.0	6	30	100
SEME7006030150E	6.0	6	30	150
SEME7006035E	6.0	6	35	90
SEME7006040E	6.0	6	40	90
SEME7006040120E	6.0	6	40	120
SEME7006045E	6.0	6	45	150
SEME7008025E	8.0	8	25	80
SEME7008030E	8.0	8	30	80
SEME7008030100E	8.0	8	30	100
SEME7008035E	8.0	8	35	90
SEME7008040E	8.0	8	40	90
SEME7008040120E	8.0	8	40	120
SEME7008040150E	8.0	8	40	150
SEME7008045E	8.0	8	45	100
SEME7008050E	8.0	8	50	100
SEME7008050150E	8.0	8	50	150
SEME7010030E	10.0	10	30	80

▶ NEXT PAGE

Mill Dia.Tolerance (mm)	Shank Dia.Tolerance
0 ~ - 0.03	h5

◎ : Excellent ○ : Good

ISO	P																			
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																		○		◎	○

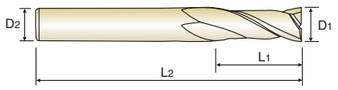
4G MILL END MILLS

PLAIN SHANK **SEME70** SERIES

CARBIDE, 2 FLUTE LONG LENGTH

▶ New coating and tool geometry applied resulting outstanding cutting abilities and wear resistance.
▶Excellent performance when cutting prehardened steels, up to HRc55 which are used for molds & dies.
▶ Available in various lengths of cut and also overall lengths.





CARBIDE | 2 | 30° | PLAIN | Y Coating | p.C222-C227

Unit : mm

EDP No.	Mill Diameter D1	Shank Diameter D2	Length of Cut L1	Overall Length L2
SEME7010030100E	10.0	10	30	100
SEME7010035E	10.0	10	35	90
SEME7010040E	10.0	10	40	90
SEME7010040120E	10.0	10	40	120
SEME7010045E	10.0	10	45	100
SEME7010050E	10.0	10	50	100
SEME7010050150E	10.0	10	50	150
SEME7010050200E	10.0	10	50	200
SEME7010055E	10.0	10	55	150
SEME7010060E	10.0	10	60	110
SEME7010060200E	10.0	10	60	200
SEME7012035E	12.0	12	35	90
SEME7012040E	12.0	12	40	100
SEME7012040120E	12.0	12	40	120
SEME7012045E	12.0	12	45	130
SEME7012050E	12.0	12	50	100
SEME7012050150E	12.0	12	50	150
SEME7012055E	12.0	12	55	110
SEME7012060E	12.0	12	60	110
SEME7012060150E	12.0	12	60	150
SEME7012060200E	12.0	12	60	200
SEME7012065E	12.0	12	65	150
SEME7012070E	12.0	12	70	120
SEME7012070200E	12.0	12	70	200

▶ NEXT PAGE

Mill Dia.Tolerance (mm)	Shank Dia.Tolerance
0 ~ - 0.03	h5

◎ : Excellent ○ : Good

ISO	P																			
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																		○		◎	○

CARBIDE
HSS
i-Xmill END MILLS
X-1EH END MILLS
4G MILL END MILLS
X-POWER PRO END MILLS
TitaNox-POWER END MILLS
V7 PLUS END MILLS
ALU-CUT END MILLS
K-2 END MILLS
GENERAL CARBIDE END MILLS

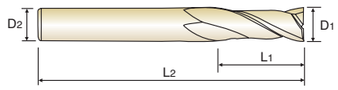
4G MILL END MILLS

PLAIN SHANK **SEME70** SERIES

CARBIDE, 2 FLUTE LONG LENGTH

▶ New coating and tool geometry applied resulting outstanding cutting abilities and wear resistance.
▶Excellent performance when cutting prehardened steels, up to HRc55 which are used for molds & dies.
▶ Available in various lengths of cut and also overall lengths.





CARBIDE | 2 | 30° | PLAIN | Y Coating | p.C222-C227

Unit : mm

EDP No.	Mill Diameter D1	Shank Diameter D2	Length of Cut L1	Overall Length L2
SEME7014050E	14.0	16	50	110
SEME7014060E	14.0	16	60	150
SEME7016040E	16.0	16	40	150
SEME7016050E	16.0	16	50	110
SEME7016050150E	16.0	16	50	150
SEME7016060E	16.0	16	60	120
SEME7016070E	16.0	16	70	130
SEME7016070150E	16.0	16	70	150
SEME7016070200E	16.0	16	70	200
SEME7016080E	16.0	16	80	150
SEME7016090E	16.0	16	90	150
SEME70160110E	16.0	16	110	200
SEME70160120E	16.0	16	120	250
SEME7018050E	18.0	20	50	120
SEME7018070E	18.0	20	70	130
SEME70180100E	18.0	20	100	200
SEME7020050E	20.0	20	50	110
SEME7020050150E	20.0	20	50	150
SEME7020060E	20.0	20	60	130
SEME7020070E	20.0	20	70	130
SEME7020080E	20.0	20	80	150
SEME7020090E	20.0	20	90	150
SEME7020090200E	20.0	20	90	200
SEME70200110E	20.0	20	110	200

▶ NEXT PAGE

Mill Dia.Tolerance (mm)	Shank Dia.Tolerance
0 ~ - 0.03	h5

◎ : 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																		○		◎	○

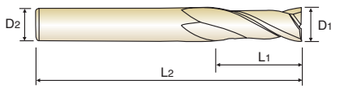
4G MILL END MILLS

PLAIN SHANK **SEME70** SERIES

CARBIDE, 2 FLUTE LONG LENGTH

▶ New coating and tool geometry applied resulting outstanding cutting abilities and wear resistance.
▶Excellent performance when cutting prehardened steels, up to HRc55 which are used for molds & dies.
▶ Available in various lengths of cut and also overall lengths.





CARBIDE | 2 | 30° | PLAIN | Y Coating

p.C222-C227

Unit : mm

EDP No.	Mill Diameter D1	Shank Diameter D2	Length of Cut L1	Overall Length L2
SEME70200120E	20.0	20	120	250
SEME7022075E	22.0	20	75	150
SEME70220110E	22.0	20	110	200
SEME7025070E	25.0	25	70	150
SEME7025090E	25.0	25	90	150
SEME70250110E	25.0	25	110	200

Mill Dia.Tolerance (mm)	Shank Dia.Tolerance
0 ~ - 0.03	h5

◎ : 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																		○		◎	○			

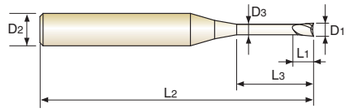
4G MILL END MILLS

PLAIN SHANK **SEM845** SERIES

CARBIDE, 2 FLUTE with EXTENDED NECK

▶ New coating and tool geometry applied resulting outstanding cutting abilities 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 size products, it is designed with a double neck to increase tool rigidity and to minimize vibration.
▶ Available in several effective lengths of cut and also overall lengths to apply on various rib processing.





CARBIDE | 2 | 30° | PLAIN | Y Coating

p.C228-C237

Unit : mm

EDP No.	Mill Diameter D1	Shank Diameter D2	Length of Cut L1	Length Below Shank L3	Overall Length L2	Neck Diameter D3
SEM845001003E	0.1	4	0.15	0.3	40	0.085
SEM845001005E	0.1	4	0.15	0.5	40	0.085
SEM84500101E	0.1	4	0.15	1	40	0.085
SEM84500150035SE	0.15	4	0.2	0.35	40	0.13
SEM845002005E	0.2	4	0.3	0.5	40	0.17
SEM84500201E	0.2	4	0.3	1	40	0.17
SEM845002015E	0.2	4	0.3	1.5	40	0.17
SEM84500202E	0.2	4	0.3	2	40	0.17
SEM84500301E	0.3	4	0.5	1	40	0.27
SEM845003015E	0.3	4	0.5	1.5	40	0.27
SEM84500302E	0.3	4	0.5	2	40	0.27
SEM845003025E	0.3	4	0.5	2.5	40	0.27
SEM84500303E	0.3	4	0.5	3	40	0.27
SEM84500304E	0.3	4	0.5	4	40	0.27
SEM84500305E	0.3	4	0.5	5	40	0.27
SEM84500401E	0.4	4	0.6	1	40	0.37
SEM845004015E	0.4	4	0.6	1.5	40	0.37
SEM84500402E	0.4	4	0.6	2	40	0.37
SEM845004025E	0.4	4	0.6	2.5	40	0.37
SEM84500403E	0.4	4	0.6	3	40	0.37
SEM84500404E	0.4	4	0.6	4	40	0.37
SEM84500405E	0.4	4	0.6	5	40	0.37
SEM84500406E	0.4	4	0.6	6	40	0.37
SEM84500408E	0.4	4	0.6	8	40	0.37

▶ 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	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																		○		◎	○			

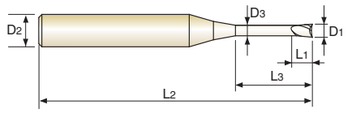
4G MILL END MILLS

PLAIN SHANK **SEM845** SERIES

CARBIDE, 2 FLUTE with EXTENDED NECK

- ▶ New coating and tool geometry applied resulting outstanding cutting abilities 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 size products, it is designed with a double neck to increase tool rigidity and to minimize vibration.
- ▶ Available in several effective lengths of cut and also overall lengths to apply on various rib processing.





CARBIDE | 2 | 30° | PLAIN | Y Coating | p.C228-C237

Unit : mm

EDP No.	Mill Diameter D1	Shank Diameter D2	Length of Cut L1	Length Below Shank L3	Overall Length L2	Neck Diameter D3
SEM84500410E	0.4	4	0.6	10	40	0.37
SEM84500501E	0.5	4	0.7	1	45	0.45
SEM845005015E	0.5	4	0.7	1.5	45	0.45
SEM84500502E	0.5	4	0.7	2	45	0.45
SEM845005025E	0.5	4	0.7	2.5	45	0.45
SEM84500503E	0.5	4	0.7	3	45	0.45
SEM84500504E	0.5	4	0.7	4	45	0.45
SEM84500505E	0.5	4	0.7	5	45	0.45
SEM84500506E	0.5	4	0.7	6	45	0.45
SEM84500508E	0.5	4	0.7	8	45	0.45
SEM84500510E	0.5	4	0.7	10	45	0.45
SEM84500512E	0.5	4	0.7	12	45	0.45
SEM84500514E	0.5	4	0.7	14	45	0.45
SEM84500516E	0.5	4	0.7	16	45	0.45
SEM84500602E	0.6	4	0.9	2	45	0.55
SEM84500603E	0.6	4	0.9	3	45	0.55
SEM84500604E	0.6	4	0.9	4	45	0.55
SEM84500605E	0.6	4	0.9	5	45	0.55
SEM84500606E	0.6	4	0.9	6	45	0.55
SEM84500608E	0.6	4	0.9	8	45	0.55
SEM84500610E	0.6	4	0.9	10	45	0.55
SEM84500612E	0.6	4	0.9	12	45	0.55
SEM84500614E	0.6	4	0.9	14	45	0.55
SEM84500616E	0.6	4	0.9	16	45	0.55

▶ 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	P																			
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																		○		◎	○

CARBIDE
HSS
i-Xmill END MILLS
X-1EH END MILLS
4G MILL END MILLS
X-POWER PRO END MILLS
TitaNox-POWER END MILLS
V7 PLUS END MILLS
ALU-CUT END MILLS
K-2 END MILLS
GENERAL CARBIDE END MILLS

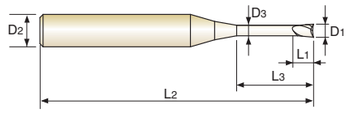
4G MILL END MILLS

PLAIN SHANK **SEM845** SERIES

CARBIDE, 2 FLUTE with EXTENDED NECK

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- ▶ For 1.0mm and under 1.0mm diameter size products, it is designed with a double neck to increase tool rigidity and to minimize vibration.
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CARBIDE | 2 | 30° | PLAIN | Y Coating | p.C228-C237

Unit : mm

EDP No.	Mill Diameter D1	Shank Diameter D2	Length of Cut L1	Length Below Shank L3	Overall Length L2	Neck Diameter D3
SEM84500702E	0.7	4	1.2	2	45	0.65
SEM84500704E	0.7	4	1.2	4	45	0.65
SEM84500706E	0.7	4	1.2	6	45	0.65
SEM84500708E	0.7	4	1.2	8	45	0.65
SEM84500710E	0.7	4	1.2	10	45	0.65
SEM84500712E	0.7	4	1.2	12	45	0.65
SEM84500802E	0.8	4	1.2	2	45	0.75
SEM84500803E	0.8	4	1.2	3	45	0.75
SEM84500804E	0.8	4	1.2	4	45	0.75
SEM84500805E	0.8	4	1.2	5	45	0.75
SEM84500806E	0.8	4	1.2	6	45	0.75
SEM84500808E	0.8	4	1.2	8	45	0.75
SEM84500810E	0.8	4	1.2	10	45	0.75
SEM84500812E	0.8	4	1.2	12	45	0.75
SEM84500814E	0.8	4	1.2	14	45	0.75
SEM84500816E	0.8	4	1.2	16	45	0.75
SEM84500820E	0.8	4	1.2	20	45	0.75
SEM84500906E	0.9	4	1.3	6	45	0.85
SEM84500908E	0.9	4	1.3	8	45	0.85
SEM84500910E	0.9	4	1.3	10	45	0.85
SEM84501002E	1.0	4	1.5	2	50	0.95
SEM84501003E	1.0	4	1.5	3	50	0.95
SEM84501004E	1.0	4	1.5	4	50	0.95
SEM84501005E	1.0	4	1.5	5	50	0.95

▶ 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	P																			
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																		○		◎	○

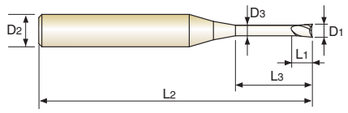
4G MILL END MILLS

PLAIN SHANK **SEM845** SERIES

CARBIDE, 2 FLUTE with EXTENDED NECK

- ▶ New coating and tool geometry applied resulting outstanding cutting abilities 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 size products, it is designed with a double neck to increase tool rigidity and to minimize vibration.
- ▶ Available in several effective lengths of cut and also overall lengths to apply on various rib processing.





CARBIDE | 2 | 30° | PLAIN | Y Coating | p.C228-C237

Unit : mm

EDP No.	Mill Diameter	Shank Diameter	Length of Cut	Length Below Shank	Overall Length	Neck Diameter
	D1	D2	L1	L3	L2	D3
SEM84501006E	1.0	4	1.5	6	50	0.95
SEM84501007E	1.0	4	1.5	7	50	0.95
SEM84501008E	1.0	4	1.5	8	50	0.95
SEM84501010E	1.0	4	1.5	10	50	0.95
SEM84501012E	1.0	4	1.5	12	50	0.95
SEM84501014E	1.0	4	1.5	14	50	0.95
SEM84501016E	1.0	4	1.5	16	50	0.95
SEM84501018E	1.0	4	1.5	18	50	0.95
SEM84501020E	1.0	4	1.5	20	50	0.95
SEM84501022E	1.0	4	1.5	22	60	0.95
SEM84501026E	1.0	4	1.5	26	60	0.95
SEM84501030E	1.0	4	1.5	30	70	0.95
SEM84501040E	1.0	4	1.5	40	80	0.95
SEM84501050E	1.0	4	1.5	50	100	0.95
SEM84501204E	1.2	4	1.8	4	50	1.15
SEM84501206E	1.2	4	1.8	6	50	1.15
SEM84501208E	1.2	4	1.8	8	50	1.15
SEM84501210E	1.2	4	1.8	10	50	1.15
SEM84501212E	1.2	4	1.8	12	50	1.15
SEM84501214E	1.2	4	1.8	14	50	1.15
SEM84501216E	1.2	4	1.8	16	50	1.15
SEM84501220E	1.2	4	1.8	20	50	1.15
SEM84501226E	1.2	4	1.8	26	60	1.15
SEM84501230E	1.2	4	1.8	30	70	1.15

▶ 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	P																			
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																		○		◎	○

CARBIDE
HSS
i-Xmill END MILLS
X-1EH END MILLS
4G MILL END MILLS
X-POWER PRO END MILLS
TitaNox-POWER END MILLS
V7 PLUS END MILLS
ALU-CUT END MILLS
K-2 END MILLS
GENERAL CARBIDE END MILLS

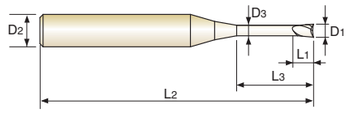
4G MILL END MILLS

PLAIN SHANK **SEM845** SERIES

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CARBIDE | 2 | 30° | PLAIN | Y Coating | p.C228-C237

Unit : mm

EDP No.	Mill Diameter	Shank Diameter	Length of Cut	Length Below Shank	Overall Length	Neck Diameter
	D1	D2	L1	L3	L2	D3
SEM84501406E	1.4	4	2.1	6	50	1.35
SEM84501408E	1.4	4	2.1	8	50	1.35
SEM84501410E	1.4	4	2.1	10	50	1.35
SEM84501414E	1.4	4	2.1	14	50	1.35
SEM84501416E	1.4	4	2.1	16	50	1.35
SEM84501420E	1.4	4	2.1	20	50	1.35
SEM84501504E	1.5	4	2.3	4	50	1.45
SEM84501505E	1.5	4	2.3	5	50	1.45
SEM84501506E	1.5	4	2.3	6	50	1.45
SEM84501507E	1.5	4	2.3	7	50	1.45
SEM84501508E	1.5	4	2.3	8	50	1.45
SEM84501510E	1.5	4	2.3	10	50	1.45
SEM84501512E	1.5	4	2.3	12	50	1.45
SEM84501514E	1.5	4	2.3	14	50	1.45
SEM84501516E	1.5	4	2.3	16	50	1.45
SEM84501518E	1.5	4	2.3	18	50	1.45
SEM84501520E	1.5	4	2.3	20	50	1.45
SEM84501522E	1.5	4	2.3	22	60	1.45
SEM84501526E	1.5	4	2.3	26	60	1.45
SEM84501530E	1.5	4	2.3	30	70	1.45
SEM84501608E	1.6	4	2.3	8	50	1.55
SEM84501610E	1.6	4	2.3	10	50	1.55
SEM84501612E	1.6	4	2.3	12	50	1.55
SEM84501616E	1.6	4	2.3	16	50	1.55

▶ 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	P																			
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																		○		◎	○

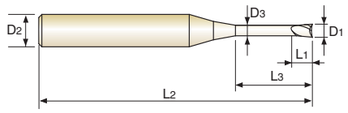
4G MILL END MILLS

PLAIN SHANK **SEM845** SERIES

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CARBIDE | 2 | 30° | PLAIN | Y Coating | p.C228-C237

Unit : mm

EDP No.	Mill Diameter D1	Shank Diameter D2	Length of Cut L1	Length Below Shank L3	Overall Length L2	Neck Diameter D3
SEM84501620E	1.6	4	2.3	20	50	1.55
SEM84501808E	1.8	4	2.7	8	50	1.75
SEM84501810E	1.8	4	2.7	10	50	1.75
SEM84501812E	1.8	4	2.7	12	50	1.75
SEM84501816E	1.8	4	2.7	16	50	1.75
SEM84501820E	1.8	4	2.7	20	50	1.75
SEM84502006E	2.0	4	3	6	50	1.95
SEM84502008E	2.0	4	3	8	50	1.95
SEM84502010E	2.0	4	3	10	50	1.95
SEM84502012E	2.0	4	3	12	50	1.95
SEM84502014E	2.0	4	3	14	50	1.95
SEM84502016E	2.0	4	3	16	50	1.95
SEM84502018E	2.0	4	3	18	50	1.95
SEM84502020E	2.0	4	3	20	50	1.95
SEM84502022E	2.0	4	3	22	60	1.95
SEM84502026E	2.0	4	3	26	60	1.95
SEM84502030E	2.0	4	3	30	70	1.95
SEM84502035E	2.0	4	3	35	70	1.95
SEM84502040E	2.0	4	3	40	80	1.95
SEM84502045E	2.0	4	3	45	90	1.95
SEM84502050E	2.0	4	3	50	100	1.95
SEM84502060E	2.0	4	3	60	110	1.95
SEM84502508E	2.5	4	4	8	50	2.40
SEM84502510E	2.5	4	4	10	50	2.40

▶ 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	P																			
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																		○		◎	○

CARBIDE
HSS
i-Xmill END MILLS
X-1EH END MILLS
4G MILL END MILLS
X-POWER PRO END MILLS
TitaNox-POWER END MILLS
V7 PLUS END MILLS
ALU-CUT END MILLS
K-2 END MILLS
GENERAL CARBIDE END MILLS

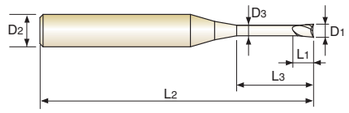
4G MILL END MILLS

PLAIN SHANK **SEM845** SERIES

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CARBIDE | 2 | 30° | PLAIN | Y Coating | p.C228-C237

Unit : mm

EDP No.	Mill Diameter D1	Shank Diameter D2	Length of Cut L1	Length Below Shank L3	Overall Length L2	Neck Diameter D3
SEM84502512E	2.5	4	4	12	50	2.40
SEM84502514E	2.5	4	4	14	50	2.40
SEM84502516E	2.5	4	4	16	50	2.40
SEM84502518E	2.5	4	4	18	50	2.40
SEM84502520E	2.5	4	4	20	50	2.40
SEM84502522E	2.5	4	4	22	60	2.40
SEM84502526E	2.5	4	4	26	60	2.40
SEM84502530E	2.5	4	4	30	70	2.40
SEM84502535E	2.5	4	4	35	70	2.40
SEM84502540E	2.5	4	4	40	80	2.40
SEM84502545E	2.5	4	4	45	90	2.40
SEM84502550E	2.5	4	4	50	100	2.40
SEM84503006E	3.0	6	4.5	6	50	2.85
SEM84503008E	3.0	6	4.5	8	50	2.85
SEM84503010E	3.0	6	4.5	10	50	2.85
SEM84503012E	3.0	6	4.5	12	50	2.85
SEM84503014E	3.0	6	4.5	14	60	2.85
SEM84503016E	3.0	6	4.5	16	60	2.85
SEM84503018E	3.0	6	4.5	18	60	2.85
SEM84503020E	3.0	6	4.5	20	60	2.85
SEM84503022E	3.0	6	4.5	22	65	2.85
SEM84503026E	3.0	6	4.5	26	65	2.85
SEM84503030E	3.0	6	4.5	30	70	2.85
SEM84503035E	3.0	6	4.5	35	70	2.85

▶ 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	P																			
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																		○		◎	○

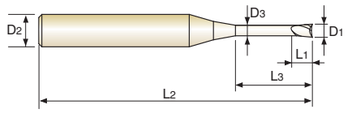
4G MILL END MILLS

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CARBIDE | 2 | 30° | PLAIN | Y Coating | p.C228-C237

Unit : mm

EDP No.	Mill Diameter D1	Shank Diameter D2	Length of Cut L1	Length Below Shank L3	Overall Length L2	Neck Diameter D3
SEM84503040E	3.0	6	4.5	40	80	2.85
SEM84503045E	3.0	6	4.5	45	90	2.85
SEM84503050E	3.0	6	4.5	50	100	2.85
SEM84503060E	3.0	6	4.5	60	100	2.85
SEM84504008E	4.0	6	6	8	50	3.85
SEM84504010E	4.0	6	6	10	50	3.85
SEM84504012E	4.0	6	6	12	50	3.85
SEM84504014E	4.0	6	6	14	60	3.85
SEM84504016E	4.0	6	6	16	60	3.85
SEM84504018E	4.0	6	6	18	60	3.85
SEM84504020E	4.0	6	6	20	60	3.85
SEM84504022E	4.0	6	6	22	65	3.85
SEM84504026E	4.0	6	6	26	65	3.85
SEM84504030E	4.0	6	6	30	70	3.85
SEM84504035E	4.0	6	6	35	70	3.85
SEM84504040E	4.0	6	6	40	80	3.85
SEM84504045E	4.0	6	6	45	90	3.85
SEM84504050E	4.0	6	6	50	100	3.85
SEM84504060E	4.0	6	6	60	100	3.85
SEM84505016E	5.0	6	8	16	60	4.85
SEM84505020E	5.0	6	8	20	60	4.85
SEM84505026E	5.0	6	8	26	65	4.85
SEM84505030E	5.0	6	8	30	70	4.85
SEM84505035E	5.0	6	8	35	75	4.85

▶ 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	P																			
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																		○		◎	○

CARBIDE
HSS
i-Xmill END MILLS
X-1EH END MILLS
4G MILL END MILLS
X-POWER PRO END MILLS
TitaNox-POWER END MILLS
V7 PLUS END MILLS
ALU-CUT END MILLS
K-2 END MILLS
GENERAL CARBIDE END MILLS

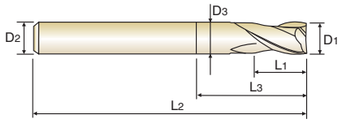
4G MILL END MILLS

PLAIN SHANK **SEM845** SERIES

CARBIDE, 2 FLUTE with EXTENDED NECK

- ▶ New coating and tool geometry applied resulting outstanding cutting abilities 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 size products, it is designed with a double neck to increase tool rigidity and to minimize vibration.
- ▶ Available in several effective lengths of cut and also overall lengths to apply on various rib processing.





CARBIDE | 2 | 30° | PLAIN | Y Coating | p.C228-C237

Unit : mm

EDP No.	Mill Diameter D1	Shank Diameter D2	Length of Cut L1	Length Below Shank L3	Overall Length L2	Neck Diameter D3
SEM84505040E	5.0	6	8	40	80	4.85
SEM84505050E	5.0	6	8	50	90	4.85
SEM84505060E	5.0	6	8	60	100	4.85
SEM84506015E	6.0	6	9	15	60	5.85
SEM84506020E	6.0	6	9	20	60	5.85
SEM84506030E	6.0	6	9	30	70	5.85
SEM84506032E	6.0	6	9	32	90	5.85
SEM84508025E	8.0	8	12	25	70	7.70
SEM84508030E	8.0	8	12	30	80	7.70
SEM84508042E	8.0	8	12	42	100	7.70
SEM84510030E	10.0	10	15	30	75	9.70
SEM84510035E	10.0	10	15	35	80	9.70
SEM84510045E	10.0	10	15	45	100	9.70
SEM84512035E	12.0	12	20	35	80	11.70
SEM84512040E	12.0	12	20	40	90	11.70
SEM84512050E	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	P																			
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																		○		◎	○

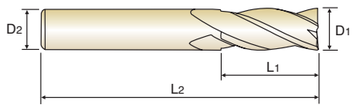
4G MILL END MILLS

PLAIN SHANK **SEME36** SERIES

CARBIDE, 4 FLUTE MULTIPLE HELIX

▶ New coating and tool geometry applied resulting outstanding cutting abilities and wear resistance.
▶ Excellent for cutting prehardened steels, carbon steels, alloy steels of molds and dies, up to HRc55 and machine parts.
▶ Multiple Helix for 3.0mm and over 3.0mm diameter end mills minimizing vibration and decreasing wear in cutting.





CARBIDE | 4 | 27°/30° | PLAIN | Y Coating | p.C238-C241

D<Ø3, 30˚ HELIX

Unit : mm

EDP No.	Mill Diameter D1	Shank Diameter D2	Length of Cut L1	Overall Length L2	Remark
SEME36008E	0.8	4	1.6	40	4mm Shank
SEME36009E	0.9	4	1.8	40	4mm Shank
SEME360104SE	1.0	4	2.5	50	4mm Shank
SEME36010E	1.0	6	2.5	50	-
SEME360124SE	1.2	4	3	50	4mm Shank
SEME36012E	1.2	6	3	50	-
SEME360154SE	1.5	4	4	50	4mm Shank
SEME36015E	1.5	6	4	50	-
SEME360204SE	2.0	4	6	50	4mm Shank
SEME36020E	2.0	6	6	50	-
SEME360254SE	2.5	4	7	50	4mm Shank
SEME36025E	2.5	6	7	50	-
SEME36030E	3.0	6	8	50	-
SEME36035E	3.5	6	10	50	-
SEME36040E	4.0	6	10	50	-
SEME36045E	4.5	6	14	50	-
SEME36050E	5.0	6	15	60	-
SEME36055E	5.5	6	15	60	-
SEME36060E	6.0	6	15	60	-
SEME36065E	6.5	8	18	60	-
SEME36070E	7.0	8	20	60	-
SEME36075E	7.5	8	20	60	-
SEME36080E	8.0	8	20	70	-
SEME36085E	8.5	10	22	70	-

▶ NEXT PAGE

Mill Dia.Tolerance (mm)	Shank Dia.Tolerance
0 ~ - 0.03	h5

◎ : Excellent ○ : Good

ISO	P																			
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																		○		◎	○

CARBIDE
HSS
i-Xmill END MILLS
X-1EH END MILLS
4G MILL END MILLS
X-POWER PRO END MILLS
TitaNox-POWER END MILLS
V7 PLUS END MILLS
ALU-CUT END MILLS
K-2 END MILLS
GENERAL CARBIDE END MILLS

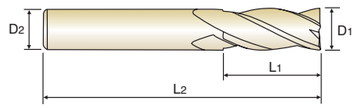
4G MILL END MILLS

PLAIN SHANK **SEME36** SERIES

CARBIDE, 4 FLUTE MULTIPLE HELIX

▶ New coating and tool geometry applied resulting outstanding cutting abilities and wear resistance.
▶ Excellent for cutting prehardened steels, carbon steels, alloy steels of molds and dies, up to HRc55 and machine parts.
▶ Multiple Helix for 3.0mm and over 3.0mm diameter end mills minimizing vibration and decreasing wear in cutting.





CARBIDE | 4 | 27°/30° | PLAIN | Y Coating | p.C238-C241

D<Ø3, 30˚ HELIX

Unit : mm

EDP No.	Mill Diameter D1	Shank Diameter D2	Length of Cut L1	Overall Length L2	Remark
SEME36090E	9.0	10	22	70	-
SEME36095E	9.5	10	24	70	-
SEME36100E	10.0	10	25	75	-
SEME36105E	10.5	12	26	75	-
SEME36110E	11.0	12	30	75	-
SEME36115E	11.5	12	30	80	-
SEME36120E	12.0	12	30	80	-
SEME36130E	13.0	12	35	100	-
SEME3614012SE	14.0	12	35	100	-
SEME3614014SE	14.0	14	35	100	-
SEME36140E	14.0	16	35	100	-
SEME36150E	15.0	16	38	100	-
SEME36160E	16.0	16	40	100	-
SEME36170E	17.0	16	42	100	-
SEME36180E	18.0	16	45	100	-
SEME3618018SE	18.0	18	45	100	-
SEME36190E	19.0	20	45	100	-
SEME36200E	20.0	20	45	100	-
SEME36210E	21.0	20	45	100	-
SEME36220E	22.0	20	45	100	-
SEME36230E	23.0	25	50	120	-
SEME36240E	24.0	25	50	120	-
SEME36250E	25.0	25	50	120	-

Mill Dia.Tolerance (mm)	Shank Dia.Tolerance
0 ~ - 0.03	h5

◎ : 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																		○		◎	○

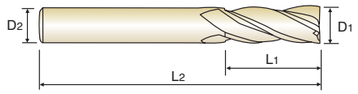
4G MILL END MILLS

PLAIN SHANK **SEME71** SERIES

CARBIDE, 4 FLUTE MULTIPLE HELIX (Sharp corner removal)

- ▶ New coating and tool geometry applied resulting outstanding cutting abilities and wear resistance.
- ▶ Excellent for cutting prehardened steels, carbon steels, alloy steels of molds and dies, up to HRc55 and machine parts.
- ▶ Multiple Helix for 3.0mm and over 3.0mm diameter endmills minimizing vibration and decreasing wear in cutting.
  - Equal index flutes design for long length and single helix (38°) end mills.
- ▶ Gash land geometry applied at the end tooth, achieving heavy duty cutting.
- ▶ Available various length products like short, regular and long length end mills etc.
- ▶ Available in short, regular and long shank end mills.





CARBIDE | 4 | 35°/38° | PLAIN | Y Coating | p.C238-C241

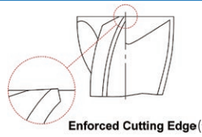
D<Ø3, Long Length 38˚ HELIX

Unit : mm

EDP No.	Mill Diameter D1	Shank Diameter D2	Length of Cut L1	Overall Length L2	Remark
SEME71010014SE	1.0	4	1	40	4mm Shank
SEME71010024SE	1.0	4	2	40	4mm Shank
SEME710104SE	1.0	4	2.5	50	4mm Shank
SEME71010034SE	1.0	4	3	50	4mm Shank
SEME71010044SE	1.0	4	4	50	4mm Shank
SEME71010064SE	1.0	4	6	50	4mm Shank
SEME7101001E	1.0	6	1	40	Short
SEME7101002E	1.0	6	2	40	Short
SEME71010E	1.0	6	2.5	50	Regular
SEME7101003E	1.0	6	3	50	Long
SEME7101004E	1.0	6	4	50	Long
SEME7101006E	1.0	6	6	50	Long
SEME71012024SE	1.2	4	2	40	4mm Shank
SEME710124SE	1.2	4	3	50	4mm Shank
SEME71012044SE	1.2	4	4	50	4mm Shank
SEME71012064SE	1.2	4	6	50	4mm Shank
SEME7101202E	1.2	6	2	40	Short
SEME71012E	1.2	6	3	50	Regular
SEME7101204E	1.2	6	4	50	Long
SEME7101206E	1.2	6	6	50	Long
SEME710150154SE	1.5	4	1.5	40	4mm Shank
SEME71015034SE	1.5	4	3	40	4mm Shank
SEME710154SE	1.5	4	4	50	4mm Shank
SEME71015064SE	1.5	4	6	50	4mm Shank

▶ NEXT PAGE

Mill Dia.Tolerance (mm)	Shank Dia.Tolerance
0 ~ - 0.03	h5



Enforced Cutting Edge(保护尖角处理)

◎ : Excellent ○ : Good

ISO	P																			
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																		○		◎	○

CARBIDE
HSS
i-Xmill END MILLS
X-1EH END MILLS
4G MILL END MILLS
X-POWER PRO END MILLS
TitaNox-POWER END MILLS
V7 PLUS END MILLS
ALU-CUT END MILLS
K-2 END MILLS
GENERAL CARBIDE END MILLS

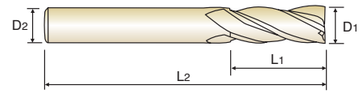
4G MILL END MILLS

PLAIN SHANK **SEME71** SERIES

CARBIDE, 4 FLUTE MULTIPLE HELIX (Sharp corner removal)

- ▶ New coating and tool geometry applied resulting outstanding cutting abilities and wear resistance.
- ▶ Excellent for cutting prehardened steels, carbon steels, alloy steels of molds and dies, up to HRc55 and machine parts.
- ▶ Multiple Helix for 3.0mm and over 3.0mm diameter endmills minimizing vibration and decreasing wear in cutting.
  - Equal index flutes design for long length and single helix (38°) end mills.
- ▶ Gash land geometry applied at the end tooth, achieving heavy duty cutting.
- ▶ Available various length products like short, regular and long length end mills etc.
- ▶ Available in short, regular and long shank end mills.





CARBIDE | 4 | 35°/38° | PLAIN | Y Coating | p.C238-C241

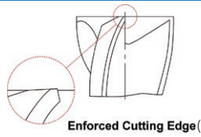
D<Ø3, Long Length 38˚ HELIX

Unit : mm

EDP No.	Mill Diameter D1	Shank Diameter D2	Length of Cut L1	Overall Length L2	Remark
SEME71015084SE	1.5	4	8	50	4mm Shank
SEME71015104SE	1.5	4	10	50	4mm Shank
SEME71015015E	1.5	6	1.5	40	Short
SEME7101503E	1.5	6	3	40	Short
SEME71015E	1.5	6	4	50	Regular
SEME7101506E	1.5	6	6	50	Long
SEME7101508E	1.5	6	8	50	Long
SEME7101510E	1.5	6	10	50	Long
SEME71020024SE	2.0	4	2	40	4mm Shank
SEME71020044SE	2.0	4	4	40	4mm Shank
SEME710204SE	2.0	4	6	50	4mm Shank
SEME71020084SE	2.0	4	8	50	4mm Shank
SEME71020104SE	2.0	4	10	50	4mm Shank
SEME71020124SE	2.0	4	12	50	4mm Shank
SEME7102002E	2.0	6	2	40	Short
SEME7102004E	2.0	6	4	40	Short
SEME71020E	2.0	6	6	50	Regular
SEME7102008E	2.0	6	8	50	Long
SEME7102010E	2.0	6	10	50	Long
SEME7102012E	2.0	6	12	50	Long
SEME710250254SE	2.5	4	2.5	40	4mm Shank
SEME71025054SE	2.5	4	5	40	4mm Shank
SEME710254SE	2.5	4	7	50	4mm Shank
SEME71025104SE	2.5	4	10	50	4mm Shank

▶ NEXT PAGE

Mill Dia.Tolerance (mm)	Shank Dia.Tolerance
0 ~ - 0.03	h5



Enforced Cutting Edge(保护尖角处理)

◎ : Excellent ○ : Good

ISO	P																			
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																		○		◎	○

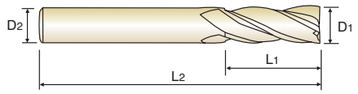
4G MILL END MILLS

PLAIN SHANK **SEME71** SERIES

CARBIDE, 4 FLUTE MULTIPLE HELIX (Sharp corner removal)

- ▶ New coating and tool geometry applied resulting outstanding cutting abilities and wear resistance.
- ▶ Excellent for cutting prehardened steels, carbon steels, alloy steels of molds and dies, up to HRc55 and machine parts.
- ▶ Multiple Helix for 3.0mm and over 3.0mm diameter endmills minimizing vibration and decreasing wear in cutting.
  - Equal index flutes design for long length and single helix (38°) end mills.
- ▶ Gash land geometry applied at the end tooth, achieving heavy duty cutting.
- ▶ Available various length products like short, regular and long length end mills etc.
- ▶ Available in short, regular and long shank end mills.





CARBIDE | 4 | 35°/38° | PLAIN | Y Coating | p.C238-C241

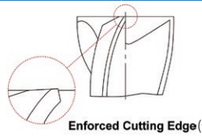
D<Ø3, Long Length 38˚ HELIX

Unit : mm

EDP No.	Mill Diameter D1	Shank Diameter D2	Length of Cut L1	Overall Length L2	Remark
SEME71025124SE	2.5	4	12	50	4mm Shank
SEME71025025E	2.5	6	2.5	40	Short
SEME7102505E	2.5	6	5	40	Short
SEME71025E	2.5	6	7	50	Regular
SEME7102510E	2.5	6	10	50	Long
SEME7102512E	2.5	6	12	50	Long
SEME7103003E	3.0	6	3	40	Short
SEME7103006E	3.0	6	6	40	Short
SEME71030E	3.0	6	8	50	Regular
SEME7103010E	3.0	6	10	50	Long
SEME7103012E	3.0	6	12	50	Long
SEME7103014E	3.0	6	14	50	Long
SEME7104004E	4.0	6	4	40	Short
SEME7104008E	4.0	6	8	40	Short
SEME71040E	4.0	6	10	50	Regular
SEME7104012E	4.0	6	12	50	Long
SEME7104014E	4.0	6	14	50	Long
SEME7104016E	4.0	6	16	50	Long
SEME7105005E	5.0	6	5	50	Short
SEME7105010E	5.0	6	10	50	Short
SEME71050E	5.0	6	15	60	Regular
SEME7105020E	5.0	6	20	60	Long
SEME7105025E	5.0	6	25	60	Long
SEME7106006E	6.0	6	6	50	Short

▶ NEXT PAGE

Mill Dia.Tolerance (mm)	Shank Dia.Tolerance
0 ~ - 0.03	h5



Enforced Cutting Edge(保护尖角处理)

◎ : 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																		○		◎	○		

CARBIDE
HSS
i-Xmill END MILLS
X-1EH END MILLS
4G MILL END MILLS
X-POWER PRO END MILLS
TitaNox-POWER END MILLS
V7 PLUS END MILLS
ALU-CUT END MILLS
K-2 END MILLS
GENERAL CARBIDE END MILLS

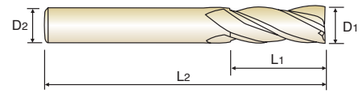
4G MILL END MILLS

PLAIN SHANK **SEME71** SERIES

CARBIDE, 4 FLUTE MULTIPLE HELIX (Sharp corner removal)

- ▶ New coating and tool geometry applied resulting outstanding cutting abilities and wear resistance.
- ▶ Excellent for cutting prehardened steels, carbon steels, alloy steels of molds and dies, up to HRc55 and machine parts.
- ▶ Multiple Helix for 3.0mm and over 3.0mm diameter endmills minimizing vibration and decreasing wear in cutting.
  - Equal index flutes design for long length and single helix (38°) end mills.
- ▶ Gash land geometry applied at the end tooth, achieving heavy duty cutting.
- ▶ Available various length products like short, regular and long length end mills etc.
- ▶ Available in short, regular and long shank end mills.





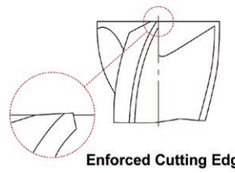
CARBIDE | 4 | 35°/38° | PLAIN | Y Coating | p.C238-C241

D<Ø3, Long Length 38˚ HELIX

Unit : mm

EDP No.	Mill Diameter D1	Shank Diameter D2	Length of Cut L1	Overall Length L2	Remark
SEME7106012E	6.0	6	12	50	Short
SEME71060E	6.0	6	15	60	Regular
SEME7106020E	6.0	6	20	60	Long
SEME7106025E	6.0	6	25	60	Long
SEME7108016E	8.0	8	16	60	Short
SEME71080E	8.0	8	20	70	Regular
SEME7108025E	8.0	8	25	70	Long
SEME7108030E	8.0	8	30	70	Long
SEME7110022E	10.0	10	22	65	Short
SEME71100E	10.0	10	25	75	Regular
SEME7110030E	10.0	10	30	75	Long
SEME7110035E	10.0	10	35	75	Long
SEME7112026E	12.0	12	26	70	Short
SEME71120E	12.0	12	30	80	Regular
SEME7112035E	12.0	12	35	80	Long
SEME7112040E	12.0	12	40	80	Long
SEME71140E	14.0	16	35	100	Regular
SEME7116032E	16.0	16	32	100	Short
SEME71160E	16.0	16	40	100	Regular
SEME71180E	18.0	20	45	100	Regular
SEME71200E	20.0	20	45	100	Regular

Mill Dia.Tolerance (mm)	Shank Dia.Tolerance
0 ~ - 0.03	h5



Enforced Cutting Edge(保护尖角处理)

◎ : 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																		○		◎	○		

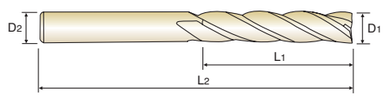
4G MILL END MILLS

PLAIN SHANK **SEME72** SERIES

CARBIDE, 4 FLUTE LONG LENGTH

▶ New coating and tool geometry applied resulting outstanding cutting abilities and wear resistance.
▶ Excellent for cutting prehardened steels, carbon steels, alloy steels of molds and dies, up to HRc55 and machine parts.
▶ Available in short, regular and long shank end mills.





CARBIDE | 4 | 30° | PLAIN | Y Coating | p.C242-C247

Unit : mm

EDP No.	Mill Diameter	Shank Diameter	Length of Cut	Overall Length
	D1	D2	L1	L2
SEME7201003E	1.0	6	3	60
SEME7201004E	1.0	6	4	60
SEME7201005E	1.0	6	5	60
SEME7201006E	1.0	6	6	60
SEME7201007E	1.0	6	7	60
SEME7201008E	1.0	6	8	60
SEME7201010E	1.0	6	10	60
SEME7201012E	1.0	6	12	60
SEME7201204E	1.2	6	4	60
SEME7201206E	1.2	6	6	60
SEME7201208E	1.2	6	8	60
SEME7201210E	1.2	6	10	60
SEME7201212E	1.2	6	12	60
SEME7201506E	1.5	6	6	60
SEME7201508E	1.5	6	8	60
SEME7201510E	1.5	6	10	60
SEME7201512E	1.5	6	12	60
SEME7201514E	1.5	6	14	60
SEME7201516E	1.5	6	16	60
SEME7202008E	2.0	6	8	60
SEME7202010E	2.0	6	10	60
SEME7202012E	2.0	6	12	60
SEME7202014E	2.0	6	14	60
SEME7202016E	2.0	6	16	60

▶ NEXT PAGE

Mill Dia.Tolerance (mm)	Shank Dia.Tolerance
0 ~ - 0.03	h5

◎ : Excellent ○ : Good

ISO	P																			
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																		○		◎	○

CARBIDE
HSS
i-Xmill END MILLS
X-1EH END MILLS
4G MILL END MILLS
X-POWER PRO END MILLS
TitaNox-POWER END MILLS
V7 PLUS END MILLS
ALU-CUT END MILLS
K-2 END MILLS
GENERAL CARBIDE END MILLS

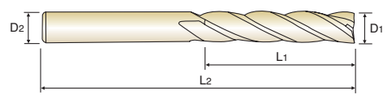
4G MILL END MILLS

PLAIN SHANK **SEME72** SERIES

CARBIDE, 4 FLUTE LONG LENGTH

▶ New coating and tool geometry applied resulting outstanding cutting abilities and wear resistance.
▶ Excellent for cutting prehardened steels, carbon steels, alloy steels of molds and dies, up to HRc55 and machine parts.
▶ Available in short, regular and long shank end mills.





CARBIDE | 4 | 30° | PLAIN | Y Coating | p.C242-C247

Unit : mm

EDP No.	Mill Diameter	Shank Diameter	Length of Cut	Overall Length
	D1	D2	L1	L2
SEME7202510E	2.5	6	10	60
SEME7202512E	2.5	6	12	60
SEME7202516E	2.5	6	16	60
SEME7202520E	2.5	6	20	60
SEME7202526E	2.5	6	26	60
SEME72030163SE	3.0	3	16	100
SEME7203010E	3.0	6	10	70
SEME7203012E	3.0	6	12	70
SEME7203014E	3.0	6	14	70
SEME7203016E	3.0	6	16	70
SEME7203020E	3.0	6	20	70
SEME7203026E	3.0	6	26	70
SEME7203030E	3.0	6	30	70
SEME72040204SE	4.0	4	20	100
SEME7204012E	4.0	6	12	70
SEME7204016E	4.0	6	16	70
SEME7204020E	4.0	6	20	70
SEME7204026E	4.0	6	26	70
SEME7204030E	4.0	6	30	70
SEME7205020E	5.0	6	20	70
SEME7205025E	5.0	6	25	70
SEME7205025100E	5.0	6	25	100
SEME7205030E	5.0	6	30	80
SEME7205035E	5.0	6	35	90
SEME7205040E	5.0	6	40	100

▶ NEXT PAGE

Mill Dia.Tolerance (mm)	Shank Dia.Tolerance
0 ~ - 0.03	h5

◎ : Excellent ○ : Good

ISO	P																			
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																		○		◎	○

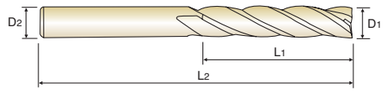
4G MILL END MILLS

PLAIN SHANK **SEME72** SERIES

CARBIDE, 4 FLUTE LONG LENGTH

▶ New coating and tool geometry applied resulting outstanding cutting abilities and wear resistance.
▶ Excellent for cutting prehardened steels, carbon steels, alloy steels of molds and dies, up to HRc55 and machine parts.
▶ Available in short, regular and long shank end mills.





CARBIDE | 4 | 30° | PLAIN | Y Coating | p.C242-C247

Unit : mm

EDP No.	Mill Diameter	Shank Diameter	Length of Cut	Overall Length
	D1	D2	L1	L2
SEME7206015E	6.0	6	15	60
SEME7206015080E	6.0	6	15	80
SEME7206020E	6.0	6	20	70
SEME7206020090E	6.0	6	20	90
SEME7206025E	6.0	6	25	75
SEME7206030E	6.0	6	30	80
SEME7206030100E	6.0	6	30	100
SEME7206030150E	6.0	6	30	150
SEME7206035E	6.0	6	35	90
SEME7206040E	6.0	6	40	90
SEME7206040120E	6.0	6	40	120
SEME7206045E	6.0	6	45	150
SEME7208025E	8.0	8	25	80
SEME7208030E	8.0	8	30	80
SEME7208030100E	8.0	8	30	100
SEME7208035E	8.0	8	35	90
SEME7208040E	8.0	8	40	90
SEME7208040120E	8.0	8	40	120
SEME7208040150E	8.0	8	40	150
SEME7208045E	8.0	8	45	100
SEME7208050E	8.0	8	50	100
SEME7208050150E	8.0	8	50	150

▶ NEXT PAGE

Mill Dia.Tolerance (mm)	Shank Dia.Tolerance
0 ~ - 0.03	h5

◎ : Excellent ○ : Good

ISO	P																			
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																		○		◎	○

CARBIDE
HSS
i-Xmill END MILLS
X-1EH END MILLS
4G MILL END MILLS
X-POWER PRO END MILLS
TitaNox-POWER END MILLS
V7 PLUS END MILLS
ALU-CUT END MILLS
K-2 END MILLS
GENERAL CARBIDE END MILLS

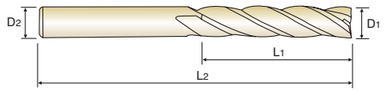
4G MILL END MILLS

PLAIN SHANK **SEME72** SERIES

CARBIDE, 4 FLUTE LONG LENGTH

▶ New coating and tool geometry applied resulting outstanding cutting abilities and wear resistance.
▶ Excellent for cutting prehardened steels, carbon steels, alloy steels of molds and dies, up to HRc55 and machine parts.
▶ Available in short, regular and long shank end mills.





CARBIDE | 4 | 30° | PLAIN | Y Coating | p.C242-C247

Unit : mm

EDP No.	Mill Diameter	Shank Diameter	Length of Cut	Overall Length
	D1	D2	L1	L2
SEME7210030E	10.0	10	30	80
SEME7210030100E	10.0	10	30	100
SEME7210035E	10.0	10	35	90
SEME7210040E	10.0	10	40	90
SEME7210040120E	10.0	10	40	120
SEME7210045E	10.0	10	45	100
SEME7210050E	10.0	10	50	100
SEME7210050150E	10.0	10	50	150
SEME7210050200E	10.0	10	50	200
SEME7210055E	10.0	10	55	150
SEME7210060E	10.0	10	60	110
SEME7210060200E	10.0	10	60	200
SEME7212035E	12.0	12	35	90
SEME7212040E	12.0	12	40	100
SEME7212040120E	12.0	12	40	120
SEME7212045E	12.0	12	45	130
SEME7212050E	12.0	12	50	100
SEME7212050150E	12.0	12	50	150
SEME7212055E	12.0	12	55	110
SEME7212060E	12.0	12	60	110
SEME7212060150E	12.0	12	60	150
SEME7212060200E	12.0	12	60	200
SEME7212065E	12.0	12	65	150
SEME7212070E	12.0	12	70	120
SEME7212070200E	12.0	12	70	200

▶ NEXT PAGE

Mill Dia.Tolerance (mm)	Shank Dia.Tolerance
0 ~ - 0.03	h5

◎ : Excellent ○ : Good

ISO	P																			
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																		○		◎	○

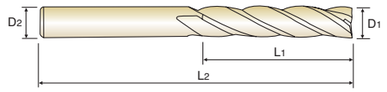
4G MILL END MILLS

PLAIN SHANK **SEME72** SERIES

CARBIDE, 4 FLUTE LONG LENGTH

▶ New coating and tool geometry applied resulting outstanding cutting abilities and wear resistance.
▶ Excellent for cutting prehardened steels, carbon steels, alloy steels of molds and dies, up to HRc55 and machine parts.
▶ Available in short, regular and long shank end mills.





CARBIDE | 4 | 30° | PLAIN | Y Coating | p.C242-C247

Unit : mm

EDP No.	Mill Diameter	Shank Diameter	Length of Cut	Overall Length
	D1	D2	L1	L2
SEME7214050E	14.0	16	50	110
SEME7214060E	14.0	16	60	150
SEME7216040E	16.0	16	40	150
SEME7216050E	16.0	16	50	110
SEME7216050150E	16.0	16	50	150
SEME7216060E	16.0	16	60	120
SEME7216070E	16.0	16	70	130
SEME7216070150E	16.0	16	70	150
SEME7216070200E	16.0	16	70	200
SEME7216080E	16.0	16	80	150
SEME7216090E	16.0	16	90	150
SEME72160110E	16.0	16	110	200
SEME72160120E	16.0	16	120	250
SEME7218050E	18.0	20	50	120
SEME7218070E	18.0	20	70	130
SEME72180100E	18.0	20	100	200
SEME7220050E	20.0	20	50	110
SEME7220050150E	20.0	20	50	150
SEME7220060E	20.0	20	60	130
SEME7220070E	20.0	20	70	130
SEME7220080E	20.0	20	80	150
SEME7220090E	20.0	20	90	150
SEME7220090200E	20.0	20	90	200
SEME72200110E	20.0	20	110	200
SEME72200120E	20.0	20	120	250

▶ NEXT PAGE

Mill Dia.Tolerance (mm)	Shank Dia.Tolerance
0 ~ - 0.03	h5

◎ : Excellent ○ : Good

ISO	P																			
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																		○		◎	○

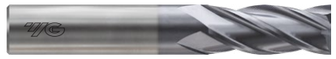
CARBIDE
HSS
i-Xmill END MILLS
X-1EH END MILLS
4G MILL END MILLS
X-POWER PRO END MILLS
TitaNox-POWER END MILLS
V7 PLUS END MILLS
ALU-CUT END MILLS
K-2 END MILLS
GENERAL CARBIDE END MILLS

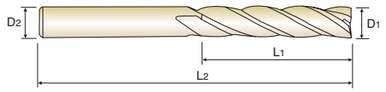
4G MILL END MILLS

PLAIN SHANK **SEME72** SERIES

CARBIDE, 4 FLUTE LONG LENGTH

▶ New coating and tool geometry applied resulting outstanding cutting abilities and wear resistance.
▶ Excellent for cutting prehardened steels, carbon steels, alloy steels of molds and dies, up to HRc55 and machine parts.
▶ Available in short, regular and long shank end mills.





CARBIDE | 4 | 30° | PLAIN | Y Coating | p.C242-C247

Unit : mm

EDP No.	Mill Diameter	Shank Diameter	Length of Cut	Overall Length
	D1	D2	L1	L2
SEME7222075E	22.0	20	75	150
SEME72220110E	22.0	20	110	200
SEME7225070E	25.0	25	70	150
SEME7225090E	25.0	25	90	150
SEME72250110E	25.0	25	110	200
SEME72250120E	25.0	25	120	250

Mill Dia.Tolerance (mm)	Shank Dia.Tolerance
0 ~ - 0.03	h5

◎ : 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																		○		◎	○

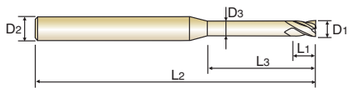
4G MILL END MILLS

PLAIN SHANK **SEME73** SERIES

CARBIDE, 4 FLUTE with EXTENDED NECK

- ▶ New coating and tool geometry applied resulting outstanding cutting abilities and wear resistance.
- ▶ Excellent for cutting prehardened steels, carbon steels, alloy steels of molds and dies, up to HRc55 and machine parts.
- ▶ Available in several effective lengths of cut and also overall lengths than previous standard products.





CARBIDE | 4 | 30° | PLAIN | Y Coating | p.C248-C253

Unit : mm

EDP No.	Mill Diameter D1	Shank Diameter D2	Length of Cut L1	Length Below Shank L3	Overall Length L2	Neck Diameter D3
SEME7301002E	1.0	4	1.5	2	50	0.95
SEME7301003E	1.0	4	1.5	3	50	0.95
SEME7301004E	1.0	4	1.5	4	50	0.95
SEME7301005E	1.0	4	1.5	5	50	0.95
SEME7301006E	1.0	4	1.5	6	50	0.95
SEME7301007E	1.0	4	1.5	7	50	0.95
SEME7301008E	1.0	4	1.5	8	50	0.95
SEME7301010E	1.0	4	1.5	10	50	0.95
SEME7301012E	1.0	4	1.5	12	50	0.95
SEME7301014E	1.0	4	1.5	14	50	0.95
SEME7301016E	1.0	4	1.5	16	50	0.95
SEME7301018E	1.0	4	1.5	18	50	0.95
SEME7301020E	1.0	4	1.5	20	50	0.95
SEME7301022E	1.0	4	1.5	22	60	0.95
SEME7301026E	1.0	4	1.5	26	60	0.95
SEME7301030E	1.0	4	1.5	30	70	0.95
SEME7301040E	1.0	4	1.5	40	80	0.95
SEME7301050E	1.0	4	1.5	50	100	0.95
SEME7301204E	1.2	4	1.8	4	50	1.15
SEME7301206E	1.2	4	1.8	6	50	1.15
SEME7301208E	1.2	4	1.8	8	50	1.15
SEME7301210E	1.2	4	1.8	10	50	1.15
SEME7301212E	1.2	4	1.8	12	50	1.15
SEME7301214E	1.2	4	1.8	14	50	1.15

▶ NEXT PAGE

Mill Dia.Tolerance (mm)	Shank Dia.Tolerance
0 ~ - 0.03	h5

◎ : 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																		○		◎	○

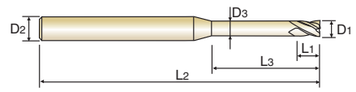
4G MILL END MILLS

PLAIN SHANK SEME73 SERIES

CARBIDE, 4 FLUTE with EXTENDED NECK

- ▶ New coating and tool geometry applied resulting outstanding cutting abilities and wear resistance.
- ▶ Excellent for cutting prehardened steels, carbon steels, alloy steels of molds and dies, up to HRc55 and machine parts.
- ▶ Available in several effective lengths of cut and also overall lengths than previous standard products.





CARBIDE | 4 | 30° | PLAIN | Y Coating | p.C248-C253

Unit : mm

EDP No.	Mill Diameter D1	Shank Diameter D2	Length of Cut L1	Length Below Shank L3	Overall Length L2	Neck Diameter D3
SEME7301216E	1.2	4	1.8	16	50	1.15
SEME7301220E	1.2	4	1.8	20	50	1.15
SEME7301226E	1.2	4	1.8	26	60	1.15
SEME7301230E	1.2	4	1.8	30	70	1.15
SEME7301504E	1.5	4	2.3	4	50	1.45
SEME7301505E	1.5	4	2.3	5	50	1.45
SEME7301506E	1.5	4	2.3	6	50	1.45
SEME7301507E	1.5	4	2.3	7	50	1.45
SEME7301508E	1.5	4	2.3	8	50	1.45
SEME7301510E	1.5	4	2.3	10	50	1.45
SEME7301512E	1.5	4	2.3	12	50	1.45
SEME7301514E	1.5	4	2.3	14	50	1.45
SEME7301516E	1.5	4	2.3	16	50	1.45
SEME7301518E	1.5	4	2.3	18	50	1.45
SEME7301520E	1.5	4	2.3	20	50	1.45
SEME7301522E	1.5	4	2.3	22	60	1.45
SEME7301526E	1.5	4	2.3	26	60	1.45
SEME7301530E	1.5	4	2.3	30	70	1.45
SEME7302006E	2.0	4	3	6	50	1.95
SEME7302008E	2.0	4	3	8	50	1.95
SEME7302010E	2.0	4	3	10	50	1.95
SEME7302012E	2.0	4	3	12	50	1.95
SEME7302014E	2.0	4	3	14	50	1.95
SEME7302016E	2.0	4	3	16	50	1.95

▶ NEXT PAGE

Mill Dia.Tolerance (mm)	Shank Dia.Tolerance
0 ~ - 0.03	h5

◎ : 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																		○		◎	○

CARBIDE
HSS
i-Xmill END MILLS
X-1EH END MILLS
4G MILL END MILLS
X-POWER PRO END MILLS
TitaNox-POWER END MILLS
V7 PLUS END MILLS
ALU-CUT END MILLS
K-2 END MILLS
GENERAL CARBIDE END MILLS

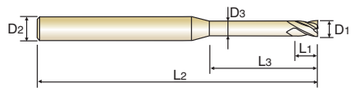
4G MILL END MILLS

PLAIN SHANK **SEME73** SERIES

CARBIDE, 4 FLUTE with EXTENDED NECK

- ▶ New coating and tool geometry applied resulting outstanding cutting abilities and wear resistance.
- ▶ Excellent for cutting prehardened steels, carbon steels, alloy steels of molds and dies, up to HRc55 and machine parts.
- ▶ Available in several effective lengths of cut and also overall lengths than previous standard products.





CARBIDE | 4 | 30° | PLAIN | Y Coating | p.C248-C253

Unit : mm

EDP No.	Mill Diameter	Shank Diameter	Length of Cut	Length Below Shank	Overall Length	Neck Diameter
	D1	D2	L1	L3	L2	D3
SEME7302018E	2.0	4	3	18	50	1.95
SEME7302020E	2.0	4	3	20	50	1.95
SEME7302022E	2.0	4	3	22	60	1.95
SEME7302026E	2.0	4	3	26	60	1.95
SEME7302030E	2.0	4	3	30	70	1.95
SEME7302035E	2.0	4	3	35	70	1.95
SEME7302040E	2.0	4	3	40	80	1.95
SEME7302045E	2.0	4	3	45	90	1.95
SEME7302050E	2.0	4	3	50	100	1.95
SEME7302060E	2.0	4	3	60	110	1.95
SEME7302508E	2.5	4	4	8	50	2.40
SEME7302510E	2.5	4	4	10	50	2.40
SEME7302512E	2.5	4	4	12	50	2.40
SEME7302514E	2.5	4	4	14	50	2.40
SEME7302516E	2.5	4	4	16	50	2.40
SEME7302518E	2.5	4	4	18	50	2.40
SEME7302520E	2.5	4	4	20	50	2.40
SEME7302522E	2.5	4	4	22	60	2.40
SEME7302526E	2.5	4	4	26	60	2.40
SEME7302530E	2.5	4	4	30	70	2.40
SEME7302535E	2.5	4	4	35	70	2.40
SEME7302540E	2.5	4	4	40	80	2.40
SEME7302545E	2.5	4	4	45	90	2.40
SEME7302550E	2.5	4	4	50	100	2.40
SEME7303006E	3.0	6	4.5	6	50	2.85
SEME7303008E	3.0	6	4.5	8	50	2.85

▶ NEXT PAGE

Mill Dia.Tolerance (mm)	Shank Dia.Tolerance
0 ~ - 0.03	h5

◎ : 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																		○		◎	○

CARBIDE
HSS
i-Xmill END MILLS
X-1EH END MILLS
4G MILL END MILLS
X-POWER PRO END MILLS
TitaNox-POWER END MILLS
V7 PLUS END MILLS
ALU-CUT END MILLS
K-2 END MILLS
GENERAL CARBIDE END MILLS

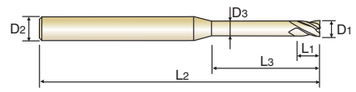
4G MILL END MILLS

PLAIN SHANK **SEME73** SERIES

CARBIDE, 4 FLUTE with EXTENDED NECK

- ▶ New coating and tool geometry applied resulting outstanding cutting abilities and wear resistance.
- ▶ Excellent for cutting prehardened steels, carbon steels, alloy steels of molds and dies, up to HRc55 and machine parts.
- ▶ Available in several effective lengths of cut and also overall lengths than previous standard products.





CARBIDE | 4 | 30° | PLAIN | Y Coating | p.C248-C253

Unit : mm

EDP No.	Mill Diameter	Shank Diameter	Length of Cut	Length Below Shank	Overall Length	Neck Diameter
	D1	D2	L1	L3	L2	D3
SEME7303010E	3.0	6	4.5	10	50	2.85
SEME7303012E	3.0	6	4.5	12	50	2.85
SEME7303014E	3.0	6	4.5	14	60	2.85
SEME7303016E	3.0	6	4.5	16	60	2.85
SEME7303018E	3.0	6	4.5	18	60	2.85
SEME7303020E	3.0	6	4.5	20	60	2.85
SEME7303022E	3.0	6	4.5	22	65	2.85
SEME7303026E	3.0	6	4.5	26	65	2.85
SEME7303030E	3.0	6	4.5	30	70	2.85
SEME7303035E	3.0	6	4.5	35	70	2.85
SEME7303040E	3.0	6	4.5	40	80	2.85
SEME7303045E	3.0	6	4.5	45	90	2.85
SEME7303050E	3.0	6	4.5	50	100	2.85
SEME7303060E	3.0	6	4.5	60	100	2.85
SEME7304008E	4.0	6	6	8	50	3.85
SEME7304010E	4.0	6	6	10	50	3.85
SEME7304012E	4.0	6	6	12	50	3.85
SEME7304014E	4.0	6	6	14	60	3.85
SEME7304016E	4.0	6	6	16	60	3.85
SEME7304018E	4.0	6	6	18	60	3.85
SEME7304020E	4.0	6	6	20	60	3.85
SEME7304022E	4.0	6	6	22	65	3.85
SEME7304025E	4.0	6	6	25	65	3.85
SEME7304026E	4.0	6	6	26	65	3.85
SEME7304030E	4.0	6	6	30	70	3.85
SEME7304035E	4.0	6	6	35	70	3.85

▶ NEXT PAGE

Mill Dia.Tolerance (mm)	Shank Dia.Tolerance
0 ~ - 0.03	h5

◎ : 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																		○		◎	○

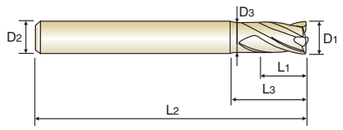
4G MILL END MILLS

PLAIN SHANK **SEME73** SERIES

CARBIDE, 4 FLUTE with EXTENDED NECK

- ▶ New coating and tool geometry applied resulting outstanding cutting abilities and wear resistance.
- ▶ Excellent for cutting prehardened steels, carbon steels, alloy steels of molds and dies, up to HRc55 and machine parts.
- ▶ Available in several effective lengths of cut and also overall lengths than previous standard products.





CARBIDE | 4 | 30° | PLAIN | Y Coating | p.C248-C253

Unit : mm

EDP No.	Mill Diameter D1	Shank Diameter D2	Length of Cut L1	Length Below Shank L3	Overall Length L2	Neck Diameter D3
SEME7304040E	4.0	6	6	40	80	3.85
SEME7304045E	4.0	6	6	45	90	3.85
SEME7304050E	4.0	6	6	50	100	3.85
SEME7304060E	4.0	6	6	60	100	3.85
SEME7305016E	5.0	6	8	16	60	4.85
SEME7305020E	5.0	6	8	20	60	4.85
SEME7305026E	5.0	6	8	26	65	4.85
SEME7305030E	5.0	6	8	30	70	4.85
SEME7305035E	5.0	6	8	35	75	4.85
SEME7305040E	5.0	6	8	40	80	4.85
SEME7305050E	5.0	6	8	50	90	4.85
SEME7305060E	5.0	6	8	60	100	4.85
SEME7306015E	6.0	6	9	15	60	5.85
SEME7306020E	6.0	6	9	20	60	5.85
SEME7306030E	6.0	6	9	30	70	5.85
SEME7306032E	6.0	6	9	32	90	5.85
SEME7308025E	8.0	8	12	25	70	7.70
SEME7308030E	8.0	8	12	30	80	7.70
SEME7308042E	8.0	8	12	42	100	7.70
SEME7310030E	10.0	10	15	30	75	9.70
SEME7310035E	10.0	10	15	35	80	9.70
SEME7310045E	10.0	10	15	45	100	9.70
SEME7312035E	12.0	12	20	35	80	11.70
SEME7312040E	12.0	12	20	40	90	11.70
SEME7312050E	12.0	12	20	50	110	11.70

Mill Dia.Tolerance (mm)	Shank Dia.Tolerance
0 ~ - 0.03	h5

◎ : 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																		○		◎	○

4G MILL END MILLS

PLAIN SHANK **SEME75** SERIES

CARBIDE, 6 FLUTE 45° HELIX (Regular, Long Shank)

- ▶ New coating and tool geometry applied resulting outstanding cutting abilities and wear resistance.
- ▶ Excellent performance when cutting prehardened steels, up to HRc55 which are used for molds & dies.
- ▶ From the 45 helix angle, better surface roughness can be achieved at side cutting.
- ▶ Available in several effective lengths of cut and also overall lengths





CARBIDE | 6 | 45° | PLAIN | Y Coating | p.C254-C255

Unit : mm

EDP No.	Mill Diameter D1	Shank Diameter D2	Length of Cut L1	Overall Length L2	Remark
SEME75060E	6.0	6	15	60	Regular
SEME7506020E	6.0	6	20	70	Long
SEME7506030E	6.0	6	30	80	Long
SEME7506030110E	6.0	6	30	110	Long
SEME75080E	8.0	8	20	70	Regular
SEME7508030E	8.0	8	30	80	Long
SEME7508035E	8.0	8	35	90	Long
SEME7508040E	8.0	8	40	90	Long
SEME7508040130E	8.0	8	40	130	Long
SEME75100E	10.0	10	25	75	Regular
SEME7510030E	10.0	10	30	80	Long
SEME7510040E	10.0	10	40	90	Long
SEME7510050E	10.0	10	50	100	Long
SEME7510050150E	10.0	10	50	150	Long
SEME75120E	12.0	12	30	80	Regular
SEME7512040E	12.0	12	40	90	Long
SEME7512050E	12.0	12	50	100	Long
SEME7512060E	12.0	12	60	110	Long
SEME7512060150E	12.0	12	60	150	Long
SEME75160E	16.0	16	40	100	Regular
SEME7516050E	16.0	16	50	110	Long
SEME7516060E	16.0	16	60	120	Long
SEME7516090E	16.0	16	90	150	Long
SEME75160110E	16.0	16	110	200	Long
SEME75160110250E	16.0	16	110	250	Long
SEME75200E	20.0	20	45	100	Regular
SEME7520060E	20.0	20	60	120	Long
SEME7520070E	20.0	20	70	130	Long
SEME75200110E	20.0	20	110	200	Long
SEME75200110250E	20.0	20	110	250	Long
SEME75200110300E	20.0	20	110	300	Long

Mill Dia.Tolerance (mm)	Shank Dia.Tolerance
0 ~ - 0.03	h5

◎ : 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																		○		◎	○

4G MILL END MILLS

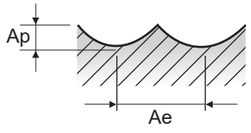
RECOMMENDED CUTTING CONDITIONS

SEMD98 SERIES — 2 FLUTE BALL NOSE

Vc = m/min.
fz = mm/tooth
RPM = rev./min.
FEED = mm/min.

ISO	VDI 3323	Material Description	Ae(mm)	Ap(mm)	Parameter	Diameter (Ø)													
						0.1	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
P	1-5	Non-alloy steel	0.08D	0.05D	Vc	13	19	28	38	47	57	66	75	85	94	113	141	187	187
					fz	0.007	0.012	0.015	0.019	0.024	0.029	0.034	0.039	0.044	0.048	0.051	0.054	0.057	0.074
					RPM	41380	30239	29709	30239	29921	30239	30012	29842	30063	29921	29974	29921	29762	23810
					FEED	579	726	891	1149	1436	1754	2041	2328	2646	2872	3057	3231	3393	3524
	6-8	Low alloy steel	0.08D	0.05D	Vc	13	19	28	38	47	57	66	75	85	94	113	141	187	187
					fz	0.007	0.012	0.015	0.019	0.024	0.029	0.034	0.039	0.044	0.048	0.051	0.054	0.057	0.074
					RPM	41380	30239	29709	30239	29921	30239	30012	29842	30063	29921	29974	29921	29762	23810
					FEED	579	726	891	1149	1436	1754	2041	2328	2646	2872	3057	3231	3393	3524
	9		0.08D	0.05D	Vc	13	19	28	38	47	57	66	75	85	94	109	136	180	180
					fz	0.006	0.011	0.014	0.017	0.021	0.025	0.029	0.033	0.038	0.042	0.045	0.047	0.05	0.066
					RPM	41380	30239	29709	30239	29921	30239	30012	29842	30063	29921	28913	28860	28648	22918
					FEED	497	665	832	1028	1257	1512	1741	1970	2285	2513	2602	2713	2865	3025
	10-11.1	High alloyed steel, and tool steel	0.08D	0.05D	Vc	13	19	28	38	47	57	66	75	85	94	113	141	187	187
					fz	0.007	0.012	0.015	0.019	0.024	0.029	0.034	0.039	0.044	0.048	0.051	0.054	0.057	0.074
					RPM	41380	30239	29709	30239	29921	30239	30012	29842	30063	29921	29974	29921	29762	23810
					FEED	579	726	891	1149	1436	1754	2041	2328	2646	2872	3057	3231	3393	3524
	11.2		0.08D	0.05D	Vc	13	19	28	38	47	57	66	75	85	94	109	136	180	180
					fz	0.006	0.011	0.014	0.017	0.021	0.025	0.029	0.033	0.038	0.042	0.045	0.047	0.05	0.066
					RPM	41380	30239	29709	30239	29921	30239	30012	29842	30063	29921	28913	28860	28648	22918
					FEED	497	665	832	1028	1257	1512	1741	1970	2285	2513	2602	2713	2865	3025
K	15-20	Grey cast iron Nodular cast iron Malleable cast iron	0.08D	0.05D	Vc	13	19	28	38	47	57	66	75	85	94	113	141	187	187
					fz	0.007	0.012	0.015	0.019	0.024	0.029	0.034	0.039	0.044	0.048	0.051	0.054	0.057	0.074
					RPM	41380	30239	29709	30239	29921	30239	30012	29842	30063	29921	29974	29921	29762	23810
					FEED	579	726	891	1149	1436	1754	2041	2328	2646	2872	3057	3231	3393	3524
H	38.1 - 38.2	Hardened steel	0.08D	0.05D	Vc	10	17	25	34	42	51	59	68	76	85	97	122	151	151
					fz	0.006	0.011	0.013	0.017	0.021	0.024	0.029	0.033	0.038	0.042	0.045	0.047	0.05	0.063
					RPM	31831	27056	26526	27056	26738	27056	26829	27056	26880	27056	25730	25889	24032	19226
					FEED	382	595	690	920	1123	1299	1556	1786	2043	2273	2316	2434	2403	2422
	40	Chilled Cast Iron	0.08D	0.05D	Vc	13	19	28	38	47	57	66	75	85	94	109	136	180	180
					fz	0.006	0.011	0.014	0.017	0.021	0.025	0.029	0.033	0.038	0.042	0.045	0.047	0.05	0.066
					RPM	41380	30239	29709	30239	29921	30239	30012	29842	30063	29921	28913	28860	28648	22918
					FEED	497	665	832	1028	1257	1512	1741	1970	2285	2513	2602	2713	2865	3025
	41	Hardened Cast Iron	0.08D	0.05D	Vc	10	17	25	34	42	51	59	68	76	85	97	122	151	151
					fz	0.006	0.011	0.013	0.017	0.021	0.024	0.029	0.033	0.038	0.042	0.045	0.047	0.05	0.063
					RPM	31831	27056	26526	27056	26738	27056	26829	27056	26880	27056	25730	25889	24032	19226
					FEED	382	595	690	920	1123	1299	1556	1786	2043	2273	2316	2434	2403	2422

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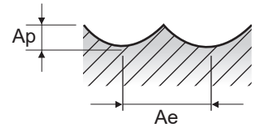
4G MILL END MILLS

RECOMMENDED CUTTING CONDITIONS

SEMD98 SERIES — 2 FLUTE BALL NOSE

Vc = m/min.
fz = mm/tooth
RPM = rev./min.
FEED = mm/min.

VDI 3323	Parameter	Diameter (Ø)																					
		3.0	3.5	4.0	4.5	5.0	5.5	6.0	6.5	7.0	8.0	8.5	9.0	10.0	11.0	12.0	13.0	14.0	15.0	16.0	18.0	20.0	25.0
1-5	Vc	187	187	187	184	175	168	157	159	159	167	168	168	175	168	157	162	165	167	168	170	168	167
	fz	0.091	0.106	0.121	0.136	0.156	0.164	0.174	0.179	0.184	0.189	0.192	0.195	0.199	0.205	0.212	0.218	0.224	0.23	0.238	0.25	0.264	0.27
	RPM	19841	17007	14881	13015	11141	9723	8329	7786	7230	6645	6291	5942	5570	4861	4165	3967	3752	3544	3342	3006	2674	2126
	FEED	3611	3605	3601	3540	3476	3189	2899	2788	2661	2512	2416	2317	2217	1993	1766	1729	1681	1630	1591	1503	1412	1148
6-8	Vc	187	187	187	184	175	168	157	159	159	167	168	168	175	168	157	162	165	167	168	170	168	167
	fz	0.091	0.106	0.121	0.136	0.156	0.164	0.174	0.179	0.184	0.189	0.192	0.195	0.199	0.205	0.212	0.218	0.224	0.23	0.238	0.25	0.264	0.27
	RPM	19841	17007	14881	13015	11141	9723	8329	7786	7230	6645	6291	5942	5570	4861	4165	3967	3752	3544	3342	3006	2674	2126
	FEED	3611	3605	3601	3540	3476	3189	2899	2788	2661	2512	2416	2317	2217	1993	1766	1729	1681	1630	1591	1503	1412	1148
9	Vc	180	180	180	177	168	162	152	153	153	161	162	161	168	161	151	155	158	160	161	164	162	162
	fz	0.083	0.097	0.111	0.122	0.138	0.144	0.153	0.156	0.159	0.164	0.167	0.17	0.174	0.18	0.188	0.197	0.208	0.221	0.206	0.215	0.227	0.231
	RPM	19099	16370	14324	12520	10695	9376	8064	7493	6957	6406	6067	5694	5348	4659	4005	3795	3592	3395	3203	2900	2578	2063
	FEED	3170	3176	3180	3055	2952	2700	2468	2338	2212	2101	2026	1936	1861	1677	1506	1495	1494	1501	1320	1247	1171	953
10 - 11.1	Vc	187	187	187	184	175	168	157	159	159	167	168	168	175	168	157	162	165	167	168	170	168	167
	fz	0.091	0.106	0.121	0.136	0.156	0.164	0.174	0.179	0.184	0.189	0.192	0.195	0.199	0.205	0.212	0.218	0.224	0.23	0.238	0.25	0.264	0.27
	RPM	19841	17007	14881	13015	11141	9723	8329	7786	7230	6645	6291	5942	5570	4861	4165	3967	3752	3544	3342	3006	2674	2126
	FEED	3611	3605	3601	3540	3476	3189	2899	2788	2661	2512	2416	2317	2217	1993	1766	1729	1681	1630	1591	1503	1412	1148
11.2	Vc	180	180	180	177	168	162	152	153	153	161	162	161	168	161	151	155	158	160	161	164	162	162
	fz	0.083	0.097	0.111	0.122	0.138	0.144	0.153	0.156	0.159	0.164	0.167	0.17	0.174	0.18	0.188	0.197	0.208	0.221	0.206	0.215	0.227	0.231
	RPM	19099	16370	14324	12520	10695	9376	8064	7493	6957	6406	6067	5694	5348	4659	4005	3795	3592	3395	3203	2900	2578	2063
	FEED	3170	3176	3180	3055	2952	2700	2468	2338	2212	2101	2026	1936	1861	1677	1506	1495	1494	1501	1320	1247	1171	953
15 - 20	Vc	187	187	187	184	175	168	157	159	159	167	168	168	175	168	157	162	165	167	168	170	168	167
	fz	0.091	0.106	0.121	0.136	0.156	0.164	0.174	0.179	0.184	0.189	0.192	0.195	0.199	0.205	0.212	0.218	0.224	0.23	0.238	0.25	0.264	0.27
	RPM	19841	17007	14881	13015	11141	9723	8329	7786	7230	6645	6291	5942	5570	4861	4165	3967	3752	3544	3342	3006	2674	2126
	FEED	3611	3605	3601	3540	3476	3189	2899	2788	2661	2512	2416	2317	2217	1993	1766	1729	1681	1630	1591	1503	1412	1148
38.1 - 38.2	Vc	151	151	151	148	141	135	124	127	128	136	136	136	141	136	127	131	133	135	136	137	136	136
	fz	0.075	0.088	0.1	0.111	0.125	0.132	0.141	0.144	0.147	0.15	0.153	0.156	0.16	0.164	0.17	0.173	0.178	0.183	0.189	0.198	0.208	0.211
	RPM	16022	13733	12016	10469	8976	7813	6578	6219	5821	5411	5093	4810	4488	3935	3369	3208	3024	2865	2706	2423	2165	1732
	FEED	2403	2417	2403	2324	2244	2063	1855	1791	1711	1623	1558	1501	1436	1291	1145	1110	1077	1049	1023	959	900	731
40	Vc	180	180	180	177	168	162	152	153	153	161	162	161	168	161	151	155	158	160	161	164	162	162
	fz	0.083	0.097	0.111	0.122	0.138	0.144	0.153	0.156	0.159	0.164	0.167	0.17	0.174	0.18	0.188	0.197	0.208	0.221	0.206	0.215	0.227	0.231
	RPM	19099	16370	14324	12520	10695	9376	8064	7493	6957	6406	6067	5694	5348	4659	4005	3795	3592	3395	3203	2900	2578	2063
	FEED	3170	3176	3180	3055	2952	2700	2468	2338	2212	2101	2026	1936	1861	1677	1506	1495	1494	1501	1320	1247	1171	953
41	Vc	151	151	151	148	141	135	124	127	128	136	136	136	141	136	127	131	133	135	136	137	136	136
	fz	0.075	0.088	0.1	0.111	0.125	0.132	0.141	0.144	0.147	0.15	0.153	0.156	0.16	0.164	0.17	0.173	0.178	0.183	0.189	0.198	0.208	0.211
	RPM	16022	13733	12016	10469	8976	7813	6578	6219	5821	5411	5093	4810	4488	3935	3369	3208	3024	2865	2706	2423	2165	1732
	FEED	2403	2417	2403	2324	2244	2063	1855	1791	1711	1623	1558	1501	1436	1291	1145	1110	1077	1049	1023	959	900	731



4G MILL END MILLS

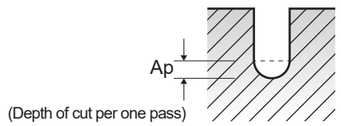
RECOMMENDED CUTTING CONDITIONS

SEM846 SERIES 2 FLUTE BALL NOSE - SLOTTING

Vc = m/min. FEED = mm/min.
fz = mm/tooth Ap = mm
RPM = rev./min. LBS = Length Below Shank

ISO	VDI 3323	Material Description	Parameter	Diameter (Ø)															
				0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.3
				LBS	0.2	0.3	0.5	1	0.5	1	1.5	2	3	1	1.5	2	2.5	3	4
P	1-5	Non-alloy steel	Vc	16	16	16	14	31	31	28	28	28	47	47	42	42	42	38	
			fz	0.002	0.002	0.002	0.002	0.003	0.003	0.003	0.003	0.003	0.005	0.005	0.004	0.004	0.004	0.004	
			RPM	50930	50930	50930	44563	49338	49338	44563	44563	44563	49869	49869	44563	44563	44563	40319	
			FEED	204	204	204	178	296	296	267	267	267	499	499	357	357	357	323	
			Ap	0.009	0.009	0.006	0.002	0.018	0.013	0.007	0.005	0.003	0.019	0.019	0.011	0.007	0.007	0.004	
	6-8	Low alloy steel	Vc	16	16	16	14	31	31	28	28	28	47	47	42	42	42	38	
			fz	0.002	0.002	0.002	0.002	0.003	0.003	0.003	0.003	0.003	0.005	0.005	0.004	0.004	0.004	0.004	
			RPM	50930	50930	50930	44563	49338	49338	44563	44563	44563	49869	49869	44563	44563	44563	40319	
			FEED	204	204	204	178	296	296	267	267	267	499	499	357	357	357	323	
			Ap	0.009	0.009	0.006	0.002	0.018	0.013	0.007	0.005	0.003	0.019	0.019	0.011	0.007	0.007	0.004	
	9		Vc	16	16	16	14	31	31	28	28	28	47	47	42	42	42	38	
			fz	0.002	0.002	0.002	0.002	0.003	0.003	0.003	0.003	0.003	0.004	0.004	0.004	0.004	0.004	0.003	
			RPM	50930	50930	50930	44563	49338	49338	44563	44563	44563	49869	49869	44563	44563	44563	40319	
			FEED	204	204	204	178	296	296	267	267	267	399	399	357	357	357	242	
			Ap	0.007	0.007	0.005	0.002	0.014	0.01	0.006	0.004	0.003	0.015	0.015	0.008	0.005	0.005	0.003	
	10-11.1	High alloyed steel, and tool steel	Vc	16	16	16	14	31	31	28	28	28	47	47	42	42	42	38	
			fz	0.002	0.002	0.002	0.002	0.003	0.003	0.003	0.003	0.003	0.005	0.005	0.004	0.004	0.004	0.004	
			RPM	50930	50930	50930	44563	49338	49338	44563	44563	44563	49869	49869	44563	44563	44563	40319	
			FEED	204	204	204	178	296	296	267	267	267	499	499	357	357	357	323	
			Ap	0.009	0.009	0.006	0.002	0.018	0.013	0.007	0.005	0.003	0.019	0.019	0.011	0.007	0.007	0.004	
	11.2		Vc	16	16	16	14	31	31	28	28	28	47	47	42	42	42	38	
			fz	0.002	0.002	0.002	0.002	0.003	0.003	0.003	0.003	0.003	0.004	0.004	0.004	0.004	0.004	0.003	
			RPM	50930	50930	50930	44563	49338	49338	44563	44563	44563	49869	49869	44563	44563	44563	40319	
			FEED	204	204	204	178	296	296	267	267	267	399	399	357	357	357	242	
			Ap	0.007	0.007	0.005	0.002	0.014	0.01	0.006	0.004	0.003	0.015	0.015	0.008	0.005	0.005	0.003	
K	15-20	Grey cast iron Nodular cast iron Malleable cast iron	Vc	16	16	16	14	31	31	28	28	28	47	47	42	42	42	38	
			fz	0.002	0.002	0.002	0.002	0.003	0.003	0.003	0.003	0.003	0.005	0.005	0.004	0.004	0.004	0.004	
			RPM	50930	50930	50930	44563	49338	49338	44563	44563	44563	49869	49869	44563	44563	44563	40319	
			FEED	204	204	204	178	296	296	267	267	267	499	499	357	357	357	323	
			Ap	0.009	0.009	0.006	0.002	0.018	0.013	0.007	0.005	0.003	0.019	0.019	0.011	0.007	0.007	0.004	
H	38.1 - 38.2	Hardened steel	Vc	16	16	16	14	27	27	24	24	24	40	40	36	36	36	32	
			fz	0.002	0.002	0.002	0.002	0.003	0.003	0.003	0.003	0.003	0.004	0.004	0.004	0.004	0.004	0.003	
			RPM	50930	50930	50930	44563	42972	42972	38197	38197	38197	42441	42441	38197	38197	38197	33953	
			FEED	204	204	204	178	258	258	229	229	229	340	340	306	306	306	204	
			Ap	0.005	0.005	0.004	0.001	0.01	0.007	0.004	0.003	0.002	0.011	0.011	0.006	0.004	0.004	0.002	
	40	Chilled Cast Iron	Vc	16	16	16	14	31	31	28	28	28	47	47	42	42	42	38	
			fz	0.002	0.002	0.002	0.002	0.003	0.003	0.003	0.003	0.003	0.004	0.004	0.004	0.004	0.004	0.003	
			RPM	50930	50930	50930	44563	49338	49338	44563	44563	44563	49869	49869	44563	44563	44563	40319	
			FEED	204	204	204	178	296	296	267	267	267	399	399	357	357	357	242	
			Ap	0.007	0.007	0.005	0.002	0.014	0.01	0.006	0.004	0.003	0.015	0.015	0.008	0.005	0.005	0.003	
	41	Hardened Cast Iron	Vc	16	16	16	14	27	27	24	24	24	40	40	36	36	36	32	
			fz	0.002	0.002	0.002	0.002	0.003	0.003	0.003	0.003	0.003	0.004	0.004	0.004	0.004	0.004	0.003	
			RPM	50930	50930	50930	44563	42972	42972	38197	38197	38197	42441	42441	38197	38197	38197	33953	
			FEED	204	204	204	178	258	258	229	229	229	340	340	306	306	306	204	
			Ap	0.005	0.005	0.004	0.001	0.01	0.007	0.004	0.003	0.002	0.011	0.011	0.006	0.004	0.004	0.002	

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4G MILL END MILLS

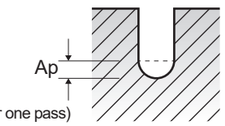
RECOMMENDED CUTTING CONDITIONS

SEM846 SERIES 2 FLUTE BALL NOSE - SLOTTING

Vc = m/min. FEED = mm/min.
fz = mm/tooth Ap = mm
RPM = rev./min. LBS = Length Below Shank

VDI 3323	Parameter	Diameter (Ø)																	
		0.3	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
	LBS	5	1	1.5	2	2.5	3	4	5	6	8	10	1	1.5	2	2.5	3	4	5	6	8
1-5	Vc	28	52	52	52	46	46	46	41	41	31	15	54	54	54	54	48	48	48	43	32
	fz	0.003	0.006	0.006	0.006	0.005	0.005	0.005	0.005	0.005	0.004	0.004	0.01	0.01	0.01	0.01	0.009	0.009	0.009	0.008	0.007
	RPM	29709	41380	41380	41380	36606	36606	36606	32627	32627	24669	11937	34377	34377	34377	34377	30558	30558	30558	27375	20372
	FEED	178	497	497	497	366	366	366	326	326	197	95	688	688	688	688	550	550	550	438	285
	Ap	0.003	0.036	0.025	0.025	0.014	0.014	0.009	0.009	0.005	0.004	0.004	0.045	0.045	0.032	0.032	0.018	0.018	0.011	0.011	0.007
6-8	Vc	28	52	52	52	46	46	46	41	41	31	15	54	54	54	54	48	48	48	43	32
	fz	0.003	0.006	0.006	0.006	0.005	0.005	0.005	0.005	0.005	0.004	0.004	0.01	0.01	0.01	0.01	0.009	0.009	0.009	0.008	0.007
	RPM	29709	41380	41380	41380	36606	36606	36606	32627	32627	24669	11937	34377	34377	34377	34377	30558	30558	30558	27375	20372
	FEED	178	497	497	497	366	366	366	326	326	197	95	688	688	688	688	550	550	550	438	285
	Ap	0.003	0.036	0.025	0.025	0.014	0.014	0.009	0.009	0.005	0.004	0.004	0.045	0.045	0.032	0.032	0.018	0.018	0.011	0.011	0.007
9	Vc	28	49	49	49	44	44	44	39	39	29	15	51	51	51	51	46	46	46	41	30
	fz	0.003	0.005	0.005	0.005	0.005	0.005	0.005	0.004	0.004	0.004	0.003	0.009	0.009	0.009	0.009	0.008	0.008	0.008	0.007	0.006
	RPM	29709	38993	38993	38993	35014	35014	35014	31035	31035	23077	11937	32468	32468	32468	32468	29285	29285	29285	26101	19099
	FEED	178	390	390	390	350	350	350	248	248	185	72	584	584	584	584	469	469	469	365	229
	Ap	0.002	0.028	0.02	0.02	0.011	0.011	0.007	0.007	0.004	0.003	0.003	0.035	0.035	0.025	0.025	0.014	0.014	0.009	0.009	0.005
10 - 11.1	Vc	28	52	52	52	46	46	46	41	41	31	15	54	54	54	54	48	48	48	43	32
	fz	0.003	0.006	0.006	0.006	0.005	0.005	0.005	0.005	0.005	0.004	0.004	0.01	0.01	0.01	0.01	0.009	0.009	0.009	0.008	0.007
	RPM	29709	41380	41380	41380	36606	36606	36606	32627	32627	24669	11937	34377	34377	34377	34377	30558	30558	30558	27375	20372
	FEED	178	497	497	497	366	366	366	326	326	197	95	688	688	688	688	550	550	550	438	285
	Ap	0.003	0.036	0.025	0.025	0.014	0.014	0.009	0.009	0.005	0.004	0.004	0.045	0.045	0.032	0.032	0.018	0.018	0.011	0.011	0.007
11.2	Vc	28	49	49	49	44	44	44	39	39	29	15	51	51	51	51	46	46	46	41	30
	fz	0.003	0.005	0.005	0.005	0.005	0.005	0.005	0.004	0.004	0.004	0.003	0.009	0.009	0.009	0.009	0.008	0.008	0.008	0.007	0.006
	RPM	29709	38993	38993	38993	35014	35014	35014	31035	31035	23077	11937	32468	32468	32468	32468	29285	29285	29285	26101	19099
	FEED	178	390	390	390	350	350	350	248	248	185	72	584	584	584	584	469	469	469	365	229
	Ap	0.002	0.028	0.02	0.02	0.011	0.011	0.007	0.007	0.004	0.003	0.003	0.035	0.035	0.025	0.025	0.014	0.014	0.009	0.009	0.005
15 - 20	Vc	28	52	52	52	46	46	46	41	41	31	15	54	54	54	54	48	48	48	43	32
	fz	0.003	0.006	0.006	0.006	0.005	0.005	0.005	0.005	0.005	0.004	0.004	0.01	0.01	0.01	0.01	0.009	0.009	0.009	0.008	0.007
	RPM	29709	41380	41380	41380	36606	36606	36606	32627	32627	24669	11937	34377	34377	34377	34377	30558	30558	30558	27375	20372
	FEED	178	497	497	497	366	366	366	326	326	197	95	688	688	688	688	550	550	550	438	285
	Ap	0.003	0.036	0.025	0.025	0.014	0.014	0.009	0.009	0.005	0.004	0.004	0.045	0.045	0.032	0.032	0.018	0.018	0.011	0.011	0.007
38.1 - 38.2	Vc	24	43	43	43	39	39	39	34	34	26	13	45	45	45	45	40	40	40	36	27
	fz	0.003	0.005	0.005	0.005	0.004	0.004	0.004	0.004	0.004	0.004	0.003	0.009	0.009	0.009	0.009	0.008	0.008	0.008	0.007	0.006
	RPM	25465	34218	34218	34218	31035	31035	31035	27056	27056	20690	10345	28648	28648	28648	28648	25465	25465	25465	22918	17189
	FEED	153	342	342	342	248	248	248	216	216	166	62	516	516	516	516	407	407	407	321	206
	Ap	0.002	0.02	0.014	0.014	0.008	0.008	0.005	0.005	0.003	0.002	0.002	0.025	0.025	0.018	0.018	0.01	0.01	0.006	0.006	0.004
40	Vc	28	49	49	49	44	44	44	39	39	29	15	51	51	51	51	46	46	46	41	30
	fz	0.003	0.005	0.005	0.005	0.005	0.005	0.005	0.004	0.004	0.004	0.003	0.009	0.009	0.009	0.009	0.008	0.008	0.008	0.007	0.006
	RPM	29709	38993	38993	38993	35014	35014	35014	31035	31035	23077	11937	32468	32468	32468	32468	29285	29285	29285	26101	19099
	FEED	178	390	390	390	350	350	350	248	248	185	72	584	584	584	584	469	469	469	365	229
	Ap	0.002	0.028	0.02	0.02	0.011	0.011	0.007	0.007	0.004	0.003	0.003	0.035	0.035	0.025	0.025	0.014	0.014	0.009	0.009	0.005
41	Vc	24	43	43	43	39	39	39	34	34	26	13	45	45	45	45	40	40	40	36	27
	fz	0.003	0.005	0.005	0.005	0.004	0.004	0.004	0.004	0.004	0.004	0.003	0.009	0.009	0.009	0.009	0.008	0.008	0.008	0.007	0.006
	RPM	25465	34218	34218	34218	31035	31035	31035	27056	27056	20690	10345	28648	28648	28648	28648	25465	25465	25465	22918	17189
	FEED	153	342	342	342	248	248	248	216	216	166	62	516	516	516	516	407	407	407	321	206
	Ap	0.002	0.02	0.014	0.014	0.008	0.008	0.005	0.005	0.003	0.002	0.002	0.025	0.025	0.018	0.018	0.01	0.01	0.006	0.006	0.004

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CARBIDE
HSS
i-Xmill END MILLS
X-1EH END MILLS
4G MILL END MILLS
X-POWER PRO END MILLS
TitaNox-POWER END MILLS
V7 PLUS END MILLS
ALU-CUT END MILLS
K-2 END MILLS
GENERAL CARBIDE END MILLS

4G MILL END MILLS

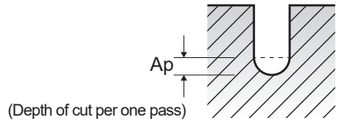
RECOMMENDED CUTTING CONDITIONS

SEM846 SERIES 2 FLUTE BALL NOSE - SLOTTING

Vc = m/min. FEED = mm/min.
fz = mm/tooth Ap = mm
RPM = rev./min. LBS = Length Below Shank

ISO	VDI 3323	Parameter	Diameter (Ø)																
			0.5	0.5	0.5	0.5	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.7	0.7
		LBS	10	12	14	16	1	2	3	4	5	6	8	10	12	14	16	2	4
P	1-5	Vc	32	16	16	5	64	64	64	58	58	58	52	39	39	19	19	75	68
		fz	0.007	0.006	0.006	0.005	0.015	0.015	0.015	0.013	0.013	0.013	0.012	0.01	0.01	0.009	0.009	0.017	0.015
		RPM	20372	10186	10186	3183	33953	33953	33953	30770	30770	30770	27587	20690	20690	10080	10080	34105	30922
		FEED	285	122	122	32	1019	1019	1019	800	800	800	662	414	414	181	181	1160	928
		Ap	0.005	0.005	0.005	0.005	0.038	0.038	0.038	0.022	0.014	0.014	0.008	0.005	0.005	0.005	0.005	0.063	0.025
	6-8	Vc	32	16	16	5	64	64	64	58	58	58	52	39	39	19	19	75	68
		fz	0.007	0.006	0.006	0.005	0.015	0.015	0.015	0.013	0.013	0.013	0.012	0.01	0.01	0.009	0.009	0.017	0.015
		RPM	20372	10186	10186	3183	33953	33953	33953	30770	30770	30770	27587	20690	20690	10080	10080	34105	30922
		FEED	285	122	122	32	1019	1019	1019	800	800	800	662	414	414	181	181	1160	928
		Ap	0.005	0.005	0.005	0.005	0.038	0.038	0.038	0.022	0.014	0.014	0.008	0.005	0.005	0.005	0.005	0.063	0.025
	9	Vc	30	15	15	5	61	61	61	55	55	55	49	37	37	18	18	71	64
		fz	0.006	0.005	0.005	0.005	0.013	0.013	0.013	0.012	0.012	0.012	0.01	0.009	0.009	0.008	0.008	0.014	0.013
		RPM	19099	9549	9549	3183	32362	32362	32362	29178	29178	29178	25995	19629	19629	9549	9549	32286	29103
		FEED	229	95	95	32	841	841	841	700	700	700	520	353	353	153	153	904	757
		Ap	0.004	0.004	0.004	0.004	0.029	0.029	0.029	0.017	0.011	0.011	0.006	0.004	0.004	0.004	0.004	0.049	0.02
	10-11.1	Vc	32	16	16	5	64	64	64	58	58	58	52	39	39	19	19	75	68
		fz	0.007	0.006	0.006	0.005	0.015	0.015	0.015	0.013	0.013	0.013	0.012	0.01	0.01	0.009	0.009	0.017	0.015
		RPM	20372	10186	10186	3183	33953	33953	33953	30770	30770	30770	27587	20690	20690	10080	10080	34105	30922
		FEED	285	122	122	32	1019	1019	1019	800	800	800	662	414	414	181	181	1160	928
		Ap	0.005	0.005	0.005	0.005	0.038	0.038	0.038	0.022	0.014	0.014	0.008	0.005	0.005	0.005	0.005	0.063	0.025
	11.2	Vc	30	15	15	5	61	61	61	55	55	55	49	37	37	18	18	71	64
		fz	0.006	0.005	0.005	0.005	0.013	0.013	0.013	0.012	0.012	0.012	0.01	0.009	0.009	0.008	0.008	0.014	0.013
		RPM	19099	9549	9549	3183	32362	32362	32362	29178	29178	29178	25995	19629	19629	9549	9549	32286	29103
		FEED	229	95	95	32	841	841	841	700	700	700	520	353	353	153	153	904	757
		Ap	0.004	0.004	0.004	0.004	0.029	0.029	0.029	0.017	0.011	0.011	0.006	0.004	0.004	0.004	0.004	0.049	0.02
K	15-20	Vc	32	16	16	5	64	64	64	58	58	58	52	39	39	19	19	75	68
		fz	0.007	0.006	0.006	0.005	0.015	0.015	0.015	0.013	0.013	0.013	0.012	0.01	0.01	0.009	0.009	0.017	0.015
		RPM	20372	10186	10186	3183	33953	33953	33953	30770	30770	30770	27587	20690	20690	10080	10080	34105	30922
		FEED	285	122	122	32	1019	1019	1019	800	800	800	662	414	414	181	181	1160	928
		Ap	0.005	0.005	0.005	0.005	0.038	0.038	0.038	0.022	0.014	0.014	0.008	0.005	0.005	0.005	0.005	0.063	0.025
H	38.1 - 38.2	Vc	27	13	13	4	54	54	54	48	48	48	43	32	32	16	16	63	56
		fz	0.006	0.006	0.006	0.004	0.012	0.012	0.012	0.011	0.011	0.011	0.01	0.008	0.008	0.007	0.007	0.013	0.012
		RPM	17189	8276	8276	2546	28648	28648	28648	25465	25465	25465	22812	16977	16977	8488	8488	28648	25465
		FEED	206	99	99	20	688	688	688	560	560	560	456	272	272	119	119	745	611
		Ap	0.003	0.003	0.003	0.003	0.021	0.021	0.021	0.012	0.008	0.008	0.005	0.003	0.003	0.003	0.003	0.035	0.014
	40	Vc	30	15	15	5	61	61	61	55	55	55	49	37	37	18	18	71	64
		fz	0.006	0.005	0.005	0.005	0.013	0.013	0.013	0.012	0.012	0.012	0.01	0.009	0.009	0.008	0.008	0.014	0.013
		RPM	19099	9549	9549	3183	32362	32362	32362	29178	29178	29178	25995	19629	19629	9549	9549	32286	29103
		FEED	229	95	95	32	841	841	841	700	700	700	520	353	353	153	153	904	757
		Ap	0.004	0.004	0.004	0.004	0.029	0.029	0.029	0.017	0.011	0.011	0.006	0.004	0.004	0.004	0.004	0.049	0.02
	41	Vc	27	13	13	4	54	54	54	48	48	48	43	32	32	16	16	63	56
		fz	0.006	0.006	0.006	0.004	0.012	0.012	0.012	0.011	0.011	0.011	0.01	0.008	0.008	0.007	0.007	0.013	0.012
		RPM	17189	8276	8276	2546	28648	28648	28648	25465	25465	25465	22812	16977	16977	8488	8488	28648	25465
		FEED	206	99	99	20	688	688	688	560	560	560	456	272	272	119	119	745	611
		Ap	0.003	0.003	0.003	0.003	0.021	0.021	0.021	0.012	0.008	0.008	0.005	0.003	0.003	0.003	0.003	0.035	0.014

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4G MILL END MILLS

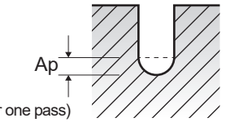
RECOMMENDED CUTTING CONDITIONS

SEM846 SERIES 2 FLUTE BALL NOSE - SLOTTING

Vc = m/min. FEED = mm/min.
fz = mm/tooth Ap = mm
RPM = rev./min. LBS = Length Below Shank

VDI 3323	Parameter	Diameter (Ø)																		
		0.7	0.7	0.7	0.7	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.9	0.9	0.9	0.9	1.0
	LBS	6	8	10	12	2	3	4	5	6	8	10	12	14	16	20	4	6	8	10	2
1-5	Vc	68	60	60	45	86	86	86	77	77	77	69	69	52	52	26	83	83	83	74	97
	fz	0.015	0.013	0.013	0.012	0.018	0.018	0.018	0.016	0.016	0.016	0.014	0.014	0.013	0.013	0.011	0.019	0.019	0.019	0.017	0.025
	RPM	30922	27284	27284	20463	34218	34218	34218	30637	30637	30637	27454	27454	20690	20690	10345	29355	29355	29355	26172	30876
	FEED	928	709	709	491	1232	1232	1232	980	980	980	769	769	538	538	228	1115	1115	1115	890	1544
	Ap	0.016	0.016	0.009	0.006	0.072	0.05	0.05	0.029	0.029	0.018	0.018	0.011	0.007	0.007	0.007	0.032	0.032	0.02	0.02	0.09
6-8	Vc	68	60	60	45	86	86	86	77	77	77	69	69	52	52	26	83	83	83	74	97
	fz	0.015	0.013	0.013	0.012	0.018	0.018	0.018	0.016	0.016	0.016	0.014	0.014	0.013	0.013	0.011	0.019	0.019	0.019	0.017	0.025
	RPM	30922	27284	27284	20463	34218	34218	34218	30637	30637	30637	27454	27454	20690	20690	10345	29355	29355	29355	26172	30876
	FEED	928	709	709	491	1232	1232	1232	980	980	980	769	769	538	538	228	1115	1115	1115	890	1544
	Ap	0.016	0.016	0.009	0.006	0.072	0.05	0.05	0.029	0.029	0.018	0.018	0.011	0.007	0.007	0.007	0.032	0.032	0.02	0.02	0.09
9	Vc	64	57	57	43	81	81	81	73	73	73	65	65	49	49	24	78	78	78	69	91
	fz	0.013	0.012	0.012	0.01	0.016	0.016	0.016	0.014	0.014	0.014	0.013	0.013	0.011	0.011	0.01	0.017	0.017	0.017	0.015	0.023
	RPM	29103	25920	25920	19553	32229	32229	32229	29046	29046	29046	25863	25863	19496	19496	9549	27587	27587	27587	24404	28966
	FEED	757	622	622	391	1031	1031	1031	813	813	813	672	672	429	429	191	938	938	938	732	1332
	Ap	0.012	0.012	0.007	0.005	0.056	0.039	0.039	0.022	0.022	0.014	0.014	0.008	0.006	0.006	0.006	0.025	0.025	0.016	0.016	0.07
10 - 11.1	Vc	68	60	60	45	86	86	86	77	77	77	69	69	52	52	26	83	83	83	74	97
	fz	0.015	0.013	0.013	0.012	0.018	0.018	0.018	0.016	0.016	0.016	0.014	0.014	0.013	0.013	0.011	0.019	0.019	0.019	0.017	0.025
	RPM	30922	27284	27284	20463	34218	34218	34218	30637	30637	30637	27454	27454	20690	20690	10345	29355	29355	29355	26172	30876
	FEED	928	709	709	491	1232	1232	1232	980	980	980	769	769	538	538	228	1115	1115	1115	890	1544
	Ap	0.016	0.016	0.009	0.006	0.072	0.05	0.05	0.029	0.029	0.018	0.018	0.011	0.007	0.007	0.007	0.032	0.032	0.02	0.02	0.09
11.2	Vc	64	57	57	43	81	81	81	73	73	73	65	65	49	49	24	78	78	78	69	91
	fz	0.013	0.012	0.012	0.01	0.016	0.016	0.016	0.014	0.014	0.014	0.013	0.013	0.011	0.011	0.01	0.017	0.017	0.017	0.015	0.023
	RPM	29103	25920	25920	19553	32229	32229	32229	29046	29046	29046	25863	25863	19496	19496	9549	27587	27587	27587	24404	28966
	FEED	757	622	622	391	1031	1031	1031	813	813	813	672	672	429	429	191	938	938	938	732	1332
	Ap	0.012	0.012	0.007	0.005	0.056	0.039	0.039	0.022	0.022	0.014	0.014	0.008	0.006	0.006	0.006	0.025	0.025	0.016	0.016	0.07
15 - 20	Vc	68	60	60	45	86	86	86	77	77	77	69	69	52	52	26	83	83	83	74	97
	fz	0.015	0.013	0.013	0.012	0.018	0.018	0.018	0.016	0.016	0.016	0.014	0.014	0.013	0.013	0.011	0.019	0.019	0.019	0.017	0.025
	RPM	30922	27284	27284	20463	34218	34218	34218	30637	30637	30637	27454	27454	20690	20690	10345	29355	29355	29355	26172	30876
	FEED	928	709	709	491	1232	1232	1232	980	980	980	769	769	538	538	228	1115	1115	1115	890	1544
	Ap	0.016	0.016	0.009	0.006	0.072	0.05	0.05	0.029	0.029	0.018	0.018	0.011	0.007	0.007	0.007	0.032	0.032	0.02	0.02	0.09
38.1 - 38.2	Vc	56	50	50	38	72	72	72	64	64	64	57	57	43	43	21	69	69	69	61	81
	fz	0.012	0.011	0.011	0.009	0.015	0.015	0.015	0.014	0.014	0.014	0.012	0.012	0.011	0.011	0.009	0.016	0.016	0.016	0.014	0.021
	RPM	25465	22736	22736	17280	28648	28648	28648	25465	25465	25465	22680	22680	17109	17109	8356	24404	24404	24404	21574	25783
	FEED	611	500	500	311	859	859	859	713	713	713	544	544	376	376	150	781	781	781	604	1083
	Ap	0.009	0.009	0.005	0.004	0.04	0.028	0.028	0.016	0.016	0.01	0.01	0.006	0.004	0.004	0.004	0.018	0.018	0.011	0.011	0.05
40	Vc	64	57	57	43	81	81	81	73	73	73	65	65	49	49	24	78	78	78	69	91
	fz	0.013	0.012	0.012	0.01	0.016	0.016	0.016	0.014	0.014	0.014	0.013	0.013	0.011	0.011	0.01	0.017	0.017	0.017	0.015	0.023
	RPM	29103	25920	25920	19553	32229	32229	32229	29046	29046	29046	25863	25863	19496	19496	9549	27587	27587	27587	24404	28966
	FEED	757	622	622	391	1031	1031	1031	813	813	813	672	672	429	429	191	938	938	938	732	1332
	Ap	0.012	0.012	0.007	0.005	0.056	0.039	0.039	0.022	0.022	0.014	0.014	0.008	0.006	0.006	0.006	0.025	0.025	0.016	0.016	0.07
41	Vc	56	50	50	38	72	72	72	64	64	64	57	57	43	43	21	69	69	69	61	81
	fz	0.012	0.011	0.011	0.009	0.015	0.015	0.015	0.014	0.014	0.014	0.012	0.012	0.011	0.011	0.009	0.016	0.016	0.016	0.014	0.021
	RPM	25465	22736	22736	17280	28648	28648	28648	25465	25465	25465	22680	22680	17109	17109	8356	24404	24404	24404	21574	25783
	FEED	611	500	500	311	859	859	859	713	713	713	544	544	376	376	150	781	781	781	604	1083
	Ap	0.009	0.009	0.005	0.004	0.04	0.028	0.028	0.016	0.016	0.01	0.01	0.006	0.004	0.004	0.004	0.018	0.018	0.011	0.011	0.05

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4G MILL END MILLS

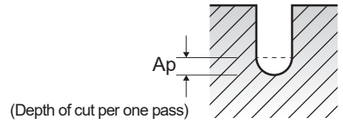
RECOMMENDED CUTTING CONDITIONS

SEM846 SERIES 2 FLUTE BALL NOSE - SLOTTING

Vc = m/min. FEED = mm/min.
fz = mm/tooth Ap = mm
RPM = rev./min. LBS = Length Below Shank

ISO	VDI 3323	Parameter	Diameter (Ø)																
			1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
		LBS	3	4	5	6	7	8	10	12	14	16	18	20	22	26	30	40	50
P	1-5	Vc	97	97	97	87	87	87	87	77	77	58	58	58	29	29	29	10	10
		fz	0.025	0.025	0.025	0.022	0.022	0.022	0.022	0.02	0.02	0.017	0.017	0.017	0.015	0.015	0.015	0.012	0.012
		RPM	30876	30876	30876	27693	27693	27693	27693	24510	24510	18462	18462	18462	9231	9231	9231	3183	3183
		FEED	1544	1544	1544	1218	1218	1218	1218	980	980	628	628	628	277	277	277	76	76
		Ap	0.09	0.063	0.063	0.036	0.036	0.036	0.023	0.023	0.014	0.014	0.009	0.009	0.009	0.009	0.009	0.009	0.006
	6-8	Vc	97	97	97	87	87	87	87	77	77	58	58	58	29	29	29	10	10
		fz	0.025	0.025	0.025	0.022	0.022	0.022	0.022	0.02	0.02	0.017	0.017	0.017	0.015	0.015	0.015	0.012	0.012
		RPM	30876	30876	30876	27693	27693	27693	27693	24510	24510	18462	18462	18462	9231	9231	9231	3183	3183
		FEED	1544	1544	1544	1218	1218	1218	1218	980	980	628	628	628	277	277	277	76	76
		Ap	0.09	0.063	0.063	0.036	0.036	0.036	0.023	0.023	0.014	0.014	0.009	0.009	0.009	0.009	0.009	0.009	0.006
	9	Vc	91	91	91	82	82	82	82	73	73	55	55	55	27	27	27	9	9
		fz	0.023	0.023	0.023	0.02	0.02	0.02	0.02	0.018	0.018	0.016	0.016	0.016	0.013	0.013	0.013	0.011	0.011
		RPM	28966	28966	28966	26101	26101	26101	26101	23237	23237	17507	17507	17507	8594	8594	8594	2865	2865
		FEED	1332	1332	1332	1044	1044	1044	1044	837	837	560	560	560	223	223	223	63	63
		Ap	0.07	0.049	0.049	0.028	0.028	0.028	0.018	0.018	0.011	0.011	0.007	0.007	0.007	0.007	0.007	0.007	0.005
	10-11.1	Vc	97	97	97	87	87	87	87	77	77	58	58	58	29	29	29	10	10
		fz	0.025	0.025	0.025	0.022	0.022	0.022	0.022	0.02	0.02	0.017	0.017	0.017	0.015	0.015	0.015	0.012	0.012
		RPM	30876	30876	30876	27693	27693	27693	27693	24510	24510	18462	18462	18462	9231	9231	9231	3183	3183
		FEED	1544	1544	1544	1218	1218	1218	1218	980	980	628	628	628	277	277	277	76	76
		Ap	0.09	0.063	0.063	0.036	0.036	0.036	0.023	0.023	0.014	0.014	0.009	0.009	0.009	0.009	0.009	0.009	0.006
	11.2	Vc	91	91	91	82	82	82	82	73	73	55	55	55	27	27	27	9	9
		fz	0.023	0.023	0.023	0.02	0.02	0.02	0.02	0.018	0.018	0.016	0.016	0.016	0.013	0.013	0.013	0.011	0.011
		RPM	28966	28966	28966	26101	26101	26101	26101	23237	23237	17507	17507	17507	8594	8594	8594	2865	2865
		FEED	1332	1332	1332	1044	1044	1044	1044	837	837	560	560	560	223	223	223	63	63
		Ap	0.07	0.049	0.049	0.028	0.028	0.028	0.018	0.018	0.011	0.011	0.007	0.007	0.007	0.007	0.007	0.007	0.005
K	15-20	Vc	97	97	97	87	87	87	87	77	77	58	58	58	29	29	29	10	10
		fz	0.025	0.025	0.025	0.022	0.022	0.022	0.022	0.02	0.02	0.017	0.017	0.017	0.015	0.015	0.015	0.012	0.012
		RPM	30876	30876	30876	27693	27693	27693	27693	24510	24510	18462	18462	18462	9231	9231	9231	3183	3183
		FEED	1544	1544	1544	1218	1218	1218	1218	980	980	628	628	628	277	277	277	76	76
		Ap	0.09	0.063	0.063	0.036	0.036	0.036	0.023	0.023	0.014	0.014	0.009	0.009	0.009	0.009	0.009	0.009	0.006
H	38.1 - 38.2	Vc	81	81	81	73	73	73	73	65	65	48	48	48	24	24	24	8	8
		fz	0.021	0.021	0.021	0.019	0.019	0.019	0.019	0.017	0.017	0.015	0.015	0.015	0.013	0.013	0.013	0.011	0.011
		RPM	25783	25783	25783	23237	23237	23237	23237	20690	20690	15279	15279	15279	7639	7639	7639	2546	2546
		FEED	1083	1083	1083	883	883	883	883	703	703	458	458	458	199	199	199	56	56
		Ap	0.05	0.035	0.035	0.02	0.02	0.02	0.013	0.013	0.008	0.008	0.005	0.005	0.005	0.005	0.005	0.005	0.003
	40	Vc	91	91	91	82	82	82	82	73	73	55	55	55	27	27	27	9	9
		fz	0.023	0.023	0.023	0.02	0.02	0.02	0.02	0.018	0.018	0.016	0.016	0.016	0.013	0.013	0.013	0.011	0.011
		RPM	28966	28966	28966	26101	26101	26101	26101	23237	23237	17507	17507	17507	8594	8594	8594	2865	2865
		FEED	1332	1332	1332	1044	1044	1044	1044	837	837	560	560	560	223	223	223	63	63
		Ap	0.07	0.049	0.049	0.028	0.028	0.028	0.018	0.018	0.011	0.011	0.007	0.007	0.007	0.007	0.007	0.007	0.005
	41	Vc	81	81	81	73	73	73	73	65	65	48	48	48	24	24	24	8	8
		fz	0.021	0.021	0.021	0.019	0.019	0.019	0.019	0.017	0.017	0.015	0.015	0.015	0.013	0.013	0.013	0.011	0.011
		RPM	25783	25783	25783	23237	23237	23237	23237	20690	20690	15279	15279	15279	7639	7639	7639	2546	2546
		FEED	1083	1083	1083	883	883	883	883	703	703	458	458	458	199	199	199	56	56
		Ap	0.05	0.035	0.035	0.02	0.02	0.02	0.013	0.013	0.008	0.008	0.005	0.005	0.005	0.005	0.005	0.005	0.003

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4G MILL END MILLS

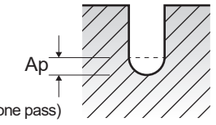
RECOMMENDED CUTTING CONDITIONS

SEM846 SERIES 2 FLUTE BALL NOSE - SLOTTING

Vc = m/min. FEED = mm/min.
fz = mm/tooth Ap = mm
RPM = rev./min. LBS = Length Below Shank

VDI 3323	Parameter	Diameter (Ø)																	
		1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.4	1.4	1.4	1.4	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5
	LBS	4	6	8	10	12	16	20	26	6	8	10	16	4	5	6	7	8	10	12	14
1-5	Vc	99	99	89	89	89	79	59	30	95	85	85	76	113	113	113	113	101	101	101	101
	fz	0.026	0.026	0.024	0.024	0.024	0.021	0.018	0.016	0.03	0.027	0.027	0.024	0.033	0.033	0.033	0.033	0.03	0.03	0.03	0.03
	RPM	26261	26261	23608	23608	23608	20955	15650	7958	21600	19326	19326	17280	23979	23979	23979	23979	21433	21433	21433	21433
	FEED	1366	1366	1133	1133	1133	880	563	255	1296	1044	1044	829	1583	1583	1583	1583	1286	1286	1286	1286
	Ap	0.076	0.076	0.043	0.027	0.027	0.016	0.011	0.011	0.088	0.05	0.05	0.032	0.135	0.095	0.095	0.095	0.054	0.054	0.054	0.034
6-8	Vc	99	99	89	89	89	79	59	30	95	85	85	76	113	113	113	113	101	101	101	101
	fz	0.026	0.026	0.024	0.024	0.024	0.021	0.018	0.016	0.03	0.027	0.027	0.024	0.033	0.033	0.033	0.033	0.03	0.03	0.03	0.03
	RPM	26261	26261	23608	23608	23608	20955	15650	7958	21600	19326	19326	17280	23979	23979	23979	23979	21433	21433	21433	21433
	FEED	1366	1366	1133	1133	1133	880	563	255	1296	1044	1044	829	1583	1583	1583	1583	1286	1286	1286	1286
	Ap	0.076	0.076	0.043	0.027	0.027	0.016	0.011	0.011	0.088	0.05	0.05	0.032	0.135	0.095	0.095	0.095	0.054	0.054	0.054	0.034
9	Vc	93	93	84	84	84	75	56	28	89	80	80	71	106	106	106	106	96	96	96	96
	fz	0.023	0.023	0.021	0.021	0.021	0.019	0.016	0.014	0.027	0.024	0.024	0.022	0.03	0.03	0.03	0.03	0.027	0.027	0.027	0.027
	RPM	24669	24669	22282	22282	22282	19894	14854	7427	20235	18189	18189	16143	22494	22494	22494	22494	20372	20372	20372	20372
	FEED	1135	1135	936	936	936	756	475	208	1093	873	873	710	1350	1350	1350	1350	1100	1100	1100	1100
	Ap	0.059	0.059	0.034	0.021	0.021	0.013	0.008	0.008	0.069	0.039	0.039	0.025	0.105	0.074	0.074	0.074	0.042	0.042	0.042	0.026
10 - 11.1	Vc	99	99	89	89	89	79	59	30	95	85	85	76	113	113	113	113	101	101	101	101
	fz	0.026	0.026	0.024	0.024	0.024	0.021	0.018	0.016	0.03	0.027	0.027	0.024	0.033	0.033	0.033	0.033	0.03	0.03	0.03	0.03
	RPM	26261	26261	23608	23608	23608	20955	15650	7958	21600	19326	19326	17280	23979	23979	23979	23979	21433	21433	21433	21433
	FEED	1366	1366	1133	1133	1133	880	563	255	1296	1044	1044	829	1583	1583	1583	1583	1286	1286	1286	1286
	Ap	0.076	0.076	0.043	0.027	0.027	0.016	0.011	0.011	0.088	0.05	0.05	0.032	0.135	0.095	0.095	0.095	0.054	0.054	0.054	0.034
11.2	Vc	93	93	84	84	84	75	56	28	89	80	80	71	106	106	106	106	96	96	96	96
	fz	0.023	0.023	0.021	0.021	0.021	0.019	0.016	0.014	0.027	0.024	0.024	0.022	0.03	0.03	0.03	0.03	0.027	0.027	0.027	0.027
	RPM	24669	24669	22282	22282	22282	19894	14854	7427	20235	18189	18189	16143	22494	22494	22494	22494	20372	20372	20372	20372
	FEED	1135	1135	936	936	936	756	475	208	1093	873	873	710	1350	1350	1350	1350	1100	1100	1100	1100
	Ap	0.059	0.059	0.034	0.021	0.021	0.013	0.008	0.008	0.069	0.039	0.039	0.025	0.105	0.074	0.074	0.074	0.042	0.042	0.042	0.026
15 - 20	Vc	99	99	89	89	89	79	59	30	95	85	85	76	113	113	113	113	101	101	101	101
	fz	0.026	0.026	0.024	0.024	0.024	0.021	0.018	0.016	0.03	0.027	0.027	0.024	0.033	0.033	0.033	0.033	0.03	0.03	0.03	0.03
	RPM	26261	26261	23608	23608	23608	20955	15650	7958	21600	19326	19326	17280	23979	23979	23979	23979	21433	21433	21433	21433
	FEED	1366	1366	1133	1133	1133	880	563	255	1296	1044	1044	829	1583	1583	1583	1583	1286	1286	1286	1286
	Ap	0.076	0.076	0.043	0.027	0.027	0.016	0.011	0.011	0.088	0.05	0.05	0.032	0.135	0.095	0.095	0.095	0.054	0.054	0.054	0.034
38.1 - 38.2	Vc	83	83	74	74	74	66	50	25	79	71	71	63	94	94	94	94	85	85	85	85
	fz	0.022	0.022	0.02	0.02	0.02	0.017	0.015	0.013	0.026	0.023	0.023	0.021	0.027	0.027	0.027	0.027	0.024	0.024	0.024	0.024
	RPM	22016	22016	19629	19629	19629	17507	13263	6631	17962	16143	16143	14324	19947	19947	19947	19947	18038	18038	18038	18038
	FEED	969	969	785	785	785	595	398	172	934	743	743	602	1077	1077	1077	1077	866	866	866	866
	Ap	0.042	0.042	0.024	0.015	0.015	0.009	0.006	0.006	0.049	0.028	0.028	0.018	0.075	0.053	0.053	0.053	0.03	0.03	0.03	0.019
40	Vc	93	93	84	84	84	75	56	28	89	80	80	71	106	106	106	106	96	96	96	96
	fz	0.023	0.023	0.021	0.021	0.021	0.019	0.016	0.014	0.027	0.024	0.024	0.022	0.03	0.03	0.03	0.03	0.027	0.027	0.027	0.027
	RPM	24669	24669	22282	22282	22282	19894	14854	7427	20235	18189	18189	16143	22494	22494	22494	22494	20372	20372	20372	20372
	FEED	1135	1135	936	936	936	756	475	208	1093	873	873	710	1350	1350	1350	1350	1100	1100	1100	1100
	Ap	0.059	0.059	0.034	0.021	0.021	0.013	0.008	0.008	0.069	0.039	0.039	0.025	0.105	0.074	0.074	0.074	0.042	0.042	0.042	0.026
41	Vc	83	83	74	74	74	66	50	25	79	71	71	63	94	94	94	94	85	85	85	85
	fz	0.022	0.022	0.02	0.02	0.02	0.017	0.015	0.013	0.026	0.023	0.023	0.021	0.027	0.027	0.027	0.027	0.024	0.024	0.024	0.024
	RPM	22016	22016	19629	19629	19629	17507	13263	6631	17962	16143	16143	14324	19947	19947	19947	19947	18038	18038	18038	18038
	FEED	969	969	785	785	785	595	398	172	934	743	743	602	1077	1077	1077	1077	866	866	866	866
	Ap	0.042	0.042	0.024	0.015	0.015	0.009	0.006	0.006	0.049	0.028	0.028	0.018	0.075	0.053	0.053	0.053	0.03	0.03	0.03	0.019

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4G MILL END MILLS

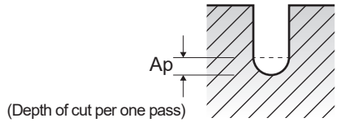
RECOMMENDED CUTTING CONDITIONS

SEM846 SERIES 2 FLUTE BALL NOSE - SLOTTING

Vc = m/min. FEED = mm/min.
fz = mm/tooth Ap = mm
RPM = rev./min. LBS = Length Below Shank

ISO	VDI 3323	Parameter	Diameter (Ø)																
			1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.6	1.6	1.6	1.6	1.6	1.6	1.8	1.8
		LBS	16	18	20	22	26	30	35	40	4	6	8	10	12	16	20	4	6
P	1-5	Vc	90	90	90	90	68	68	34	34	112	112	112	100	100	100	89	126	126
		fz	0.026	0.026	0.026	0.026	0.023	0.023	0.02	0.02	0.035	0.035	0.035	0.032	0.032	0.032	0.028	0.04	0.04
		RPM	19099	19099	19099	19099	14430	14430	7215	7215	22282	22282	22282	19894	19894	19894	17706	22282	22282
		FEED	993	993	993	993	664	664	289	289	1560	1560	1560	1273	1273	1273	992	1783	1783
		Ap	0.034	0.034	0.02	0.02	0.014	0.014	0.01	0.01	0.101	0.101	0.101	0.058	0.058	0.036	0.036	0.113	0.113
	6-8	Vc	90	90	90	90	68	68	34	34	112	112	112	100	100	100	89	126	126
		fz	0.026	0.026	0.026	0.026	0.023	0.023	0.02	0.02	0.035	0.035	0.035	0.032	0.032	0.032	0.028	0.04	0.04
		RPM	19099	19099	19099	19099	14430	14430	7215	7215	22282	22282	22282	19894	19894	19894	17706	22282	22282
		FEED	993	993	993	993	664	664	289	289	1560	1560	1560	1273	1273	1273	992	1783	1783
		Ap	0.034	0.034	0.02	0.02	0.014	0.014	0.01	0.01	0.101	0.101	0.101	0.058	0.058	0.036	0.036	0.113	0.113
	9	Vc	85	85	85	85	64	64	32	32	106	106	106	95	95	95	84	119	119
		fz	0.024	0.024	0.024	0.024	0.021	0.021	0.018	0.018	0.031	0.031	0.031	0.028	0.028	0.028	0.025	0.035	0.035
		RPM	18038	18038	18038	18038	13581	13581	6791	6791	21088	21088	21088	18900	18900	18900	16711	21044	21044
		FEED	866	866	866	866	570	570	244	244	1307	1307	1307	1058	1058	1058	836	1473	1473
		Ap	0.026	0.026	0.016	0.016	0.011	0.011	0.008	0.008	0.078	0.078	0.078	0.045	0.045	0.028	0.028	0.088	0.088
	10-11.1	Vc	90	90	90	90	68	68	34	34	112	112	112	100	100	100	89	126	126
		fz	0.026	0.026	0.026	0.026	0.023	0.023	0.02	0.02	0.035	0.035	0.035	0.032	0.032	0.032	0.028	0.04	0.04
		RPM	19099	19099	19099	19099	14430	14430	7215	7215	22282	22282	22282	19894	19894	19894	17706	22282	22282
		FEED	993	993	993	993	664	664	289	289	1560	1560	1560	1273	1273	1273	992	1783	1783
		Ap	0.034	0.034	0.02	0.02	0.014	0.014	0.01	0.01	0.101	0.101	0.101	0.058	0.058	0.036	0.036	0.113	0.113
	11.2	Vc	85	85	85	85	64	64	32	32	106	106	106	95	95	95	84	119	119
		fz	0.024	0.024	0.024	0.024	0.021	0.021	0.018	0.018	0.031	0.031	0.031	0.028	0.028	0.028	0.025	0.035	0.035
		RPM	18038	18038	18038	18038	13581	13581	6791	6791	21088	21088	21088	18900	18900	18900	16711	21044	21044
		FEED	866	866	866	866	570	570	244	244	1307	1307	1307	1058	1058	1058	836	1473	1473
		Ap	0.026	0.026	0.016	0.016	0.011	0.011	0.008	0.008	0.078	0.078	0.078	0.045	0.045	0.028	0.028	0.088	0.088
K	15-20	Vc	90	90	90	90	68	68	34	34	112	112	112	100	100	100	89	126	126
		fz	0.026	0.026	0.026	0.026	0.023	0.023	0.02	0.02	0.035	0.035	0.035	0.032	0.032	0.032	0.028	0.04	0.04
		RPM	19099	19099	19099	19099	14430	14430	7215	7215	22282	22282	22282	19894	19894	19894	17706	22282	22282
		FEED	993	993	993	993	664	664	289	289	1560	1560	1560	1273	1273	1273	992	1783	1783
		Ap	0.034	0.034	0.02	0.02	0.014	0.014	0.01	0.01	0.101	0.101	0.101	0.058	0.058	0.036	0.036	0.113	0.113
H	38.1 - 38.2	Vc	75	75	75	75	57	57	28	28	93	93	93	84	84	84	74	105	105
		fz	0.022	0.022	0.022	0.022	0.019	0.019	0.016	0.016	0.03	0.03	0.03	0.027	0.027	0.027	0.024	0.033	0.033
		RPM	15915	15915	15915	15915	12096	12096	5942	5942	18502	18502	18502	16711	16711	16711	14722	18568	18568
		FEED	700	700	700	700	460	460	190	190	1110	1110	1110	902	902	902	707	1225	1225
		Ap	0.019	0.019	0.011	0.011	0.008	0.008	0.005	0.005	0.056	0.056	0.056	0.032	0.032	0.02	0.02	0.063	0.063
	40	Vc	85	85	85	85	64	64	32	32	106	106	106	95	95	95	84	119	119
		fz	0.024	0.024	0.024	0.024	0.021	0.021	0.018	0.018	0.031	0.031	0.031	0.028	0.028	0.028	0.025	0.035	0.035
		RPM	18038	18038	18038	18038	13581	13581	6791	6791	21088	21088	21088	18900	18900	18900	16711	21044	21044
		FEED	866	866	866	866	570	570	244	244	1307	1307	1307	1058	1058	1058	836	1473	1473
		Ap	0.026	0.026	0.016	0.016	0.011	0.011	0.008	0.008	0.078	0.078	0.078	0.045	0.045	0.028	0.028	0.088	0.088
	41	Vc	75	75	75	75	57	57	28	28	93	93	93	84	84	84	74	105	105
		fz	0.022	0.022	0.022	0.022	0.019	0.019	0.016	0.016	0.03	0.03	0.03	0.027	0.027	0.027	0.024	0.033	0.033
		RPM	15915	15915	15915	15915	12096	12096	5942	5942	18502	18502	18502	16711	16711	16711	14722	18568	18568
		FEED	700	700	700	700	460	460	190	190	1110	1110	1110	902	902	902	707	1225	1225
		Ap	0.019	0.019	0.011	0.011	0.008	0.008	0.005	0.005	0.056	0.056	0.056	0.032	0.032	0.02	0.02	0.063	0.063

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4G MILL END MILLS

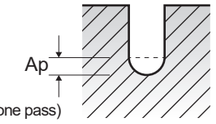
RECOMMENDED CUTTING CONDITIONS

SEM846 SERIES 2 FLUTE BALL NOSE - SLOTTING

Vc = m/min. FEED = mm/min.
fz = mm/tooth Ap = mm
RPM = rev./min. LBS = Length Below Shank

VDI 3323	Parameter	Diameter (Ø)																			
		1.8	1.8	1.8	1.8	1.8	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
	LBS	8	10	12	16	20	6	8	10	12	14	16	18	20	22	26	30	35	40	45	50
1-5	Vc	126	113	113	113	100	113	113	113	102	102	102	102	102	90	90	90	68	68	34	34
	fz	0.04	0.036	0.036	0.036	0.032	0.05	0.05	0.05	0.045	0.045	0.045	0.045	0.045	0.04	0.04	0.04	0.035	0.035	0.03	0.03
	RPM	22282	19983	19983	19983	17684	17985	17985	17985	16234	16234	16234	16234	16234	14324	14324	14324	10823	10823	5411	5411
	FEED	1783	1439	1439	1439	1132	1798	1798	1798	1461	1461	1461	1461	1461	1146	1146	1146	758	758	325	325
	Ap	0.113	0.065	0.065	0.041	0.041	0.18	0.126	0.126	0.072	0.072	0.072	0.045	0.045	0.045	0.045	0.027	0.018	0.018	0.018	0.018
6-8	Vc	126	113	113	113	100	113	113	113	102	102	102	102	102	90	90	90	68	68	34	34
	fz	0.04	0.036	0.036	0.036	0.032	0.05	0.05	0.05	0.045	0.045	0.045	0.045	0.045	0.04	0.04	0.04	0.035	0.035	0.03	0.03
	RPM	22282	19983	19983	19983	17684	17985	17985	17985	16234	16234	16234	16234	16234	14324	14324	14324	10823	10823	5411	5411
	FEED	1783	1439	1439	1439	1132	1798	1798	1798	1461	1461	1461	1461	1461	1146	1146	1146	758	758	325	325
	Ap	0.113	0.065	0.065	0.041	0.041	0.18	0.126	0.126	0.072	0.072	0.072	0.045	0.045	0.045	0.045	0.027	0.018	0.018	0.018	0.018
9	Vc	119	107	107	107	95	107	107	107	96	96	96	96	96	85	85	85	64	64	32	32
	fz	0.035	0.031	0.031	0.031	0.028	0.045	0.045	0.045	0.04	0.04	0.04	0.04	0.04	0.036	0.036	0.036	0.031	0.031	0.027	0.027
	RPM	21044	18922	18922	18922	16800	17030	17030	17030	15279	15279	15279	15279	15279	13528	13528	13528	10186	10186	5093	5093
	FEED	1473	1173	1173	1173	941	1533	1533	1533	1222	1222	1222	1222	1222	974	974	974	632	632	275	275
	Ap	0.088	0.05	0.05	0.032	0.032	0.14	0.098	0.098	0.056	0.056	0.056	0.035	0.035	0.035	0.035	0.021	0.014	0.014	0.014	0.014
10 - 11.1	Vc	126	113	113	113	100	113	113	113	102	102	102	102	102	90	90	90	68	68	34	34
	fz	0.04	0.036	0.036	0.036	0.032	0.05	0.05	0.05	0.045	0.045	0.045	0.045	0.045	0.04	0.04	0.04	0.035	0.035	0.03	0.03
	RPM	22282	19983	19983	19983	17684	17985	17985	17985	16234	16234	16234	16234	16234	14324	14324	14324	10823	10823	5411	5411
	FEED	1783	1439	1439	1439	1132	1798	1798	1798	1461	1461	1461	1461	1461	1146	1146	1146	758	758	325	325
	Ap	0.113	0.065	0.065	0.041	0.041	0.18	0.126	0.126	0.072	0.072	0.072	0.045	0.045	0.045	0.045	0.027	0.018	0.018	0.018	0.018
11.2	Vc	119	107	107	107	95	107	107	107	96	96	96	96	96	85	85	85	64	64	32	32
	fz	0.035	0.031	0.031	0.031	0.028	0.045	0.045	0.045	0.04	0.04	0.04	0.04	0.04	0.036	0.036	0.036	0.031	0.031	0.027	0.027
	RPM	21044	18922	18922	18922	16800	17030	17030	17030	15279	15279	15279	15279	15279	13528	13528	13528	10186	10186	5093	5093
	FEED	1473	1173	1173	1173	941	1533	1533	1533	1222	1222	1222	1222	1222	974	974	974	632	632	275	275
	Ap	0.088	0.05	0.05	0.032	0.032	0.14	0.098	0.098	0.056	0.056	0.056	0.035	0.035	0.035	0.035	0.021	0.014	0.014	0.014	0.014
15 - 20	Vc	126	113	113	113	100	113	113	113	102	102	102	102	102	90	90	90	68	68	34	34
	fz	0.04	0.036	0.036	0.036	0.032	0.05	0.05	0.05	0.045	0.045	0.045	0.045	0.045	0.04	0.04	0.04	0.035	0.035	0.03	0.03
	RPM	22282	19983	19983	19983	17684	17985	17985	17985	16234	16234	16234	16234	16234	14324	14324	14324	10823	10823	5411	5411
	FEED	1783	1439	1439	1439	1132	1798	1798	1798	1461	1461	1461	1461	1461	1146	1146	1146	758	758	325	325
	Ap	0.113	0.065	0.065	0.041	0.041	0.18	0.126	0.126	0.072	0.072	0.072	0.045	0.045	0.045	0.045	0.027	0.018	0.018	0.018	0.018
38.1 - 38.2	Vc	105	94	94	94	84	94	94	94	85	85	85	85	85	75	75	75	57	57	28	28
	fz	0.033	0.03	0.03	0.03	0.027	0.043	0.043	0.043	0.039	0.039	0.039	0.039	0.039	0.034	0.034	0.034	0.03	0.03	0.026	0.026
	RPM	18568	16623	16623	16623	14854	14961	14961	14961	13528	13528	13528	13528	13528	11937	11937	11937	9072	9072	4456	4456
	FEED	1225	997	997	997	802	1287	1287	1287	1055	1055	1055	1055	1055	812	812	812	544	544	232	232
	Ap	0.063	0.036	0.036	0.023	0.023	0.1	0.07	0.07	0.04	0.04	0.04	0.025	0.025	0.025	0.025	0.015	0.01	0.01	0.01	0.01
40	Vc	119	107	107	107	95	107	107	107	96	96	96	96	96	85	85	85	64	64	32	32
	fz	0.035	0.031	0.031	0.031	0.028	0.045	0.045	0.045	0.04	0.04	0.04	0.04	0.04	0.036	0.036	0.036	0.031	0.031	0.027	0.027
	RPM	21044	18922	18922	18922	16800	17030	17030	17030	15279	15279	15279	15279	15279	13528	13528	13528	10186	10186	5093	5093
	FEED	1473	1173	1173	1173	941	1533	1533	1533	1222	1222	1222	1222	1222	974	974	974	632	632	275	275
	Ap	0.088	0.05	0.05	0.032	0.032	0.14	0.098	0.098	0.056	0.056	0.056	0.035	0.035	0.035	0.035	0.021	0.014	0.014	0.014	0.014
41	Vc	105	94	94	94	84	94	94	94	85	85	85	85	85	75	75	75	57	57	28	28
	fz	0.033	0.03	0.03	0.03	0.027	0.043	0.043	0.043	0.039	0.039	0.039	0.039	0.039	0.034	0.034	0.034	0.03	0.03	0.026	0.026
	RPM	18568	16623	16623	16623	14854	14961	14961	14961	13528	13528	13528	13528	13528	11937	11937	11937	9072	9072	4456	4456
	FEED	1225	997	997	997	802	1287	1287	1287	1055	1055	1055	1055	1055	812	812	812	544	544	232	232
	Ap	0.063	0.036	0.036	0.023	0.023	0.1	0.07	0.07	0.04	0.04	0.04	0.025	0.025	0.025	0.025	0.015	0.01	0.01	0.01	0.01

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4G MILL END MILLS

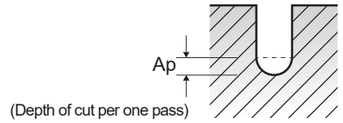
RECOMMENDED CUTTING CONDITIONS

SEM846 SERIES 2 FLUTE BALL NOSE - SLOTTING

Vc = m/min. FEED = mm/min.
fz = mm/tooth Ap = mm
RPM = rev./min. LBS = Length Below Shank

ISO	VDI 3323	Parameter	Diameter (Ø)															
			2.0	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	3.0	3.0	3.0	3.0
		LBS	60	8	10	12	16	20	22	26	30	35	40	45	50	6	8	10	12
P	1-5	Vc	34	124	124	124	112	112	112	99	99	99	74	74	74	129	129	129	129
		fz	0.03	0.061	0.061	0.061	0.055	0.055	0.055	0.049	0.049	0.049	0.043	0.043	0.043	0.075	0.075	0.075	0.075
		RPM	5411	15788	15788	15788	14260	14260	14260	12605	12605	12605	9422	9422	9422	13687	13687	13687	13687
		FEED	325	1926	1926	1926	1569	1569	1569	1235	1235	1235	810	810	810	2053	2053	2053	2053
		Ap	0.018	0.158	0.158	0.158	0.09	0.09	0.056	0.056	0.056	0.034	0.034	0.023	0.023	0.27	0.27	0.189	0.189
	6-8	Vc	34	124	124	124	112	112	112	99	99	99	74	74	74	129	129	129	129
		fz	0.03	0.061	0.061	0.061	0.055	0.055	0.055	0.049	0.049	0.049	0.043	0.043	0.043	0.075	0.075	0.075	0.075
		RPM	5411	15788	15788	15788	14260	14260	14260	12605	12605	12605	9422	9422	9422	13687	13687	13687	13687
		FEED	325	1926	1926	1926	1569	1569	1569	1235	1235	1235	810	810	810	2053	2053	2053	2053
		Ap	0.018	0.158	0.158	0.158	0.09	0.09	0.056	0.056	0.056	0.034	0.034	0.023	0.023	0.27	0.27	0.189	0.189
	9	Vc	32	117	117	117	105	105	105	94	94	94	70	70	70	122	122	122	122
		fz	0.027	0.054	0.054	0.054	0.048	0.048	0.048	0.043	0.043	0.043	0.038	0.038	0.038	0.067	0.067	0.067	0.067
		RPM	5093	14897	14897	14897	13369	13369	13369	11968	11968	11968	8913	8913	8913	12945	12945	12945	12945
		FEED	275	1609	1609	1609	1283	1283	1283	1029	1029	1029	677	677	677	1735	1735	1735	1735
		Ap	0.014	0.123	0.123	0.123	0.07	0.07	0.044	0.044	0.044	0.026	0.026	0.018	0.018	0.21	0.21	0.147	0.147
	10-11.1	Vc	34	124	124	124	112	112	112	99	99	99	74	74	74	129	129	129	129
		fz	0.03	0.061	0.061	0.061	0.055	0.055	0.055	0.049	0.049	0.049	0.043	0.043	0.043	0.075	0.075	0.075	0.075
		RPM	5411	15788	15788	15788	14260	14260	14260	12605	12605	12605	9422	9422	9422	13687	13687	13687	13687
		FEED	325	1926	1926	1926	1569	1569	1569	1235	1235	1235	810	810	810	2053	2053	2053	2053
		Ap	0.018	0.158	0.158	0.158	0.09	0.09	0.056	0.056	0.056	0.034	0.034	0.023	0.023	0.27	0.27	0.189	0.189
	11.2	Vc	32	117	117	117	105	105	105	94	94	94	70	70	70	122	122	122	122
		fz	0.027	0.054	0.054	0.054	0.048	0.048	0.048	0.043	0.043	0.043	0.038	0.038	0.038	0.067	0.067	0.067	0.067
		RPM	5093	14897	14897	14897	13369	13369	13369	11968	11968	11968	8913	8913	8913	12945	12945	12945	12945
		FEED	275	1609	1609	1609	1283	1283	1283	1029	1029	1029	677	677	677	1735	1735	1735	1735
		Ap	0.014	0.123	0.123	0.123	0.07	0.07	0.044	0.044	0.044	0.026	0.026	0.018	0.018	0.21	0.21	0.147	0.147
K	15-20	Vc	34	124	124	124	112	112	112	99	99	99	74	74	74	129	129	129	129
		fz	0.03	0.061	0.061	0.061	0.055	0.055	0.055	0.049	0.049	0.049	0.043	0.043	0.043	0.075	0.075	0.075	0.075
		RPM	5411	15788	15788	15788	14260	14260	14260	12605	12605	12605	9422	9422	9422	13687	13687	13687	13687
		FEED	325	1926	1926	1926	1569	1569	1569	1235	1235	1235	810	810	810	2053	2053	2053	2053
		Ap	0.018	0.158	0.158	0.158	0.09	0.09	0.056	0.056	0.056	0.034	0.034	0.023	0.023	0.27	0.27	0.189	0.189
H	38.1 - 38.2	Vc	28	104	104	104	93	93	93	83	83	83	62	62	62	107	107	107	107
		fz	0.026	0.049	0.049	0.049	0.044	0.044	0.044	0.04	0.04	0.04	0.035	0.035	0.035	0.063	0.063	0.063	0.063
		RPM	4456	13242	13242	13242	11841	11841	11841	10568	10568	10568	7894	7894	7894	11353	11353	11353	11353
		FEED	232	1298	1298	1298	1042	1042	1042	845	845	845	553	553	553	1430	1430	1430	1430
		Ap	0.01	0.088	0.088	0.088	0.05	0.05	0.031	0.031	0.031	0.019	0.019	0.013	0.013	0.15	0.15	0.105	0.105
	40	Vc	32	117	117	117	105	105	105	94	94	94	70	70	70	122	122	122	122
		fz	0.027	0.054	0.054	0.054	0.048	0.048	0.048	0.043	0.043	0.043	0.038	0.038	0.038	0.067	0.067	0.067	0.067
		RPM	5093	14897	14897	14897	13369	13369	13369	11968	11968	11968	8913	8913	8913	12945	12945	12945	12945
		FEED	275	1609	1609	1609	1283	1283	1283	1029	1029	1029	677	677	677	1735	1735	1735	1735
		Ap	0.014	0.123	0.123	0.123	0.07	0.07	0.044	0.044	0.044	0.026	0.026	0.018	0.018	0.21	0.21	0.147	0.147
	41	Vc	28	104	104	104	93	93	93	83	83	83	62	62	62	107	107	107	107
		fz	0.026	0.049	0.049	0.049	0.044	0.044	0.044	0.04	0.04	0.04	0.035	0.035	0.035	0.063	0.063	0.063	0.063
		RPM	4456	13242	13242	13242	11841	11841	11841	10568	10568	10568	7894	7894	7894	11353	11353	11353	11353
		FEED	232	1298	1298	1298	1042	1042	1042	845	845	845	553	553	553	1430	1430	1430	1430
		Ap	0.01	0.088	0.088	0.088	0.05	0.05	0.031	0.031	0.031	0.019	0.019	0.013	0.013	0.15	0.15	0.105	0.105

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4G MILL END MILLS

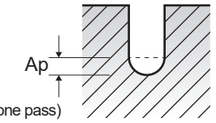
RECOMMENDED CUTTING CONDITIONS

SEM846 SERIES 2 FLUTE BALL NOSE - SLOTTING

Vc = m/min. FEED = mm/min.
fz = mm/tooth Ap = mm
RPM = rev./min. LBS = Length Below Shank

VDI 3323	Parameter	Diameter (Ø)																
		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
	LBS	14	16	18	20	22	26	30	35	40	45	50	60	8	10	12	14	16	18	20	22
1-5	Vc	129	116	116	116	116	116	116	103	103	103	77	77	123	123	123	123	123	123	123	111
	fz	0.075	0.067	0.067	0.067	0.067	0.067	0.067	0.06	0.06	0.06	0.052	0.052	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.09
	RPM	13687	12308	12308	12308	12308	12308	12308	10929	10929	10929	8170	8170	9788	9788	9788	9788	9788	9788	9788	8833
	FEED	2053	1649	1649	1649	1649	1649	1649	1311	1311	1311	850	850	1958	1958	1958	1958	1958	1958	1958	1590
	Ap	0.189	0.108	0.108	0.108	0.108	0.068	0.068	0.068	0.041	0.041	0.027	0.027	0.36	0.36	0.36	0.252	0.252	0.252	0.252	0.144
6-8	Vc	129	116	116	116	116	116	116	103	103	103	77	77	123	123	123	123	123	123	123	111
	fz	0.075	0.067	0.067	0.067	0.067	0.067	0.067	0.06	0.06	0.06	0.052	0.052	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.09
	RPM	13687	12308	12308	12308	12308	12308	12308	10929	10929	10929	8170	8170	9788	9788	9788	9788	9788	9788	9788	8833
	FEED	2053	1649	1649	1649	1649	1649	1649	1311	1311	1311	850	850	1958	1958	1958	1958	1958	1958	1958	1590
	Ap	0.189	0.108	0.108	0.108	0.108	0.068	0.068	0.068	0.041	0.041	0.027	0.027	0.36	0.36	0.36	0.252	0.252	0.252	0.252	0.144
9	Vc	122	109	109	109	109	109	109	97	97	97	73	73	117	117	117	117	117	117	117	105
	fz	0.067	0.06	0.06	0.06	0.06	0.06	0.06	0.054	0.054	0.054	0.047	0.047	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.081
	RPM	12945	11565	11565	11565	11565	11565	11565	10292	10292	10292	7746	7746	9311	9311	9311	9311	9311	9311	9311	8356
	FEED	1735	1388	1388	1388	1388	1388	1388	1112	1112	1112	728	728	1676	1676	1676	1676	1676	1676	1676	1354
	Ap	0.147	0.084	0.084	0.084	0.084	0.053	0.053	0.053	0.032	0.032	0.021	0.021	0.28	0.28	0.28	0.196	0.196	0.196	0.196	0.112
10 - 11.1	Vc	129	116	116	116	116	116	116	103	103	103	77	77	123	123	123	123	123	123	123	111
	fz	0.075	0.067	0.067	0.067	0.067	0.067	0.067	0.06	0.06	0.06	0.052	0.052	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.09
	RPM	13687	12308	12308	12308	12308	12308	12308	10929	10929	10929	8170	8170	9788	9788	9788	9788	9788	9788	9788	8833
	FEED	2053	1649	1649	1649	1649	1649	1649	1311	1311	1311	850	850	1958	1958	1958	1958	1958	1958	1958	1590
	Ap	0.189	0.108	0.108	0.108	0.108	0.068	0.068	0.068	0.041	0.041	0.027	0.027	0.36	0.36	0.36	0.252	0.252	0.252	0.252	0.144
11.2	Vc	122	109	109	109	109	109	109	97	97	97	73	73	117	117	117	117	117	117	117	105
	fz	0.067	0.06	0.06	0.06	0.06	0.06	0.06	0.054	0.054	0.054	0.047	0.047	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.081
	RPM	12945	11565	11565	11565	11565	11565	11565	10292	10292	10292	7746	7746	9311	9311	9311	9311	9311	9311	9311	8356
	FEED	1735	1388	1388	1388	1388	1388	1388	1112	1112	1112	728	728	1676	1676	1676	1676	1676	1676	1676	1354
	Ap	0.147	0.084	0.084	0.084	0.084	0.053	0.053	0.053	0.032	0.032	0.021	0.021	0.28	0.28	0.28	0.196	0.196	0.196	0.196	0.112
15 - 20	Vc	129	116	116	116	116	116	116	103	103	103	77	77	123	123	123	123	123	123	123	111
	fz	0.075	0.067	0.067	0.067	0.067	0.067	0.067	0.06	0.06	0.06	0.052	0.052	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.09
	RPM	13687	12308	12308	12308	12308	12308	12308	10929	10929	10929	8170	8170	9788	9788	9788	9788	9788	9788	9788	8833
	FEED	2053	1649	1649	1649	1649	1649	1649	1311	1311	1311	850	850	1958	1958	1958	1958	1958	1958	1958	1590
	Ap	0.189	0.108	0.108	0.108	0.108	0.068	0.068	0.068	0.041	0.041	0.027	0.027	0.36	0.36	0.36	0.252	0.252	0.252	0.252	0.144
38.1 - 38.2	Vc	107	97	97	97	97	97	97	86	86	86	64	64	103	103	103	103	103	103	103	93
	fz	0.063	0.057	0.057	0.057	0.057	0.057	0.057	0.05	0.05	0.05	0.044	0.044	0.085	0.085	0.085	0.085	0.085	0.085	0.085	0.077
	RPM	11353	10292	10292	10292	10292	10292	10292	9125	9125	9125	6791	6791	8196	8196	8196	8196	8196	8196	8196	7401
	FEED	1430	1173	1173	1173	1173	1173	1173	912	912	912	598	598	1393	1393	1393	1393	1393	1393	1393	1140
	Ap	0.105	0.06	0.06	0.06	0.06	0.038	0.038	0.038	0.023	0.023	0.015	0.015	0.2	0.2	0.2	0.14	0.14	0.14	0.14	0.08
40	Vc	122	109	109	109	109	109	109	97	97	97	73	73	117	117	117	117	117	117	117	105
	fz	0.067	0.06	0.06	0.06	0.06	0.06	0.06	0.054	0.054	0.054	0.047	0.047	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.081
	RPM	12945	11565	11565	11565	11565	11565	11565	10292	10292	10292	7746	7746	9311	9311	9311	9311	9311	9311	9311	8356
	FEED	1735	1388	1388	1388	1388	1388	1388	1112	1112	1112	728	728	1676	1676	1676	1676	1676	1676	1676	1354
	Ap	0.147	0.084	0.084	0.084	0.084	0.053	0.053	0.053	0.032	0.032	0.021	0.021	0.28	0.28	0.28	0.196	0.196	0.196	0.196	0.112
41	Vc	107	97	97	97	97	97	97	86	86	86	64	64	103	103	103	103	103	103	103	93
	fz	0.063	0.057	0.057	0.057	0.057	0.057	0.057	0.05	0.05	0.05	0.044	0.044	0.085	0.085	0.085	0.085	0.085	0.085	0.085	0.077
	RPM	11353	10292	10292	10292	10292	10292	10292	9125	9125	9125	6791	6791	8196	8196	8196	8196	8196	8196	8196	7401
	FEED	1430	1173	1173	1173	1173	1173	1173	912	912	912	598	598	1393	1393	1393	1393	1393	1393	1393	1140
	Ap	0.105	0.06	0.06	0.06	0.06	0.038	0.038	0.038	0.023	0.023	0.015	0.015	0.2	0.2	0.2	0.14	0.14	0.14	0.14	0.08

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4G MILL END MILLS

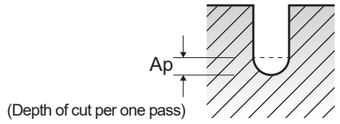
RECOMMENDED CUTTING CONDITIONS

SEM846 SERIES 2 FLUTE BALL NOSE - SLOTTING

Vc = m/min. FEED = mm/min.
fz = mm/tooth Ap = mm
RPM = rev./min. LBS = Length Below Shank

ISO	VDI 3323	Parameter	Diameter (Ø)									
			4.0	4.0	4.0	4.0	4.0	4.0	5.0	5.0	5.0	5.0
		LBS	26	30	35	40	45	50	60	15	20	26	30
P	1-5	Vc	111	111	111	111	99	99	99	121	121	109	109
		fz	0.09	0.09	0.09	0.09	0.08	0.08	0.08	0.12	0.12	0.108	0.108
		RPM	8833	8833	8833	8833	7878	7878	7878	7703	7703	6939	6939
		FEED	1590	1590	1590	1590	1261	1261	1261	1849	1849	1499	1499
		Ap	0.144	0.144	0.09	0.09	0.09	0.09	0.054	0.315	0.315	0.18	0.18
	6-8	Vc	111	111	111	111	99	99	99	121	121	109	109
		fz	0.09	0.09	0.09	0.09	0.08	0.08	0.08	0.12	0.12	0.108	0.108
		RPM	8833	8833	8833	8833	7878	7878	7878	7703	7703	6939	6939
		FEED	1590	1590	1590	1590	1261	1261	1261	1849	1849	1499	1499
		Ap	0.144	0.144	0.09	0.09	0.09	0.09	0.054	0.315	0.315	0.18	0.18
	9	Vc	105	105	105	105	93	93	93	115	115	103	103
		fz	0.081	0.081	0.081	0.081	0.072	0.072	0.072	0.1	0.1	0.09	0.09
		RPM	8356	8356	8356	8356	7401	7401	7401	7321	7321	6557	6557
		FEED	1354	1354	1354	1354	1066	1066	1066	1464	1464	1180	1180
		Ap	0.112	0.112	0.07	0.07	0.07	0.07	0.042	0.245	0.245	0.14	0.14
	10-11.1	Vc	111	111	111	111	99	99	99	121	121	109	109
		fz	0.09	0.09	0.09	0.09	0.08	0.08	0.08	0.12	0.12	0.108	0.108
		RPM	8833	8833	8833	8833	7878	7878	7878	7703	7703	6939	6939
		FEED	1590	1590	1590	1590	1261	1261	1261	1849	1849	1499	1499
		Ap	0.144	0.144	0.09	0.09	0.09	0.09	0.054	0.315	0.315	0.18	0.18
	11.2	Vc	105	105	105	105	93	93	93	115	115	103	103
		fz	0.081	0.081	0.081	0.081	0.072	0.072	0.072	0.1	0.1	0.09	0.09
		RPM	8356	8356	8356	8356	7401	7401	7401	7321	7321	6557	6557
		FEED	1354	1354	1354	1354	1066	1066	1066	1464	1464	1180	1180
		Ap	0.112	0.112	0.07	0.07	0.07	0.07	0.042	0.245	0.245	0.14	0.14
K	15-20	Vc	111	111	111	111	99	99	99	121	121	109	109
		fz	0.09	0.09	0.09	0.09	0.08	0.08	0.08	0.12	0.12	0.108	0.108
		RPM	8833	8833	8833	8833	7878	7878	7878	7703	7703	6939	6939
		FEED	1590	1590	1590	1590	1261	1261	1261	1849	1849	1499	1499
		Ap	0.144	0.144	0.09	0.09	0.09	0.09	0.054	0.315	0.315	0.18	0.18
H	38.1 - 38.2	Vc	93	93	93	93	82	82	82	101	101	90	90
		fz	0.077	0.077	0.077	0.077	0.068	0.068	0.068	0.1	0.1	0.09	0.09
		RPM	7401	7401	7401	7401	6525	6525	6525	6430	6430	5730	5730
		FEED	1140	1140	1140	1140	887	887	887	1286	1286	1031	1031
		Ap	0.08	0.08	0.05	0.05	0.05	0.05	0.03	0.175	0.175	0.1	0.1
	40	Vc	105	105	105	105	93	93	93	115	115	103	103
		fz	0.081	0.081	0.081	0.081	0.072	0.072	0.072	0.1	0.1	0.09	0.09
		RPM	8356	8356	8356	8356	7401	7401	7401	7321	7321	6557	6557
		FEED	1354	1354	1354	1354	1066	1066	1066	1464	1464	1180	1180
		Ap	0.112	0.112	0.07	0.07	0.07	0.07	0.042	0.245	0.245	0.14	0.14
	41	Vc	93	93	93	93	82	82	82	101	101	90	90
		fz	0.077	0.077	0.077	0.077	0.068	0.068	0.068	0.1	0.1	0.09	0.09
		RPM	7401	7401	7401	7401	6525	6525	6525	6430	6430	5730	5730
		FEED	1140	1140	1140	1140	887	887	887	1286	1286	1031	1031
		Ap	0.08	0.08	0.05	0.05	0.05	0.05	0.03	0.175	0.175	0.1	0.1

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4G MILL END MILLS

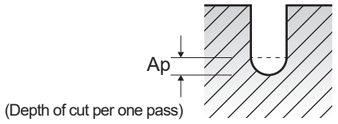
RECOMMENDED CUTTING CONDITIONS

SEM846 SERIES 2 FLUTE BALL NOSE - SLOTTING

Vc = m/min. FEED = mm/min.
fz = mm/tooth Ap = mm
RPM = rev./min. LBS = Length Below Shank

VDI 3323	Parameter	Diameter (Ø)												
		5.0	5.0	5.0	5.0	6.0	6.0	8.0	8.0	10.0	10.0	12.0	12.0	12.0
	LBS	35	40	50	60	20	30	25	30	30	40	32	45	50
1-5	Vc	109	109	109	97	123	123	122	122	121	121	121	121	100
	fz	0.108	0.108	0.108	0.096	0.146	0.146	0.186	0.186	0.214	0.214	0.238	0.238	0.151
	RPM	6939	6939	6939	6175	6525	6525	4854	4854	3852	3852	3210	3210	2653
	FEED	1499	1499	1499	1186	1905	1905	1806	1806	1648	1648	1528	1528	801
	Ap	0.18	0.18	0.113	0.113	0.378	0.378	0.504	0.504	0.9	0.63	1.08	0.756	0.756
6-8	Vc	109	109	109	97	123	123	122	122	121	121	121	121	100
	fz	0.108	0.108	0.108	0.096	0.146	0.146	0.186	0.186	0.214	0.214	0.238	0.238	0.151
	RPM	6939	6939	6939	6175	6525	6525	4854	4854	3852	3852	3210	3210	2653
	FEED	1499	1499	1499	1186	1905	1905	1806	1806	1648	1648	1528	1528	801
	Ap	0.18	0.18	0.113	0.113	0.378	0.378	0.504	0.504	0.9	0.63	1.08	0.756	0.756
9	Vc	103	103	103	92	117	117	116	116	116	116	115	115	95
	fz	0.09	0.09	0.09	0.08	0.129	0.129	0.163	0.163	0.19	0.19	0.213	0.213	0.119
	RPM	6557	6557	6557	5857	6207	6207	4615	4615	3692	3692	3050	3050	2520
	FEED	1180	1180	1180	937	1601	1601	1505	1505	1403	1403	1300	1300	600
	Ap	0.14	0.14	0.088	0.088	0.294	0.294	0.392	0.392	0.7	0.49	0.84	0.588	0.588
10 - 11.1	Vc	109	109	109	97	123	123	122	122	121	121	121	121	100
	fz	0.108	0.108	0.108	0.096	0.146	0.146	0.186	0.186	0.214	0.214	0.238	0.238	0.151
	RPM	6939	6939	6939	6175	6525	6525	4854	4854	3852	3852	3210	3210	2653
	FEED	1499	1499	1499	1186	1905	1905	1806	1806	1648	1648	1528	1528	801
	Ap	0.18	0.18	0.113	0.113	0.378	0.378	0.504	0.504	0.9	0.63	1.08	0.756	0.756
11.2	Vc	103	103	103	92	117	117	116	116	116	116	115	115	95
	fz	0.09	0.09	0.09	0.08	0.129	0.129	0.163	0.163	0.19	0.19	0.213	0.213	0.119
	RPM	6557	6557	6557	5857	6207	6207	4615	4615	3692	3692	3050	3050	2520
	FEED	1180	1180	1180	937	1601	1601	1505	1505	1403	1403	1300	1300	600
	Ap	0.14	0.14	0.088	0.088	0.294	0.294	0.392	0.392	0.7	0.49	0.84	0.588	0.588
15 - 20	Vc	109	109	109	97	123	123	122	122	121	121	121	121	100
	fz	0.108	0.108	0.108	0.096	0.146	0.146	0.186	0.186	0.214	0.214	0.238	0.238	0.151
	RPM	6939	6939	6939	6175	6525	6525	4854	4854	3852	3852	3210	3210	2653
	FEED	1499	1499	1499	1186	1905	1905	1806	1806	1648	1648	1528	1528	801
	Ap	0.18	0.18	0.113	0.113	0.378	0.378	0.504	0.504	0.9	0.63	1.08	0.756	0.756
38.1 - 38.2	Vc	90	90	90	80	104	104	101	101	101	101	100	100	82
	fz	0.09	0.09	0.09	0.08	0.121	0.121	0.16	0.16	0.188	0.188	0.208	0.208	0.08
	RPM	5730	5730	5730	5093	5517	5517	4019	4019	3215	3215	2653	2653	2175
	FEED	1031	1031	1031	815	1335	1335	1286	1286	1209	1209	1103	1103	348
	Ap	0.1	0.1	0.063	0.063	0.21	0.21	0.28	0.28	0.5	0.35	0.6	0.42	0.42
40	Vc	103	103	103	92	117	117	116	116	116	116	115	115	95
	fz	0.09	0.09	0.09	0.08	0.129	0.129	0.163	0.163	0.19	0.19	0.213	0.213	0.119
	RPM	6557	6557	6557	5857	6207	6207	4615	4615	3692	3692	3050	3050	2520
	FEED	1180	1180	1180	937	1601	1601	1505	1505	1403	1403	1300	1300	600
	Ap	0.14	0.14	0.088	0.088	0.294	0.294	0.392	0.392	0.7	0.49	0.84	0.588	0.588
41	Vc	90	90	90	80	104	104	101	101	101	101	100	100	82
	fz	0.09	0.09	0.09	0.08	0.121	0.121	0.16	0.16	0.188	0.188	0.208	0.208	0.08
	RPM	5730	5730	5730	5093	5517	5517	4019	4019	3215	3215	2653	2653	2175
	FEED	1031	1031	1031	815	1335	1335	1286	1286	1209	1209	1103	1103	348
	Ap	0.1	0.1	0.063	0.063	0.21	0.21	0.28	0.28	0.5	0.35	0.6	0.42	0.42

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CARBIDE
HSS
i-Xmill END MILLS
X-1EH END MILLS
4G MILL END MILLS
X-POWER PRO END MILLS
TitaNox-POWER END MILLS
V7 PLUS END MILLS
ALU-CUT END MILLS
K-2 END MILLS
GENERAL CARBIDE END MILLS

4G MILL END MILLS

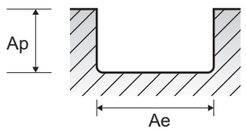
RECOMMENDED CUTTING CONDITIONS

SEMD99 SERIES 2 FLUTE CORNER RADIUS - SLOTTING

Vc = m/min.
fz = mm/tooth
RPM = rev./min.
FEED = mm/min.

ISO	VDI 3323	Material Description	Ae(mm)	Ap(mm)	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
P	1-5	Non-alloy steel	1.0D	0.2D	Vc	28	39	52	57	57	66	75	85	87	93	104
					fz	0.002	0.002	0.002	0.003	0.004	0.004	0.004	0.004	0.004	0.005	0.006
					RPM	44563	41380	41380	36287	30239	30012	29842	30063	27693	24669	22069
					FEED	178	166	166	218	242	240	239	241	222	247	265
	6-8	Low alloy steel	1.0D	0.2D	Vc	28	39	52	57	57	66	75	85	87	93	104
					fz	0.002	0.002	0.002	0.003	0.004	0.004	0.004	0.004	0.004	0.005	0.006
					RPM	44563	41380	41380	36287	30239	30012	29842	30063	27693	24669	22069
					FEED	178	166	166	218	242	240	239	241	222	247	265
	9		1.0D	0.2D	Vc	18	25	34	37	37	44	50	53	57	59	64
					fz	0.001	0.001	0.001	0.002	0.002	0.002	0.002	0.002	0.003	0.003	0.004
					RPM	28648	26526	27056	23555	19629	20008	19894	18745	18144	15650	13581
					FEED	57	53	54	94	79	80	80	75	109	94	109
	10-11.1	High alloyed steel, and tool steel	1.0D	0.2D	Vc	28	39	52	57	57	66	75	85	87	93	104
					fz	0.002	0.002	0.002	0.003	0.004	0.004	0.004	0.004	0.004	0.005	0.006
					RPM	44563	41380	41380	36287	30239	30012	29842	30063	27693	24669	22069
					FEED	178	166	166	218	242	240	239	241	222	247	265
	11.2		1.0D	0.2D	Vc	18	25	34	37	37	44	50	53	57	59	64
					fz	0.001	0.001	0.001	0.002	0.002	0.002	0.002	0.002	0.003	0.003	0.004
					RPM	28648	26526	27056	23555	19629	20008	19894	18745	18144	15650	13581
					FEED	57	53	54	94	79	80	80	75	109	94	109
K	15-20	Grey cast iron Nodular cast iron Malleable cast iron	1.0D	0.2D	Vc	28	39	52	57	57	66	75	85	87	93	104
					fz	0.002	0.002	0.002	0.003	0.004	0.004	0.004	0.004	0.004	0.005	0.006
					RPM	44563	41380	41380	36287	30239	30012	29842	30063	27693	24669	22069
					FEED	178	166	166	218	242	240	239	241	222	247	265
H	38.1 - 38.2	Hardened steel	1.0D	0.2D	Vc	11	16	21	22	23	27	30	33	35	37	40
					fz	0.001	0.001	0.001	0.002	0.002	0.002	0.002	0.002	0.003	0.003	0.004
					RPM	17507	16977	16711	14006	12202	12278	11937	11671	11141	9815	8488
					FEED	35	34	33	56	49	49	48	47	67	59	68
	40	Chilled Cast Iron	1.0D	0.2D	Vc	18	25	34	37	37	44	50	53	57	59	64
					fz	0.001	0.001	0.001	0.002	0.002	0.002	0.002	0.002	0.003	0.003	0.004
					RPM	28648	26526	27056	23555	19629	20008	19894	18745	18144	15650	13581
					FEED	57	53	54	94	79	80	80	75	109	94	109
	41	Hardened Cast Iron	1.0D	0.2D	Vc	11	16	21	22	23	27	30	33	35	37	40
					fz	0.001	0.001	0.001	0.002	0.002	0.002	0.002	0.002	0.003	0.003	0.004
					RPM	28648	26526	27056	23555	19629	20008	19894	18745	18144	15650	13581
					FEED	57	53	54	94	79	80	80	75	109	94	109

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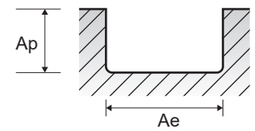
4G MILL END MILLS

RECOMMENDED CUTTING CONDITIONS

SEMD99 SERIES 2 FLUTE CORNER RADIUS - SLOTTING

Vc = m/min.
fz = mm/tooth
RPM = rev./min.
FEED = mm/min.

VDI 3323	Parameter	Diameter (Ø) 2.0	2.5	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
1-5	Vc	113	118	125	132	135	141	144	147	149	153	151	158	158	155	159	156	158
	fz	0.007	0.009	0.011	0.013	0.016	0.019	0.023	0.027	0.032	0.037	0.045	0.054	0.052	0.051	0.054	0.058	0.056
	RPM	17985	15024	13263	12005	10743	9974	9167	8508	7905	6957	6008	5029	4572	4112	3615	3104	2515
	FEED	252	270	292	312	344	379	422	459	506	515	541	543	475	419	390	360	282
6-8	Vc	113	118	125	132	135	141	144	147	149	153	151	158	158	155	159	156	158
	fz	0.007	0.009	0.011	0.013	0.016	0.019	0.023	0.027	0.032	0.037	0.045	0.054	0.052	0.051	0.054	0.058	0.056
	RPM	17985	15024	13263	12005	10743	9974	9167	8508	7905	6957	6008	5029	4572	4112	3615	3104	2515
	FEED	252	270	292	312	344	379	422	459	506	515	541	543	475	419	390	360	282
9	Vc	73	75	81	85	86	89	91	94	95	97	96	103	105	105	107	106	103
	fz	0.005	0.007	0.008	0.01	0.012	0.015	0.017	0.021	0.025	0.028	0.033	0.038	0.04	0.041	0.041	0.04	0.037
	RPM	11618	9549	8594	7730	6844	6295	5793	5440	5040	4411	3820	3279	3038	2785	2433	2109	1639
	FEED	116	134	138	155	164	189	197	228	252	247	252	249	243	228	199	169	121
10 - 11.1	Vc	113	118	125	132	135	141	144	147	149	153	151	158	158	155	159	156	158
	fz	0.007	0.009	0.011	0.013	0.016	0.019	0.023	0.027	0.032	0.037	0.045	0.054	0.052	0.051	0.054	0.058	0.056
	RPM	17985	15024	13263	12005	10743	9974	9167	8508	7905	6957	6008	5029	4572	4112	3615	3104	2515
	FEED	252	270	292	312	344	379	422	459	506	515	541	543	475	419	390	360	282
11.2	Vc	73	75	81	85	86	89	91	94	95	97	96	103	105	105	107	106	103
	fz	0.005	0.007	0.008	0.01	0.012	0.015	0.017	0.021	0.025	0.028	0.033	0.038	0.04	0.041	0.041	0.04	0.037
	RPM	11618	9549	8594	7730	6844	6295	5793	5440	5040	4411	3820	3279	3038	2785	2433	2109	1639
	FEED	116	134	138	155	164	189	197	228	252	247	252	249	243	228	199	169	121
15 - 20	Vc	113	118	125	132	135	141	144	147	149	153	151	158	158	155	159	156	158
	fz	0.007	0.009	0.011	0.013	0.016	0.019	0.023	0.027	0.032	0.037	0.045	0.054	0.052	0.051	0.054	0.058	0.056
	RPM	17985	15024	13263	12005	10743	9974	9167	8508	7905	6957	6008	5029	4572	4112	3615	3104	2515
	FEED	252	270	292	312	344	379	422	459	506	515	541	543	475	419	390	360	282
38.1 - 38.2	Vc	45	48	50	53	54	61	60	61	62	64	63	63	64	63	65	64	63
	fz	0.005	0.006	0.007	0.008	0.009	0.01	0.013	0.016	0.018	0.021	0.024	0.03	0.03	0.03	0.03	0.031	0.03
	RPM	7162	6112	5305	4820	4297	4315	3820	3530	3289	2910	2507	2005	1852	1671	1478	1273	1003
	FEED	72	73	74	77	77	86	99	113	118	122	120	120	111	100	89	79	60
40	Vc	73	75	81	85	86	89	91	94	95	97	96	103	105	105	107	106	103
	fz	0.005	0.007	0.008	0.01	0.012	0.015	0.017	0.021	0.025	0.028	0.033	0.038	0.04	0.041	0.041	0.04	0.037
	RPM	11618	9549	8594	7730	6844	6295	5793	5440	5040	4411	3820	3279	3038	2785	2433	2109	1639
	FEED	116	134	138	155	164	189	197	228	252	247	252	249	243	228	199	169	121
41	Vc	45	48	50	53	54	61	60	61	62	64	63	63	64	63	65	64	63
	fz	0.005	0.006	0.007	0.008	0.009	0.01	0.013	0.016	0.018	0.021	0.024	0.03	0.03	0.03	0.03	0.031	0.03
	RPM	7162	6112	5305	4820	4297	4315	3820	3530	3289	2910	2507	2005	1852	1671	1478	1273	1003
	FEED	72	73	74	77	77	86	99	113	118	122	120	120	111	100	89	79	60



4G MILL END MILLS

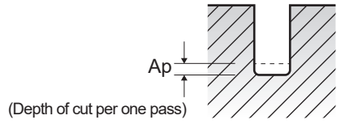
RECOMMENDED CUTTING CONDITIONS

SEME61 SERIES — 2 FLUTE CORNER RADIUS - SLOTTING

Vc = m/min. FEED = mm/min.
fz = mm/tooth Ap = mm
RPM = rev./min. LBS = Length Below Shank

ISO	VDI 3323	Material Description	Parameter	Diameter (Ø)											
				0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.4	0.4	0.4	0.4	0.4
			LBS	0.5	1	1.5	2	1	2	3	1	1.5	2	2.5	3
P	1-5	Non-alloy steel	Vc	31	31	28	28	47	42	42	63	63	63	57	57
			fz	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002
			RPM	49338	49338	44563	44563	49869	44563	44563	50134	50134	50134	45359	45359
			FEED	197	197	178	178	199	178	178	201	201	201	181	181
			Ap	0.04	0.028	0.016	0.01	0.042	0.024	0.015	0.08	0.056	0.056	0.032	0.032
	6-8	Low alloy steel	Vc	31	31	28	28	47	42	42	63	63	63	57	57
			fz	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002
			RPM	49338	49338	44563	44563	49869	44563	44563	50134	50134	50134	45359	45359
			FEED	197	197	178	178	199	178	178	201	201	201	181	181
			Ap	0.04	0.028	0.016	0.01	0.042	0.024	0.015	0.08	0.056	0.056	0.032	0.032
	9		Vc	22	22	20	20	30	27	27	40	40	40	36	36
			fz	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001
			RPM	35014	35014	31831	31831	31831	28648	28648	31831	31831	31831	28648	28648
			FEED	70	70	64	64	64	57	57	64	64	64	57	57
			Ap	0.03	0.021	0.012	0.008	0.032	0.018	0.011	0.06	0.042	0.042	0.024	0.024
	10-11.1	High alloyed steel, and tool steel	Vc	31	31	28	28	47	42	42	63	63	63	57	57
			fz	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002
			RPM	49338	49338	44563	44563	49869	44563	44563	50134	50134	50134	45359	45359
			FEED	197	197	178	178	199	178	178	201	201	201	181	181
			Ap	0.04	0.028	0.016	0.01	0.042	0.024	0.015	0.08	0.056	0.056	0.032	0.032
	11.2		Vc	22	22	20	20	30	27	27	40	40	40	36	36
			fz	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001
			RPM	35014	35014	31831	31831	31831	28648	28648	31831	31831	31831	28648	28648
			FEED	70	70	64	64	64	57	57	64	64	64	57	57
			Ap	0.03	0.021	0.012	0.008	0.032	0.018	0.011	0.06	0.042	0.042	0.024	0.024
K	15-20	Grey cast iron Nodular cast iron Malleable cast iron	Vc	31	31	28	28	47	42	42	63	63	63	57	57
			fz	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002
			RPM	49338	49338	44563	44563	49869	44563	44563	50134	50134	50134	45359	45359
			FEED	197	197	178	178	199	178	178	201	201	201	181	181
			Ap	0.04	0.028	0.016	0.01	0.042	0.024	0.015	0.08	0.056	0.056	0.032	0.032
H	38.1 - 38.2	Hardened steel	Vc	13	13	12	12	19	17	17	25	25	25	23	23
			fz	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001
			RPM	20690	20690	19099	19099	20160	18038	18038	19894	19894	19894	18303	18303
			FEED	41	41	38	38	40	36	36	40	40	40	37	37
			Ap	0.024	0.017	0.01	0.006	0.025	0.014	0.009	0.048	0.034	0.034	0.019	0.019
	40	Chilled Cast Iron	Vc	22	22	20	20	30	27	27	40	40	40	36	36
			fz	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001
			RPM	35014	35014	31831	31831	31831	28648	28648	31831	31831	31831	28648	28648
			FEED	70	70	64	64	64	57	57	64	64	64	57	57
			Ap	0.03	0.021	0.012	0.008	0.032	0.018	0.011	0.06	0.042	0.042	0.024	0.024
	41	Hardened Cast Iron	Vc	13	13	12	12	19	17	17	25	25	25	23	23
			fz	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001
			RPM	20690	20690	19099	19099	20160	18038	18038	19894	19894	19894	18303	18303
			FEED	41	41	38	38	40	36	36	40	40	40	37	37
			Ap	0.024	0.017	0.01	0.006	0.025	0.014	0.009	0.048	0.034	0.034	0.019	0.019

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4G MILL END MILLS

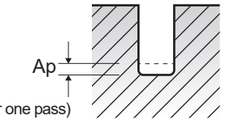
RECOMMENDED CUTTING CONDITIONS

SEME61 SERIES — 2 FLUTE CORNER RADIUS - SLOTTING

Vc = m/min. FEED = mm/min.
fz = mm/tooth Ap = mm
RPM = rev./min. LBS = Length Below Shank

VDI 3323	Parameter	Diameter (Ø)															
		0.4	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.6	0.6	0.6	0.6	0.6	0.6	0.7
	LBS	4	1	1.5	2	2.5	3	4	5	6	2	3	4	6	8	10	2
1-5	Vc	57	68	68	68	68	61	61	61	54	69	69	62	62	55	41	80
	fz	0.002	0.003	0.003	0.003	0.003	0.002	0.002	0.002	0.002	0.003	0.003	0.003	0.003	0.003	0.002	0.003
	RPM	45359	43290	43290	43290	43290	38834	38834	38834	34377	36606	36606	32892	32892	29178	21751	36378
	FEED	181	260	260	260	260	155	155	155	138	220	220	197	197	175	87	218
	Ap	0.02	0.1	0.1	0.07	0.07	0.04	0.04	0.025	0.025	0.084	0.084	0.048	0.03	0.018	0.012	0.14
6-8	Vc	57	68	68	68	68	61	61	61	54	69	69	62	62	55	41	80
	fz	0.002	0.003	0.003	0.003	0.003	0.002	0.002	0.002	0.002	0.003	0.003	0.003	0.003	0.003	0.002	0.003
	RPM	45359	43290	43290	43290	43290	38834	38834	38834	34377	36606	36606	32892	32892	29178	21751	36378
	FEED	181	260	260	260	260	155	155	155	138	220	220	197	197	175	87	218
	Ap	0.02	0.1	0.1	0.07	0.07	0.04	0.04	0.025	0.025	0.084	0.084	0.048	0.03	0.018	0.012	0.14
9	Vc	36	44	44	44	44	40	40	40	35	45	45	41	41	36	27	53
	fz	0.001	0.002	0.002	0.002	0.002	0.001	0.001	0.001	0.001	0.002	0.002	0.002	0.002	0.002	0.002	0.002
	RPM	28648	28011	28011	28011	28011	25465	25465	25465	22282	23873	23873	21751	21751	19099	14324	24101
	FEED	57	112	112	112	112	51	51	51	45	95	95	87	87	76	57	96
	Ap	0.015	0.075	0.075	0.053	0.053	0.03	0.03	0.019	0.019	0.063	0.063	0.036	0.023	0.014	0.009	0.105
10 - 11.1	Vc	57	68	68	68	68	61	61	61	54	69	69	62	62	55	41	80
	fz	0.002	0.003	0.003	0.003	0.003	0.002	0.002	0.002	0.002	0.003	0.003	0.003	0.003	0.003	0.002	0.003
	RPM	45359	43290	43290	43290	43290	38834	38834	38834	34377	36606	36606	32892	32892	29178	21751	36378
	FEED	181	260	260	260	260	155	155	155	138	220	220	197	197	175	87	218
	Ap	0.02	0.1	0.1	0.07	0.07	0.04	0.04	0.025	0.025	0.084	0.084	0.048	0.03	0.018	0.012	0.14
11.2	Vc	36	44	44	44	44	40	40	40	35	45	45	41	41	36	27	53
	fz	0.001	0.002	0.002	0.002	0.002	0.001	0.001	0.001	0.001	0.002	0.002	0.002	0.002	0.002	0.002	0.002
	RPM	28648	28011	28011	28011	28011	25465	25465	25465	22282	23873	23873	21751	21751	19099	14324	24101
	FEED	57	112	112	112	112	51	51	51	45	95	95	87	87	76	57	96
	Ap	0.015	0.075	0.075	0.053	0.053	0.03	0.03	0.019	0.019	0.063	0.063	0.036	0.023	0.014	0.009	0.105
15 - 20	Vc	57	68	68	68	68	61	61	61	54	69	69	62	62	55	41	80
	fz	0.002	0.003	0.003	0.003	0.003	0.002	0.002	0.002	0.002	0.003	0.003	0.003	0.003	0.003	0.002	0.003
	RPM	45359	43290	43290	43290	43290	38834	38834	38834	34377	36606	36606	32892	32892	29178	21751	36378
	FEED	181	260	260	260	260	155	155	155	138	220	220	197	197	175	87	218
	Ap	0.02	0.1	0.1	0.07	0.07	0.04	0.04	0.025	0.025	0.084	0.084	0.048	0.03	0.018	0.012	0.14
38.1 - 38.2	Vc	23	27	27	27	27	24	24	24	21	27	27	25	25	22	16	32
	fz	0.001	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.001	0.002	0.002	0.002	0.002	0.002	0.001	0.002
	RPM	18303	17189	17189	17189	17189	15279	15279	15279	13369	14324	14324	13263	13263	11671	8488	14551
	FEED	37	69	69	69	69	61	61	61	27	57	57	53	53	47	17	58
	Ap	0.012	0.06	0.06	0.042	0.042	0.024	0.024	0.015	0.015	0.05	0.05	0.029	0.018	0.011	0.007	0.084
40	Vc	36	44	44	44	44	40	40	40	35	45	45	41	41	36	27	53
	fz	0.001	0.002	0.002	0.002	0.002	0.001	0.001	0.001	0.001	0.002	0.002	0.002	0.002	0.002	0.002	0.002
	RPM	28648	28011	28011	28011	28011	25465	25465	25465	22282	23873	23873	21751	21751	19099	14324	24101
	FEED	57	112	112	112	112	51	51	51	45	95	95	87	87	76	57	96
	Ap	0.015	0.075	0.075	0.053	0.053	0.03	0.03	0.019	0.019	0.063	0.063	0.036	0.023	0.014	0.009	0.105
41	Vc	23	27	27	27	27	24	24	24	21	27	27	25	25	22	16	32
	fz	0.001	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.001	0.002	0.002	0.002	0.002	0.002	0.001	0.002
	RPM	18303	17189	17189	17189	17189	15279	15279	15279	13369	14324	14324	13263	13263	11671	8488	14551
	FEED	37	69	69	69	69	61	61	61	27	57	57	53	53	47	17	58
	Ap	0.012	0.06	0.06	0.042	0.042	0.024	0.024	0.015	0.015	0.05	0.05	0.029	0.018	0.011	0.007	0.084

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4G MILL END MILLS

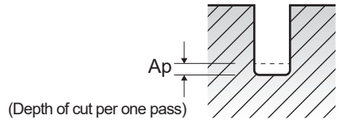
RECOMMENDED CUTTING CONDITIONS

SEME61 SERIES 2 FLUTE CORNER RADIUS - SLOTTING

Vc = m/min. FEED = mm/min.
fz = mm/tooth Ap = mm
RPM = rev./min. LBS = Length Below Shank

ISO	VDI 3323	Parameter	Diameter (Ø)														
			0.7	0.7	0.7	0.7	0.8	0.8	0.8	0.8	0.8	0.8	1.0	1.0	1.0	1.0	1.0
		LBS	4	6	8	10	2	3	4	6	8	10	3	4	6	8	10
P	1-5	Vc	72	72	64	64	91	91	91	82	82	73	104	104	94	94	94
		fz	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.004	0.004	0.004	0.004	0.004
		RPM	32740	32740	29103	29103	36208	36208	36208	32627	32627	29046	33104	33104	29921	29921	29921
		FEED	196	196	175	175	217	217	217	196	196	174	265	265	239	239	239
		Ap	0.056	0.035	0.035	0.021	0.16	0.112	0.112	0.064	0.04	0.04	0.2	0.14	0.08	0.08	0.05
	6-8	Vc	72	72	64	64	91	91	91	82	82	73	104	104	94	94	94
		fz	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.004	0.004	0.004	0.004	0.004
		RPM	32740	32740	29103	29103	36208	36208	36208	32627	32627	29046	33104	33104	29921	29921	29921
		FEED	196	196	175	175	217	217	217	196	196	174	265	265	239	239	239
		Ap	0.056	0.035	0.035	0.021	0.16	0.112	0.112	0.064	0.04	0.04	0.2	0.14	0.08	0.08	0.05
	9	Vc	48	48	42	42	60	60	60	54	54	48	68	68	61	61	61
		fz	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.003	0.003	0.002	0.002	0.002
		RPM	21827	21827	19099	19099	23873	23873	23873	21486	21486	19099	21645	21645	19417	19417	19417
		FEED	87	87	76	76	95	95	95	86	86	76	130	130	78	78	78
		Ap	0.042	0.026	0.026	0.016	0.12	0.084	0.084	0.048	0.03	0.03	0.15	0.105	0.06	0.06	0.038
	10-11.1	Vc	72	72	64	64	91	91	91	82	82	73	104	104	94	94	94
		fz	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.004	0.004	0.004	0.004	0.004
		RPM	32740	32740	29103	29103	36208	36208	36208	32627	32627	29046	33104	33104	29921	29921	29921
		FEED	196	196	175	175	217	217	217	196	196	174	265	265	239	239	239
		Ap	0.056	0.035	0.035	0.021	0.16	0.112	0.112	0.064	0.04	0.04	0.2	0.14	0.08	0.08	0.05
	11.2	Vc	48	48	42	42	60	60	60	54	54	48	68	68	61	61	61
		fz	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.003	0.003	0.002	0.002	0.002
		RPM	21827	21827	19099	19099	23873	23873	23873	21486	21486	19099	21645	21645	19417	19417	19417
		FEED	87	87	76	76	95	95	95	86	86	76	130	130	78	78	78
		Ap	0.042	0.026	0.026	0.016	0.12	0.084	0.084	0.048	0.03	0.03	0.15	0.105	0.06	0.06	0.038
K	15-20	Vc	72	72	64	64	91	91	91	82	82	73	104	104	94	94	94
		fz	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.004	0.004	0.004	0.004	0.004
		RPM	32740	32740	29103	29103	36208	36208	36208	32627	32627	29046	33104	33104	29921	29921	29921
		FEED	196	196	175	175	217	217	217	196	196	174	265	265	239	239	239
		Ap	0.056	0.035	0.035	0.021	0.16	0.112	0.112	0.064	0.04	0.04	0.2	0.14	0.08	0.08	0.05
H	38.1 - 38.2	Vc	29	29	26	26	36	36	36	33	33	29	41	41	37	37	37
		fz	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.003	0.003	0.002	0.002	0.002
		RPM	13187	13187	11823	11823	14324	14324	14324	13130	13130	11539	13051	13051	11777	11777	11777
		FEED	53	53	47	47	57	57	57	53	53	46	78	78	47	47	47
		Ap	0.034	0.021	0.021	0.013	0.096	0.067	0.067	0.038	0.024	0.024	0.12	0.084	0.048	0.048	0.03
	40	Vc	48	48	42	42	60	60	60	54	54	48	68	68	61	61	61
		fz	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.003	0.003	0.002	0.002	0.002
		RPM	21827	21827	19099	19099	23873	23873	23873	21486	21486	19099	21645	21645	19417	19417	19417
		FEED	87	87	76	76	95	95	95	86	86	76	130	130	78	78	78
		Ap	0.042	0.026	0.026	0.016	0.12	0.084	0.084	0.048	0.03	0.03	0.15	0.105	0.06	0.06	0.038
	41	Vc	29	29	26	26	36	36	36	33	33	29	41	41	37	37	37
		fz	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.003	0.003	0.002	0.002	0.002
		RPM	13187	13187	11823	11823	14324	14324	14324	13130	13130	11539	13051	13051	11777	11777	11777
		FEED	53	53	47	47	57	57	57	53	53	46	78	78	47	47	47
		Ap	0.034	0.021	0.021	0.013	0.096	0.067	0.067	0.038	0.024	0.024	0.12	0.084	0.048	0.048	0.03

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4G MILL END MILLS

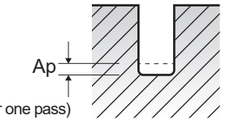
RECOMMENDED CUTTING CONDITIONS

SEME61 SERIES 2 FLUTE CORNER RADIUS - SLOTTING

Vc = m/min. FEED = mm/min.
fz = mm/tooth Ap = mm
RPM = rev./min. LBS = Length Below Shank

VDI 3323	Parameter	Diameter (Ø)															
		1.0	1.0	1.0	1.0	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.5	1.5	1.5	1.5	
	LBS	12	14	16	20	3	4	6	8	10	12	16	20	4	6	8	10
1-5	Vc	83	83	62	62	112	112	112	101	101	101	90	67	124	124	112	112
	fz	0.003	0.003	0.003	0.003	0.005	0.005	0.005	0.004	0.004	0.004	0.004	0.003	0.006	0.006	0.005	0.005
	RPM	26420	26420	19735	19735	29709	29709	29709	26791	26791	26791	23873	17772	26314	26314	23767	23767
	FEED	159	159	118	118	297	297	297	214	214	214	191	107	316	316	238	238
	Ap	0.05	0.03	0.03	0.02	0.24	0.168	0.168	0.096	0.06	0.06	0.036	0.024	0.3	0.21	0.12	0.12
6-8	Vc	83	83	62	62	112	112	112	101	101	101	90	67	124	124	112	112
	fz	0.003	0.003	0.003	0.003	0.005	0.005	0.005	0.004	0.004	0.004	0.004	0.003	0.006	0.006	0.005	0.005
	RPM	26420	26420	19735	19735	29709	29709	29709	26791	26791	26791	23873	17772	26314	26314	23767	23767
	FEED	159	159	118	118	297	297	297	214	214	214	191	107	316	316	238	238
	Ap	0.05	0.03	0.03	0.02	0.24	0.168	0.168	0.096	0.06	0.06	0.036	0.024	0.3	0.21	0.12	0.12
9	Vc	54	54	41	41	71	71	71	64	64	64	57	43	76	76	69	69
	fz	0.002	0.002	0.002	0.002	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.002	0.004	0.004	0.004	0.004
	RPM	17189	17189	13051	13051	18833	18833	18833	16977	16977	16977	15120	11406	16128	16128	14642	14642
	FEED	69	69	52	52	113	113	113	102	102	102	91	46	129	129	117	117
	Ap	0.038	0.023	0.023	0.015	0.18	0.126	0.126	0.072	0.045	0.045	0.027	0.018	0.225	0.158	0.09	0.09
10 - 11.1	Vc	83	83	62	62	112	112	112	101	101	101	90	67	124	124	112	112
	fz	0.003	0.003	0.003	0.003	0.005	0.005	0.005	0.004	0.004	0.004	0.004	0.003	0.006	0.006	0.005	0.005
	RPM	26420	26420	19735	19735	29709	29709	29709	26791	26791	26791	23873	17772	26314	26314	23767	23767
	FEED	159	159	118	118	297	297	297	214	214	214	191	107	316	316	238	238
	Ap	0.05	0.03	0.03	0.02	0.24	0.168	0.168	0.096	0.06	0.06	0.036	0.024	0.3	0.21	0.12	0.12
11.2	Vc	54	54	41	41	71	71	71	64	64	64	57	43	76	76	69	69
	fz	0.002	0.002	0.002	0.002	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.002	0.004	0.004	0.004	0.004
	RPM	17189	17189	13051	13051	18833	18833	18833	16977	16977	16977	15120	11406	16128	16128	14642	14642
	FEED	69	69	52	52	113	113	113	102	102	102	91	46	129	129	117	117
	Ap	0.038	0.023	0.023	0.015	0.18	0.126	0.126	0.072	0.045	0.045	0.027	0.018	0.225	0.158	0.09	0.09
15 - 20	Vc	83	83	62	62	112	112	112	101	101	101	90	67	124	124	112	112
	fz	0.003	0.003	0.003	0.003	0.005	0.005	0.005	0.004	0.004	0.004	0.004	0.003	0.006	0.006	0.005	0.005
	RPM	26420	26420	19735	19735	29709	29709	29709	26791	26791	26791	23873	17772	26314	26314	23767	23767
	FEED	159	159	118	118	297	297	297	214	214	214	191	107	316	316	238	238
	Ap	0.05	0.03	0.03	0.02	0.24	0.168	0.168	0.096	0.06	0.06	0.036	0.024	0.3	0.21	0.12	0.12
38.1 - 38.2	Vc	33	33	25	25	44	44	44	40	40	40	35	26	48	48	43	43
	fz	0.002	0.002	0.002	0.002	0.003	0.003	0.003	0.003	0.003	0.003	0.002	0.002	0.003	0.003	0.003	0.003
	RPM	10504	10504	7958	7958	11671	11671	11671	10610	10610	10610	9284	6897	10186	10186	9125	9125
	FEED	42	42	32	32	70	70	70	64	64	64	37	28	61	61	55	55
	Ap	0.03	0.018	0.018	0.012	0.144	0.101	0.101	0.058	0.036	0.036	0.022	0.014	0.18	0.126	0.072	0.072
40	Vc	54	54	41	41	71	71	71	64	64	64	57	43	76	76	69	69
	fz	0.002	0.002	0.002	0.002	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.002	0.004	0.004	0.004	0.004
	RPM	17189	17189	13051	13051	18833	18833	18833	16977	16977	16977	15120	11406	16128	16128	14642	14642
	FEED	69	69	52	52	113	113	113	102	102	102	91	46	129	129	117	117
	Ap	0.038	0.023	0.023	0.015	0.18	0.126	0.126	0.072	0.045	0.045	0.027	0.018	0.225	0.158	0.09	0.09
41	Vc	33	33	25	25	44	44	44	40	40	40	35	26	48	48	43	43
	fz	0.002	0.002	0.002	0.002	0.003	0.003	0.003	0.003	0.003	0.003	0.002	0.002	0.003	0.003	0.003	0.003
	RPM	10504	10504	7958	7958	11671	11671	11671	10610	10610	10610	9284	6897	10186	10186	9125	9125
	FEED	42	42	32	32	70	70	70	64	64	64	37	28	61	61	55	55
	Ap	0.03	0.018	0.018	0.012	0.144	0.101	0.101	0.058	0.036	0.036	0.022	0.014	0.18	0.126	0.072	0.072

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4G MILL END MILLS

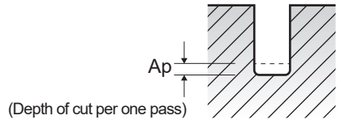
RECOMMENDED CUTTING CONDITIONS

SEME61 SERIES 2 FLUTE CORNER RADIUS - SLOTTING

Vc = m/min. FEED = mm/min.
fz = mm/tooth Ap = mm
RPM = rev./min. LBS = Length Below Shank

ISO	VDI 3323	Parameter	Diameter (Ø)														
			1.5	1.5	1.5	1.5	1.5	1.5	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
		LBS	12	14	16	20	22	26	6	8	10	12	14	16	20	22	26
P	1-5	Vc	112	112	100	100	100	75	136	136	136	122	122	122	122	109	109
		fz	0.005	0.005	0.004	0.004	0.004	0.004	0.007	0.007	0.007	0.006	0.006	0.006	0.006	0.006	0.006
		RPM	23767	23767	21221	21221	21221	15915	21645	21645	21645	19417	19417	19417	19417	17348	17348
		FEED	238	238	170	170	170	127	303	303	303	233	233	233	233	208	208
		Ap	0.12	0.075	0.075	0.045	0.045	0.03	0.4	0.28	0.28	0.16	0.16	0.16	0.1	0.1	0.1
	6-8	Vc	112	112	100	100	100	75	136	136	136	122	122	122	122	109	109
		fz	0.005	0.005	0.004	0.004	0.004	0.004	0.007	0.007	0.007	0.006	0.006	0.006	0.006	0.006	0.006
		RPM	23767	23767	21221	21221	21221	15915	21645	21645	21645	19417	19417	19417	19417	17348	17348
		FEED	238	238	170	170	170	127	303	303	303	233	233	233	233	208	208
		Ap	0.12	0.075	0.075	0.045	0.045	0.03	0.4	0.28	0.28	0.16	0.16	0.16	0.1	0.1	0.1
	9	Vc	69	69	61	61	61	46	87	87	87	78	78	78	78	69	69
		fz	0.004	0.004	0.003	0.003	0.003	0.003	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.004	0.004
		RPM	14642	14642	12945	12945	12945	9762	13846	13846	13846	12414	12414	12414	12414	10982	10982
		FEED	117	117	78	78	78	59	138	138	138	124	124	124	124	88	88
		Ap	0.09	0.056	0.056	0.034	0.034	0.023	0.3	0.21	0.21	0.12	0.12	0.12	0.075	0.075	0.075
	10-11.1	Vc	112	112	100	100	100	75	136	136	136	122	122	122	122	109	109
		fz	0.005	0.005	0.004	0.004	0.004	0.004	0.007	0.007	0.007	0.006	0.006	0.006	0.006	0.006	0.006
		RPM	23767	23767	21221	21221	21221	15915	21645	21645	21645	19417	19417	19417	19417	17348	17348
		FEED	238	238	170	170	170	127	303	303	303	233	233	233	233	208	208
		Ap	0.12	0.075	0.075	0.045	0.045	0.03	0.4	0.28	0.28	0.16	0.16	0.16	0.1	0.1	0.1
	11.2	Vc	69	69	61	61	61	46	87	87	87	78	78	78	78	69	69
		fz	0.004	0.004	0.003	0.003	0.003	0.003	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.004	0.004
		RPM	14642	14642	12945	12945	12945	9762	13846	13846	13846	12414	12414	12414	12414	10982	10982
		FEED	117	117	78	78	78	59	138	138	138	124	124	124	124	88	88
		Ap	0.09	0.056	0.056	0.034	0.034	0.023	0.3	0.21	0.21	0.12	0.12	0.12	0.075	0.075	0.075
K	15-20	Vc	112	112	100	100	100	75	136	136	136	122	122	122	122	109	109
		fz	0.005	0.005	0.004	0.004	0.004	0.004	0.007	0.007	0.007	0.006	0.006	0.006	0.006	0.006	0.006
		RPM	23767	23767	21221	21221	21221	15915	21645	21645	21645	19417	19417	19417	19417	17348	17348
		FEED	238	238	170	170	170	127	303	303	303	233	233	233	233	208	208
		Ap	0.12	0.075	0.075	0.045	0.045	0.03	0.4	0.28	0.28	0.16	0.16	0.16	0.1	0.1	0.1
H	38.1 - 38.2	Vc	43	43	38	38	38	29	54	54	54	49	49	49	49	43	43
		fz	0.003	0.003	0.003	0.003	0.003	0.002	0.005	0.005	0.005	0.004	0.004	0.004	0.004	0.004	0.004
		RPM	9125	9125	8064	8064	8064	6154	8594	8594	8594	7799	7799	7799	7799	6844	6844
		FEED	55	55	48	48	48	25	86	86	86	62	62	62	62	55	55
		Ap	0.072	0.045	0.045	0.027	0.027	0.018	0.24	0.168	0.168	0.096	0.096	0.096	0.06	0.06	0.06
	40	Vc	69	69	61	61	61	46	87	87	87	78	78	78	78	69	69
		fz	0.004	0.004	0.003	0.003	0.003	0.003	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.004	0.004
		RPM	14642	14642	12945	12945	12945	9762	13846	13846	13846	12414	12414	12414	12414	10982	10982
		FEED	117	117	78	78	78	59	138	138	138	124	124	124	124	88	88
		Ap	0.09	0.056	0.056	0.034	0.034	0.023	0.3	0.21	0.21	0.12	0.12	0.12	0.075	0.075	0.075
	41	Vc	43	43	38	38	38	29	54	54	54	49	49	49	49	43	43
		fz	0.003	0.003	0.003	0.003	0.003	0.002	0.005	0.005	0.005	0.004	0.004	0.004	0.004	0.004	0.004
		RPM	9125	9125	8064	8064	8064	6154	8594	8594	8594	7799	7799	7799	7799	6844	6844
		FEED	55	55	48	48	48	25	86	86	86	62	62	62	62	55	55
		Ap	0.072	0.045	0.045	0.027	0.027	0.018	0.24	0.168	0.168	0.096	0.096	0.096	0.06	0.06	0.06

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4G MILL END MILLS

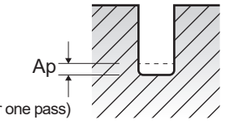
RECOMMENDED CUTTING CONDITIONS

SEME61 SERIES 2 FLUTE CORNER RADIUS - SLOTTING

Vc = m/min. FEED = mm/min.
fz = mm/tooth Ap = mm
RPM = rev./min. LBS = Length Below Shank

VDI 3323	Parameter	Diameter (Ø)															
		2.0	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	3.0	3.0	3.0	3.0	3.0	3.0	3.0
	LBS	30	8	10	12	14	16	20	26	30	8	10	12	14	16	20	26
1-5	Vc	109	141	141	141	127	127	127	113	113	150	150	150	150	135	135	135
	fz	0.006	0.009	0.009	0.009	0.008	0.008	0.008	0.007	0.007	0.01	0.01	0.01	0.01	0.009	0.009	0.009
	RPM	17348	17953	17953	17953	16170	16170	16170	14388	14388	15915	15915	15915	15915	14324	14324	14324
	FEED	208	323	323	323	259	259	259	201	201	318	318	318	318	258	258	258
	Ap	0.06	0.35	0.35	0.35	0.2	0.2	0.2	0.125	0.125	0.6	0.42	0.42	0.42	0.24	0.24	0.15
6-8	Vc	109	141	141	141	127	127	127	113	113	150	150	150	150	135	135	135
	fz	0.006	0.009	0.009	0.009	0.008	0.008	0.008	0.007	0.007	0.01	0.01	0.01	0.01	0.009	0.009	0.009
	RPM	17348	17953	17953	17953	16170	16170	16170	14388	14388	15915	15915	15915	15915	14324	14324	14324
	FEED	208	323	323	323	259	259	259	201	201	318	318	318	318	258	258	258
	Ap	0.06	0.35	0.35	0.35	0.2	0.2	0.2	0.125	0.125	0.6	0.42	0.42	0.42	0.24	0.24	0.15
9	Vc	69	90	90	90	81	81	81	72	72	97	97	97	97	87	87	87
	fz	0.004	0.007	0.007	0.007	0.006	0.006	0.006	0.005	0.005	0.008	0.008	0.008	0.008	0.007	0.007	0.007
	RPM	10982	11459	11459	11459	10313	10313	10313	9167	9167	10292	10292	10292	10292	9231	9231	9231
	FEED	88	160	160	160	124	124	124	92	92	165	165	165	165	129	129	129
	Ap	0.045	0.263	0.263	0.263	0.15	0.15	0.15	0.094	0.094	0.45	0.315	0.315	0.315	0.18	0.18	0.113
10 - 11.1	Vc	109	141	141	141	127	127	127	113	113	150	150	150	150	135	135	135
	fz	0.006	0.009	0.009	0.009	0.008	0.008	0.008	0.007	0.007	0.01	0.01	0.01	0.01	0.009	0.009	0.009
	RPM	17348	17953	17953	17953	16170	16170	16170	14388	14388	15915	15915	15915	15915	14324	14324	14324
	FEED	208	323	323	323	259	259	259	201	201	318	318	318	318	258	258	258
	Ap	0.06	0.35	0.35	0.35	0.2	0.2	0.2	0.125	0.125	0.6	0.42	0.42	0.42	0.24	0.24	0.15
11.2	Vc	69	90	90	90	81	81	81	72	72	97	97	97	97	87	87	87
	fz	0.004	0.007	0.007	0.007	0.006	0.006	0.006	0.005	0.005	0.008	0.008	0.008	0.008	0.007	0.007	0.007
	RPM	10982	11459	11459	11459	10313	10313	10313	9167	9167	10292	10292	10292	10292	9231	9231	9231
	FEED	88	160	160	160	124	124	124	92	92	165	165	165	165	129	129	129
	Ap	0.045	0.263	0.263	0.263	0.15	0.15	0.15	0.094	0.094	0.45	0.315	0.315	0.315	0.18	0.18	0.113
15 - 20	Vc	109	141	141	141	127	127	127	113	113	150	150	150	150	135	135	135
	fz	0.006	0.009	0.009	0.009	0.008	0.008	0.008	0.007	0.007	0.01	0.01	0.01	0.01	0.009	0.009	0.009
	RPM	17348	17953	17953	17953	16170	16170	16170	14388	14388	15915	15915	15915	15915	14324	14324	14324
	FEED	208	323	323	323	259	259	259	201	201	318	318	318	318	258	258	258
	Ap	0.06	0.35	0.35	0.35	0.2	0.2	0.2	0.125	0.125	0.6	0.42	0.42	0.42	0.24	0.24	0.15
38.1 - 38.2	Vc	43	57	57	57	52	52	52	46	46	59	59	59	59	53	53	53
	fz	0.004	0.005	0.005	0.005	0.005	0.005	0.005	0.004	0.004	0.006	0.006	0.006	0.006	0.006	0.006	0.006
	RPM	6844	7257	7257	7257	6621	6621	6621	5857	5857	6260	6260	6260	6260	5623	5623	5623
	FEED	55	73	73	73	66	66	66	47	47	75	75	75	75	67	67	67
	Ap	0.036	0.21	0.21	0.21	0.12	0.12	0.12	0.075	0.075	0.36	0.252	0.252	0.252	0.144	0.144	0.09
40	Vc	69	90	90	90	81	81	81	72	72	97	97	97	97	87	87	87
	fz	0.004	0.007	0.007	0.007	0.006	0.006	0.006	0.005	0.005	0.008	0.008	0.008	0.008	0.007	0.007	0.007
	RPM	10982	11459	11459	11459	10313	10313	10313	9167	9167	10292	10292	10292	10292	9231	9231	9231
	FEED	88	160	160	160	124	124	124	92	92	165	165	165	165	129	129	129
	Ap	0.045	0.263	0.263	0.263	0.15	0.15	0.15	0.094	0.094	0.45	0.315	0.315	0.315	0.18	0.18	0.113
41	Vc	43	57	57	57	52	52	52	46	46	59	59	59	59	53	53	53
	fz	0.004	0.005	0.005	0.005	0.005	0.005	0.005	0.004	0.004	0.006	0.006	0.006	0.006	0.006	0.006	0.006
	RPM	6844	7257	7257	7257	6621	6621	6621	5857	5857	6260	6260	6260	6260	5623	5623	5623
	FEED	55	73	73	73	66	66	66	47	47	75	75	75	75	67	67	67
	Ap	0.036	0.21	0.21	0.21	0.12	0.12	0.12	0.075	0.075	0.36	0.252	0.252	0.252	0.144	0.144	0.09

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4G MILL END MILLS

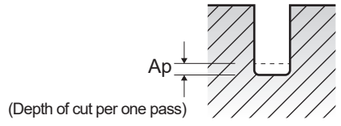
RECOMMENDED CUTTING CONDITIONS

SEME61 SERIES 2 FLUTE CORNER RADIUS - SLOTTING

Vc = m/min. FEED = mm/min.
fz = mm/tooth Ap = mm
RPM = rev./min. LBS = Length Below Shank

ISO	VDI 3323	Parameter	Diameter (Ø)												
			3.0	3.0	3.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
		LBS	30	35	40	10	12	14	16	20	26	30	35	40	45
P	1-5	Vc	135	120	120	161	161	161	161	161	145	145	145	145	129
		fz	0.009	0.008	0.008	0.016	0.016	0.016	0.016	0.016	0.014	0.014	0.014	0.014	0.012
		RPM	14324	12732	12732	12812	12812	12812	12812	12812	11539	11539	11539	11539	10265
		FEED	258	204	204	410	410	410	410	410	323	323	323	323	246
		Ap	0.15	0.15	0.09	0.8	0.8	0.56	0.56	0.56	0.32	0.32	0.2	0.2	0.2
	6-8	Vc	135	120	120	161	161	161	161	161	145	145	145	145	129
		fz	0.009	0.008	0.008	0.016	0.016	0.016	0.016	0.016	0.014	0.014	0.014	0.014	0.012
		RPM	14324	12732	12732	12812	12812	12812	12812	12812	11539	11539	11539	11539	10265
		FEED	258	204	204	410	410	410	410	410	323	323	323	323	246
		Ap	0.15	0.15	0.09	0.8	0.8	0.56	0.56	0.56	0.32	0.32	0.2	0.2	0.2
	9	Vc	87	78	78	103	103	103	103	103	93	93	93	93	82
		fz	0.007	0.006	0.006	0.012	0.012	0.012	0.012	0.012	0.011	0.011	0.011	0.011	0.01
		RPM	9231	8276	8276	8196	8196	8196	8196	8196	7401	7401	7401	7401	6525
		FEED	129	99	99	197	197	197	197	197	163	163	163	163	131
		Ap	0.113	0.113	0.068	0.6	0.6	0.42	0.42	0.42	0.24	0.24	0.15	0.15	0.15
	10-11.1	Vc	135	120	120	161	161	161	161	161	145	145	145	145	129
		fz	0.009	0.008	0.008	0.016	0.016	0.016	0.016	0.016	0.014	0.014	0.014	0.014	0.012
		RPM	14324	12732	12732	12812	12812	12812	12812	12812	11539	11539	11539	11539	10265
		FEED	258	204	204	410	410	410	410	410	323	323	323	323	246
		Ap	0.15	0.15	0.09	0.8	0.8	0.56	0.56	0.56	0.32	0.32	0.2	0.2	0.2
	11.2	Vc	87	78	78	103	103	103	103	103	93	93	93	93	82
		fz	0.007	0.006	0.006	0.012	0.012	0.012	0.012	0.012	0.011	0.011	0.011	0.011	0.01
		RPM	9231	8276	8276	8196	8196	8196	8196	8196	7401	7401	7401	7401	6525
		FEED	129	99	99	197	197	197	197	197	163	163	163	163	131
		Ap	0.113	0.113	0.068	0.6	0.6	0.42	0.42	0.42	0.24	0.24	0.15	0.15	0.15
K	15-20	Vc	135	120	120	161	161	161	161	161	145	145	145	145	129
		fz	0.009	0.008	0.008	0.016	0.016	0.016	0.016	0.016	0.014	0.014	0.014	0.014	0.012
		RPM	14324	12732	12732	12812	12812	12812	12812	12812	11539	11539	11539	11539	10265
		FEED	258	204	204	410	410	410	410	410	323	323	323	323	246
		Ap	0.15	0.15	0.09	0.8	0.8	0.56	0.56	0.56	0.32	0.32	0.2	0.2	0.2
H	38.1 - 38.2	Vc	53	48	48	65	65	65	65	65	58	58	58	58	52
		fz	0.006	0.005	0.005	0.009	0.009	0.009	0.009	0.009	0.008	0.008	0.008	0.008	0.007
		RPM	5623	5093	5093	5173	5173	5173	5173	5173	4615	4615	4615	4615	4138
		FEED	67	51	51	93	93	93	93	93	74	74	74	74	58
		Ap	0.09	0.09	0.054	0.48	0.48	0.336	0.336	0.336	0.192	0.192	0.12	0.12	0.12
	40	Vc	87	78	78	103	103	103	103	103	93	93	93	93	82
		fz	0.007	0.006	0.006	0.012	0.012	0.012	0.012	0.012	0.011	0.011	0.011	0.011	0.01
		RPM	9231	8276	8276	8196	8196	8196	8196	8196	7401	7401	7401	7401	6525
		FEED	129	99	99	197	197	197	197	197	163	163	163	163	131
		Ap	0.113	0.113	0.068	0.6	0.6	0.42	0.42	0.42	0.24	0.24	0.15	0.15	0.15
	41	Vc	53	48	48	65	65	65	65	65	58	58	58	58	52
		fz	0.006	0.005	0.005	0.009	0.009	0.009	0.009	0.009	0.008	0.008	0.008	0.008	0.007
		RPM	5623	5093	5093	5173	5173	5173	5173	5173	4615	4615	4615	4615	4138
		FEED	67	51	51	93	93	93	93	93	74	74	74	74	58
		Ap	0.09	0.09	0.054	0.48	0.48	0.336	0.336	0.336	0.192	0.192	0.12	0.12	0.12

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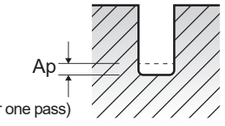
4G MILL END MILLS

RECOMMENDED CUTTING CONDITIONS

SEME61 SERIES 2 FLUTE CORNER RADIUS - SLOTTING

Vc = m/min. FEED = mm/min.
fz = mm/tooth Ap = mm
RPM = rev./min. LBS = Length Below Shank

VDI 3323	Parameter	Diameter (Ø)													
		4.0	5.0	6.0	6.0	8.0	8.0	10.0	10.0	12.0	12.0	16.0	16.0	20.0	20.0
	LBS	50	15	20	30	25	35	30	40	32	45	35	50	40	55
1-5	Vc	129	173	179	179	181	181	188	188	188	188	187	187	188	188
	fz	0.012	0.023	0.032	0.032	0.044	0.044	0.053	0.053	0.05	0.05	0.06	0.06	0.055	0.055
	RPM	10265	11014	9496	9496	7202	7202	5984	5984	4987	4987	3720	3720	2992	2992
	FEED	246	507	608	608	634	634	634	634	499	499	446	446	329	329
	Ap	0.2	1	0.84	0.84	1.12	1.12	2	1.4	2.4	1.68	3.2	2.24	4	4
6-8	Vc	129	173	179	179	181	181	188	188	188	188	187	187	188	188
	fz	0.012	0.023	0.032	0.032	0.044	0.044	0.053	0.053	0.05	0.05	0.06	0.06	0.055	0.055
	RPM	10265	11014	9496	9496	7202	7202	5984	5984	4987	4987	3720	3720	2992	2992
	FEED	246	507	608	608	634	634	634	634	499	499	446	446	329	329
	Ap	0.2	1	0.84	0.84	1.12	1.12	2	1.4	2.4	1.68	3.2	2.24	4	4
9	Vc	82	110	113	113	114	114	126	126	126	126	127	127	123	123
	fz	0.01	0.017	0.025	0.025	0.033	0.033	0.038	0.038	0.04	0.04	0.042	0.042	0.036	0.036
	RPM	6525	7003	5995	5995	4536	4536	4011	4011	3342	3342	2527	2527	1958	1958
	FEED	131	238	300	300	299	299	305	305	267	267	212	212	141	141
	Ap	0.15	0.75	0.63	0.63	0.84	0.84	1.5	1.05	1.8	1.26	2.4	1.68	3	3
10 - 11.1	Vc	129	173	179	179	181	181	188	188	188	188	187	187	188	188
	fz	0.012	0.023	0.032	0.032	0.044	0.044	0.053	0.053	0.05	0.05	0.06	0.06	0.055	0.055
	RPM	10265	11014	9496	9496	7202	7202	5984	5984	4987	4987	3720	3720	2992	2992
	FEED	246	507	608	608	634	634	634	634	499	499	446	446	329	329
	Ap	0.2	1	0.84	0.84	1.12	1.12	2	1.4	2.4	1.68	3.2	2.24	4	4
11.2	Vc	82	110	113	113	114	114	126	126	126	126	127	127	123	123
	fz	0.01	0.017	0.025	0.025	0.033	0.033	0.038	0.038	0.04	0.04	0.042	0.042	0.036	0.036
	RPM	6525	7003	5995	5995	4536	4536	4011	4011	3342	3342	2527	2527	1958	1958
	FEED	131	238	300	300	299	299	305	305	267	267	212	212	141	141
	Ap	0.15	0.75	0.63	0.63	0.84	0.84	1.5	1.05	1.8	1.26	2.4	1.68	3	3
15 - 20	Vc	129	173	179	179	181	181	188	188	188	188	187	187	188	188
	fz	0.012	0.023	0.032	0.032	0.044	0.044	0.053	0.053	0.05	0.05	0.06	0.06	0.055	0.055
	RPM	10265	11014	9496	9496	7202	7202	5984	5984	4987	4987	3720	3720	2992	2992
	FEED	246	507	608	608	634	634	634	634	499	499	446	446	329	329
	Ap	0.2	1	0.84	0.84	1.12	1.12	2	1.4	2.4	1.68	3.2	2.24	4	4
38.1 - 38.2	Vc	52	72	74	74	76	76	76	76	75	75	77	77	75	75
	fz	0.007	0.013	0.018	0.018	0.023	0.023	0.029	0.029	0.03	0.03	0.031	0.031	0.029	0.029
	RPM	4138	4584	3926	3926	3024	3024	2419	2419	1989	1989	1532	1532	1194	1194
	FEED	58	119	141	141	139	139	140	140	119	119	95	95	69	69
	Ap	0.12	0.6	0.504	0.504	0.672	0.672	1.2	0.84	1.44	1.008	1.92	1.344	2.4	2.4
40	Vc	82	110	113	113	114	114	126	126	126	126	127	127	123	123
	fz	0.01	0.017	0.025	0.025	0.033	0.033	0.038	0.038	0.04	0.04	0.042	0.042	0.036	0.036
	RPM	6525	7003	5995	5995	4536	4536	4011	4011	3342	3342	2527	2527	1958	1958
	FEED	131	238	300	300	299	299	305	305	267	267	212	212	141	141
	Ap	0.15	0.75	0.63	0.63	0.84	0.84	1.5	1.05	1.8	1.26	2.4	1.68	3	3
41	Vc	52	72	74	74	76	76	76	76	75	75	77	77	75	75
	fz	0.007	0.013	0.018	0.018	0.023	0.023	0.029	0.029	0.03	0.03	0.031	0.031	0.029	0.029
	RPM	4138	4584	3926	3926	3024	3024	2419	2419	1989	1989	1532	1532	1194	1194
	FEED	58	119	141	141	139	139	140	140	119	119	95	95	69	69
	Ap	0.12	0.6	0.504	0.504	0.672	0.672	1.2	0.84	1.44	1.008	1.92	1.344	2.4	2.4



4G MILL END MILLS

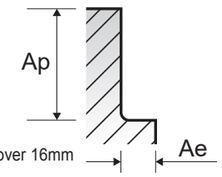
RECOMMENDED CUTTING CONDITIONS

SEME01 SERIES 4 FLUTE CORNER RADIUS - SIDE CUTTING

Vc = m/min.
fz = mm/tooth
RPM = rev./min.
FEED = mm/min.

ISO	VDI 3323	Material Description	Ae(mm)	Ap(mm)	Parameter	Diameter (Ø) 1.0	1.2	1.5	2.0	2.5	3.0	3.5	4.0
P	1-5	Non-alloy steel	0.05D	2D	Vc	87	93	104	113	118	125	132	135
					fz	0.003	0.003	0.004	0.004	0.006	0.006	0.008	0.01
					RPM	27693	24669	22069	17985	15024	13263	12005	10743
					FEED	332	296	353	288	361	318	384	430
	6-8	Low alloy steel	0.05D	2D	Vc	87	93	104	113	118	125	132	135
					fz	0.003	0.003	0.004	0.004	0.006	0.006	0.008	0.01
					RPM	27693	24669	22069	17985	15024	13263	12005	10743
					FEED	332	296	353	288	361	318	384	430
	9		0.05D	2D	Vc	57	59	64	73	75	81	85	86
					fz	0.003	0.004	0.004	0.005	0.007	0.008	0.009	0.011
					RPM	18144	15650	13581	11618	9549	8594	7730	6844
					FEED	218	250	217	232	267	275	278	301
	10-11.1	High alloyed steel, and tool steel	0.05D	2D	Vc	87	93	104	113	118	125	132	135
					fz	0.003	0.003	0.004	0.004	0.006	0.006	0.008	0.01
					RPM	27693	24669	22069	17985	15024	13263	12005	10743
					FEED	332	296	353	288	361	318	384	430
	11.2		0.05D	2D	Vc	57	59	64	73	75	81	85	86
					fz	0.003	0.004	0.004	0.005	0.007	0.008	0.009	0.011
					RPM	18144	15650	13581	11618	9549	8594	7730	6844
					FEED	218	250	217	232	267	275	278	301
K	15-20	Grey cast iron Nodular cast iron Malleable cast iron	0.05D	2D	Vc	87	93	104	113	118	125	132	135
					fz	0.003	0.003	0.004	0.004	0.006	0.006	0.008	0.01
					RPM	27693	24669	22069	17985	15024	13263	12005	10743
					FEED	332	296	353	288	361	318	384	430
H	38.1 - 38.2	Hardened steel	0.02D	2D	Vc	35	37	40	45	48	50	53	54
					fz	0.003	0.003	0.004	0.005	0.005	0.006	0.007	0.008
					RPM	11141	9815	8488	7162	6112	5305	4820	4297
					FEED	134	118	136	143	122	127	135	138
	40	Chilled Cast Iron	0.05D	2D	Vc	57	59	64	73	75	81	85	86
					fz	0.003	0.004	0.004	0.005	0.007	0.008	0.009	0.011
					RPM	18144	15650	13581	11618	9549	8594	7730	6844
					FEED	218	250	217	232	267	275	278	301
	41	Hardened Cast Iron	0.02D	2D	Vc	35	37	40	45	48	50	53	54
					fz	0.003	0.003	0.004	0.005	0.005	0.006	0.007	0.008
					RPM	11141	9815	8488	7162	6112	5305	4820	4297
					FEED	134	118	136	143	122	127	135	138

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* 1.5XD Axial cutting depth should be for diameter over 16mm

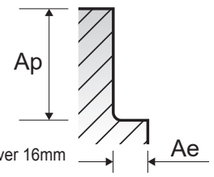
4G MILL END MILLS

RECOMMENDED CUTTING CONDITIONS

SEME01 SERIES 4 FLUTE CORNER RADIUS - SIDE CUTTING

Vc = m/min.
fz = mm/tooth
RPM = rev./min.
FEED = mm/min.

VDI 3323	Parameter	Diameter (Ø) 4.5	5.0	5.5	6.0	7.0	8.0	10.0	11.0	12.0	14.0	16.0	20.0
1-5	Vc	141	144	147	149	153	151	158	158	155	159	156	158
	fz	0.011	0.012	0.013	0.014	0.016	0.019	0.023	0.022	0.022	0.022	0.023	0.023
	RPM	9974	9167	8508	7905	6957	6008	5029	4572	4112	3615	3104	2515
	FEED	439	440	442	443	445	457	463	402	362	318	286	231
6-8	Vc	141	144	147	149	153	151	158	158	155	159	156	158
	fz	0.011	0.012	0.013	0.014	0.016	0.019	0.023	0.022	0.022	0.022	0.023	0.023
	RPM	9974	9167	8508	7905	6957	6008	5029	4572	4112	3615	3104	2515
	FEED	439	440	442	443	445	457	463	402	362	318	286	231
9	Vc	89	91	94	95	97	96	103	105	105	107	106	103
	fz	0.013	0.016	0.017	0.018	0.02	0.024	0.027	0.028	0.029	0.028	0.027	0.027
	RPM	6295	5793	5440	5040	4411	3820	3279	3038	2785	2433	2109	1639
	FEED	327	371	370	363	353	367	354	340	323	272	228	177
10 - 11.1	Vc	141	144	147	149	153	151	158	158	155	159	156	158
	fz	0.011	0.012	0.013	0.014	0.016	0.019	0.023	0.022	0.022	0.022	0.023	0.023
	RPM	9974	9167	8508	7905	6957	6008	5029	4572	4112	3615	3104	2515
	FEED	439	440	442	443	445	457	463	402	362	318	286	231
11.2	Vc	89	91	94	95	97	96	103	105	105	107	106	103
	fz	0.013	0.016	0.017	0.018	0.02	0.024	0.027	0.028	0.029	0.028	0.027	0.027
	RPM	6295	5793	5440	5040	4411	3820	3279	3038	2785	2433	2109	1639
	FEED	327	371	370	363	353	367	354	340	323	272	228	177
15 - 20	Vc	141	144	147	149	153	151	158	158	155	159	156	158
	fz	0.011	0.012	0.013	0.014	0.016	0.019	0.023	0.022	0.022	0.022	0.023	0.023
	RPM	9974	9167	8508	7905	6957	6008	5029	4572	4112	3615	3104	2515
	FEED	439	440	442	443	445	457	463	402	362	318	286	231
38.1 - 38.2	Vc	57	60	61	62	64	63	63	64	63	65	64	63
	fz	0.01	0.011	0.012	0.013	0.015	0.017	0.021	0.021	0.021	0.021	0.022	0.023
	RPM	4032	3820	3530	3289	2910	2507	2005	1852	1671	1478	1273	1003
	FEED	161	168	169	171	175	170	168	156	140	124	112	92
40	Vc	89	91	94	95	97	96	103	105	105	107	106	103
	fz	0.013	0.016	0.017	0.018	0.02	0.024	0.027	0.028	0.029	0.028	0.027	0.027
	RPM	6295	5793	5440	5040	4411	3820	3279	3038	2785	2433	2109	1639
	FEED	327	371	370	363	353	367	354	340	323	272	228	177
41	Vc	57	60	61	62	64	63	63	64	63	65	64	63
	fz	0.01	0.011	0.012	0.013	0.015	0.017	0.021	0.021	0.021	0.021	0.022	0.023
	RPM	4032	3820	3530	3289	2910	2507	2005	1852	1671	1478	1273	1003
	FEED	161	168	169	171	175	170	168	156	140	124	112	92



* 1.5XD Axial cutting depth should be for diameter over 16mm

4G MILL END MILLS

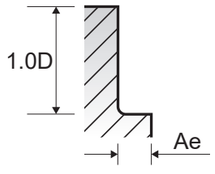
RECOMMENDED CUTTING CONDITIONS

SEME64 SERIES — 4 FLUTE CORNER RADIUS - SIDE CUTTING

Vc = m/min. FEED = mm/min.
fz = mm /tooth Ae = mm
RPM = rev./min. LBS = Length Below Shank

ISO	VDI 3323	Material Description	Parameter	Diameter (Ø)															
				1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.2	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
P	1-5	Non-alloy steel	Vc		104	94	94	94	83	62	62	31	31	112	112	112	101	101	101	90
			fz		0.003	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.003	0.003	0.003	0.003	0.003	0.003	0.002
			RPM		33104	29921	29921	29921	26420	19735	19735	9868	9868	29709	29709	29709	26791	26791	26791	23873
			FEED		397	239	239	239	211	158	158	79	79	357	357	357	321	321	321	191
			Ae		0.021	0.012	0.012	0.008	0.008	0.005	0.003	0.003	0.003	0.036	0.025	0.025	0.014	0.009	0.009	0.005
	6-8	Low alloy steel	Vc		104	94	94	94	83	62	62	31	31	112	112	112	101	101	101	90
			fz		0.003	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.003	0.003	0.003	0.003	0.003	0.003	0.002
			RPM		33104	29921	29921	29921	26420	19735	19735	9868	9868	29709	29709	29709	26791	26791	26791	23873
			FEED		397	239	239	239	211	158	158	79	79	357	357	357	321	321	321	191
			Ae		0.021	0.012	0.012	0.008	0.008	0.005	0.003	0.003	0.003	0.036	0.025	0.025	0.014	0.009	0.009	0.005
	9		Vc		68	61	61	61	54	41	41	20	20	71	71	71	64	64	64	57
			fz		0.003	0.003	0.003	0.003	0.002	0.002	0.002	0.002	0.002	0.004	0.004	0.004	0.003	0.003	0.003	0.003
			RPM		21645	19417	19417	19417	17189	13051	13051	6366	6366	18833	18833	18833	16977	16977	16977	15120
			FEED		260	233	233	233	138	104	104	51	51	301	301	301	204	204	204	181
			Ae		0.016	0.009	0.009	0.006	0.006	0.003	0.002	0.002	0.002	0.027	0.01	0.019	0.011	0.007	0.007	0.004
	10-11.1	High alloyed steel, and tool steel	Vc		104	94	94	94	83	62	62	31	31	112	112	112	101	101	101	90
			fz		0.003	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.003	0.003	0.003	0.003	0.003	0.003	0.002
			RPM		33104	29921	29921	29921	26420	19735	19735	9868	9868	29709	29709	29709	26791	26791	26791	23873
			FEED		397	239	239	239	211	158	158	79	79	357	357	357	321	321	321	191
			Ae		0.021	0.012	0.012	0.008	0.008	0.005	0.003	0.003	0.003	0.036	0.025	0.025	0.014	0.009	0.009	0.005
	11.2		Vc		68	61	61	61	54	41	41	20	20	71	71	71	64	64	64	57
			fz		0.003	0.003	0.003	0.003	0.002	0.002	0.002	0.002	0.002	0.004	0.004	0.004	0.003	0.003	0.003	0.003
			RPM		21645	19417	19417	19417	17189	13051	13051	6366	6366	18833	18833	18833	16977	16977	16977	15120
			FEED		260	233	233	233	138	104	104	51	51	301	301	301	204	204	204	181
			Ae		0.016	0.009	0.009	0.006	0.006	0.003	0.002	0.002	0.002	0.027	0.01	0.019	0.011	0.007	0.007	0.004
K	15-20	Grey cast iron Nodular cast iron Malleable cast iron	Vc		104	94	94	94	83	62	62	31	31	112	112	112	101	101	101	90
			fz		0.003	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.003	0.003	0.003	0.003	0.003	0.003	0.002
			RPM		33104	29921	29921	29921	26420	19735	19735	9868	9868	29709	29709	29709	26791	26791	26791	23873
			FEED		397	239	239	239	211	158	158	79	79	357	357	357	321	321	321	191
			Ae		0.021	0.012	0.012	0.008	0.008	0.005	0.003	0.003	0.003	0.036	0.025	0.025	0.014	0.009	0.009	0.005
H	38.1 - 38.2	Hardened steel	Vc		41	37	37	37	33	25	25	12	12	44	44	44	40	40	40	35
			fz		0.003	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.003	0.003	0.003	0.003	0.003	0.003	0.002
			RPM		13051	11777	11777	11777	10504	7958	7958	3820	3820	11671	11671	11671	10610	10610	10610	9284
			FEED		157	94	94	94	84	64	64	31	31	140	140	140	127	127	127	74
			Ae		0.013	0.007	0.007	0.005	0.005	0.003	0.002	0.002	0.002	0.022	0.015	0.015	0.009	0.005	0.005	0.003
	40	Chilled Cast Iron	Vc		68	61	61	61	54	41	41	20	20	71	71	71	64	64	64	57
			fz		0.003	0.003	0.003	0.003	0.002	0.002	0.002	0.002	0.002	0.004	0.004	0.004	0.003	0.003	0.003	0.003
			RPM		21645	19417	19417	19417	17189	13051	13051	6366	6366	18833	18833	18833	16977	16977	16977	15120
			FEED		260	233	233	233	138	104	104	51	51	301	301	301	204	204	204	181
			Ae		0.016	0.009	0.009	0.006	0.006	0.003	0.002	0.002	0.002	0.027	0.01	0.019	0.011	0.007	0.007	0.004
	41	Hardened Cast Iron	Vc		41	37	37	37	33	25	25	12	12	44	44	44	40	40	40	35
			fz		0.003	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.003	0.003	0.003	0.003	0.003	0.003	0.002
			RPM		13051	11777	11777	11777	10504	7958	7958	3820	3820	11671	11671	11671	10610	10610	10610	9284
			FEED		157	94	94	94	84	64	64	31	31	140	140	140	127	127	127	74
			Ae		0.013	0.007	0.007	0.005	0.005	0.003	0.002	0.002	0.002	0.022	0.015	0.015	0.009	0.005	0.005	0.003

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4G MILL END MILLS

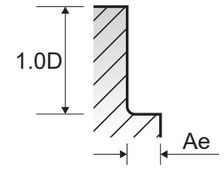
RECOMMENDED CUTTING CONDITIONS

SEME64 SERIES — 4 FLUTE CORNER RADIUS - SIDE CUTTING

Vc = m/min. FEED = mm/min.
fz = mm /tooth Ae = mm
RPM = rev./min. LBS = Length Below Shank

VDI 3323	Parameter	Diameter (Ø)																						
		1.2	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.5
	LBS	20	4	6	8	10	12	14	16	20	22	26	6	8	10	12	14	16	20	22	26	30	8
1-5	Vc	67	124	124	112	112	112	112	100	100	100	75	136	136	136	122	122	122	122	109	109	109	141
	fz	0.002	0.004	0.004	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.002	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.005
	RPM	17772	26314	26314	23767	23767	23767	23767	21221	21221	21221	15915	21645	21645	21645	19417	19417	19417	19417	17348	17348	17348	17953
	FEED	142	421	421	285	285	285	285	255	255	255	127	346	346	346	311	311	311	311	278	278	278	359
	Ae	0.004	0.045	0.032	0.018	0.018	0.018	0.011	0.011	0.007	0.007	0.005	0.06	0.042	0.042	0.024	0.024	0.024	0.015	0.015	0.015	0.009	0.053
6-8	Vc	67	124	124	112	112	112	112	100	100	100	75	136	136	136	122	122	122	122	109	109	109	141
	fz	0.002	0.004	0.004	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.002	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.005
	RPM	17772	26314	26314	23767	23767	23767	23767	21221	21221	21221	15915	21645	21645	21645	19417	19417	19417	19417	17348	17348	17348	17953
	FEED	142	421	421	285	285	285	285	255	255	255	127	346	346	346	311	311	311	311	278	278	278	359
	Ae	0.004	0.045	0.032	0.018	0.018	0.018	0.011	0.011	0.007	0.007	0.005	0.06	0.042	0.042	0.024	0.024	0.024	0.015	0.015	0.015	0.009	0.053
9	Vc	43	76	76	69	69	69	69	61	61	61	46	87	87	87	78	78	78	78	69	69	69	90
	fz	0.002	0.004	0.004	0.004	0.004	0.004	0.004	0.003	0.003	0.003	0.003	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.004	0.004	0.004	0.007
	RPM	11406	16128	16128	14642	14642	14642	14642	12945	12945	12945	9762	13846	13846	13846	12414	12414	12414	12414	10982	10982	10982	11459
	FEED	91	258	258	234	234	234	234	155	155	155	117	277	277	277	248	248	248	248	176	176	176	321
	Ae	0.003	0.034	0.024	0.014	0.014	0.014	0.008	0.008	0.005	0.005	0.003	0.045	0.032	0.032	0.018	0.018	0.018	0.011	0.011	0.011	0.007	0.039
10 - 11.1	Vc	67	124	124	112	112	112	112	100	100	100	75	136	136	136	122	122	122	122	109	109	109	141
	fz	0.002	0.004	0.004	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.002	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.005
	RPM	17772	26314	26314	23767	23767	23767	23767	21221	21221	21221	15915	21645	21645	21645	19417	19417	19417	19417	17348	17348	17348	17953
	FEED	142	421	421	285	285	285	285	255	255	255	127	346	346	346	311	311	311	311	278	278	278	359
	Ae	0.004	0.045	0.032	0.018	0.018	0.018	0.011	0.011	0.007	0.007	0.005	0.06	0.042	0.042	0.024	0.024	0.024	0.015	0.015	0.015	0.009	0.053
11.2	Vc	43	76	76	69	69	69	69	61	61	61	46	87	87	87	78	78	78	78	69	69	69	90
	fz	0.002	0.004	0.004	0.004	0.004	0.004	0.004	0.003	0.003	0.003	0.003	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.004	0.004	0.004	0.007
	RPM	11406	16128	16128	14642	14642	14642	14642	12945	12945	12945	9762	13846	13846	13846	12414	12414	12414	12414	10982	10982	10982	11459
	FEED	91	258	258	234	234	234	234	155	155	155	117	277	277	277	248	248	248	248	176	176	176	321
	Ae	0.003	0.034	0.024	0.014	0.014	0.014	0.008	0.008	0.005	0.005	0.003	0.045	0.032	0.032	0.018	0.018	0.018	0.011	0.011	0.011	0.007	0.039
15 - 20	Vc	67	124	124	112	112	112	112	100	100	100	75	136	136	136	122	122	122	122	109	109	109	141
	fz	0.002	0.004	0.004	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.002	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.005
	RPM	17772	26314	26314	23767	23767	23767	23767	21221	21221	21221	15915	21645	21645	21645	19417	19417	19417	19417	17348	17348	17348	17953
	FEED	142	421	421	285	285	285	285	255	255	255	127	346	346	346	311	311	311	311	278	278	278	359
	Ae	0.004	0.045	0.032	0.018	0.018	0.018	0.011	0.011	0.007	0.007	0.005	0.06	0.042	0.042	0.024	0.024	0.024	0.015	0.015	0.015	0.009	0.053
38.1 - 38.2	Vc	26	48	48	43	43	43	43	38	38	38	29	54	54	54	49	49	49	49	43	43	43	57
	fz	0.002	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.002	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.003	0.003	0.003	0.005
	RPM	6897	10186	10186	9125	9125	9125	9125	8064	8064	8064	6154	8594	8594	8594	7799	7799	7799	7799	6844	6844	6844	7257
	FEED	55	122	122	109	109	109	109	97	97	97	49	138	138	138	125	125	125	125	82	82	82	145
	Ae	0.002	0.027	0.019	0.011	0.011	0.011	0.007	0.007	0.004	0.004	0.003	0.036	0.025	0.025	0.014	0.014	0.014	0.009	0.009	0.009	0.005	0.032
40	Vc	43	76	76	69	69	69	69	61	61	61	46	87	87	87	78	78	78	78	69	69	69	90
	fz	0.002	0.004	0.004	0.004	0.004	0.004	0.004	0.003	0.003	0.003	0.003	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.004	0.004	0.004	0.007
	RPM	11406	16128	16128	14642	14642	14642	14642	12945	12945	12945	9762	13846	13846	13846	12414	12414	12414	12414	10982	10982	10982	11459
	FEED	91	258	258	234	234	234	234	155	155	155	117	277	277	277	248	248	248	248	176	176	176	321
	Ae	0.003	0.034	0.024	0.014	0.014	0.014	0.008	0.008	0.005	0.005	0.003	0.045	0.032	0.032	0.018	0.018	0.018	0.011	0.011	0.011	0.007	0.039
41	Vc	26	48	48	43	43	43	43	38	38	38	29	54	54	54	49	49	49	49	43	43	43	57
	fz	0.002	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.002	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.003	0.003	0.003	0.005
	RPM	6897	10186	10186	9125	9125	9125	9125	8064	8064	8064	6154	8594	8594	8594	7799	7799	7799	7799	6844	6844	6844	7257
	FEED	55	122	122	109	109	109	109	97	97	97	49	138	138	138	125	125	125	125	82	82	82	145
	Ae	0.002	0.027	0.019	0.011	0.011	0.011	0.007	0.007	0.004	0.004	0.003	0.036	0.025	0.025	0.014	0.014	0.014	0.009	0.009	0.009	0.005	0.032

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4G MILL END MILLS

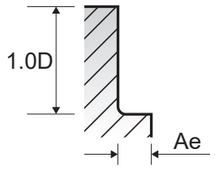
RECOMMENDED CUTTING CONDITIONS

SEME64 SERIES — 4 FLUTE CORNER RADIUS - SIDE CUTTING

Vc = m/min. FEED = mm/min.
fz = mm /tooth Ae = mm
RPM = rev./min. LBS = Length Below Shank

ISO	VDI 3323	Parameter	Diameter (Ø)																	
			2.5	2.5	2.5	2.5	2.5	2.5	2.5	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	4.0	4.0
		LBS	10	12	14	16	20	26	30	8	10	12	14	16	20	26	30	35	40	10	12
P	1-5	Vc	141	141	127	127	127	113	113	150	150	150	150	135	135	135	135	120	120	161	161
		fz	0.005	0.005	0.005	0.005	0.005	0.004	0.004	0.006	0.006	0.006	0.006	0.006	0.006	0.006	0.006	0.005	0.005	0.01	0.01
		RPM	17953	17953	16170	16170	16170	14388	14388	15915	15915	15915	15915	14324	14324	14324	14324	12732	12732	12812	12812
		FEED	359	359	323	323	323	230	230	382	382	382	382	344	344	344	344	255	255	512	512
		Ae	0.053	0.053	0.03	0.03	0.03	0.019	0.019	0.09	0.063	0.063	0.063	0.036	0.036	0.023	0.023	0.023	0.014	0.12	0.12
	6-8	Vc	141	141	127	127	127	113	113	150	150	150	150	135	135	135	135	120	120	161	161
		fz	0.005	0.005	0.005	0.005	0.005	0.004	0.004	0.006	0.006	0.006	0.006	0.006	0.006	0.006	0.006	0.005	0.005	0.01	0.01
		RPM	17953	17953	16170	16170	16170	14388	14388	15915	15915	15915	15915	14324	14324	14324	14324	12732	12732	12812	12812
		FEED	359	359	323	323	323	230	230	382	382	382	382	344	344	344	344	255	255	512	512
		Ae	0.053	0.053	0.03	0.03	0.03	0.019	0.019	0.09	0.063	0.063	0.063	0.036	0.036	0.023	0.023	0.023	0.014	0.12	0.12
	9	Vc	90	90	81	81	81	72	72	97	97	97	97	87	87	87	87	78	78	103	103
		fz	0.007	0.007	0.006	0.006	0.006	0.005	0.005	0.008	0.008	0.008	0.008	0.007	0.007	0.007	0.007	0.006	0.006	0.011	0.011
		RPM	11459	11459	10313	10313	10313	9167	9167	10292	10292	10292	10292	9231	9231	9231	9231	8276	8276	8196	8196
		FEED	321	321	248	248	248	183	183	329	329	329	329	258	258	258	258	199	199	361	361
		Ae	0.039	0.039	0.023	0.023	0.023	0.014	0.014	0.068	0.047	0.047	0.047	0.027	0.027	0.017	0.017	0.017	0.01	0.09	0.09
	10-11.1	Vc	141	141	127	127	127	113	113	150	150	150	150	135	135	135	135	120	120	161	161
		fz	0.005	0.005	0.005	0.005	0.005	0.004	0.004	0.006	0.006	0.006	0.006	0.006	0.006	0.006	0.006	0.005	0.005	0.01	0.01
		RPM	17953	17953	16170	16170	16170	14388	14388	15915	15915	15915	15915	14324	14324	14324	14324	12732	12732	12812	12812
		FEED	359	359	323	323	323	230	230	382	382	382	382	344	344	344	344	255	255	512	512
		Ae	0.053	0.053	0.03	0.03	0.03	0.019	0.019	0.09	0.063	0.063	0.063	0.036	0.036	0.023	0.023	0.023	0.014	0.12	0.12
	11.2	Vc	90	90	81	81	81	72	72	97	97	97	97	87	87	87	87	78	78	103	103
		fz	0.007	0.007	0.006	0.006	0.006	0.005	0.005	0.008	0.008	0.008	0.008	0.007	0.007	0.007	0.007	0.006	0.006	0.011	0.011
		RPM	11459	11459	10313	10313	10313	9167	9167	10292	10292	10292	10292	9231	9231	9231	9231	8276	8276	8196	8196
		FEED	321	321	248	248	248	183	183	329	329	329	329	258	258	258	258	199	199	361	361
		Ae	0.039	0.039	0.023	0.023	0.023	0.014	0.014	0.068	0.047	0.047	0.047	0.027	0.027	0.017	0.017	0.017	0.01	0.09	0.09
K	15-20	Vc	141	141	127	127	127	113	113	150	150	150	150	135	135	135	135	120	120	161	161
		fz	0.005	0.005	0.005	0.005	0.005	0.004	0.004	0.006	0.006	0.006	0.006	0.006	0.006	0.006	0.006	0.005	0.005	0.01	0.01
		RPM	17953	17953	16170	16170	16170	14388	14388	15915	15915	15915	15915	14324	14324	14324	14324	12732	12732	12812	12812
		FEED	359	359	323	323	323	230	230	382	382	382	382	344	344	344	344	255	255	512	512
		Ae	0.053	0.053	0.03	0.03	0.03	0.019	0.019	0.09	0.063	0.063	0.063	0.036	0.036	0.023	0.023	0.023	0.014	0.12	0.12
H	38.1 - 38.2	Vc	57	57	52	52	52	46	46	59	59	59	59	53	53	53	53	48	48	65	65
		fz	0.005	0.005	0.005	0.005	0.005	0.004	0.004	0.006	0.006	0.006	0.006	0.005	0.005	0.005	0.005	0.005	0.005	0.008	0.008
		RPM	7257	7257	6621	6621	6621	5857	5857	6260	6260	6260	6260	5623	5623	5623	5623	5093	5093	5173	5173
		FEED	145	145	132	132	132	94	94	150	150	150	150	112	112	112	112	102	102	166	166
		Ae	0.032	0.032	0.018	0.018	0.018	0.011	0.011	0.054	0.038	0.038	0.038	0.022	0.022	0.014	0.014	0.014	0.008	0.072	0.072
	40	Vc	90	90	81	81	81	72	72	97	97	97	97	87	87	87	87	78	78	103	103
		fz	0.007	0.007	0.006	0.006	0.006	0.005	0.005	0.008	0.008	0.008	0.008	0.007	0.007	0.007	0.007	0.006	0.006	0.011	0.011
		RPM	11459	11459	10313	10313	10313	9167	9167	10292	10292	10292	10292	9231	9231	9231	9231	8276	8276	8196	8196
		FEED	321	321	248	248	248	183	183	329	329	329	329	258	258	258	258	199	199	361	361
		Ae	0.039	0.039	0.023	0.023	0.023	0.014	0.014	0.068	0.047	0.047	0.047	0.027	0.027	0.017	0.017	0.017	0.01	0.09	0.09
	41	Vc	57	57	52	52	52	46	46	59	59	59	59	53	53	53	53	48	48	65	65
		fz	0.005	0.005	0.005	0.005	0.005	0.004	0.004	0.006	0.006	0.006	0.006	0.005	0.005	0.005	0.005	0.005	0.005	0.008	0.008
		RPM	7257	7257	6621	6621	6621	5857	5857	6260	6260	6260	6260	5623	5623	5623	5623	5093	5093	5173	5173
		FEED	145	145	132	132	132	94	94	150	150	150	150	112	112	112	112	102	102	166	166
		Ae	0.032	0.032	0.018	0.018	0.018	0.011	0.011	0.054	0.038	0.038	0.038	0.022	0.022	0.014	0.014	0.014	0.008	0.072	0.072

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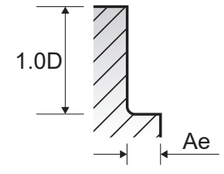
4G MILL END MILLS

RECOMMENDED CUTTING CONDITIONS

SEME64 SERIES — 4 FLUTE CORNER RADIUS - SIDE CUTTING

Vc = m/min. FEED = mm/min.
fz = mm /tooth Ae = mm
RPM = rev./min. LBS = Length Below Shank

VDI 3323	Parameter	Diameter (Ø)																			
		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	5.0	6.0	6.0	8.0	8.0	10.0	10.0	12.0	12.0	16.0	16.0	20.0	20.0
	LBS	14	16	20	26	30	35	40	45	50	15	20	30	25	35	30	40	32	45	35	50	40	55
1-5	Vc	161	161	161	145	145	145	145	129	129	173	179	179	181	181	188	188	188	188	187	187	188	188
	fz	0.01	0.01	0.01	0.009	0.009	0.009	0.009	0.008	0.008	0.012	0.013	0.013	0.019	0.019	0.023	0.023	0.022	0.022	0.022	0.022	0.023	0.023
	RPM	12812	12812	12812	11539	11539	11539	11539	10265	10265	11014	9496	9496	7202	7202	5984	5984	4987	4987	3720	3720	2992	2992
	FEED	512	512	512	415	415	415	415	328	328	529	494	494	547	547	551	551	439	439	327	327	275	275
	Ae	0.084	0.084	0.084	0.048	0.048	0.03	0.03	0.03	0.03	0.15	0.126	0.126	0.168	0.168	0.3	0.21	0.36	0.252	0.48	0.336	0.6	0.6
6-8	Vc	161	161	161	145	145	145	145	129	129	173	179	179	181	181	188	188	188	188	187	187	188	188
	fz	0.01	0.01	0.01	0.009	0.009	0.009	0.009	0.008	0.008	0.012	0.013	0.013	0.019	0.019	0.023	0.023	0.022	0.022	0.022	0.022	0.023	0.023
	RPM	12812	12812	12812	11539	11539	11539	11539	10265	10265	11014	9496	9496	7202	7202	5984	5984	4987	4987	3720	3720	2992	2992
	FEED	512	512	512	415	415	415	415	328	328	529	494	494	547	547	551	551	439	439	327	327	275	275
	Ae	0.084	0.084	0.084	0.048	0.048	0.03	0.03	0.03	0.03	0.15	0.126	0.126	0.168	0.168	0.3	0.21	0.36	0.252	0.48	0.336	0.6	0.6
9	Vc	103	103	103	93	93	93	93	82	82	110	113	113	114	114	126	126	126	126	127	127	123	123
	fz	0.011	0.011	0.011	0.01	0.01	0.01	0.01	0.009	0.009	0.015	0.018	0.018	0.024	0.024	0.027	0.027	0.028	0.028	0.028	0.028	0.027	0.027
	RPM	8196	8196	8196	7401	7401	7401	7401	6525	6525	7003	5995	5995	4536	4536	4011	4011	3342	3342	2527	2527	1958	1958
	FEED	361	361	361	296	296	296	296	235	235	420	432	432	435	435	433	433	374	374	283	283	211	211
	Ae	0.063	0.063	0.063	0.036	0.036	0.023	0.023	0.023	0.023	0.113	0.095	0.095	0.126	0.126	0.225	0.158	0.27	0.189	0.36	0.252	0.45	0.45
10 - 11.1	Vc	161	161	161	145	145	145	145	129	129	173	179	179	181	181	188	188	188	188	187	187	188	188
	fz	0.01	0.01	0.01	0.009	0.009	0.009	0.009	0.008	0.008	0.012	0.013	0.013	0.019	0.019	0.023	0.023	0.022	0.022	0.022	0.022	0.023	0.023
	RPM	12812	12812	12812	11539	11539	11539	11539	10265	10265	11014	9496	9496	7202	7202	5984	5984	4987	4987	3720	3720	2992	2992
	FEED	512	512	512	415	415	415	415	328	328	529	494	494	547	547	551	551	439	439	327	327	275	275
	Ae	0.084	0.084	0.084	0.048	0.048	0.03	0.03	0.03	0.03	0.15	0.126	0.126	0.168	0.168	0.3	0.21	0.36	0.252	0.48	0.336	0.6	0.6
11.2	Vc	103	103	103	93	93	93	93	82	82	110	113	113	114	114	126	126	126	126	127	127	123	123
	fz	0.011	0.011	0.011	0.01	0.01	0.01	0.01	0.009	0.009	0.015	0.018	0.018	0.024	0.024	0.027	0.027	0.028	0.028	0.028	0.028	0.027	0.027
	RPM	8196	8196	8196	7401	7401	7401	7401	6525	6525	7003	5995	5995	4536	4536	4011	4011	3342	3342	2527	2527	1958	1958
	FEED	361	361	361	296	296	296	296	235	235	420	432	432	435	435	433	433	374	374	283	283	211	211
	Ae	0.063	0.063	0.063	0.036	0.036	0.023	0.023	0.023	0.023	0.113	0.095	0.095	0.126	0.126	0.225	0.158	0.27	0.189	0.36	0.252	0.45	0.45
15 - 20	Vc	161	161	161	145	145	145	145	129	129	173	179	179	181	181	188	188	188	188	187	187	188	188
	fz	0.01	0.01	0.01	0.009	0.009	0.009	0.009	0.008	0.008	0.012	0.013	0.013	0.019	0.019	0.023	0.023	0.022	0.022	0.022	0.022	0.023	0.023
	RPM	12812	12812	12812	11539	11539	11539	11539	10265	10265	11014	9496	9496	7202	7202	5984	5984	4987	4987	3720	3720	2992	2992
	FEED	512	512	512	415	415	415	415	328	328	529	494	494	547	547	551	551	439	439	327	327	275	275
	Ae	0.084	0.084	0.084	0.048	0.048	0.03	0.03	0.03	0.03	0.15	0.126	0.126	0.168	0.168	0.3	0.21	0.36	0.252	0.48	0.336	0.6	0.6
38.1 - 38.2	Vc	65	65	65	58	58	58	58	52	52	72	74	74	76	76	76	76	75	75	77	77	75	75
	fz	0.008	0.008	0.008	0.007	0.007	0.007	0.007	0.006	0.006	0.011	0.013	0.013	0.017	0.017	0.021	0.021	0.02	0.02	0.022	0.022	0.021	0.021
	RPM	5173	5173	5173	4615	4615	4615	4615	4138	4138	4584	3926	3926	3024	3024	2419	2419	1989	1989	1532	1532	1194	1194
	FEED	166	166	166	129	129	129	129	99	99	202	204	204	206	206	203	203	159	159	135	135	100	100
	Ae	0.05	0.05	0.05	0.029	0.029	0.018	0.018	0.018	0.018	0.09	0.076	0.076	0.101	0.101	0.18	0.126	0.216	0.151	0.288	0.202	0.36	0.36
40	Vc	103	103	103	93	93	93	93	82	82	110	113	113	114	114	126	126	126	126	127	127	123	123
	fz	0.011	0.011	0.011	0.01	0.01	0.01	0.01	0.009	0.009	0.015	0.018	0.018	0.024	0.024	0.027	0.027	0.028	0.028	0.028	0.028	0.027	0.027
	RPM	8196	8196	8196	7401	7401	7401	7401	6525	6525	7003	5995	5995	4536	4536	4011	4011	3342	3342	2527	2527	1958	1958
	FEED	361	361	361	296	296	296	296	235	235	420	432	432	435	435	433	433	374	374	283	283	211	211
	Ae	0.063	0.063	0.063	0.036	0.036	0.023	0.023	0.023	0.023	0.113	0.095	0.095	0.126	0.126	0.225	0.158	0.27	0.189	0.36	0.252	0.45	0.45
41	Vc	65	65	65	58	58	58	58	52	52	72	74	74	76	76	76	76	75	75	77	77	75	75
	fz	0.008	0.008	0.008	0.007	0.007	0.007	0.007	0.006	0.006	0.011	0.013	0.013	0.017	0.017	0.021	0.021	0.02	0.02	0.022	0.022	0.021	0.021
	RPM	5173	5173	5173	4615	4615	4615	4615	4138	4138	4584	3926	3926	3024	3024	2419	2419	1989	1989	1532	1532	1194	1194
	FEED	166	166	166	129	129	129	129	99	99	202	204	204	206	206	203	203	159	159	135	135	100	100
	Ae	0.05	0.05	0.05	0.029	0.029	0.018	0.018	0.018	0.018	0.09	0.076	0.076	0.101	0.101	0.18	0.126	0.216	0.151	0.288	0.202	0.36	0.36



4G MILL END MILLS

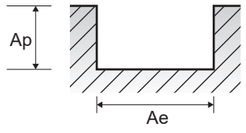
RECOMMENDED CUTTING CONDITIONS

SEME35 SERIES 2 FLUTE - SLOTTING

Vc = m/min.
fz = mm/tooth
RPM = rev./min.
FEED = mm/min.

ISO	VDI 3323	Material Description	Ae(mm)	Ap(mm)	Parameter	Diameter (Ø)								
						0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9
P	1-5	Non-alloy steel	1.0D	0.5D (up to Ø3: 0.2D) (up to Ø1: 0.15D)	Vc	13	26	37	49	57	60	62	63	66
					fz	0.001	0.001	0.001	0.001	0.002	0.002	0.003	0.003	0.004
					RPM	41380	41380	39258	38993	36287	31831	28193	25067	23343
					FEED	83	83	79	78	145	127	169	150	187
	6-8	Low alloy steel	1.0D	0.5D (up to Ø3: 0.2D) (up to Ø1: 0.15D)	Vc	13	26	37	49	57	60	62	63	66
					fz	0.001	0.001	0.001	0.001	0.002	0.002	0.003	0.003	0.004
					RPM	41380	41380	39258	38993	36287	31831	28193	25067	23343
					FEED	83	83	79	78	145	127	169	150	187
	9		1.0D	0.5D (up to Ø3: 0.2D) (up to Ø1: 0.15D)	Vc	8	16	22	29	34	36	37	38	40
					fz	0.001	0.001	0.001	0.001	0.002	0.002	0.003	0.003	0.003
					RPM	25465	25465	23343	23077	21645	19099	16825	15120	14147
					FEED	51	51	47	46	87	76	101	91	85
	10 - 11.1	High alloyed steel, and tool steel	1.0D	0.5D (up to Ø3: 0.2D) (up to Ø1: 0.15D)	Vc	13	26	37	49	57	60	62	63	66
					fz	0.001	0.001	0.001	0.001	0.002	0.002	0.003	0.003	0.004
					RPM	41380	41380	39258	38993	36287	31831	28193	25067	23343
					FEED	83	83	79	78	145	127	169	150	187
	11.2		1.0D	0.5D (up to Ø3: 0.2D) (up to Ø1: 0.15D)	Vc	8	16	22	29	34	36	37	38	40
					fz	0.001	0.001	0.001	0.001	0.002	0.002	0.003	0.003	0.003
					RPM	25465	25465	23343	23077	21645	19099	16825	15120	14147
					FEED	51	51	47	46	87	76	101	91	85
M	14.1	Stainless steel	1.0D	0.5D (up to Ø1: 0.02D)	Vc	7	13	18	25	28	30	31	31	33
					fz	0.001	0.001	0.001	0.001	0.002	0.002	0.003	0.003	0.003
					RPM	22282	20690	19099	19894	17825	15915	14097	12335	11671
					FEED	45	41	38	40	71	64	85	74	70
K	15-20	Grey cast iron Nodular cast iron Malleable cast iron	1.0D	0.5D (up to Ø3: 0.2D) (up to Ø1: 0.15D)	Vc	13	26	37	49	57	60	62	63	66
					fz	0.001	0.001	0.001	0.001	0.002	0.002	0.003	0.003	0.004
					RPM	41380	41380	39258	38993	36287	31831	28193	25067	23343
					FEED	83	83	79	78	145	127	169	150	187
H	38.1 - 38.2	Hardened steel	1.0D	0.05D (up to Ø1: 0.02D)	Vc	5	11	15	20	23	24	25	25	27
					fz	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.002	0.002
					RPM	15915	17507	15915	15915	14642	12732	11368	9947	9549
					FEED	16	35	32	32	29	25	23	40	38
	40	Chilled Cast Iron	1.0D	0.05D (up to Ø1: 0.02D)	Vc	8	16	22	29	34	36	37	38	40
					fz	0.001	0.001	0.001	0.001	0.002	0.002	0.003	0.003	0.003
					RPM	25465	25465	23343	23077	21645	19099	16825	15120	14147
					FEED	51	51	47	46	87	76	101	91	85
	41	Hardened Cast Iron	1.0D	0.05D (up to Ø1: 0.02D)	Vc	5	11	15	20	23	24	25	25	27
					fz	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.002	0.002
					RPM	15915	17507	15915	15915	14642	12732	11368	9947	9549
					FEED	16	35	32	32	29	25	23	40	38

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4G MILL END MILLS

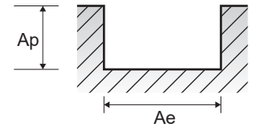
RECOMMENDED CUTTING CONDITIONS

SEME35 SERIES 2 FLUTE - SLOTTING

Vc = m/min.
fz = mm/tooth
RPM = rev./min.
FEED = mm/min.

VDI 3323	Parameter	Diameter (Ø)													
		1.0	1.2	1.5	2.0	2.5	3.0	3.5	4.0	4.5	5.0	5.5	6.0	6.5	7.0
1-5	Vc	68	68	71	73	80	84	91	95	98	99	102	105	107	107
	fz	0.004	0.005	0.006	0.009	0.01	0.012	0.016	0.021	0.023	0.027	0.03	0.033	0.036	0.039
	RPM	21645	18038	15067	11618	10186	8913	8276	7560	6932	6303	5903	5570	5240	4866
	FEED	173	180	181	209	204	214	265	318	319	340	354	368	377	380
6-8	Vc	68	68	71	73	80	84	91	95	98	99	102	105	107	107
	fz	0.004	0.005	0.006	0.009	0.01	0.012	0.016	0.021	0.023	0.027	0.03	0.033	0.036	0.039
	RPM	21645	18038	15067	11618	10186	8913	8276	7560	6932	6303	5903	5570	5240	4866
	FEED	173	180	181	209	204	214	265	318	319	340	354	368	377	380
9	Vc	41	41	42	48	52	52	56	58	59	59	62	63	64	65
	fz	0.004	0.005	0.006	0.008	0.01	0.013	0.017	0.021	0.023	0.026	0.03	0.034	0.036	0.037
	RPM	13051	10876	8913	7639	6621	5517	5093	4615	4173	3756	3588	3342	3134	2956
	FEED	104	109	107	122	132	143	173	194	192	195	215	227	226	219
10 - 11.1	Vc	68	68	71	73	80	84	91	95	98	99	102	105	107	107
	fz	0.004	0.005	0.006	0.009	0.01	0.012	0.016	0.021	0.023	0.027	0.03	0.033	0.036	0.039
	RPM	21645	18038	15067	11618	10186	8913	8276	7560	6932	6303	5903	5570	5240	4866
	FEED	173	180	181	209	204	214	265	318	319	340	354	368	377	380
11.2	Vc	41	41	42	48	52	52	56	58	59	59	62	63	64	65
	fz	0.004	0.005	0.006	0.008	0.01	0.013	0.017	0.021	0.023	0.026	0.03	0.034	0.036	0.037
	RPM	13051	10876	8913	7639	6621	5517	5093	4615	4173	3756	3588	3342	3134	2956
	FEED	104	109	107	122	132	143	173	194	192	195	215	227	226	219
14.1	Vc	34	34	35	40	43	44	47	49	50	50	52	54	54	54
	fz	0.004	0.005	0.006	0.008	0.01	0.014	0.016	0.021	0.023	0.027	0.03	0.033	0.036	0.038
	RPM	10823	9019	7427	6366	5475	4669	4274	3899	3537	3183	3009	2865	2644	2456
	FEED	87	90	89	102	109	131	137	164	163	172	181	189	190	187
15 - 20	Vc	68	68	71	73	80	84	91	95	98	99	102	105	107	107
	fz	0.004	0.005	0.006	0.009	0.01	0.012	0.016	0.021	0.023	0.027	0.03	0.033	0.036	0.039
	RPM	21645	18038	15067	11618	10186	8913	8276	7560	6932	6303	5903	5570	5240	4866
	FEED	173	180	181	209	204	214	265	318	319	340	354	368	377	380
38.1 - 38.2	Vc	27	27	28	32	33	32	35	37	37	36	37	38	39	40
	fz	0.002	0.002	0.003	0.004	0.005	0.006	0.007	0.007	0.009	0.011	0.013	0.015	0.016	0.018
	RPM	8594	7162	5942	5093	4202	3395	3183	2944	2617	2292	2141	2016	1910	1819
	FEED	34	29	36	41	42	41	45	41	47	50	56	60	61	65
40	Vc	41	41	42	48	52	52	56	58	59	59	62	63	64	65
	fz	0.004	0.005	0.006	0.008	0.01	0.013	0.017	0.021	0.023	0.026	0.03	0.034	0.036	0.037
	RPM	13051	10876	8913	7639	6621	5517	5093	4615	4173	3756	3588	3342	3134	2956
	FEED	104	109	107	122	132	143	173	194	192	195	215	227	226	219
41	Vc	27	27	28	32	33	32	35	37	37	36	37	38	39	40
	fz	0.002	0.002	0.003	0.004	0.005	0.006	0.007	0.007	0.009	0.011	0.013	0.015	0.016	0.018
	RPM	8594	7162	5942	5093	4202	3395	3183	2944	2617	2292	2141	2016	1910	1819
	FEED	34	29	36	41	42	41	45	41	47	50	56	60	61	65

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4G MILL END MILLS

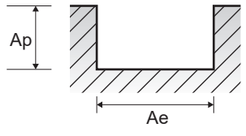
RECOMMENDED CUTTING CONDITIONS

SEME35 SERIES 2 FLUTE - SLOTTING

Vc = m/min.
fz = mm/tooth
RPM = rev./min.
FEED = mm/min.

ISO	VDI 3323	Ae(mm)	Ap(mm)	Parameter	Diameter (Ø)									
					7.5	8.0	8.5	9.0	9.5	10.0	10.5	11.0	11.5	12.0
P	1-5	1.0D	0.5D (up to Ø3: 0.2D) (up to Ø1: 0.15D)	Vc	107	106	106	105	104	102	103	104	104	103
				fz	0.043	0.048	0.049	0.05	0.051	0.053	0.053	0.053	0.053	0.054
				RPM	4541	4218	3970	3714	3485	3247	3122	3009	2879	2732
				FEED	391	405	389	371	355	344	331	319	305	295
	6-8	1.0D	0.5D (up to Ø3: 0.2D) (up to Ø1: 0.15D)	Vc	107	106	106	105	104	102	103	104	104	103
				fz	0.043	0.048	0.049	0.05	0.051	0.053	0.053	0.053	0.053	0.054
				RPM	4541	4218	3970	3714	3485	3247	3122	3009	2879	2732
				FEED	391	405	389	371	355	344	331	319	305	295
	9	1.0D	0.5D (up to Ø3: 0.2D) (up to Ø1: 0.15D)	Vc	64	63	64	64	64	63	63	64	64	63
				fz	0.039	0.042	0.042	0.042	0.042	0.043	0.042	0.041	0.04	0.04
				RPM	2716	2507	2397	2264	2144	2005	1910	1852	1771	1671
				FEED	212	211	201	190	180	172	160	152	142	134
	10 - 11.1	1.0D	0.5D (up to Ø3: 0.2D) (up to Ø1: 0.15D)	Vc	107	106	106	105	104	102	103	104	104	103
				fz	0.043	0.048	0.049	0.05	0.051	0.053	0.053	0.053	0.053	0.054
				RPM	4541	4218	3970	3714	3485	3247	3122	3009	2879	2732
				FEED	391	405	389	371	355	344	331	319	305	295
	11.2	1.0D	0.5D (up to Ø3: 0.2D) (up to Ø1: 0.15D)	Vc	64	63	64	64	64	63	63	64	64	63
				fz	0.039	0.042	0.042	0.042	0.042	0.043	0.042	0.041	0.04	0.04
				RPM	2716	2507	2397	2264	2144	2005	1910	1852	1771	1671
				FEED	212	211	201	190	180	172	160	152	142	134
M	14.1	1.0D	0.5D (up to Ø1: 0.02D)	Vc	54	53	53	53	53	53	53	53	52	51
				fz	0.042	0.045	0.046	0.048	0.049	0.051	0.05	0.049	0.049	0.05
				RPM	2292	2109	1985	1874	1776	1687	1607	1534	1439	1353
				FEED	193	190	183	180	174	172	161	150	141	135
K	15-20	1.0D	0.5D (up to Ø3: 0.2D) (up to Ø1: 0.15D)	Vc	107	106	106	105	104	102	103	104	104	103
				fz	0.043	0.048	0.049	0.05	0.051	0.053	0.053	0.053	0.053	0.054
				RPM	4541	4218	3970	3714	3485	3247	3122	3009	2879	2732
				FEED	391	405	389	371	355	344	331	319	305	295
H	38.1 - 38.2	1.0D	0.05D (up to Ø1: 0.02D)	Vc	41	42	43	43	43	43	43	44	44	44
				fz	0.021	0.024	0.023	0.022	0.022	0.023	0.023	0.023	0.024	0.025
				RPM	1740	1671	1610	1521	1441	1369	1304	1273	1218	1167
				FEED	73	80	74	67	63	63	60	59	58	58
	40	1.0D	0.05D (up to Ø1: 0.02D)	Vc	64	63	64	64	64	63	63	64	64	63
				fz	0.039	0.042	0.042	0.042	0.042	0.043	0.042	0.041	0.04	0.04
				RPM	2716	2507	2397	2264	2144	2005	1910	1852	1771	1671
				FEED	212	211	201	190	180	172	160	152	142	134
	41	1.0D	0.05D (up to Ø1: 0.02D)	Vc	41	42	43	43	43	43	43	44	44	44
				fz	0.021	0.024	0.023	0.022	0.022	0.023	0.023	0.023	0.024	0.025
				RPM	1740	1671	1610	1521	1441	1369	1304	1273	1218	1167
				FEED	73	80	74	67	63	63	60	59	58	58

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CARBIDE
HSS
i-Xmill END MILLS
X-1EH END MILLS
4G MILL END MILLS
X-POWER PRO END MILLS
TitaNox-POWER END MILLS
V7 PLUS END MILLS
ALU-CUT END MILLS
K-2 END MILLS
GENERAL CARBIDE END MILLS

4G MILL END MILLS

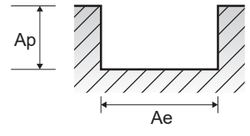
RECOMMENDED CUTTING CONDITIONS

SEME35 SERIES 2 FLUTE - SLOTTING

Vc = m/min.
fz = mm/tooth
RPM = rev./min.
FEED = mm/min.

VDI 3323	Parameter	Diameter (Ø)												
		13.0	14.0	15.0	16.0	17.0	18.0	19.0	20.0	21.0	22.0	23.0	24.0	25.0
1-5	Vc	106	109	110	111	111	110	108	106	107	107	107	107	107
	fz	0.054	0.054	0.052	0.052	0.052	0.053	0.052	0.054	0.053	0.053	0.051	0.049	0.05
	RPM	2595	2478	2334	2208	2078	1945	1809	1687	1622	1548	1481	1419	1362
	FEED	280	268	243	230	216	206	188	182	172	164	151	139	136
6-8	Vc	106	109	110	111	111	110	108	106	107	107	107	107	107
	fz	0.054	0.054	0.052	0.052	0.052	0.053	0.052	0.054	0.053	0.053	0.051	0.049	0.05
	RPM	2595	2478	2334	2208	2078	1945	1809	1687	1622	1548	1481	1419	1362
	FEED	280	268	243	230	216	206	188	182	172	164	151	139	136
9	Vc	65	67	68	68	69	68	68	67	67	67	67	67	66
	fz	0.041	0.041	0.042	0.042	0.041	0.041	0.04	0.04	0.04	0.041	0.042	0.043	0.044
	RPM	1592	1523	1443	1353	1292	1203	1139	1066	1016	969	927	889	840
	FEED	131	125	121	114	106	99	91	85	81	79	78	76	74
10 - 11.1	Vc	106	109	110	111	111	110	108	106	107	107	107	107	107
	fz	0.054	0.054	0.052	0.052	0.052	0.053	0.052	0.054	0.053	0.053	0.051	0.049	0.05
	RPM	2595	2478	2334	2208	2078	1945	1809	1687	1622	1548	1481	1419	1362
	FEED	280	268	243	230	216	206	188	182	172	164	151	139	136
11.2	Vc	65	67	68	68	69	68	68	67	67	67	67	67	66
	fz	0.041	0.041	0.042	0.042	0.041	0.041	0.04	0.04	0.04	0.041	0.042	0.043	0.044
	RPM	1592	1523	1443	1353	1292	1203	1139	1066	1016	969	927	889	840
	FEED	131	125	121	114	106	99	91	85	81	79	78	76	74
14.1	Vc	52	53	53	53	54	54	53	53	53	54	54	54	53
	fz	0.051	0.052	0.053	0.054	0.052	0.053	0.05	0.05	0.05	0.049	0.048	0.047	0.046
	RPM	1273	1205	1125	1054	1011	955	888	844	803	781	747	716	675
	FEED	130	125	119	114	105	101	89	84	80	77	72	67	62
15 - 20	Vc	106	109	110	111	111	110	108	106	107	107	107	107	107
	fz	0.054	0.054	0.052	0.052	0.052	0.053	0.052	0.054	0.053	0.053	0.051	0.049	0.05
	RPM	2595	2478	2334	2208	2078	1945	1809	1687	1622	1548	1481	1419	1362
	FEED	280	268	243	230	216	206	188	182	172	164	151	139	136
38.1 - 38.2	Vc	45	45	45	45	45	45	44	43	43	43	43	43	42
	fz	0.025	0.024	0.023	0.023	0.023	0.023	0.023	0.024	0.022	0.022	0.021	0.02	0.019
	RPM	1102	1023	955	895	843	796	737	684	652	622	595	570	535
	FEED	55	49	44	41	39	37	34	33	29	27	25	23	20
40	Vc	65	67	68	68	69	68	68	67	67	67	67	67	66
	fz	0.041	0.041	0.042	0.042	0.041	0.041	0.04	0.04	0.04	0.041	0.042	0.043	0.044
	RPM	1592	1523	1443	1353	1292	1203	1139	1066	1016	969	927	889	840
	FEED	131	125	121	114	106	99	91	85	81	79	78	76	74
41	Vc	45	45	45	45	45	45	44	43	43	43	43	43	42
	fz	0.025	0.024	0.023	0.023	0.023	0.023	0.023	0.024	0.022	0.022	0.021	0.02	0.019
	RPM	1102	1023	955	895	843	796	737	684	652	622	595	570	535
	FEED	55	49	44	41	39	37	34	33	29	27	25	23	20

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4G MILL END MILLS

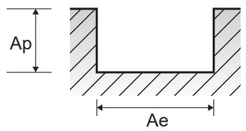
RECOMMENDED CUTTING CONDITIONS

SEME70 SERIES 2 FLUTE - SLOTTING

Vc = m/min.
fz = mm /tooth
RPM = rev./min .
FEED = mm/min.
LOC = Length of Cut

ISO	VDI 3323	Material Description	Ae(mm)	Ap(mm)	Parameter	Diameter (Ø)											
						1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.2	1.2	1.2	1.2
					LOC	3	4	5	6	7	8	10	12	4	6	8	10
P	1-5	Non-alloy steel	1.0D	0.3D (up to Ø3:0.4mm)	Vc	50	50	50	45	45	45	45	40	51	51	46	46
					fz	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.003	0.003	0.002	0.002
					RPM	15915	15915	15915	14324	14324	14324	14324	12732	13528	13528	12202	12202
					FEED	64	64	64	57	57	57	57	51	81	81	49	49
	6-8	Low alloy steel	1.0D	0.3D (up to Ø3:0.4mm)	Vc	50	50	50	45	45	45	45	40	51	51	46	46
					fz	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.003	0.003	0.002	0.002
					RPM	15915	15915	15915	14324	14324	14324	14324	12732	13528	13528	12202	12202
					FEED	64	64	64	57	57	57	57	51	81	81	49	49
	9		1.0D	0.3D (up to Ø3:0.4mm)	Vc	40	40	40	36	36	36	36	32	41	41	37	37
					fz	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.003	0.003	0.003	0.002
					RPM	12732	12732	12732	11459	11459	11459	11459	10186	10876	10876	9815	9815
					FEED	51	51	51	46	46	46	46	41	65	65	59	39
	10-11.1	High alloyed steel, and tool steel	1.0D	0.3D (up to Ø3:0.4mm)	Vc	50	50	50	45	45	45	45	40	51	51	46	46
					fz	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.003	0.003	0.002	0.002
					RPM	15915	15915	15915	14324	14324	14324	14324	12732	13528	13528	12202	12202
					FEED	64	64	64	57	57	57	57	51	81	81	49	49
	11.2		1.0D	0.3D (up to Ø3:0.4mm)	Vc	40	40	40	36	36	36	36	32	41	41	37	37
					fz	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.003	0.003	0.003	0.002
					RPM	12732	12732	12732	11459	11459	11459	11459	10186	10876	10876	9815	9815
					FEED	51	51	51	46	46	46	46	41	65	65	59	39
K	15-20	Grey cast iron Nodular cast iron Malleable cast iron	1.0D	0.3D (up to Ø3:0.4mm)	Vc	50	50	50	45	45	45	45	40	51	51	46	46
					fz	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.003	0.003	0.002	0.002
					RPM	15915	15915	15915	14324	14324	14324	14324	12732	13528	13528	12202	12202
					FEED	64	64	64	57	57	57	57	51	81	81	49	49
H	38.1 - 38.2	Hardened steel	1.0D	0.05D	Vc	25	25	25	23	23	23	23	20	25	25	23	23
					fz	0.002	0.002	0.002	0.002	0.002	0.001	0.001	0.001	0.002	0.002	0.002	0.002
					RPM	7958	7958	7958	7321	7321	7321	7321	6366	6631	6631	6101	6101
					FEED	32	32	32	29	29	15	15	13	27	27	24	24
	40	Chilled Cast Iron	1.0D	0.3D (up to Ø3:0.4mm)	Vc	40	40	40	36	36	36	36	32	41	41	37	37
					fz	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.003	0.003	0.003	0.002
					RPM	12732	12732	12732	11459	11459	11459	11459	10186	10876	10876	9815	9815
					FEED	51	51	51	46	46	46	46	41	65	65	59	39
	41	Hardened Cast Iron	1.0D	0.05D	Vc	25	25	25	23	23	23	23	20	25	25	23	23
					fz	0.002	0.002	0.002	0.002	0.002	0.001	0.001	0.001	0.002	0.002	0.002	0.002
					RPM	7958	7958	7958	7321	7321	7321	7321	6366	6631	6631	6101	6101
					FEED	32	32	32	29	29	15	15	13	27	27	24	24

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CARBIDE
HSS
i-Xmill END MILLS
X-1EH END MILLS
4G MILL END MILLS
X-POWER PRO END MILLS
TitaNox-POWER END MILLS
V7 PLUS END MILLS
ALU-CUT END MILLS
K-2 END MILLS
GENERAL CARBIDE END MILLS

4G MILL END MILLS

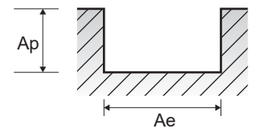
RECOMMENDED CUTTING CONDITIONS

SEME70 SERIES 2 FLUTE - SLOTTING

Vc = m/min.
fz = mm /tooth
RPM = rev./min .
FEED = mm/min.
LOC = Length of Cut

VDI 3323	Parameter	Diameter (Ø)sa																			
		1.2	1.5	1.5	1.5	1.5	1.5	1.5	2.0	2.0	2.0	2.0	2.0	2.5	2.5	2.5	2.5	2.5	3.0	3.0	3.0
	LOC	12	6	8	10	12	14	16	8	10	12	14	16	10	12	16	20	26	10	12	14
1-5	Vc	46	53	48	48	48	48	42	57	57	51	51	51	60	60	54	54	48	60	60	60
	fz	0.002	0.004	0.003	0.003	0.003	0.003	0.003	0.005	0.005	0.004	0.004	0.004	0.006	0.006	0.005	0.005	0.004	0.008	0.008	0.008
	RPM	12202	11247	10186	10186	10186	10186	8913	9072	9072	8117	8117	8117	7639	7639	6875	6875	6112	6366	6366	6366
	FEED	49	90	61	61	61	61	53	91	91	65	65	65	92	92	69	69	49	102	102	102
6-8	Vc	46	53	48	48	48	48	42	57	57	51	51	51	60	60	54	54	48	60	60	60
	fz	0.002	0.004	0.003	0.003	0.003	0.003	0.003	0.005	0.005	0.004	0.004	0.004	0.006	0.006	0.005	0.005	0.004	0.008	0.008	0.008
	RPM	12202	11247	10186	10186	10186	10186	8913	9072	9072	8117	8117	8117	7639	7639	6875	6875	6112	6366	6366	6366
	FEED	49	90	61	61	61	61	53	91	91	65	65	65	92	92	69	69	49	102	102	102
9	Vc	37	42	38	38	38	38	34	46	46	41	41	41	49	49	44	44	39	49	49	49
	fz	0.002	0.004	0.004	0.003	0.003	0.003	0.003	0.005	0.005	0.005	0.005	0.004	0.006	0.006	0.006	0.005	0.005	0.008	0.008	0.008
	RPM	9815	8913	8064	8064	8064	8064	7215	7321	7321	6525	6525	6525	6239	6239	5602	5602	4966	5199	5199	5199
	FEED	39	71	65	48	48	48	43	73	73	65	65	52	75	75	67	56	50	83	83	83
10 - 11.1	Vc	46	53	48	48	48	48	42	57	57	51	51	51	60	60	54	54	48	60	60	60
	fz	0.002	0.004	0.003	0.003	0.003	0.003	0.003	0.005	0.005	0.004	0.004	0.004	0.006	0.006	0.005	0.005	0.004	0.008	0.008	0.008
	RPM	12202	11247	10186	10186	10186	10186	8913	9072	9072	8117	8117	8117	7639	7639	6875	6875	6112	6366	6366	6366
	FEED	49	90	61	61	61	61	53	91	91	65	65	65	92	92	69	69	49	102	102	102
11.2	Vc	37	42	38	38	38	38	34	46	46	41	41	41	49	49	44	44	39	49	49	49
	fz	0.002	0.004	0.004	0.003	0.003	0.003	0.003	0.005	0.005	0.005	0.005	0.004	0.006	0.006	0.006	0.005	0.005	0.008	0.008	0.008
	RPM	9815	8913	8064	8064	8064	8064	7215	7321	7321	6525	6525	6525	6239	6239	5602	5602	4966	5199	5199	5199
	FEED	39	71	65	48	48	48	43	73	73	65	65	52	75	75	67	56	50	83	83	83
15 - 20	Vc	46	53	48	48	48	48	42	57	57	51	51	51	60	60	54	54	48	60	60	60
	fz	0.002	0.004	0.003	0.003	0.003	0.003	0.003	0.005	0.005	0.004	0.004	0.004	0.006	0.006	0.005	0.005	0.004	0.008	0.008	0.008
	RPM	12202	11247	10186	10186	10186	10186	8913	9072	9072	8117	8117	8117	7639	7639	6875	6875	6112	6366	6366	6366
	FEED	49	90	61	61	61	61	53	91	91	65	65	65	92	92	69	69	49	102	102	102
38.1 - 38.2	Vc	23	26	24	24	24	24	21	29	29	26	26	26	30	30	27	27	24	30	30	30
	fz	0.002	0.003	0.003	0.002	0.002	0.002	0.002	0.004	0.004	0.004	0.004	0.003	0.005	0.005	0.004	0.004	0.003	0.006	0.006	0.006
	RPM	6101	5517	5093	5093	5093	5093	4456	4615	4615	4138	4138	4138	3820	3820	3438	3438	3056	3183	3183	3183
	FEED	24	33	31	20	20	20	18	37	37	33	33	25	38	38	28	28	18	38	38	38
40	Vc	37	42	38	38	38	38	34	46	46	41	41	41	49	49	44	44	39	49	49	49
	fz	0.002	0.004	0.004	0.003	0.003	0.003	0.003	0.005	0.005	0.005	0.005	0.004	0.006	0.006	0.006	0.005	0.005	0.008	0.008	0.008
	RPM	9815	8913	8064	8064	8064	8064	7215	7321	7321	6525	6525	6525	6239	6239	5602	5602	4966	5199	5199	5199
	FEED	39	71	65	48	48	48	43	73	73	65	65	52	75	75	67	56	50	83	83	83
41	Vc	23	26	24	24	24	24	21	29	29	26	26	26	30	30	27	27	24	30	30	30
	fz	0.002	0.003	0.003	0.002	0.002	0.002	0.002	0.004	0.004	0.004	0.004	0.003	0.005	0.005	0.004	0.004	0.003	0.006	0.006	0.006
	RPM	6101	5517	5093	5093	5093	5093	4456	4615	4615	4138	4138	4138	3820	3820	3438	3438	3056	3183	3183	3183
	FEED	24	33	31	20	20	20	18	37	37	33	33	25	38	38	28	28	18	38	38	38

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4G MILL END MILLS

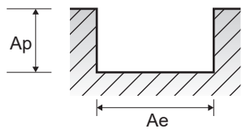
RECOMMENDED CUTTING CONDITIONS

SEME70 SERIES 2 FLUTE - SLOTTING

Vc = m/min.
fz = mm /tooth
RPM = rev./min .
FEED = mm/min.
LOC = Length of Cut

ISO	VDI 3323	Ae(mm)	Ap(mm)	Parameter	Diameter (Ø)														
					3.0	3.0	3.0	3.0	4.0	4.0	4.0	4.0	4.0	5.0	5.0	5.0	5.0	5.0	6.0
				LOC	16	20	26	30	12	16	20	26	30	20	25	30	35	40	15
P	1-5	1.0D	0.3D (up to Ø3:0.4mm)	Vc	54	54	54	54	65	65	65	58	58	69	69	62	62	62	72
				fz	0.008	0.007	0.006	0.006	0.012	0.012	0.012	0.01	0.01	0.017	0.017	0.015	0.015	0.014	0.024
				RPM	5730	5730	5730	5730	5173	5173	5173	4615	4615	4393	4393	3947	3947	3947	3820
				FEED	92	80	69	69	124	124	124	92	92	149	149	118	118	111	183
	6-8	1.0D	0.3D (up to Ø3:0.4mm)	Vc	54	54	54	54	65	65	65	58	58	69	69	62	62	62	72
				fz	0.008	0.007	0.006	0.006	0.012	0.012	0.012	0.01	0.01	0.017	0.017	0.015	0.015	0.014	0.024
				RPM	5730	5730	5730	5730	5173	5173	5173	4615	4615	4393	4393	3947	3947	3947	3820
				FEED	92	80	69	69	124	124	124	92	92	149	149	118	118	111	183
	9	1.0D	0.3D (up to Ø3:0.4mm)	Vc	44	44	44	44	52	52	52	46	46	55	55	49	49	49	57
				fz	0.008	0.008	0.006	0.006	0.012	0.012	0.012	0.012	0.012	0.018	0.018	0.016	0.016	0.014	0.025
				RPM	4669	4669	4669	4669	4138	4138	4138	3661	3661	3501	3501	3119	3119	3119	3024
				FEED	75	75	56	56	99	99	99	88	88	126	126	100	100	87	151
	10-11.1	1.0D	0.3D (up to Ø3:0.4mm)	Vc	54	54	54	54	65	65	65	58	58	69	69	62	62	62	72
				fz	0.008	0.007	0.006	0.006	0.012	0.012	0.012	0.01	0.01	0.017	0.017	0.015	0.015	0.014	0.024
				RPM	5730	5730	5730	5730	5173	5173	5173	4615	4615	4393	4393	3947	3947	3947	3820
				FEED	92	80	69	69	124	124	124	92	92	149	149	118	118	111	183
	11.2	1.0D	0.3D (up to Ø3:0.4mm)	Vc	44	44	44	44	52	52	52	46	46	55	55	49	49	49	57
				fz	0.008	0.008	0.006	0.006	0.012	0.012	0.012	0.012	0.012	0.018	0.018	0.016	0.016	0.014	0.025
				RPM	4669	4669	4669	4669	4138	4138	4138	3661	3661	3501	3501	3119	3119	3119	3024
				FEED	75	75	56	56	99	99	99	88	88	126	126	100	100	87	151
K	15-20	1.0D	0.3D (up to Ø3:0.4mm)	Vc	54	54	54	54	65	65	65	58	58	69	69	62	62	62	72
				fz	0.008	0.007	0.006	0.006	0.012	0.012	0.012	0.01	0.01	0.017	0.017	0.015	0.015	0.014	0.024
				RPM	5730	5730	5730	5730	5173	5173	5173	4615	4615	4393	4393	3947	3947	3947	3820
				FEED	92	80	69	69	124	124	124	92	92	149	149	118	118	111	183
H	38.1 - 38.2	1.0D	0.05D	Vc	27	27	27	27	32	32	32	29	29	36	36	32	32	32	37
				fz	0.007	0.006	0.005	0.005	0.01	0.01	0.01	0.009	0.009	0.012	0.012	0.011	0.011	0.01	0.018
				RPM	2865	2865	2865	2865	2546	2546	2546	2308	2308	2292	2292	2037	2037	2037	1963
				FEED	40	34	29	29	51	51	51	42	42	55	55	45	45	41	71
	40	1.0D	0.3D (up to Ø3:0.4mm)	Vc	44	44	44	44	52	52	52	46	46	55	55	49	49	49	57
				fz	0.008	0.008	0.006	0.006	0.012	0.012	0.012	0.012	0.012	0.018	0.018	0.016	0.016	0.014	0.025
				RPM	4669	4669	4669	4669	4138	4138	4138	3661	3661	3501	3501	3119	3119	3119	3024
				FEED	75	75	56	56	99	99	99	88	88	126	126	100	100	87	151
	41	1.0D	0.05D	Vc	27	27	27	27	32	32	32	29	29	36	36	32	32	32	37
				fz	0.007	0.006	0.005	0.005	0.01	0.01	0.01	0.009	0.009	0.012	0.012	0.011	0.011	0.01	0.018
				RPM	4669	4669	4669	4669	4138	4138	4138	3661	3661	3501	3501	3119	3119	3119	3024
				FEED	75	75	56	56	99	99	99	88	88	126	126	100	100	87	151

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4G MILL END MILLS

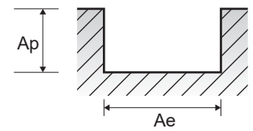
RECOMMENDED CUTTING CONDITIONS

SEME70 SERIES 2 FLUTE - SLOTTING

Vc = m/min.
fz = mm /tooth
RPM = rev./min .
FEED = mm/min.
LOC = Length of Cut

VDI 3323	Parameter	Diameter (Ø)																			
		6.0	6.0	6.0	6.0	6.0	6.0	8.0	8.0	8.0	8.0	8.0	8.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	12.0
	LOC	20	25	30	35	40	45	25	30	35	40	45	50	30	35	40	45	50	55	60	35
1-5	Vc	72	72	72	64	64	64	72	72	72	72	65	65	77	77	77	77	77	69	69	75
	fz	0.024	0.024	0.02	0.02	0.018	0.018	0.033	0.033	0.033	0.028	0.028	0.025	0.039	0.039	0.039	0.033	0.033	0.033	0.029	0.038
	RPM	3820	3820	3820	3395	3395	3395	2865	2865	2865	2865	2586	2586	2451	2451	2451	2451	2451	2196	2196	1989
	FEED	183	183	153	136	122	122	189	189	189	160	145	129	191	191	191	162	162	145	127	151
6-8	Vc	72	72	72	64	64	64	72	72	72	72	65	65	77	77	77	77	77	69	69	75
	fz	0.024	0.024	0.02	0.02	0.018	0.018	0.033	0.033	0.033	0.028	0.028	0.025	0.039	0.039	0.039	0.033	0.033	0.033	0.029	0.038
	RPM	3820	3820	3820	3395	3395	3395	2865	2865	2865	2865	2586	2586	2451	2451	2451	2451	2451	2196	2196	1989
	FEED	183	183	153	136	122	122	189	189	189	160	145	129	191	191	191	162	162	145	127	151
9	Vc	57	57	57	52	52	52	57	57	57	57	52	52	63	63	63	63	63	57	57	63
	fz	0.025	0.025	0.021	0.021	0.018	0.018	0.033	0.033	0.033	0.027	0.028	0.024	0.038	0.038	0.038	0.031	0.031	0.032	0.028	0.04
	RPM	3024	3024	3024	2759	2759	2759	2268	2268	2268	2268	2069	2069	2005	2005	2005	2005	2005	1814	1814	1671
	FEED	151	151	127	116	99	99	150	150	150	122	116	99	152	152	152	124	124	116	102	134
10 - 11.1	Vc	72	72	72	64	64	64	72	72	72	72	65	65	77	77	77	77	77	69	69	75
	fz	0.024	0.024	0.02	0.02	0.018	0.018	0.033	0.033	0.033	0.028	0.028	0.025	0.039	0.039	0.039	0.033	0.033	0.033	0.029	0.038
	RPM	3820	3820	3820	3395	3395	3395	2865	2865	2865	2865	2586	2586	2451	2451	2451	2451	2451	2196	2196	1989
	FEED	183	183	153	136	122	122	189	189	189	160	145	129	191	191	191	162	162	145	127	151
11.2	Vc	57	57	57	52	52	52	57	57	57	57	52	52	63	63	63	63	63	57	57	63
	fz	0.025	0.025	0.021	0.021	0.018	0.018	0.033	0.033	0.033	0.027	0.028	0.024	0.038	0.038	0.038	0.031	0.031	0.032	0.028	0.04
	RPM	3024	3024	3024	2759	2759	2759	2268	2268	2268	2268	2069	2069	2005	2005	2005	2005	2005	1814	1814	1671
	FEED	151	151	127	116	99	99	150	150	150	122	116	99	152	152	152	124	124	116	102	134
15 - 20	Vc	72	72	72	64	64	64	72	72	72	72	65	65	77	77	77	77	77	69	69	75
	fz	0.024	0.024	0.02	0.02	0.018	0.018	0.033	0.033	0.033	0.028	0.028	0.025	0.039	0.039	0.039	0.033	0.033	0.033	0.029	0.038
	RPM	3820	3820	3820	3395	3395	3395	2865	2865	2865	2865	2586	2586	2451	2451	2451	2451	2451	2196	2196	1989
	FEED	183	183	153	136	122	122	189	189	189	160	145	129	191	191	191	162	162	145	127	151
38.1 - 38.2	Vc	37	37	37	33	33	33	38	38	38	38	34	34	38	38	38	38	38	34	34	38
	fz	0.018	0.018	0.015	0.016	0.014	0.014	0.023	0.023	0.023	0.02	0.02	0.018	0.029	0.029	0.029	0.025	0.025	0.025	0.023	0.027
	RPM	1963	1963	1963	1751	1751	1751	1512	1512	1512	1512	1353	1353	1210	1210	1210	1210	1210	1082	1082	1008
	FEED	71	71	59	56	49	49	70	70	70	60	54	49	70	70	70	60	60	54	50	54
40	Vc	57	57	57	52	52	52	57	57	57	57	52	52	63	63	63	63	63	57	57	63
	fz	0.025	0.025	0.021	0.021	0.018	0.018	0.033	0.033	0.033	0.027	0.028	0.024	0.038	0.038	0.038	0.031	0.031	0.032	0.028	0.04
	RPM	3024	3024	3024	2759	2759	2759	2268	2268	2268	2268	2069	2069	2005	2005	2005	2005	2005	1814	1814	1671
	FEED	151	151	127	116	99	99	150	150	150	122	116	99	152	152	152	124	124	116	102	134
41	Vc	37	37	37	33	33	33	38	38	38	38	34	34	38	38	38	38	38	34	34	38
	fz	0.018	0.018	0.015	0.016	0.014	0.014	0.023	0.023	0.023	0.02	0.02	0.018	0.029	0.029	0.029	0.025	0.025	0.025	0.023	0.027
	RPM	1963	1963	1963	1751	1751	1751	1512	1512	1512	1512	1353	1353	1210	1210	1210	1210	1210	1082	1082	1008
	FEED	71	71	59	56	49	49	70	70	70	60	54	49	70	70	70	60	60	54	50	54

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CARBIDE
HSS
i-Xmill END MILLS
X-1EH END MILLS
4G MILL END MILLS
X-POWER PRO END MILLS
TitaNox-POWER END MILLS
V7 PLUS END MILLS
ALU-CUT END MILLS
K-2 END MILLS
GENERAL CARBIDE END MILLS

4G MILL END MILLS

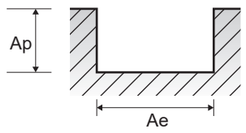
RECOMMENDED CUTTING CONDITIONS

SEME70 SERIES 2 FLUTE - SLOTTING

Vc = m/min.
fz = mm /tooth
RPM = rev./min .
FEED = mm/min.
LOC = Length of Cut

ISO	VDI 3323	Ae(mm)	Ap(mm)	Parameter	Diameter (Ø)														
					12.0	12.0	12.0	12.0	12.0	12.0	12.0	14.0	14.0	16.0	16.0	16.0	16.0	16.0
				LOC	40	45	50	55	60	65	70	50	60	40	50	60	70	80
P	1-5	1.0D	0.3D (up to Ø3:0.4mm)	Vc	75	75	75	75	75	68	68	81	81	85	85	85	85	85
				fz	0.038	0.033	0.033	0.033	0.028	0.028	0.028	0.034	0.034	0.041	0.041	0.035	0.035	0.031
				RPM	1989	1989	1989	1989	1989	1804	1804	1842	1842	1691	1691	1691	1691	1691
				FEED	151	131	131	131	111	101	101	125	125	139	139	118	118	105
	6-8	1.0D	0.3D (up to Ø3:0.4mm)	Vc	75	75	75	75	75	68	68	81	81	85	85	85	85	85
				fz	0.038	0.033	0.033	0.033	0.028	0.028	0.028	0.034	0.034	0.041	0.041	0.035	0.035	0.031
				RPM	1989	1989	1989	1989	1989	1804	1804	1842	1842	1691	1691	1691	1691	1691
				FEED	151	131	131	131	111	101	101	125	125	139	139	118	118	105
	9	1.0D	0.3D (up to Ø3:0.4mm)	Vc	63	63	63	63	63	57	57	65	65	64	64	64	64	64
				fz	0.04	0.034	0.034	0.034	0.03	0.03	0.03	0.034	0.034	0.041	0.041	0.035	0.035	0.031
				RPM	1671	1671	1671	1671	1671	1512	1512	1478	1478	1273	1273	1273	1273	1273
				FEED	134	114	114	114	100	91	91	100	100	104	104	89	89	79
	10-11.1	1.0D	0.3D (up to Ø3:0.4mm)	Vc	75	75	75	75	75	68	68	81	81	85	85	85	85	85
				fz	0.038	0.033	0.033	0.033	0.028	0.028	0.028	0.034	0.034	0.041	0.041	0.035	0.035	0.031
				RPM	1989	1989	1989	1989	1989	1804	1804	1842	1842	1691	1691	1691	1691	1691
				FEED	151	131	131	131	111	101	101	125	125	139	139	118	118	105
	11.2	1.0D	0.3D (up to Ø3:0.4mm)	Vc	63	63	63	63	63	57	57	65	65	64	64	64	64	64
				fz	0.04	0.034	0.034	0.034	0.03	0.03	0.03	0.034	0.034	0.041	0.041	0.035	0.035	0.031
				RPM	1671	1671	1671	1671	1671	1512	1512	1478	1478	1273	1273	1273	1273	1273
				FEED	134	114	114	114	100	91	91	100	100	104	104	89	89	79
K	15-20	1.0D	0.3D (up to Ø3:0.4mm)	Vc	75	75	75	75	75	68	68	81	81	85	85	85	85	85
				fz	0.038	0.033	0.033	0.033	0.028	0.028	0.028	0.034	0.034	0.041	0.041	0.035	0.035	0.031
				RPM	1989	1989	1989	1989	1989	1804	1804	1842	1842	1691	1691	1691	1691	1691
				FEED	151	131	131	131	111	101	101	125	125	139	139	118	118	105
H	38.1 - 38.2	1.0D	0.05D	Vc	38	38	38	38	38	34	34	40	40	40	40	40	40	40
				fz	0.027	0.022	0.022	0.022	0.02	0.019	0.019	0.025	0.025	0.031	0.031	0.025	0.025	0.022
				RPM	1008	1008	1008	1008	1008	902	902	909	909	796	796	796	796	796
				FEED	54	44	44	44	40	34	34	45	45	49	49	40	40	35
	40	1.0D	0.3D (up to Ø3:0.4mm)	Vc	63	63	63	63	63	57	57	65	65	64	64	64	64	64
				fz	0.04	0.034	0.034	0.034	0.03	0.03	0.03	0.034	0.034	0.041	0.041	0.035	0.035	0.031
				RPM	1671	1671	1671	1671	1671	1512	1512	1478	1478	1273	1273	1273	1273	1273
				FEED	134	114	114	114	100	91	91	100	100	104	104	89	89	79
	41	1.0D	0.05D	Vc	38	38	38	38	38	34	34	40	40	40	40	40	40	40
				fz	0.027	0.022	0.022	0.022	0.02	0.019	0.019	0.025	0.025	0.031	0.031	0.025	0.025	0.022
				RPM	1008	1008	1008	1008	1008	902	902	909	909	796	796	796	796	796
				FEED	54	44	44	44	40	34	34	45	45	49	49	40	40	35

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CARBIDE
HSS
i-Xmill END MILLS
X-1EH END MILLS
4G MILL END MILLS
X-POWER PRO END MILLS
TitaNox-POWER END MILLS
V7 PLUS END MILLS
ALU-CUT END MILLS
K-2 END MILLS
GENERAL CARBIDE END MILLS

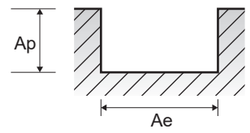
4G MILL END MILLS

RECOMMENDED CUTTING CONDITIONS

SEME70 SERIES 2 FLUTE - SLOTTING

Vc = m/min.
fz = mm /tooth
RPM = rev./min .
FEED = mm/min.
LOC = Length of Cut

VDI 3323	Parameter	Diameter (Ø)																	
		16.0	16.0	16.0	18.0	18.0	18.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	22.0	22.0	25.0	25.0	25.0	25.0
	LOC	90	110	120	50	70	100	50	60	70	80	90	110	120	75	110	70	90	110	120
1-5	Vc	77	77	77	82	82	74	77	77	77	77	77	69	69	76	76	77	77	77	77
	fz	0.031	0.031	0.031	0.041	0.034	0.031	0.041	0.041	0.035	0.035	0.031	0.032	0.032	0.034	0.032	0.041	0.036	0.036	0.031
	RPM	1532	1532	1532	1450	1450	1309	1225	1225	1225	1225	1225	1098	1098	1100	1100	980	980	980	980
	FEED	95	95	95	119	99	81	100	100	86	86	76	70	70	75	70	80	71	71	61
6-8	Vc	77	77	77	82	82	74	77	77	77	77	77	69	69	76	76	77	77	77	77
	fz	0.031	0.031	0.031	0.041	0.034	0.031	0.041	0.041	0.035	0.035	0.031	0.032	0.032	0.034	0.032	0.041	0.036	0.036	0.031
	RPM	1532	1532	1532	1450	1450	1309	1225	1225	1225	1225	1225	1098	1098	1100	1100	980	980	980	980
	FEED	95	95	95	119	99	81	100	100	86	86	76	70	70	75	70	80	71	71	61
9	Vc	58	58	58	63	63	57	60	60	60	60	60	54	54	58	58	59	59	59	59
	fz	0.03	0.03	0.03	0.04	0.033	0.03	0.039	0.039	0.034	0.034	0.029	0.029	0.029	0.033	0.03	0.04	0.033	0.033	0.03
	RPM	1154	1154	1154	1114	1114	1008	955	955	955	955	955	859	859	839	839	751	751	751	751
	FEED	69	69	69	89	74	60	74	74	65	65	55	50	50	55	50	60	50	50	45
10 - 11.1	Vc	77	77	77	82	82	74	77	77	77	77	77	69	69	76	76	77	77	77	77
	fz	0.031	0.031	0.031	0.041	0.034	0.031	0.041	0.041	0.035	0.035	0.031	0.032	0.032	0.034	0.032	0.041	0.036	0.036	0.031
	RPM	1532	1532	1532	1450	1450	1309	1225	1225	1225	1225	1225	1098	1098	1100	1100	980	980	980	980
	FEED	95	95	95	119	99	81	100	100	86	86	76	70	70	75	70	80	71	71	61
11.2	Vc	58	58	58	63	63	57	60	60	60	60	60	54	54	58	58	59	59	59	59
	fz	0.03	0.03	0.03	0.04	0.033	0.03	0.039	0.039	0.034	0.034	0.029	0.029	0.029	0.033	0.03	0.04	0.033	0.033	0.03
	RPM	1154	1154	1154	1114	1114	1008	955	955	955	955	955	859	859	839	839	751	751	751	751
	FEED	69	69	69	89	74	60	74	74	65	65	55	50	50	55	50	60	50	50	45
15 - 20	Vc	77	77	77	82	82	74	77	77	77	77	77	69	69	76	76	77	77	77	77
	fz	0.031	0.031	0.031	0.041	0.034	0.031	0.041	0.041	0.035	0.035	0.031	0.032	0.032	0.034	0.032	0.041	0.036	0.036	0.031
	RPM	1532	1532	1532	1450	1450	1309	1225	1225	1225	1225	1225	1098	1098	1100	1100	980	980	980	980
	FEED	95	95	95	119	99	81	100	100	86	86	76	70	70	75	70	80	71	71	61
38.1 - 38.2	Vc	36	36	36	40	40	36	38	38	38	38	38	34	34	38	38	38	38	38	38
	fz	0.021	0.021	0.021	0.029	0.025	0.024	0.029	0.029	0.025	0.025	0.021	0.023	0.023	0.027	0.023	0.031	0.026	0.026	0.026
	RPM	716	716	716	707	707	637	605	605	605	605	605	541	541	550	550	484	484	484	484
	FEED	30	30	30	41	35	31	35	35	30	30	25	25	25	30	25	30	25	25	25
40	Vc	58	58	58	63	63	57	60	60	60	60	60	54	54	58	58	59	59	59	59
	fz	0.03	0.03	0.03	0.04	0.033	0.03	0.039	0.039	0.034	0.034	0.029	0.029	0.029	0.033	0.03	0.04	0.033	0.033	0.03
	RPM	1154	1154	1154	1114	1114	1008	955	955	955	955	955	859	859	839	839	751	751	751	751
	FEED	69	69	69	89	74	60	74	74	65	65	55	50	50	55	50	60	50	50	45
41	Vc	36	36	36	40	40	36	38	38	38	38	38	34	34	38	38	38	38	38	38
	fz	0.021	0.021	0.021	0.029	0.025	0.024	0.029	0.029	0.025	0.025	0.021	0.023	0.023	0.027	0.023	0.031	0.026	0.026	0.026
	RPM	716	716	716	707	707	637	605	605	605	605	605	541	541	550	550	484	484	484	484
	FEED	30	30	30	41	35	31	35	35	30	30	25	25	25	30	25	30	25	25	25



4G MILL END MILLS

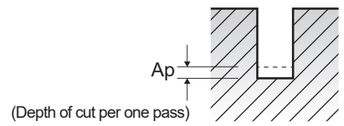
RECOMMENDED CUTTING CONDITIONS

SEM845 SERIES 2 FLUTE - SLOTTING

Vc = m/min. FEED = mm/min.
fz = mm/tooth Ap = mm
RPM = rev./min. LBS = Length Below Shank

ISO	VDI 3323	Material Description	Parameter	Diameter (Ø)																
				0.1	0.1	0.1	0.15	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.4	0.4
			LBS	0.3	0.5	1	0.35	0.5	1	1.5	2	1	1.5	2	2.5	3	4	5	1	1.5
P	1-5	Non-alloy steel	Vc	16	16	14	20	24	24	22	22	32	32	29	29	29	26	19	34	34
			fz	0.003	0.003	0.003	0.004	0.005	0.005	0.004	0.004	0.006	0.006	0.005	0.005	0.005	0.005	0.004	0.01	0.01
			RPM	50930	50930	44563	42441	38197	38197	35014	33953	33953	30770	30770	30770	27587	20160	27056	27056	
			FEED	306	306	267	340	382	382	280	280	407	407	308	308	308	276	161	541	541
			Ap	0.009	0.006	0.002	0.013	0.018	0.013	0.007	0.005	0.019	0.019	0.011	0.007	0.007	0.004	0.003	0.036	0.025
	6-8	Low alloy steel	Vc	16	16	14	20	24	24	22	22	32	32	29	29	29	26	19	34	34
			fz	0.003	0.003	0.003	0.004	0.005	0.005	0.004	0.004	0.006	0.006	0.005	0.005	0.005	0.005	0.004	0.01	0.01
			RPM	50930	50930	44563	42441	38197	38197	35014	35014	33953	33953	30770	30770	30770	27587	20160	27056	27056
			FEED	306	306	267	340	382	382	280	280	407	407	308	308	308	276	161	541	541
			Ap	0.009	0.006	0.002	0.013	0.018	0.013	0.007	0.005	0.019	0.019	0.011	0.007	0.007	0.004	0.003	0.036	0.025
	9		Vc	15	15	13	19	23	23	21	21	30	30	27	27	27	24	18	32	32
			fz	0.002	0.002	0.002	0.003	0.004	0.004	0.003	0.003	0.004	0.004	0.004	0.004	0.004	0.003	0.003	0.007	0.007
			RPM	47746	47746	41380	40319	36606	36606	33423	33423	31831	31831	28648	28648	28648	25465	19099	25465	25465
			FEED	191	191	166	242	293	293	201	201	255	255	229	229	229	153	115	357	357
			Ap	0.007	0.005	0.002	0.010	0.014	0.01	0.006	0.004	0.015	0.015	0.008	0.005	0.005	0.003	0.002	0.028	0.02
	10-11.1	High alloyed steel, and tool steel	Vc	16	16	14	20	24	24	22	22	32	32	29	29	29	26	19	34	34
			fz	0.003	0.003	0.003	0.004	0.005	0.005	0.004	0.004	0.006	0.006	0.005	0.005	0.005	0.005	0.004	0.01	0.01
			RPM	50930	50930	44563	42441	38197	38197	35014	35014	33953	33953	30770	30770	30770	27587	20160	27056	27056
			FEED	306	306	267	340	382	382	280	280	407	407	308	308	308	276	161	541	541
			Ap	0.009	0.006	0.002	0.013	0.018	0.013	0.007	0.005	0.019	0.019	0.011	0.007	0.007	0.004	0.003	0.036	0.025
	11.2		Vc	15	15	13	19	23	23	21	21	30	30	27	27	27	24	18	32	32
			fz	0.002	0.002	0.002	0.003	0.004	0.004	0.003	0.003	0.004	0.004	0.004	0.004	0.004	0.003	0.003	0.007	0.007
			RPM	47746	47746	41380	40319	36606	36606	33423	33423	31831	31831	28648	28648	28648	25465	19099	25465	25465
			FEED	191	191	166	242	293	293	201	201	255	255	229	229	229	153	115	357	357
			Ap	0.007	0.005	0.002	0.010	0.014	0.01	0.006	0.004	0.015	0.015	0.008	0.005	0.005	0.003	0.002	0.028	0.02
K	15-20	Grey cast iron Nodular cast iron Malleable cast iron	Vc	16	16	14	20	24	24	22	22	32	32	29	29	29	26	19	34	34
			fz	0.003	0.003	0.003	0.004	0.005	0.005	0.004	0.004	0.006	0.006	0.005	0.005	0.005	0.005	0.004	0.01	0.01
			RPM	50930	50930	44563	42441	38197	38197	35014	35014	33953	33953	30770	30770	30770	27587	20160	27056	27056
			FEED	306	306	267	340	382	382	280	280	407	407	308	308	308	276	161	541	541
			Ap	0.009	0.006	0.002	0.013	0.018	0.013	0.007	0.005	0.019	0.019	0.011	0.007	0.007	0.004	0.003	0.036	0.025
H	38.1 - 38.2	Hardened steel	Vc	13	13	11	16	20	20	18	18	27	27	24	24	24	21	16	29	29
			fz	0.002	0.002	0.002	0.002	0.003	0.003	0.003	0.003	0.004	0.004	0.004	0.004	0.004	0.003	0.003	0.006	0.006
			RPM	41380	41380	35014	33953	31831	31831	28648	28648	28648	28648	25465	25465	25465	22282	16977	23077	23077
			FEED	166	166	140	136	191	191	172	172	229	229	204	204	204	134	102	277	277
			Ap	0.005	0.004	0.001	0.007	0.01	0.007	0.004	0.003	0.011	0.011	0.006	0.004	0.004	0.002	0.002	0.02	0.014
	40	Chilled Cast Iron	Vc	15	15	13	19	23	23	21	21	30	30	27	27	27	24	18	32	32
			fz	0.002	0.002	0.002	0.003	0.004	0.004	0.003	0.003	0.004	0.004	0.004	0.004	0.004	0.003	0.003	0.007	0.007
			RPM	47746	47746	41380	40319	36606	36606	33423	33423	31831	31831	28648	28648	28648	25465	19099	25465	25465
			FEED	191	191	166	242	293	293	201	201	255	255	229	229	229	153	115	357	357
			Ap	0.007	0.005	0.002	0.010	0.014	0.01	0.006	0.004	0.015	0.015	0.008	0.005	0.005	0.003	0.002	0.028	0.02
	41	Hardened Cast Iron	Vc	13	13	11	16	20	20	18	18	27	27	24	24	24	21	16	29	29
			fz	0.002	0.002	0.002	0.002	0.003	0.003	0.003	0.003	0.004	0.004	0.004	0.004	0.004	0.003	0.003	0.006	0.006
			RPM	41380	41380	35014	33953	31831	31831	28648	28648	28648	28648	25465	25465	25465	22282	16977	23077	23077
			FEED	166	166	140	136	191	191	172	172	229	229	204	204	204	134	102	277	277
			Ap	0.005	0.004	0.001	0.007	0.01	0.007	0.004	0.003	0.011	0.011	0.006	0.004	0.004	0.002	0.002	0.02	0.014

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4G MILL END MILLS

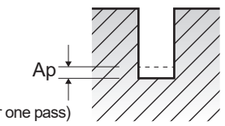
RECOMMENDED CUTTING CONDITIONS

SEM845 SERIES 2 FLUTE - SLOTTING

Vc = m/min. FEED = mm/min.
fz = mm/tooth Ap = mm
RPM = rev./min. LBS = Length Below Shank

VDI 3323	Parameter	Diameter (Ø)																								
		0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.6	0.6
	LBS	2	2.5	3	4	5	6	8	10	1	1.5	2	2.5	3	4	5	6	8	10	12	14	16	2	3
1-5	Vc	34	31	31	31	28	28	21	10	43	43	43	43	39	39	39	34	26	26	13	13	4	52	52
	fz	0.01	0.009	0.009	0.009	0.008	0.008	0.007	0.006	0.01	0.01	0.01	0.01	0.009	0.009	0.009	0.008	0.007	0.007	0.006	0.006	0.005	0.014	0.014
	RPM	27056	24669	24669	24669	22282	22282	16711	7958	27375	27375	27375	27375	24828	24828	24828	21645	16552	16552	8276	8276	2546	27587	27587
	FEED	541	444	444	444	357	357	234	95	547	547	547	547	447	447	447	346	232	232	99	99	25	772	772
	Ap	0.025	0.014	0.014	0.009	0.009	0.005	0.004	0.004	0.045	0.045	0.032	0.032	0.018	0.018	0.011	0.011	0.007	0.005	0.005	0.005	0.005	0.038	0.038
6-8	Vc	34	31	31	31	28	28	21	10	43	43	43	43	39	39	39	34	26	26	13	13	4	52	52
	fz	0.01	0.009	0.009	0.009	0.008	0.008	0.007	0.006	0.01	0.01	0.01	0.01	0.009	0.009	0.009	0.008	0.007	0.007	0.006	0.006	0.005	0.014	0.014
	RPM	27056	24669	24669	24669	22282	22282	16711	7958	27375	27375	27375	27375	24828	24828	24828	21645	16552	16552	8276	8276	2546	27587	27587
	FEED	541	444	444	444	357	357	234	95	547	547	547	547	447	447	447	346	232	232	99	99	25	772	772
	Ap	0.025	0.014	0.014	0.009	0.009	0.005	0.004	0.004	0.045	0.045	0.032	0.032	0.018	0.018	0.011	0.011	0.007	0.005	0.005	0.005	0.005	0.038	0.038
9	Vc	32	29	29	29	26	26	19	10	41	41	41	41	36	36	36	32	24	24	12	12	4	49	49
	fz	0.007	0.007	0.007	0.007	0.006	0.006	0.005	0.005	0.008	0.008	0.008	0.008	0.007	0.007	0.007	0.007	0.006	0.006	0.005	0.005	0.004	0.011	0.011
	RPM	25465	23077	23077	23077	20690	20690	15120	7958	26101	26101	26101	26101	22918	22918	22918	20372	15279	15279	7639	7639	2546	25995	25995
	FEED	357	323	323	323	248	248	151	80	418	418	418	418	321	321	321	285	183	183	76	76	20	572	572
	Ap	0.02	0.011	0.011	0.007	0.007	0.004	0.003	0.003	0.035	0.035	0.025	0.025	0.014	0.014	0.009	0.009	0.005	0.004	0.004	0.004	0.004	0.029	0.029
10 - 11.1	Vc	34	31	31	31	28	28	21	10	43	43	43	43	39	39	39	34	26	26	13	13	4	52	52
	fz	0.01	0.009	0.009	0.009	0.008	0.008	0.007	0.006	0.01	0.01	0.01	0.01	0.009	0.009	0.009	0.008	0.007	0.007	0.006	0.006	0.005	0.014	0.014
	RPM	27056	24669	24669	24669	22282	22282	16711	7958	27375	27375	27375	27375	24828	24828	24828	21645	16552	16552	8276	8276	2546	27587	27587
	FEED	541	444	444	444	357	357	234	95	547	547	547	547	447	447	447	346	232	232	99	99	25	772	772
	Ap	0.025	0.014	0.014	0.009	0.009	0.005	0.004	0.004	0.045	0.045	0.032	0.032	0.018	0.018	0.011	0.011	0.007	0.005	0.005	0.005	0.005	0.038	0.038
11.2	Vc	32	29	29	29	26	26	19	10	41	41	41	41	36	36	36	32	24	24	12	12	4	49	49
	fz	0.007	0.007	0.007	0.007	0.006	0.006	0.005	0.005	0.008	0.008	0.008	0.008	0.007	0.007	0.007	0.007	0.006	0.006	0.005	0.005	0.004	0.011	0.011
	RPM	25465	23077	23077	23077	20690	20690	15120	7958	26101	26101	26101	26101	22918	22918	22918	20372	15279	15279	7639	7639	2546	25995	25995
	FEED	357	323	323	323	248	248	151	80	418	418	418	418	321	321	321	285	183	183	76	76	20	572	572
	Ap	0.02	0.011	0.011	0.007	0.007	0.004	0.003	0.003	0.035	0.035	0.025	0.025	0.014	0.014	0.009	0.009	0.005	0.004	0.004	0.004	0.004	0.029	0.029
15 - 20	Vc	34	31	31	31	28	28	21	10	43	43	43	43	39	39	39	34	26	26	13	13	4	52	52
	fz	0.01	0.009	0.009	0.009	0.008	0.008	0.007	0.006	0.01	0.01	0.01	0.01	0.009	0.009	0.009	0.008	0.007	0.007	0.006	0.006	0.005	0.014	0.014
	RPM	27056	24669	24669	24669	22282	22282	16711	7958	27375	27375	27375	27375	24828	24828	24828	21645	16552	16552	8276	8276	2546	27587	27587
	FEED	541	444	444	444	357	357	234	95	547	547	547	547	447	447	447	346	232	232	99	99	25	772	772
	Ap	0.025	0.014	0.014	0.009	0.009	0.005	0.004	0.004	0.045	0.045	0.032	0.032	0.018	0.018	0.011	0.011	0.007	0.005	0.005	0.005	0.005	0.038	0.038
38.1 - 38.2	Vc	29	26	26	26	23	23	17	9	36	36	36	36	32	32	32	29	21	21	11	11	4	43	43
	fz	0.006	0.005	0.005	0.005	0.005	0.005	0.004	0.004	0.006	0.006	0.006	0.006	0.006	0.006	0.006	0.005	0.004	0.004	0.004	0.004	0.003	0.009	0.009
	RPM	23077	20690	20690	20690	18303	18303	13528	7162	22918	22918	22918	22918	20372	20372	20372	18462	13369	13369	7003	7003	2546	22812	22812
	FEED	277	207	207	207	183	183	108	57	275	275	275	275	244	244	244	185	107	107	56	56	15	411	411
	Ap	0.014	0.008	0.008	0.005	0.005	0.003	0.002	0.002	0.025	0.025	0.018	0.018	0.01	0.01	0.006	0.006	0.004	0.003	0.003	0.003	0.003	0.021	0.021
40	Vc	32	29	29	29	26	26	19	10	41	41	41	41	36	36	36	32	24	24	12	12	4	49	49
	fz	0.007	0.007	0.007	0.007	0.006	0.006	0.005	0.005	0.008	0.008	0.008	0.008	0.007	0.007	0.007	0.007	0.006	0.006	0.005	0.005	0.004	0.011	0.011
	RPM	25465	23077	23077	23077	20690	20690	15120	7958	26101	26101	26101	26101	22918	22918	22918	20372	15279	15279	7639	7639	2546	25995	25995
	FEED	357	323	323	323	248	248	151	80	418	418	418	418	321	321	321	285	183	183	76	76	20	572	572
	Ap	0.02	0.011	0.011	0.007	0.007	0.004	0.003	0.003	0.035	0.035	0.025	0.025	0.014	0.014	0.009	0.009	0.005	0.004	0.004	0.004	0.004	0.029	0.029
41	Vc	29	26	26	26	23	23	17	9	36	36	36	36	32	32	32	29	21	21	11	11	4	43	43
	fz	0.006	0.005	0.005	0.005	0.005	0.005	0.004	0.004	0.006	0.006	0.006	0.006	0.006	0.006	0.006	0.005	0.004	0.004	0.004	0.004	0.003	0.009	0.009
	RPM	23077	20690	20690	20690	18303	18303	13528	7162	22918	22918	22918	22918	20372	20372	20372	18462	13369	13369	7003	7003	2546	22812	22812
	FEED	277	207	207	207	183	183	108	57	275	275	275	275	244	244	244	185	107	107	56	56	15	411	411
	Ap	0.014	0.008	0.008	0.005	0.005	0.003	0.002	0.002	0.025	0.025	0.018	0.018	0.01	0.01	0.006	0.006	0.004	0.003	0.003	0.003	0.003	0.021	0.021

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X-1EH END MILLS
4G MILL END MILLS
X-POWER PRO END MILLS
TitaNox-POWER END MILLS
V7 PLUS END MILLS
ALU-CUT END MILLS
K-2 END MILLS
GENERAL CARBIDE END MILLS

4G MILL END MILLS

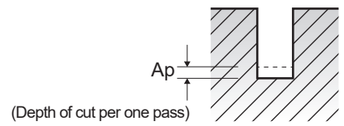
RECOMMENDED CUTTING CONDITIONS

SEM845 SERIES 2 FLUTE - SLOTTING

Vc = m/min. FEED = mm/min.
fz = mm/tooth Ap = mm
RPM = rev./min. LBS = Length Below Shank

ISO	VDI 3323	Parameter	Diameter (Ø)																		
			0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.7	0.7	0.7	0.7	0.7	0.7	0.8	0.8	0.8	0.8	0.8	0.8
		LBS	4	5	6	8	10	12	14	16	2	4	6	8	10	12	2	3	4	5	6	8
P	1-5	Vc	46	46	46	41	31	31	15	15	60	54	54	48	48	36	69	69	69	62	62	62
		fz	0.013	0.013	0.013	0.011	0.01	0.01	0.009	0.009	0.014	0.013	0.013	0.011	0.011	0.01	0.014	0.014	0.014	0.013	0.013	0.013
		RPM	24404	24404	24404	21751	16446	16446	7958	7958	27284	24555	24555	21827	21827	16370	27454	27454	27454	24669	24669	24669
		FEED	634	634	634	479	329	329	143	143	764	638	638	480	480	327	769	769	769	641	641	641
		Ap	0.022	0.014	0.014	0.008	0.005	0.005	0.005	0.005	0.063	0.025	0.016	0.016	0.009	0.006	0.072	0.05	0.05	0.029	0.029	0.018
	6-8	Vc	46	46	46	41	31	31	15	15	60	54	54	48	48	36	69	69	69	62	62	62
		fz	0.013	0.013	0.013	0.011	0.01	0.01	0.009	0.009	0.014	0.013	0.013	0.011	0.011	0.01	0.014	0.014	0.014	0.013	0.013	0.013
		RPM	24404	24404	24404	21751	16446	16446	7958	7958	27284	24555	24555	21827	21827	16370	27454	27454	27454	24669	24669	24669
		FEED	634	634	634	479	329	329	143	143	764	638	638	480	480	327	769	769	769	641	641	641
		Ap	0.022	0.014	0.014	0.008	0.005	0.005	0.005	0.005	0.063	0.025	0.016	0.016	0.009	0.006	0.072	0.05	0.05	0.029	0.029	0.018
	9	Vc	44	44	44	39	29	29	15	15	57	51	51	45	45	34	65	65	65	58	58	58
		fz	0.009	0.009	0.009	0.008	0.007	0.007	0.006	0.006	0.011	0.009	0.009	0.008	0.008	0.007	0.012	0.012	0.012	0.011	0.011	0.011
		RPM	23343	23343	23343	20690	15385	15385	7958	7958	25920	23191	23191	20463	20463	15461	25863	25863	25863	23077	23077	23077
		FEED	420	420	420	331	215	215	95	95	570	417	417	327	327	216	621	621	621	508	508	508
		Ap	0.017	0.011	0.011	0.006	0.004	0.004	0.004	0.004	0.049	0.02	0.012	0.012	0.007	0.005	0.056	0.039	0.039	0.022	0.022	0.014
	10-11.1	Vc	46	46	46	41	31	31	15	15	60	54	54	48	48	36	69	69	69	62	62	62
		fz	0.013	0.013	0.013	0.011	0.01	0.01	0.009	0.009	0.014	0.013	0.013	0.011	0.011	0.01	0.014	0.014	0.014	0.013	0.013	0.013
		RPM	24404	24404	24404	21751	16446	16446	7958	7958	27284	24555	24555	21827	21827	16370	27454	27454	27454	24669	24669	24669
		FEED	634	634	634	479	329	329	143	143	764	638	638	480	480	327	769	769	769	641	641	641
		Ap	0.022	0.014	0.014	0.008	0.005	0.005	0.005	0.005	0.063	0.025	0.016	0.016	0.009	0.006	0.072	0.05	0.05	0.029	0.029	0.018
	11.2	Vc	44	44	44	39	29	29	15	15	57	51	51	45	45	34	65	65	65	58	58	58
		fz	0.009	0.009	0.009	0.008	0.007	0.007	0.006	0.006	0.011	0.009	0.009	0.008	0.008	0.007	0.012	0.012	0.012	0.011	0.011	0.011
		RPM	23343	23343	23343	20690	15385	15385	7958	7958	25920	23191	23191	20463	20463	15461	25863	25863	25863	23077	23077	23077
		FEED	420	420	420	331	215	215	95	95	570	417	417	327	327	216	621	621	621	508	508	508
		Ap	0.017	0.011	0.011	0.006	0.004	0.004	0.004	0.004	0.049	0.02	0.012	0.012	0.007	0.005	0.056	0.039	0.039	0.022	0.022	0.014
K	15-20	Vc	46	46	46	41	31	31	15	15	60	54	54	48	48	36	69	69	69	62	62	62
		fz	0.013	0.013	0.013	0.011	0.01	0.01	0.009	0.009	0.014	0.013	0.013	0.011	0.011	0.01	0.014	0.014	0.014	0.013	0.013	0.013
		RPM	24404	24404	24404	21751	16446	16446	7958	7958	27284	24555	24555	21827	21827	16370	27454	27454	27454	24669	24669	24669
		FEED	634	634	634	479	329	329	143	143	764	638	638	480	480	327	769	769	769	641	641	641
		Ap	0.022	0.014	0.014	0.008	0.005	0.005	0.005	0.005	0.063	0.025	0.016	0.016	0.009	0.006	0.072	0.05	0.05	0.029	0.029	0.018
H	38.1 - 38.2	Vc	39	39	39	34	26	26	13	13	50	45	45	40	40	30	57	57	57	52	52	52
		fz	0.008	0.008	0.008	0.007	0.006	0.006	0.005	0.005	0.009	0.008	0.008	0.007	0.007	0.006	0.01	0.01	0.01	0.009	0.009	0.009
		RPM	20690	20690	20690	18038	13793	13793	6897	6897	22736	20463	20463	18189	18189	13642	22680	22680	22680	20690	20690	20690
		FEED	331	331	331	253	166	166	69	69	409	327	327	255	255	164	454	454	454	372	372	372
		Ap	0.012	0.008	0.008	0.005	0.003	0.003	0.003	0.003	0.035	0.014	0.009	0.009	0.005	0.004	0.04	0.028	0.028	0.016	0.016	0.01
	40	Vc	44	44	44	39	29	29	15	15	57	51	51	45	45	34	65	65	65	58	58	58
		fz	0.009	0.009	0.009	0.008	0.007	0.007	0.006	0.006	0.011	0.009	0.009	0.008	0.008	0.007	0.012	0.012	0.012	0.011	0.011	0.011
		RPM	23343	23343	23343	20690	15385	15385	7958	7958	25920	23191	23191	20463	20463	15461	25863	25863	25863	23077	23077	23077
		FEED	420	420	420	331	215	215	95	95	570	417	417	327	327	216	621	621	621	508	508	508
		Ap	0.017	0.011	0.011	0.006	0.004	0.004	0.004	0.004	0.049	0.02	0.012	0.012	0.007	0.005	0.056	0.039	0.039	0.022	0.022	0.014
	41	Vc	39	39	39	34	26	26	13	13	50	45	45	40	40	30	57	57	57	52	52	52
		fz	0.008	0.008	0.008	0.007	0.006	0.006	0.005	0.005	0.009	0.008	0.008	0.007	0.007	0.006	0.01	0.01	0.01	0.009	0.009	0.009
		RPM	20690	20690	20690	18038	13793	13793	6897	6897	22736	20463	20463	18189	18189	13642	22680	22680	22680	20690	20690	20690
		FEED	331	331	331	253	166	166	69	69	409	327	327	255	255	164	454	454	454	372	372	372
		Ap	0.012	0.008	0.008	0.005	0.003	0.003	0.003	0.003	0.035	0.014	0.009	0.009	0.005	0.004	0.04	0.028	0.028	0.016	0.016	0.01

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X-1EH END MILLS
4G MILL END MILLS
X-POWER PRO END MILLS
TitaNox-POWER END MILLS
V7 PLUS END MILLS
ALU-CUT END MILLS
K-2 END MILLS
GENERAL CARBIDE END MILLS

4G MILL END MILLS

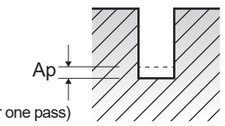
RECOMMENDED CUTTING CONDITIONS

SEM845 SERIES 2 FLUTE - SLOTTING

Vc = m/min. FEED = mm/min.
fz = mm/tooth Ap = mm
RPM = rev./min. LBS = Length Below Shank

VDI 3323	Parameter	Diameter (Ø)																			
		0.8	0.8	0.8	0.8	0.8	0.9	0.9	0.9	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	LBS	10	12	14	16	20	6	8	10	2	3	4	5	6	7	8	10	12	14	16	18	20	22
1-5	Vc	55	55	41	41	21	63	63	56	77	77	77	77	70	70	70	70	62	62	46	46	46	23
	fz	0.011	0.011	0.01	0.01	0.009	0.013	0.013	0.012	0.021	0.021	0.021	0.021	0.019	0.019	0.019	0.019	0.017	0.017	0.015	0.015	0.015	0.013
	RPM	21884	21884	16313	16313	8356	22282	22282	19806	24510	24510	24510	24510	22282	22282	22282	22282	19735	19735	14642	14642	14642	7321
	FEED	481	481	326	326	150	579	579	475	1029	1029	1029	1029	847	847	847	847	671	671	439	439	439	190
	Ap	0.018	0.011	0.007	0.007	0.007	0.032	0.02	0.02	0.09	0.09	0.063	0.063	0.036	0.036	0.036	0.023	0.023	0.014	0.014	0.009	0.009	0.009
6-8	Vc	55	55	41	41	21	63	63	56	77	77	77	77	70	70	70	70	62	62	46	46	46	23
	fz	0.011	0.011	0.01	0.01	0.009	0.013	0.013	0.012	0.021	0.021	0.021	0.021	0.019	0.019	0.019	0.019	0.017	0.017	0.015	0.015	0.015	0.013
	RPM	21884	21884	16313	16313	8356	22282	22282	19806	24510	24510	24510	24510	22282	22282	22282	22282	19735	19735	14642	14642	14642	7321
	FEED	481	481	326	326	150	579	579	475	1029	1029	1029	1029	847	847	847	847	671	671	439	439	439	190
	Ap	0.018	0.011	0.007	0.007	0.007	0.032	0.02	0.02	0.09	0.09	0.063	0.063	0.036	0.036	0.036	0.023	0.023	0.014	0.014	0.009	0.009	0.009
9	Vc	52	52	39	39	19	59	59	53	73	73	73	73	66	66	66	66	59	59	44	44	44	22
	fz	0.009	0.009	0.008	0.008	0.007	0.01	0.01	0.009	0.019	0.019	0.019	0.019	0.017	0.017	0.017	0.017	0.015	0.015	0.013	0.013	0.013	0.011
	RPM	20690	20690	15518	15518	7560	20867	20867	18745	23237	23237	23237	23237	21008	21008	21008	21008	18780	18780	14006	14006	14006	7003
	FEED	372	372	248	248	106	417	417	337	883	883	883	883	714	714	714	714	563	563	364	364	364	154
	Ap	0.014	0.008	0.006	0.006	0.006	0.025	0.016	0.016	0.07	0.07	0.049	0.049	0.028	0.028	0.028	0.018	0.018	0.011	0.011	0.007	0.007	0.007
10 - 11.1	Vc	55	55	41	41	21	63	63	56	77	77	77	77	70	70	70	70	62	62	46	46	46	23
	fz	0.011	0.011	0.01	0.01	0.009	0.013	0.013	0.012	0.021	0.021	0.021	0.021	0.019	0.019	0.019	0.019	0.017	0.017	0.015	0.015	0.015	0.013
	RPM	21884	21884	16313	16313	8356	22282	22282	19806	24510	24510	24510	24510	22282	22282	22282	22282	19735	19735	14642	14642	14642	7321
	FEED	481	481	326	326	150	579	579	475	1029	1029	1029	1029	847	847	847	847	671	671	439	439	439	190
	Ap	0.018	0.011	0.007	0.007	0.007	0.032	0.02	0.02	0.09	0.09	0.063	0.063	0.036	0.036	0.036	0.023	0.023	0.014	0.014	0.009	0.009	0.009
11.2	Vc	52	52	39	39	19	59	59	53	73	73	73	73	66	66	66	66	59	59	44	44	44	22
	fz	0.009	0.009	0.008	0.008	0.007	0.01	0.01	0.009	0.019	0.019	0.019	0.019	0.017	0.017	0.017	0.017	0.015	0.015	0.013	0.013	0.013	0.011
	RPM	20690	20690	15518	15518	7560	20867	20867	18745	23237	23237	23237	23237	21008	21008	21008	21008	18780	18780	14006	14006	14006	7003
	FEED	372	372	248	248	106	417	417	337	883	883	883	883	714	714	714	714	563	563	364	364	364	154
	Ap	0.014	0.008	0.006	0.006	0.006	0.025	0.016	0.016	0.07	0.07	0.049	0.049	0.028	0.028	0.028	0.018	0.018	0.011	0.011	0.007	0.007	0.007
15 - 20	Vc	55	55	41	41	21	63	63	56	77	77	77	77	70	70	70	70	62	62	46	46	46	23
	fz	0.011	0.011	0.01	0.01	0.009	0.013	0.013	0.012	0.021	0.021	0.021	0.021	0.019	0.019	0.019	0.019	0.017	0.017	0.015	0.015	0.015	0.013
	RPM	21884	21884	16313	16313	8356	22282	22282	19806	24510	24510	24510	24510	22282	22282	22282	22282	19735	19735	14642	14642	14642	7321
	FEED	481	481	326	326	150	579	579	475	1029	1029	1029	1029	847	847	847	847	671	671	439	439	439	190
	Ap	0.018	0.011	0.007	0.007	0.007	0.032	0.02	0.02	0.09	0.09	0.063	0.063	0.036	0.036	0.036	0.023	0.023	0.014	0.014	0.009	0.009	0.009
38.1 - 38.2	Vc	46	46	34	34	17	52	52	46	64	64	64	64	58	58	58	58	52	52	39	39	39	19
	fz	0.008	0.008	0.007	0.007	0.006	0.009	0.009	0.008	0.016	0.016	0.016	0.016	0.015	0.015	0.015	0.015	0.013	0.013	0.011	0.011	0.011	0.01
	RPM	18303	18303	13528	13528	6764	18391	18391	16269	20372	20372	20372	20372	18462	18462	18462	18462	16552	16552	12414	12414	12414	6048
	FEED	293	293	189	189	81	331	331	260	652	652	652	652	554	554	554	554	430	430	273	273	273	121
	Ap	0.01	0.006	0.004	0.004	0.004	0.018	0.011	0.011	0.05	0.05	0.035	0.035	0.02	0.02	0.02	0.013	0.013	0.008	0.008	0.005	0.005	0.005
40	Vc	52	52	39	39	19	59	59	53	73	73	73	73	66	66	66	66	59	59	44	44	44	22
	fz	0.009	0.009	0.008	0.008	0.007	0.01	0.01	0.009	0.019	0.019	0.019	0.019	0.017	0.017	0.017	0.017	0.015	0.015	0.013	0.013	0.013	0.011
	RPM	20690	20690	15518	15518	7560	20867	20867	18745	23237	23237	23237	23237	21008	21008	21008	21008	18780	18780	14006	14006	14006	7003
	FEED	372	372	248	248	106	417	417	337	883	883	883	883	714	714	714	714	563	563	364	364	364	154
	Ap	0.014	0.008	0.006	0.006	0.006	0.025	0.016	0.016	0.07	0.07	0.049	0.049	0.028	0.028	0.028	0.018	0.018	0.011	0.011	0.007	0.007	0.007
41	Vc	46	46	34	34	17	52	52	46	64	64	64	64	58	58	58	58	52	52	39	39	39	19
	fz	0.008	0.008	0.007	0.007	0.006	0.009	0.009	0.008	0.016	0.016	0.016	0.016	0.015	0.015	0.015	0.015	0.013	0.013	0.011	0.011	0.011	0.01
	RPM	18303	18303	13528	13528	6764	18391	18391	16269	20372	20372	20372	20372	18462	18462	18462	18462	16552	16552	12414	12414	12414	6048
	FEED	293	293	189	189	81	331	331	260	652	652	652	652	554	554	554	554	430	430	273	273	273	121
	Ap	0.01	0.006	0.004	0.004	0.004	0.018	0.011	0.011	0.05	0.05	0.035	0.035	0.02	0.02	0.02	0.013	0.013	0.008	0.008	0.005	0.005	0.005

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4G MILL END MILLS

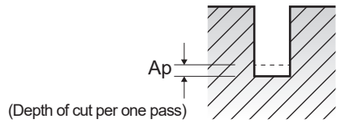
RECOMMENDED CUTTING CONDITIONS

SEM845 SERIES 2 FLUTE - SLOTTING

Vc = m/min. FEED = mm/min.
fz = mm/tooth Ap = mm
RPM = rev./min. LBS = Length Below Shank

ISO	VDI 3323	Parameter	Diameter (Ø)																		
			1.0	1.0	1.0	1.0	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.4	1.4	1.4	1.4	1.4	1.4
		LBS	26	30	40	50	4	6	8	10	12	14	16	20	26	30	6	8	10	14	16	20
P	1-5	Vc	23	23	8	8	83	83	74	74	74	66	66	50	25	25	84	76	76	76	68	68
		fz	0.013	0.013	0.01	0.01	0.021	0.021	0.019	0.019	0.019	0.017	0.017	0.015	0.013	0.013	0.021	0.019	0.019	0.019	0.017	0.017
		RPM	7321	7321	2546	2546	22016	22016	19629	19629	19629	17507	17507	13263	6631	6631	19099	17280	17280	17280	15461	15461
		FEED	190	190	51	51	925	925	746	746	746	595	595	398	172	172	802	657	657	657	526	526
		Ap	0.009	0.009	0.009	0.006	0.076	0.076	0.043	0.027	0.027	0.027	0.016	0.011	0.011	0.011	0.088	0.05	0.05	0.032	0.032	0.019
	6-8	Vc	23	23	8	8	83	83	74	74	74	66	66	50	25	25	84	76	76	76	68	68
		fz	0.013	0.013	0.01	0.01	0.021	0.021	0.019	0.019	0.019	0.017	0.017	0.015	0.013	0.013	0.021	0.019	0.019	0.019	0.017	0.017
		RPM	7321	7321	2546	2546	22016	22016	19629	19629	19629	17507	17507	13263	6631	6631	19099	17280	17280	17280	15461	15461
		FEED	190	190	51	51	925	925	746	746	746	595	595	398	172	172	802	657	657	657	526	526
		Ap	0.009	0.009	0.009	0.006	0.076	0.076	0.043	0.027	0.027	0.027	0.016	0.011	0.011	0.011	0.088	0.05	0.05	0.032	0.032	0.019
	9	Vc	22	22	7	7	78	78	70	70	70	62	62	47	23	23	80	72	72	72	64	64
		fz	0.011	0.011	0.01	0.01	0.017	0.017	0.016	0.016	0.016	0.014	0.014	0.012	0.01	0.01	0.016	0.014	0.014	0.014	0.013	0.013
		RPM	7003	7003	2228	2228	20690	20690	18568	18568	18568	16446	16446	12467	6101	6101	18189	16370	16370	16370	14551	14551
		FEED	154	154	45	45	703	703	594	594	594	460	460	299	122	122	582	458	458	458	378	378
		Ap	0.007	0.007	0.007	0.005	0.059	0.059	0.034	0.021	0.021	0.021	0.013	0.008	0.008	0.008	0.069	0.039	0.039	0.025	0.025	0.015
	10-11.1	Vc	23	23	8	8	83	83	74	74	74	66	66	50	25	25	84	76	76	76	68	68
		fz	0.013	0.013	0.01	0.01	0.021	0.021	0.019	0.019	0.019	0.017	0.017	0.015	0.013	0.013	0.021	0.019	0.019	0.019	0.017	0.017
		RPM	7321	7321	2546	2546	22016	22016	19629	19629	19629	17507	17507	13263	6631	6631	19099	17280	17280	17280	15461	15461
		FEED	190	190	51	51	925	925	746	746	746	595	595	398	172	172	802	657	657	657	526	526
		Ap	0.009	0.009	0.009	0.006	0.076	0.076	0.043	0.027	0.027	0.027	0.016	0.011	0.011	0.011	0.088	0.05	0.05	0.032	0.032	0.019
	11.2	Vc	22	22	7	7	78	78	70	70	70	62	62	47	23	23	80	72	72	72	64	64
		fz	0.011	0.011	0.01	0.01	0.017	0.017	0.016	0.016	0.016	0.014	0.014	0.012	0.01	0.01	0.016	0.014	0.014	0.014	0.013	0.013
		RPM	7003	7003	2228	2228	20690	20690	18568	18568	18568	16446	16446	12467	6101	6101	18189	16370	16370	16370	14551	14551
		FEED	154	154	45	45	703	703	594	594	594	460	460	299	122	122	582	458	458	458	378	378
		Ap	0.007	0.007	0.007	0.005	0.059	0.059	0.034	0.021	0.021	0.021	0.013	0.008	0.008	0.008	0.069	0.039	0.039	0.025	0.025	0.015
K	15-20	Vc	23	23	8	8	83	83	74	74	74	66	66	50	25	25	84	76	76	76	68	68
		fz	0.013	0.013	0.01	0.01	0.021	0.021	0.019	0.019	0.019	0.017	0.017	0.015	0.013	0.013	0.021	0.019	0.019	0.019	0.017	0.017
		RPM	7321	7321	2546	2546	22016	22016	19629	19629	19629	17507	17507	13263	6631	6631	19099	17280	17280	17280	15461	15461
		FEED	190	190	51	51	925	925	746	746	746	595	595	398	172	172	802	657	657	657	526	526
		Ap	0.009	0.009	0.009	0.006	0.076	0.076	0.043	0.027	0.027	0.027	0.016	0.011	0.011	0.011	0.088	0.05	0.05	0.032	0.032	0.019
H	38.1 - 38.2	Vc	19	19	6	6	69	69	62	62	62	55	55	41	21	21	70	63	63	63	56	56
		fz	0.01	0.01	0.009	0.009	0.013	0.013	0.012	0.012	0.012	0.011	0.011	0.009	0.008	0.008	0.013	0.012	0.012	0.012	0.011	0.011
		RPM	6048	6048	1910	1910	18303	18303	16446	16446	16446	14589	14589	10876	5570	5570	15915	14324	14324	14324	12732	12732
		FEED	121	121	34	34	476	476	395	395	395	321	321	196	89	89	414	344	344	344	280	280
		Ap	0.005	0.005	0.005	0.003	0.042	0.042	0.024	0.015	0.015	0.015	0.009	0.006	0.006	0.006	0.049	0.028	0.028	0.018	0.018	0.011
	40	Vc	22	22	7	7	78	78	70	70	70	62	62	47	23	23	80	72	72	72	64	64
		fz	0.011	0.011	0.01	0.01	0.017	0.017	0.016	0.016	0.016	0.014	0.014	0.012	0.01	0.01	0.016	0.014	0.014	0.014	0.013	0.013
		RPM	7003	7003	2228	2228	20690	20690	18568	18568	18568	16446	16446	12467	6101	6101	18189	16370	16370	16370	14551	14551
		FEED	154	154	45	45	703	703	594	594	594	460	460	299	122	122	582	458	458	458	378	378
		Ap	0.007	0.007	0.007	0.005	0.059	0.059	0.034	0.021	0.021	0.021	0.013	0.008	0.008	0.008	0.069	0.039	0.039	0.025	0.025	0.015
	41	Vc	19	19	6	6	69	69	62	62	62	55	55	41	21	21	70	63	63	63	56	56
		fz	0.01	0.01	0.009	0.009	0.013	0.013	0.012	0.012	0.012	0.011	0.011	0.009	0.008	0.008	0.013	0.012	0.012	0.012	0.011	0.011
		RPM	6048	6048	1910	1910	18303	18303	16446	16446	16446	14589	14589	10876	5570	5570	15915	14324	14324	14324	12732	12732
		FEED	121	121	34	34	476	476	395	395	395	321	321	196	89	89	414	344	344	344	280	280
		Ap	0.005	0.005	0.005	0.003	0.042	0.042	0.024	0.015	0.015	0.015	0.009	0.006	0.006	0.006	0.049	0.028	0.028	0.018	0.018	0.011

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4G MILL END MILLS

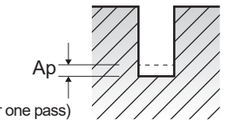
RECOMMENDED CUTTING CONDITIONS

SEM845 SERIES 2 FLUTE - SLOTTING

Vc = m/min. FEED = mm/min.
fz = mm/tooth Ap = mm
RPM = rev./min. LBS = Length Below Shank

VDI 3323	Parameter	Diameter (Ø)																			
		1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.6	1.6	1.6	1.6	1.6	1.8	1.8	1.8
	LBS	4	5	6	7	8	10	12	14	16	18	20	22	26	30	8	10	12	16	20	8	10	12
1-5	Vc	90	90	90	90	81	81	81	81	72	72	72	72	54	54	89	81	81	81	72	101	91	91
	fz	0.024	0.024	0.024	0.024	0.021	0.021	0.021	0.021	0.019	0.019	0.019	0.019	0.016	0.016	0.024	0.021	0.021	0.021	0.019	0.024	0.021	0.021
	RPM	19099	19099	19099	19099	17189	17189	17189	17189	15279	15279	15279	15279	11459	11459	17706	16114	16114	16114	14324	17861	16092	16092
	FEED	917	917	917	917	722	722	722	722	581	581	581	581	367	367	850	677	677	677	544	857	676	676
	Ap	0.135	0.095	0.095	0.095	0.054	0.054	0.054	0.034	0.034	0.034	0.02	0.02	0.014	0.014	0.101	0.058	0.058	0.036	0.036	0.113	0.065	0.065
6-8	Vc	90	90	90	90	81	81	81	81	72	72	72	72	54	54	89	81	81	81	72	101	91	91
	fz	0.024	0.024	0.024	0.024	0.021	0.021	0.021	0.021	0.019	0.019	0.019	0.019	0.016	0.016	0.024	0.021	0.021	0.021	0.019	0.024	0.021	0.021
	RPM	19099	19099	19099	19099	17189	17189	17189	17189	15279	15279	15279	15279	11459	11459	17706	16114	16114	16114	14324	17861	16092	16092
	FEED	917	917	917	917	722	722	722	722	581	581	581	581	367	367	850	677	677	677	544	857	676	676
	Ap	0.135	0.095	0.095	0.095	0.054	0.054	0.054	0.034	0.034	0.034	0.02	0.02	0.014	0.014	0.101	0.058	0.058	0.036	0.036	0.113	0.065	0.065
9	Vc	85	85	85	85	77	77	77	77	68	68	68	68	51	51	84	76	76	76	68	95	86	86
	fz	0.018	0.018	0.018	0.018	0.016	0.016	0.016	0.016	0.014	0.014	0.014	0.014	0.012	0.012	0.019	0.018	0.018	0.018	0.016	0.019	0.018	0.018
	RPM	18038	18038	18038	18038	16340	16340	16340	16340	14430	14430	14430	14430	10823	10823	16711	15120	15120	15120	13528	16800	15208	15208
	FEED	649	649	649	649	523	523	523	523	404	404	404	404	260	260	635	544	544	544	433	638	547	547
	Ap	0.105	0.074	0.074	0.074	0.042	0.042	0.042	0.026	0.026	0.026	0.016	0.016	0.011	0.011	0.078	0.045	0.045	0.028	0.028	0.088	0.05	0.05
10 - 11.1	Vc	90	90	90	90	81	81	81	81	72	72	72	72	54	54	89	81	81	81	72	101	91	91
	fz	0.024	0.024	0.024	0.024	0.021	0.021	0.021	0.021	0.019	0.019	0.019	0.019	0.016	0.016	0.024	0.021	0.021	0.021	0.019	0.024	0.021	0.021
	RPM	19099	19099	19099	19099	17189	17189	17189	17189	15279	15279	15279	15279	11459	11459	17706	16114	16114	16114	14324	17861	16092	16092
	FEED	917	917	917	917	722	722	722	722	581	581	581	581	367	367	850	677	677	677	544	857	676	676
	Ap	0.135	0.095	0.095	0.095	0.054	0.054	0.054	0.034	0.034	0.034	0.02	0.02	0.014	0.014	0.101	0.058	0.058	0.036	0.036	0.113	0.065	0.065
11.2	Vc	85	85	85	85	77	77	77	77	68	68	68	68	51	51	84	76	76	76	68	95	86	86
	fz	0.018	0.018	0.018	0.018	0.016	0.016	0.016	0.016	0.014	0.014	0.014	0.014	0.012	0.012	0.019	0.018	0.018	0.018	0.016	0.019	0.018	0.018
	RPM	18038	18038	18038	18038	16340	16340	16340	16340	14430	14430	14430	14430	10823	10823	16711	15120	15120	15120	13528	16800	15208	15208
	FEED	649	649	649	649	523	523	523	523	404	404	404	404	260	260	635	544	544	544	433	638	547	547
	Ap	0.105	0.074	0.074	0.074	0.042	0.042	0.042	0.026	0.026	0.026	0.016	0.016	0.011	0.011	0.078	0.045	0.045	0.028	0.028	0.088	0.05	0.05
15 - 20	Vc	90	90	90	90	81	81	81	81	72	72	72	72	54	54	89	81	81	81	72	101	91	91
	fz	0.024	0.024	0.024	0.024	0.021	0.021	0.021	0.021	0.019	0.019	0.019	0.019	0.016	0.016	0.024	0.021	0.021	0.021	0.019	0.024	0.021	0.021
	RPM	19099	19099	19099	19099	17189	17189	17189	17189	15279	15279	15279	15279	11459	11459	17706	16114	16114	16114	14324	17861	16092	16092
	FEED	917	917	917	917	722	722	722	722	581	581	581	581	367	367	850	677	677	677	544	857	676	676
	Ap	0.135	0.095	0.095	0.095	0.054	0.054	0.054	0.034	0.034	0.034	0.02	0.02	0.014	0.014	0.101	0.058	0.058	0.036	0.036	0.113	0.065	0.065
38.1 - 38.2	Vc	75	75	75	75	68	68	68	68	60	60	60	60	45	45	74	67	67	67	60	84	75	75
	fz	0.015	0.015	0.015	0.015	0.013	0.013	0.013	0.013	0.012	0.012	0.012	0.012	0.01	0.01	0.017	0.015	0.015	0.015	0.013	0.017	0.015	0.015
	RPM	15915	15915	15915	15915	14430	14430	14430	14430	12732	12732	12732	12732	9549	9549	14722	13329	13329	13329	11937	14854	13263	13263
	FEED	477	477	477	477	375	375	375	375	306	306	306	306	191	191	501	400	400	400	310	505	398	398
	Ap	0.075	0.053	0.053	0.053	0.03	0.03	0.03	0.019	0.019	0.019	0.011	0.011	0.008	0.008	0.056	0.032	0.032	0.02	0.02	0.063	0.036	0.036
40	Vc	85	85	85	85	77	77	77	77	68	68	68	68	51	51	84	76	76	76	68	95	86	86
	fz	0.018	0.018	0.018	0.018	0.016	0.016	0.016	0.016	0.014	0.014	0.014	0.014	0.012	0.012	0.019	0.018	0.018	0.018	0.016	0.019	0.018	0.018
	RPM	18038	18038	18038	18038	16340	16340	16340	16340	14430	14430	14430	14430	10823	10823	16711	15120	15120	15120	13528	16800	15208	15208
	FEED	649	649	649	649	523	523	523	523	404	404	404	404	260	260	635	544	544	544	433	638	547	547
	Ap	0.105	0.074	0.074	0.074	0.042	0.042	0.042	0.026	0.026	0.026	0.016	0.016	0.011	0.011	0.078	0.045	0.045	0.028	0.028	0.088	0.05	0.05
41	Vc	75	75	75	75	68	68	68	68	60	60	60	60	45	45	74	67	67	67	60	84	75	75
	fz	0.015	0.015	0.015	0.015	0.013	0.013	0.013	0.013	0.012	0.012	0.012	0.012	0.01	0.01	0.017	0.015	0.015	0.015	0.013	0.017	0.015	0.015
	RPM	15915	15915	15915	15915	14430	14430	14430	14430	12732	12732	12732	12732	9549	9549	14722	13329	13329	13329	11937	14854	13263	13263
	FEED	477	477	477	477	375	375	375	375	306	306	306	306	191	191	501	400	400	400	310	505	398	398
	Ap	0.075	0.053	0.053	0.053	0.03	0.03	0.03	0.019	0.019	0.019	0.011	0.011	0.008	0.008	0.056	0.032	0.032	0.02	0.02	0.063	0.036	0.036

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CARBIDE
HSS
i-Xmill END MILLS
X-1EH END MILLS
4G MILL END MILLS
X-POWER PRO END MILLS
TitaNox-POWER END MILLS
V7 PLUS END MILLS
ALU-CUT END MILLS
K-2 END MILLS
GENERAL CARBIDE END MILLS

4G MILL END MILLS

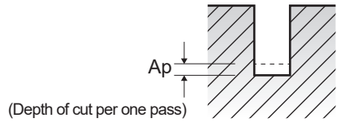
RECOMMENDED CUTTING CONDITIONS

SEM845 SERIES 2 FLUTE - SLOTTING

Vc = m/min. FEED = mm/min.
fz = mm/tooth Ap = mm
RPM = rev./min. LBS = Length Below Shank

ISO	VDI 3323	Parameter	Diameter (Ø)																		
			1.8	1.8	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.5	2.5
		LBS	16	20	6	8	10	12	14	16	18	20	22	26	30	35	40	45	50	60	8	10
P	1-5	Vc	91	81	90	90	90	81	81	81	81	81	72	72	72	54	54	27	27	27	97	97
		fz	0.021	0.019	0.028	0.028	0.028	0.026	0.026	0.026	0.026	0.026	0.023	0.023	0.023	0.02	0.02	0.017	0.017	0.017	0.039	0.039
		RPM	16092	14324	14324	14324	14324	12892	12892	12892	12892	12892	11459	11459	11459	8594	8594	4297	4297	4297	12350	12350
		FEED	676	544	802	802	802	670	670	670	670	670	527	527	527	344	344	146	146	146	963	963
		Ap	0.041	0.041	0.18	0.126	0.126	0.072	0.072	0.072	0.045	0.045	0.045	0.045	0.027	0.018	0.018	0.018	0.018	0.018	0.158	0.158
	6-8	Vc	91	81	90	90	90	81	81	81	81	81	72	72	72	54	54	27	27	27	97	97
		fz	0.021	0.019	0.028	0.028	0.028	0.026	0.026	0.026	0.026	0.026	0.023	0.023	0.023	0.02	0.02	0.017	0.017	0.017	0.039	0.039
		RPM	16092	14324	14324	14324	14324	12892	12892	12892	12892	12892	11459	11459	11459	8594	8594	4297	4297	4297	12350	12350
		FEED	676	544	802	802	802	670	670	670	670	670	527	527	527	344	344	146	146	146	963	963
		Ap	0.041	0.041	0.18	0.126	0.126	0.072	0.072	0.072	0.045	0.045	0.045	0.045	0.027	0.018	0.018	0.018	0.018	0.018	0.158	0.158
	9	Vc	86	76	85	85	85	77	77	77	77	77	68	68	68	51	51	26	26	26	91	91
		fz	0.018	0.016	0.023	0.023	0.023	0.02	0.02	0.02	0.02	0.02	0.018	0.018	0.018	0.016	0.016	0.013	0.013	0.013	0.029	0.029
		RPM	15208	13440	13528	13528	13528	12255	12255	12255	12255	12255	10823	10823	10823	8117	8117	4138	4138	4138	11586	11586
		FEED	547	430	622	622	622	490	490	490	490	490	390	390	390	260	260	108	108	108	672	672
		Ap	0.032	0.032	0.14	0.098	0.098	0.056	0.056	0.056	0.035	0.035	0.035	0.035	0.021	0.014	0.014	0.014	0.014	0.014	0.123	0.123
	10-11.1	Vc	91	81	90	90	90	81	81	81	81	81	72	72	72	54	54	27	27	27	97	97
		fz	0.021	0.019	0.028	0.028	0.028	0.026	0.026	0.026	0.026	0.026	0.023	0.023	0.023	0.02	0.02	0.017	0.017	0.017	0.039	0.039
		RPM	16092	14324	14324	14324	14324	12892	12892	12892	12892	12892	11459	11459	11459	8594	8594	4297	4297	4297	12350	12350
		FEED	676	544	802	802	802	670	670	670	670	670	527	527	527	344	344	146	146	146	963	963
		Ap	0.041	0.041	0.18	0.126	0.126	0.072	0.072	0.072	0.045	0.045	0.045	0.045	0.027	0.018	0.018	0.018	0.018	0.018	0.158	0.158
	11.2	Vc	86	76	85	85	85	77	77	77	77	77	68	68	68	51	51	26	26	26	91	91
		fz	0.018	0.016	0.023	0.023	0.023	0.02	0.02	0.02	0.02	0.02	0.018	0.018	0.018	0.016	0.016	0.013	0.013	0.013	0.029	0.029
		RPM	15208	13440	13528	13528	13528	12255	12255	12255	12255	12255	10823	10823	10823	8117	8117	4138	4138	4138	11586	11586
		FEED	547	430	622	622	622	490	490	490	490	490	390	390	390	260	260	108	108	108	672	672
		Ap	0.032	0.032	0.14	0.098	0.098	0.056	0.056	0.056	0.035	0.035	0.035	0.035	0.021	0.014	0.014	0.014	0.014	0.014	0.123	0.123
K	15-20	Vc	91	81	90	90	90	81	81	81	81	81	72	72	72	54	54	27	27	27	97	97
		fz	0.021	0.019	0.028	0.028	0.028	0.026	0.026	0.026	0.026	0.026	0.023	0.023	0.023	0.02	0.02	0.017	0.017	0.017	0.039	0.039
		RPM	16092	14324	14324	14324	14324	12892	12892	12892	12892	12892	11459	11459	11459	8594	8594	4297	4297	4297	12350	12350
		FEED	676	544	802	802	802	670	670	670	670	670	527	527	527	344	344	146	146	146	963	963
		Ap	0.041	0.041	0.18	0.126	0.126	0.072	0.072	0.072	0.045	0.045	0.045	0.045	0.027	0.018	0.018	0.018	0.018	0.018	0.158	0.158
H	38.1 - 38.2	Vc	75	67	75	75	75	68	68	68	68	68	60	60	60	45	45	23	23	23	81	81
		fz	0.015	0.013	0.02	0.02	0.02	0.018	0.018	0.018	0.018	0.018	0.016	0.016	0.016	0.014	0.014	0.012	0.012	0.012	0.025	0.025
		RPM	13263	11848	11937	11937	11937	10823	10823	10823	10823	10823	9549	9549	9549	7162	7162	3661	3661	3661	10313	10313
		FEED	398	308	477	477	477	390	390	390	390	390	306	306	306	201	201	88	88	88	516	516
		Ap	0.023	0.023	0.1	0.07	0.07	0.04	0.04	0.04	0.025	0.025	0.025	0.025	0.015	0.01	0.01	0.01	0.01	0.01	0.088	0.088
	40	Vc	86	76	85	85	85	77	77	77	77	77	68	68	68	51	51	26	26	26	91	91
		fz	0.018	0.016	0.023	0.023	0.023	0.02	0.02	0.02	0.02	0.02	0.018	0.018	0.018	0.016	0.016	0.013	0.013	0.013	0.029	0.029
		RPM	15208	13440	13528	13528	13528	12255	12255	12255	12255	12255	10823	10823	10823	8117	8117	4138	4138	4138	11586	11586
		FEED	547	430	622	622	622	490	490	490	490	490	390	390	390	260	260	108	108	108	672	672
		Ap	0.032	0.032	0.14	0.098	0.098	0.056	0.056	0.056	0.035	0.035	0.035	0.035	0.021	0.014	0.014	0.014	0.014	0.014	0.123	0.123
	41	Vc	75	67	75	75	75	68	68	68	68	68	60	60	60	45	45	23	23	23	81	81
		fz	0.015	0.013	0.02	0.02	0.02	0.018	0.018	0.018	0.018	0.018	0.016	0.016	0.016	0.014	0.014	0.012	0.012	0.012	0.025	0.025
		RPM	13263	11848	11937	11937	11937	10823	10823	10823	10823	10823	9549	9549	9549	7162	7162	3661	3661	3661	10313	10313
		FEED	398	308	477	477	477	390	390	390	390	390	306	306	306	201	201	88	88	88	516	516
		Ap	0.023	0.023	0.1	0.07	0.07	0.04	0.04	0.04	0.025	0.025	0.025	0.025	0.015	0.01	0.01	0.01	0.01	0.01	0.088	0.088

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4G MILL END MILLS

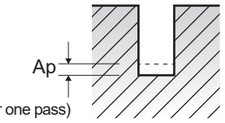
RECOMMENDED CUTTING CONDITIONS

SEM845 SERIES 2 FLUTE - SLOTTING

Vc = m/min. FEED = mm/min.
fz = mm/tooth Ap = mm
RPM = rev./min. LBS = Length Below Shank

VDI 3323	Parameter	Diameter (Ø)																			
		2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
	LBS	12	14	16	18	20	22	26	30	35	40	45	50	6	8	10	12	14	16	18	20	22	26
1-5	Vc	97	87	87	87	87	87	77	77	77	58	58	58	103	103	103	103	103	92	92	92	92	92
	fz	0.039	0.035	0.035	0.035	0.035	0.035	0.032	0.032	0.032	0.027	0.027	0.027	0.039	0.039	0.039	0.039	0.039	0.035	0.035	0.035	0.035	0.035
	RPM	12350	11077	11077	11077	11077	11077	9804	9804	9804	7385	7385	7385	10929	10929	10929	10929	10929	9762	9762	9762	9762	9762
	FEED	963	775	775	775	775	775	627	627	627	399	399	399	852	852	852	852	852	683	683	683	683	683
	Ap	0.158	0.09	0.09	0.09	0.09	0.056	0.056	0.056	0.034	0.034	0.023	0.023	0.27	0.27	0.189	0.189	0.189	0.108	0.108	0.108	0.108	0.068
6-8	Vc	97	87	87	87	87	87	77	77	77	58	58	58	103	103	103	103	103	92	92	92	92	92
	fz	0.039	0.035	0.035	0.035	0.035	0.035	0.032	0.032	0.032	0.027	0.027	0.027	0.039	0.039	0.039	0.039	0.039	0.035	0.035	0.035	0.035	0.035
	RPM	12350	11077	11077	11077	11077	11077	9804	9804	9804	7385	7385	7385	10929	10929	10929	10929	10929	9762	9762	9762	9762	9762
	FEED	963	775	775	775	775	775	627	627	627	399	399	399	852	852	852	852	852	683	683	683	683	683
	Ap	0.158	0.09	0.09	0.09	0.09	0.056	0.056	0.056	0.034	0.034	0.023	0.023	0.27	0.27	0.189	0.189	0.189	0.108	0.108	0.108	0.108	0.068
9	Vc	91	82	82	82	82	82	73	73	73	55	55	55	97	97	97	97	97	87	87	87	87	87
	fz	0.029	0.026	0.026	0.026	0.026	0.026	0.023	0.023	0.023	0.02	0.02	0.02	0.029	0.029	0.029	0.029	0.029	0.026	0.026	0.026	0.026	0.026
	RPM	11586	10441	10441	10441	10441	10441	9295	9295	9295	7003	7003	7003	10292	10292	10292	10292	10292	9231	9231	9231	9231	9231
	FEED	672	543	543	543	543	543	428	428	428	280	280	280	597	597	597	597	597	480	480	480	480	480
	Ap	0.123	0.07	0.07	0.07	0.07	0.044	0.044	0.044	0.026	0.026	0.018	0.018	0.21	0.21	0.147	0.147	0.147	0.084	0.084	0.084	0.084	0.053
10 - 11.1	Vc	97	87	87	87	87	87	77	77	77	58	58	58	103	103	103	103	103	92	92	92	92	92
	fz	0.039	0.035	0.035	0.035	0.035	0.035	0.032	0.032	0.032	0.027	0.027	0.027	0.039	0.039	0.039	0.039	0.039	0.035	0.035	0.035	0.035	0.035
	RPM	12350	11077	11077	11077	11077	11077	9804	9804	9804	7385	7385	7385	10929	10929	10929	10929	10929	9762	9762	9762	9762	9762
	FEED	963	775	775	775	775	775	627	627	627	399	399	399	852	852	852	852	852	683	683	683	683	683
	Ap	0.158	0.09	0.09	0.09	0.09	0.056	0.056	0.056	0.034	0.034	0.023	0.023	0.27	0.27	0.189	0.189	0.189	0.108	0.108	0.108	0.108	0.068
11.2	Vc	91	82	82	82	82	82	73	73	73	55	55	55	97	97	97	97	97	87	87	87	87	87
	fz	0.029	0.026	0.026	0.026	0.026	0.026	0.023	0.023	0.023	0.02	0.02	0.02	0.029	0.029	0.029	0.029	0.029	0.026	0.026	0.026	0.026	0.026
	RPM	11586	10441	10441	10441	10441	10441	9295	9295	9295	7003	7003	7003	10292	10292	10292	10292	10292	9231	9231	9231	9231	9231
	FEED	672	543	543	543	543	543	428	428	428	280	280	280	597	597	597	597	597	480	480	480	480	480
	Ap	0.123	0.07	0.07	0.07	0.07	0.044	0.044	0.044	0.026	0.026	0.018	0.018	0.21	0.21	0.147	0.147	0.147	0.084	0.084	0.084	0.084	0.053
15 - 20	Vc	97	87	87	87	87	87	77	77	77	58	58	58	103	103	103	103	103	92	92	92	92	92
	fz	0.039	0.035	0.035	0.035	0.035	0.035	0.032	0.032	0.032	0.027	0.027	0.027	0.039	0.039	0.039	0.039	0.039	0.035	0.035	0.035	0.035	0.035
	RPM	12350	11077	11077	11077	11077	11077	9804	9804	9804	7385	7385	7385	10929	10929	10929	10929	10929	9762	9762	9762	9762	9762
	FEED	963	775	775	775	775	775	627	627	627	399	399	399	852	852	852	852	852	683	683	683	683	683
	Ap	0.158	0.09	0.09	0.09	0.09	0.056	0.056	0.056	0.034	0.034	0.023	0.023	0.27	0.27	0.189	0.189	0.189	0.108	0.108	0.108	0.108	0.068
38.1 - 38.2	Vc	81	73	73	73	73	73	65	65	65	49	49	49	62	62	62	62	62	56	56	56	56	56
	fz	0.025	0.022	0.022	0.022	0.022	0.022	0.02	0.02	0.02	0.017	0.017	0.017	0.034	0.034	0.034	0.034	0.034	0.031	0.031	0.031	0.031	0.031
	RPM	10313	9295	9295	9295	9295	9295	8276	8276	8276	6239	6239	6239	6578	6578	6578	6578	6578	5942	5942	5942	5942	5942
	FEED	516	409	409	409	409	409	331	331	331	212	212	212	447	447	447	447	447	368	368	368	368	368
	Ap	0.088	0.05	0.05	0.05	0.05	0.031	0.031	0.031	0.019	0.019	0.013	0.013	0.15	0.15	0.105	0.105	0.105	0.06	0.06	0.06	0.06	0.038
40	Vc	91	82	82	82	82	82	73	73	73	55	55	55	97	97	97	97	97	87	87	87	87	87
	fz	0.029	0.026	0.026	0.026	0.026	0.026	0.023	0.023	0.023	0.02	0.02	0.02	0.029	0.029	0.029	0.029	0.029	0.026	0.026	0.026	0.026	0.026
	RPM	11586	10441	10441	10441	10441	10441	9295	9295	9295	7003	7003	7003	10292	10292	10292	10292	10292	9231	9231	9231	9231	9231
	FEED	672	543	543	543	543	543	428	428	428	280	280	280	597	597	597	597	597	480	480	480	480	480
	Ap	0.123	0.07	0.07	0.07	0.07	0.044	0.044	0.044	0.026	0.026	0.018	0.018	0.21	0.21	0.147	0.147	0.147	0.084	0.084	0.084	0.084	0.053
41	Vc	81	73	73	73	73	73	65	65	65	49	49	49	62	62	62	62	62	56	56	56	56	56
	fz	0.025	0.022	0.022	0.022	0.022	0.022	0.02	0.02	0.02	0.017	0.017	0.017	0.034	0.034	0.034	0.034	0.034	0.031	0.031	0.031	0.031	0.031
	RPM	10313	9295	9295	9295	9295	9295	8276	8276	8276	6239	6239	6239	6578	6578	6578	6578	6578	5942	5942	5942	5942	5942
	FEED	516	409	409	409	409	409	331	331	331	212	212	212	447	447	447	447	447	368	368	368	368	368
	Ap	0.088	0.05	0.05	0.05	0.05	0.031	0.031	0.031	0.019	0.019	0.013	0.013	0.15	0.15	0.105	0.105	0.105	0.06	0.06	0.06	0.06	0.038

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4G MILL END MILLS

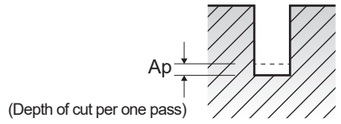
RECOMMENDED CUTTING CONDITIONS

SEM845 SERIES 2 FLUTE - SLOTTING

Vc = m/min. FEED = mm/min.
fz = mm/tooth Ap = mm
RPM = rev./min. LBS = Length Below Shank

ISO	VDI 3323	Parameter	Diameter (Ø)																		
			3.0	3.0	3.0	3.0	3.0	3.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
		LBS	30	35	40	45	50	60	8	10	12	14	16	18	20	22	26	30	35	40	45	50
P	1-5	Vc	92	82	82	82	62	62	101	101	101	101	101	101	101	90	90	90	90	90	80	80
		fz	0.035	0.032	0.032	0.032	0.028	0.028	0.081	0.081	0.081	0.081	0.081	0.081	0.081	0.073	0.073	0.073	0.073	0.073	0.065	0.065
		RPM	9762	8700	8700	8700	6578	6578	8037	8037	8037	8037	8037	8037	8037	7162	7162	7162	7162	7162	6366	6366
		FEED	683	557	557	557	368	368	1302	1302	1302	1302	1302	1302	1302	1046	1046	1046	1046	1046	828	828
		Ap	0.068	0.068	0.041	0.041	0.027	0.027	0.36	0.36	0.36	0.252	0.252	0.252	0.252	0.144	0.144	0.144	0.09	0.09	0.09	0.09
	6-8	Vc	92	82	82	82	62	62	101	101	101	101	101	101	101	90	90	90	90	90	80	80
		fz	0.035	0.032	0.032	0.032	0.028	0.028	0.081	0.081	0.081	0.081	0.081	0.081	0.081	0.073	0.073	0.073	0.073	0.073	0.065	0.065
		RPM	9762	8700	8700	8700	6578	6578	8037	8037	8037	8037	8037	8037	8037	7162	7162	7162	7162	7162	6366	6366
		FEED	683	557	557	557	368	368	1302	1302	1302	1302	1302	1302	1302	1046	1046	1046	1046	1046	828	828
		Ap	0.068	0.068	0.041	0.041	0.027	0.027	0.36	0.36	0.36	0.252	0.252	0.252	0.252	0.144	0.144	0.144	0.09	0.09	0.09	0.09
	9	Vc	87	78	78	78	58	58	96	96	96	96	96	96	96	86	86	86	86	86	76	76
		fz	0.026	0.023	0.023	0.023	0.021	0.021	0.076	0.076	0.076	0.076	0.076	0.076	0.076	0.069	0.069	0.069	0.069	0.069	0.061	0.061
		RPM	9231	8276	8276	8276	6154	6154	7639	7639	7639	7639	7639	7639	7639	6844	6844	6844	6844	6844	6048	6048
		FEED	480	381	381	381	258	258	1161	1161	1161	1161	1161	1161	1161	944	944	944	944	944	738	738
		Ap	0.053	0.053	0.032	0.032	0.021	0.021	0.28	0.28	0.28	0.196	0.196	0.196	0.196	0.112	0.112	0.112	0.07	0.07	0.07	0.07
	10-11.1	Vc	92	82	82	82	62	62	101	101	101	101	101	101	101	90	90	90	90	90	80	80
		fz	0.035	0.032	0.032	0.032	0.028	0.028	0.081	0.081	0.081	0.081	0.081	0.081	0.081	0.073	0.073	0.073	0.073	0.073	0.065	0.065
		RPM	9762	8700	8700	8700	6578	6578	8037	8037	8037	8037	8037	8037	8037	7162	7162	7162	7162	7162	6366	6366
		FEED	683	557	557	557	368	368	1302	1302	1302	1302	1302	1302	1302	1046	1046	1046	1046	1046	828	828
		Ap	0.068	0.068	0.041	0.041	0.027	0.027	0.36	0.36	0.36	0.252	0.252	0.252	0.252	0.144	0.144	0.144	0.09	0.09	0.09	0.09
	11.2	Vc	87	78	78	78	58	58	96	96	96	96	96	96	96	86	86	86	86	86	76	76
		fz	0.026	0.023	0.023	0.023	0.021	0.021	0.076	0.076	0.076	0.076	0.076	0.076	0.076	0.069	0.069	0.069	0.069	0.069	0.061	0.061
		RPM	9231	8276	8276	8276	6154	6154	7639	7639	7639	7639	7639	7639	7639	6844	6844	6844	6844	6844	6048	6048
		FEED	480	381	381	381	258	258	1161	1161	1161	1161	1161	1161	1161	944	944	944	944	944	738	738
		Ap	0.053	0.053	0.032	0.032	0.021	0.021	0.28	0.28	0.28	0.196	0.196	0.196	0.196	0.112	0.112	0.112	0.07	0.07	0.07	0.07
K	15-20	Vc	92	82	82	82	62	62	101	101	101	101	101	101	101	90	90	90	90	90	80	80
		fz	0.035	0.032	0.032	0.032	0.028	0.028	0.081	0.081	0.081	0.081	0.081	0.081	0.081	0.073	0.073	0.073	0.073	0.073	0.065	0.065
		RPM	9762	8700	8700	8700	6578	6578	8037	8037	8037	8037	8037	8037	8037	7162	7162	7162	7162	7162	6366	6366
		FEED	683	557	557	557	368	368	1302	1302	1302	1302	1302	1302	1302	1046	1046	1046	1046	1046	828	828
		Ap	0.068	0.068	0.041	0.041	0.027	0.027	0.36	0.36	0.36	0.252	0.252	0.252	0.252	0.144	0.144	0.144	0.09	0.09	0.09	0.09
H	38.1 - 38.2	Vc	56	50	50	50	37	37	84	84	84	84	84	84	84	76	76	76	76	76	67	67
		fz	0.031	0.027	0.027	0.027	0.024	0.024	0.057	0.057	0.057	0.057	0.057	0.057	0.057	0.052	0.052	0.052	0.052	0.052	0.046	0.046
		RPM	5942	5305	5305	5305	3926	3926	6685	6685	6685	6685	6685	6685	6685	6048	6048	6048	6048	6048	5332	5332
		FEED	368	286	286	286	188	188	762	762	762	762	762	762	762	629	629	629	629	629	491	491
		Ap	0.038	0.038	0.023	0.023	0.015	0.015	0.2	0.2	0.2	0.14	0.14	0.14	0.14	0.08	0.08	0.08	0.05	0.05	0.05	0.05
	40	Vc	87	78	78	78	58	58	96	96	96	96	96	96	96	86	86	86	86	86	76	76
		fz	0.026	0.023	0.023	0.023	0.021	0.021	0.076	0.076	0.076	0.076	0.076	0.076	0.076	0.069	0.069	0.069	0.069	0.069	0.061	0.061
		RPM	9231	8276	8276	8276	6154	6154	7639	7639	7639	7639	7639	7639	7639	6844	6844	6844	6844	6844	6048	6048
		FEED	480	381	381	381	258	258	1161	1161	1161	1161	1161	1161	1161	944	944	944	944	944	738	738
		Ap	0.053	0.053	0.032	0.032	0.021	0.021	0.28	0.28	0.28	0.196	0.196	0.196	0.196	0.112	0.112	0.112	0.07	0.07	0.07	0.07
	41	Vc	56	50	50	50	37	37	84	84	84	84	84	84	84	76	76	76	76	76	67	67
		fz	0.031	0.027	0.027	0.027	0.024	0.024	0.057	0.057	0.057	0.057	0.057	0.057	0.057	0.052	0.052	0.052	0.052	0.052	0.046	0.046
		RPM	5942	5305	5305	5305	3926	3926	6685	6685	6685	6685	6685	6685	6685	6048	6048	6048	6048	6048	5332	5332
		FEED	368	286	286	286	188	188	762	762	762	762	762	762	762	629	629	629	629	629	491	491
		Ap	0.038	0.038	0.023	0.023	0.015	0.015	0.2	0.2	0.2	0.14	0.14	0.14	0.14	0.08	0.08	0.08	0.05	0.05	0.05	0.05

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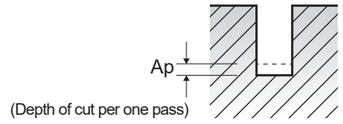
4G MILL END MILLS

RECOMMENDED CUTTING CONDITIONS

SEM845 SERIES 2 FLUTE - SLOTTING

Vc = m/min. FEED = mm/min.
fz = mm/tooth Ap = mm
RPM = rev./min. LBS = Length Below Shank

VDI 3323	Parameter	Diameter (Ø)																			
		4.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	6.0	6.0	6.0	6.0	8.0	8.0	8.0	10.0	10.0	10.0	12.0	12.0	12.0
	LBS	60	16	20	26	30	35	40	50	60	15	20	30	32	25	30	42	30	35	45	35	40	50
1-5	Vc	80	101	101	90	90	90	90	90	80	100	100	100	90	101	101	90	101	101	101	100	100	100
	fz	0.065	0.09	0.09	0.081	0.081	0.081	0.081	0.081	0.072	0.1	0.1	0.1	0.09	0.119	0.119	0.107	0.141	0.141	0.141	0.151	0.151	0.151
	RPM	6366	6430	6430	5730	5730	5730	5730	5730	5093	5305	5305	5305	4775	4019	4019	3581	3215	3215	3215	2653	2653	2653
	FEED	828	1157	1157	928	928	928	928	928	733	1061	1061	1061	859	956	956	766	907	907	907	801	801	801
	Ap	0.054	0.315	0.315	0.18	0.18	0.18	0.18	0.113	0.113	0.54	0.378	0.378	0.216	0.504	0.504	0.288	0.9	0.63	0.63	1.08	0.756	0.756
6-8	Vc	80	101	101	90	90	90	90	90	80	100	100	100	90	101	101	90	101	101	101	100	100	100
	fz	0.065	0.09	0.09	0.081	0.081	0.081	0.081	0.081	0.072	0.1	0.1	0.1	0.09	0.119	0.119	0.107	0.141	0.141	0.141	0.151	0.151	0.151
	RPM	6366	6430	6430	5730	5730	5730	5730	5730	5093	5305	5305	5305	4775	4019	4019	3581	3215	3215	3215	2653	2653	2653
	FEED	828	1157	1157	928	928	928	928	928	733	1061	1061	1061	859	956	956	766	907	907	907	801	801	801
	Ap	0.054	0.315	0.315	0.18	0.18	0.18	0.18	0.113	0.113	0.54	0.378	0.378	0.216	0.504	0.504	0.288	0.9	0.63	0.63	1.08	0.756	0.756
9	Vc	76	96	96	86	86	86	86	86	77	94	94	94	85	96	96	85	96	96	96	95	95	95
	fz	0.061	0.074	0.074	0.066	0.066	0.066	0.066	0.066	0.059	0.082	0.082	0.082	0.074	0.099	0.099	0.089	0.111	0.111	0.111	0.119	0.119	0.119
	RPM	6048	6112	6112	5475	5475	5475	5475	5475	4902	4987	4987	4987	4509	3820	3820	3382	3056	3056	3056	2520	2520	2520
	FEED	738	905	905	723	723	723	723	723	578	818	818	818	667	756	756	602	678	678	678	600	600	600
	Ap	0.042	0.245	0.245	0.14	0.14	0.14	0.14	0.088	0.088	0.42	0.294	0.294	0.168	0.392	0.392	0.224	0.7	0.49	0.49	0.84	0.588	0.588
10 - 11.1	Vc	80	101	101	90	90	90	90	90	80	100	100	100	90	101	101	90	101	101	101	100	100	100
	fz	0.065	0.09	0.09	0.081	0.081	0.081	0.081	0.081	0.072	0.1	0.1	0.1	0.09	0.119	0.119	0.107	0.141	0.141	0.141	0.151	0.151	0.151
	RPM	6366	6430	6430	5730	5730	5730	5730	5730	5093	5305	5305	5305	4775	4019	4019	3581	3215	3215	3215	2653	2653	2653
	FEED	828	1157	1157	928	928	928	928	928	733	1061	1061	1061	859	956	956	766	907	907	907	801	801	801
	Ap	0.054	0.315	0.315	0.18	0.18	0.18	0.18	0.113	0.113	0.54	0.378	0.378	0.216	0.504	0.504	0.288	0.9	0.63	0.63	1.08	0.756	0.756
11.2	Vc	76	96	96	86	86	86	86	86	77	94	94	94	85	96	96	85	96	96	96	95	95	95
	fz	0.061	0.074	0.074	0.066	0.066	0.066	0.066	0.066	0.059	0.082	0.082	0.082	0.074	0.099	0.099	0.089	0.111	0.111	0.111	0.119	0.119	0.119
	RPM	6048	6112	6112	5475	5475	5475	5475	5475	4902	4987	4987	4987	4509	3820	3820	3382	3056	3056	3056	2520	2520	2520
	FEED	738	905	905	723	723	723	723	723	578	818	818	818	667	756	756	602	678	678	678	600	600	600
	Ap	0.042	0.245	0.245	0.14	0.14	0.14	0.14	0.088	0.088	0.42	0.294	0.294	0.168	0.392	0.392	0.224	0.7	0.49	0.49	0.84	0.588	0.588
15 - 20	Vc	80	101	101	90	90	90	90	90	80	100	100	100	90	101	101	90	101	101	101	100	100	100
	fz	0.065	0.09	0.09	0.081	0.081	0.081	0.081	0.081	0.072	0.1	0.1	0.1	0.09	0.119	0.119	0.107	0.141	0.141	0.141	0.151	0.151	0.151
	RPM	6366	6430	6430	5730	5730	5730	5730	5730	5093	5305	5305	5305	4775	4019	4019	3581	3215	3215	3215	2653	2653	2653
	FEED	828	1157	1157	928	928	928	928	928	733	1061	1061	1061	859	956	956	766	907	907	907	801	801	801
	Ap	0.054	0.315	0.315	0.18	0.18	0.18	0.18	0.113	0.113	0.54	0.378	0.378	0.216	0.504	0.504	0.288	0.9	0.63	0.63	1.08	0.756	0.756
38.1 - 38.2	Vc	67	85	85	76	76	76	76	76	68	83	83	83	75	83	83	74	83	83	83	82	82	82
	fz	0.046	0.056	0.056	0.05	0.05	0.05	0.05	0.05	0.045	0.063	0.063	0.063	0.056	0.076	0.076	0.069	0.076	0.076	0.076	0.08	0.08	0.08
	RPM	5332	5411	5411	4838	4838	4838	4838	4838	4329	4403	4403	4403	3979	3302	3302	2944	2642	2642	2642	2175	2175	2175
	FEED	491	606	606	484	484	484	484	484	390	555	555	555	446	502	502	406	402	402	402	348	348	348
	Ap	0.03	0.175	0.175	0.1	0.1	0.1	0.1	0.063	0.063	0.3	0.21	0.21	0.12	0.28	0.28	0.16	0.5	0.35	0.35	0.6	0.42	0.42
40	Vc	76	96	96	86	86	86	86	86	77	94	94	94	85	96	96	85	96	96	96	95	95	95
	fz	0.061	0.074	0.074	0.066	0.066	0.066	0.066	0.066	0.059	0.082	0.082	0.082	0.074	0.099	0.099	0.089	0.111	0.111	0.111	0.119	0.119	0.119
	RPM	6048	6112	6112	5475	5475	5475	5475	5475	4902	4987	4987	4987	4509	3820	3820	3382	3056	3056	3056	2520	2520	2520
	FEED	738	905	905	723	723	723	723	723	578	818	818	818	667	756	756	602	678	678	678	600	600	600
	Ap	0.042	0.245	0.245	0.14	0.14	0.14	0.14	0.088	0.088	0.42	0.294	0.294	0.168	0.392	0.392	0.224	0.7	0.49	0.49	0.84	0.588	0.588
41	Vc	67	85	85	76	76	76	76	76	68	83	83	83	75	83	83	74	83	83	83	82	82	82
	fz	0.046	0.056	0.056	0.05	0.05	0.05	0.05	0.05	0.045	0.063	0.063	0.063	0.056	0.076	0.076	0.069	0.076	0.076	0.076	0.08	0.08	0.08
	RPM	5332	5411	5411	4838	4838	4838	4838	4838	4329	4403	4403	4403	3979	3302	3302	2944	2642	2642	2642	2175	2175	2175
	FEED	491	606	606	484	484	484	484	484	390	555	555	555	446	502	502	406	402	402	402	348	348	348
	Ap	0.03	0.175	0.175	0.1	0.1	0.1	0.1	0.063	0.063	0.3	0.21	0.21	0.12	0.28	0.28	0.16	0.5	0.35	0.35	0.6	0.42	0.42



4G MILL END MILLS

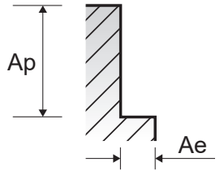
RECOMMENDED CUTTING CONDITIONS

SEME36, SEME71 SERIES — 4 FLUTE - SIDE CUTTING

Vc = m/min.
fz = mm/tooth
RPM = rev./min.
FEED = mm/min.

ISO	VDI 3323	Material Description	Ae(mm)	Ap(mm)	Parameter	Diameter (Ø) 0.8	0.9	1.0	1.2	1.5	2.0	2.5	3.0
P	1-5	Non-alloy steel	0.05D	1.0D	Vc	79	83	84	85	88	91	101	105
					fz	0.002	0.002	0.002	0.003	0.004	0.005	0.006	0.008
					RPM	31433	29355	26738	22547	18674	14483	12860	11141
					FEED	251	235	214	271	299	290	309	357
	6-8	Low alloy steel	0.05D	1.0D	Vc	79	83	84	85	88	91	101	105
					fz	0.002	0.002	0.002	0.003	0.004	0.005	0.006	0.008
					RPM	31433	29355	26738	22547	18674	14483	12860	11141
					FEED	251	235	214	271	299	290	309	357
	9		0.05D	1.0D	Vc	47	50	51	51	53	59	64	66
					fz	0.002	0.002	0.002	0.003	0.004	0.005	0.006	0.008
					RPM	18701	17684	16234	13528	11247	9390	8149	7003
					FEED	150	141	130	162	180	188	196	224
	10-11.1	High alloyed steel, and tool steel	0.05D	1.0D	Vc	79	83	84	85	88	91	101	105
					fz	0.002	0.002	0.002	0.003	0.004	0.005	0.006	0.008
					RPM	31433	29355	26738	22547	18674	14483	12860	11141
					FEED	251	235	214	271	299	290	309	357
	11.2		0.05D	1.0D	Vc	47	50	51	51	53	59	64	66
					fz	0.002	0.002	0.002	0.003	0.004	0.005	0.006	0.008
					RPM	18701	17684	16234	13528	11247	9390	8149	7003
					FEED	150	141	130	162	180	188	196	224
M	14.1	Stainless steel	0.05D	1.0D	Vc	39	41	42	42	44	50	54	54
					fz	0.002	0.002	0.002	0.003	0.004	0.005	0.006	0.008
					RPM	15518	14501	13369	11141	9337	7958	6875	5730
					FEED	124	116	107	134	149	159	165	183
K	15-20	Grey cast iron Nodular cast iron Malleable cast iron	0.05D	1.0D	Vc	79	83	84	85	88	91	101	105
					fz	0.002	0.002	0.002	0.003	0.004	0.005	0.006	0.008
					RPM	31433	29355	26738	22547	18674	14483	12860	11141
					FEED	251	235	214	271	299	290	309	357
H	38.1 - 38.2	Hardened steel	0.05D	1.0D	Vc	31	33	34	34	35	40	41	40
					fz	0.001	0.001	0.001	0.001	0.002	0.002	0.003	0.004
					RPM	12335	11671	10823	9019	7427	6366	5220	4244
					FEED	49	47	43	36	59	51	63	68
	40	Chilled Cast Iron	0.05D	1.0D	Vc	47	50	51	51	53	59	64	66
					fz	0.002	0.002	0.002	0.003	0.004	0.005	0.006	0.008
					RPM	18701	17684	16234	13528	11247	9390	8149	7003
					FEED	150	141	130	162	180	188	196	224
	41	Hardened Cast Iron	0.05D	1.0D	Vc	31	33	34	34	35	40	41	40
					fz	0.001	0.001	0.001	0.001	0.002	0.002	0.003	0.004
					RPM	12335	11671	10823	9019	7427	6366	5220	4244
					FEED	49	47	43	36	59	51	63	68

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4G MILL END MILLS

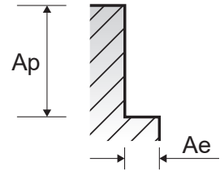
RECOMMENDED CUTTING CONDITIONS

SEME36, SEME71 SERIES — 4 FLUTE - SIDE CUTTING

Vc = m/min.
fz = mm/tooth
RPM = rev./min.
FEED = mm/min.

VDI 3323	Parameter	Diameter (Ø) 3.5	4.0	4.5	5.0	5.5	6.0	6.5	7.0	7.5	8.0	8.5	9.0
1-5	Vc	113	119	122	124	128	131	133	134	134	132	132	132
	fz	0.011	0.016	0.018	0.02	0.022	0.025	0.027	0.03	0.032	0.035	0.036	0.037
	RPM	10277	9470	8630	7894	7408	6950	6513	6093	5687	5252	4943	4669
	FEED	452	606	621	632	652	695	703	731	728	735	712	691
6-8	Vc	113	119	122	124	128	131	133	134	134	132	132	132
	fz	0.011	0.016	0.018	0.02	0.022	0.025	0.027	0.03	0.032	0.035	0.036	0.037
	RPM	10277	9470	8630	7894	7408	6950	6513	6093	5687	5252	4943	4669
	FEED	452	606	621	632	652	695	703	731	728	735	712	691
9	Vc	70	73	74	74	77	79	80	81	80	79	80	80
	fz	0.011	0.016	0.018	0.02	0.023	0.026	0.027	0.028	0.03	0.032	0.032	0.031
	RPM	6366	5809	5234	4711	4456	4191	3918	3683	3395	3143	2996	2829
	FEED	280	372	377	377	410	436	423	413	407	402	383	351
10 - 11.1	Vc	113	119	122	124	128	131	133	134	134	132	132	132
	fz	0.011	0.016	0.018	0.02	0.022	0.025	0.027	0.03	0.032	0.035	0.036	0.037
	RPM	10277	9470	8630	7894	7408	6950	6513	6093	5687	5252	4943	4669
	FEED	452	606	621	632	652	695	703	731	728	735	712	691
11.2	Vc	70	73	74	74	77	79	80	81	80	79	80	80
	fz	0.011	0.016	0.018	0.02	0.023	0.026	0.027	0.028	0.03	0.032	0.032	0.031
	RPM	6366	5809	5234	4711	4456	4191	3918	3683	3395	3143	2996	2829
	FEED	280	372	377	377	410	436	423	413	407	402	383	351
14.1	Vc	58	61	62	62	65	67	68	68	67	66	66	67
	fz	0.011	0.015	0.017	0.02	0.022	0.024	0.026	0.029	0.031	0.035	0.036	0.036
	RPM	5275	4854	4386	3947	3762	3554	3330	3092	2844	2626	2472	2370
	FEED	232	291	298	316	331	341	346	359	353	368	356	341
15 - 20	Vc	113	119	122	124	128	131	133	134	134	132	132	132
	fz	0.011	0.016	0.018	0.02	0.022	0.025	0.027	0.03	0.032	0.035	0.036	0.037
	RPM	10277	9470	8630	7894	7408	6950	6513	6093	5687	5252	4943	4669
	FEED	452	606	621	632	652	695	703	731	728	735	712	691
38.1 - 38.2	Vc	43	46	47	46	47	47	49	51	52	53	53	54
	fz	0.004	0.004	0.005	0.006	0.007	0.009	0.01	0.011	0.013	0.014	0.014	0.014
	RPM	3911	3661	3325	2928	2720	2493	2400	2319	2207	2109	1985	1910
	FEED	63	59	66	70	76	90	96	102	115	118	111	107
40	Vc	70	73	74	74	77	79	80	81	80	79	80	80
	fz	0.011	0.016	0.018	0.02	0.023	0.026	0.027	0.028	0.03	0.032	0.032	0.031
	RPM	6366	5809	5234	4711	4456	4191	3918	3683	3395	3143	2996	2829
	FEED	280	372	377	377	410	436	423	413	407	402	383	351
41	Vc	43	46	47	46	47	47	49	51	52	53	53	54
	fz	0.004	0.004	0.005	0.006	0.007	0.009	0.01	0.011	0.013	0.014	0.014	0.014
	RPM	3911	3661	3325	2928	2720	2493	2400	2319	2207	2109	1985	1910
	FEED	63	59	66	70	76	90	96	102	115	118	111	107

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4G MILL END MILLS

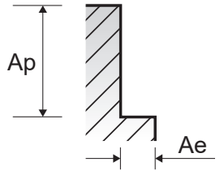
RECOMMENDED CUTTING CONDITIONS

SEME36, SEME71 SERIES — 4 FLUTE - SIDE CUTTING

Vc = m/min.
f z = mm/tooth
R P M = rev./min.
FEED = mm/min.

ISO	VDI 3323	Ae(mm)	Ap(mm)	Parameter	Diameter (Ø) 9.5	10.0	10.5	11.0	11.5	12.0	13.0	14.0
P	1-5	0.05D	1.0D	Vc	130	128	129	130	130	129	133	136
				fz	0.038	0.039	0.04	0.04	0.04	0.04	0.04	0.04
				RPM	4356	4074	3911	3762	3598	3422	3257	3092
				FEED	662	636	626	602	576	547	521	495
	6-8	0.05D	1.0D	Vc	130	128	129	130	130	129	133	136
				fz	0.038	0.039	0.04	0.04	0.04	0.04	0.04	0.04
				RPM	4356	4074	3911	3762	3598	3422	3257	3092
				FEED	662	636	626	602	576	547	521	495
	9	0.05D	1.0D	Vc	79	79	79	79	79	79	82	84
				fz	0.031	0.032	0.032	0.032	0.032	0.032	0.031	0.031
				RPM	2647	2515	2395	2286	2187	2096	2008	1910
				FEED	328	322	307	293	280	268	249	237
	10-11.1	0.05D	1.0D	Vc	130	128	129	130	130	129	133	136
				fz	0.038	0.039	0.04	0.04	0.04	0.04	0.04	0.04
				RPM	4356	4074	3911	3762	3598	3422	3257	3092
				FEED	662	636	626	602	576	547	521	495
	11.2	0.05D	1.0D	Vc	79	79	79	79	79	79	82	84
				fz	0.031	0.032	0.032	0.032	0.032	0.032	0.031	0.031
				RPM	2647	2515	2395	2286	2187	2096	2008	1910
				FEED	328	322	307	293	280	268	249	237
M	14.1	0.05D	1.0D	Vc	67	66	66	66	65	64	66	68
				fz	0.037	0.038	0.038	0.038	0.038	0.037	0.037	0.037
				RPM	2245	2101	2001	1910	1799	1698	1616	1546
				FEED	332	319	304	290	273	251	239	229
K	15-20	0.05D	1.0D	Vc	130	128	129	130	130	129	133	136
				fz	0.038	0.039	0.04	0.04	0.04	0.04	0.04	0.04
				RPM	4356	4074	3911	3762	3598	3422	3257	3092
				FEED	662	636	626	602	576	547	521	495
H	38.1 - 38.2	0.05D	1.0D	Vc	54	53	54	55	55	55	56	57
				fz	0.014	0.014	0.014	0.014	0.015	0.015	0.015	0.015
				RPM	1809	1687	1637	1592	1522	1459	1371	1296
				FEED	101	94	92	89	91	88	82	78
	40	0.05D	1.0D	Vc	79	79	79	79	79	79	82	84
				fz	0.031	0.032	0.032	0.032	0.032	0.032	0.031	0.031
				RPM	2647	2515	2395	2286	2187	2096	2008	1910
				FEED	328	322	307	293	280	268	249	237
	41	0.05D	1.0D	Vc	54	53	54	55	55	55	56	57
				fz	0.014	0.014	0.014	0.014	0.015	0.015	0.015	0.015
				RPM	1809	1687	1637	1592	1522	1459	1371	1296
				FEED	101	94	92	89	91	88	82	78

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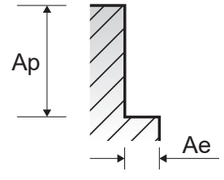
4G MILL END MILLS

RECOMMENDED CUTTING CONDITIONS

SEME36, SEME71 SERIES — 4 FLUTE - SIDE CUTTING

Vc = m/min.
fz = mm/tooth
RPM = rev./min.
FEED = mm/min.

VDI 3323	Parameter	Diameter (Ø) 15.0	16.0	17.0	18.0	19.0	20.0	21.0	22.0	23.0	24.0	25.0
1-5	Vc	138	138	138	137	135	132	133	134	134	134	134
	fz	0.039	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.039	0.039
	RPM	2928	2745	2584	2423	2262	2101	2016	1939	1855	1777	1706
	FEED	457	439	413	388	362	336	323	310	297	277	266
6-8	Vc	138	138	138	137	135	132	133	134	134	134	134
	fz	0.039	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.039	0.039
	RPM	2928	2745	2584	2423	2262	2101	2016	1939	1855	1777	1706
	FEED	457	439	413	388	362	336	323	310	297	277	266
9	Vc	85	85	86	85	85	84	84	84	84	84	82
	fz	0.031	0.032	0.031	0.031	0.032	0.032	0.032	0.033	0.031	0.032	0.032
	RPM	1804	1691	1610	1503	1424	1337	1273	1215	1163	1114	1044
	FEED	224	216	200	186	182	171	163	160	144	143	134
10 - 11.1	Vc	138	138	138	137	135	132	133	134	134	134	134
	fz	0.039	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.039	0.039
	RPM	2928	2745	2584	2423	2262	2101	2016	1939	1855	1777	1706
	FEED	457	439	413	388	362	336	323	310	297	277	266
11.2	Vc	85	85	86	85	85	84	84	84	84	84	82
	fz	0.031	0.032	0.031	0.031	0.032	0.032	0.032	0.033	0.031	0.032	0.032
	RPM	1804	1691	1610	1503	1424	1337	1273	1215	1163	1114	1044
	FEED	224	216	200	186	182	171	163	160	144	143	134
14.1	Vc	69	69	69	68	67	66	67	67	67	67	67
	fz	0.038	0.038	0.039	0.038	0.039	0.038	0.037	0.037	0.038	0.037	0.037
	RPM	1464	1373	1292	1203	1122	1050	1016	969	927	889	853
	FEED	223	209	202	183	175	160	150	143	141	132	126
15 - 20	Vc	138	138	138	137	135	132	133	134	134	134	134
	fz	0.039	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.039	0.039
	RPM	2928	2745	2584	2423	2262	2101	2016	1939	1855	1777	1706
	FEED	457	439	413	388	362	336	323	310	297	277	266
38.1 - 38.2	Vc	57	57	57	56	55	53	54	54	54	54	53
	fz	0.014	0.014	0.014	0.014	0.013	0.012	0.013	0.013	0.012	0.011	0.012
	RPM	1210	1134	1067	990	921	844	819	781	747	716	675
	FEED	68	64	60	55	48	40	43	41	36	32	32
40	Vc	85	85	86	85	85	84	84	84	84	84	82
	fz	0.031	0.032	0.031	0.031	0.032	0.032	0.032	0.033	0.031	0.032	0.032
	RPM	1804	1691	1610	1503	1424	1337	1273	1215	1163	1114	1044
	FEED	224	216	200	186	182	171	163	160	144	143	134
41	Vc	57	57	57	56	55	53	54	54	54	54	53
	fz	0.014	0.014	0.014	0.014	0.013	0.012	0.013	0.013	0.012	0.011	0.012
	RPM	1210	1134	1067	990	921	844	819	781	747	716	675
	FEED	68	64	60	55	48	40	43	41	36	32	32



4G MILL END MILLS

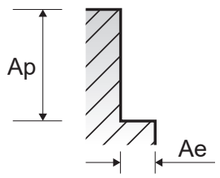
RECOMMENDED CUTTING CONDITIONS

SEME72 SERIES 4 FLUTE - SIDE CUTTING

Vc = m/min.
fz = mm /tooth
RPM = rev./min .
FEED = mm/min.
LOC = Length of Cut

ISO	VDI 3323	Material Description	Ae(mm)	Ap(mm)	Parameter	Diameter (Ø)											
						1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.2	1.2	1.2	1.2	
					LOC	3	4	5	6	7	8	10	12	4	6	8	10
P	1-5	Non-alloy steel	0.05D	2.5D	Vc	60	60	60	54	54	54	54	48	61	61	55	55
					fz	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.003	0.003	0.003	0.002
					RPM	19099	19099	19099	17189	17189	17189	17189	15279	16181	16181	14589	14589
					FEED	153	153	153	138	138	138	138	122	194	194	175	117
	6-8	Low alloy steel	0.05D	2.5D	Vc	60	60	60	54	54	54	54	48	61	61	55	55
					fz	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.003	0.003	0.003	0.002
					RPM	19099	19099	19099	17189	17189	17189	17189	15279	16181	16181	14589	14589
					FEED	153	153	153	138	138	138	138	122	194	194	175	117
	9		0.05D	2.5D	Vc	34	34	34	31	31	31	31	28	35	35	31	31
					fz	0.002	0.002	0.002	0.002	0.002	0.001	0.001	0.001	0.002	0.002	0.002	0.002
					RPM	10823	10823	10823	9868	9868	9868	9868	8913	9284	9284	8223	8223
					FEED	87	87	87	79	79	39	39	36	74	74	66	66
	10-11.1	High alloyed steel, and tool steel	0.05D	2.5D	Vc	60	60	60	54	54	54	54	48	61	61	55	55
					fz	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.003	0.003	0.003	0.002
					RPM	19099	19099	19099	17189	17189	17189	17189	15279	16181	16181	14589	14589
					FEED	153	153	153	138	138	138	138	122	194	194	175	117
	11.2		0.05D	2.5D	Vc	34	34	34	31	31	31	31	28	35	35	31	31
					fz	0.002	0.002	0.002	0.002	0.002	0.001	0.001	0.001	0.002	0.002	0.002	0.002
					RPM	10823	10823	10823	9868	9868	9868	9868	8913	9284	9284	8223	8223
					FEED	87	87	87	79	79	39	39	36	74	74	66	66
K	15-20	Grey cast iron Nodular cast iron Malleable cast iron	0.05D	2.5D	Vc	60	60	60	54	54	54	54	48	61	61	55	55
					fz	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.003	0.003	0.003	0.002
					RPM	19099	19099	19099	17189	17189	17189	17189	15279	16181	16181	14589	14589
					FEED	153	153	153	138	138	138	138	122	194	194	175	117
H	38.1 - 38.2	Hardened steel	0.02D	2.0D	Vc	21	21	21	19	19	19	19	17	21	21	19	19
					fz	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.002	0.002	0.002	0.001
					RPM	6685	6685	6685	6048	6048	6048	6048	5411	5570	5570	5040	5040
					FEED	27	27	27	24	24	24	24	22	45	45	40	20
	40	Chilled Cast Iron	0.05D	2.5D	Vc	34	34	34	31	31	31	31	28	35	35	31	31
					fz	0.002	0.002	0.002	0.002	0.002	0.001	0.001	0.001	0.002	0.002	0.002	0.002
					RPM	10823	10823	10823	9868	9868	9868	9868	8913	9284	9284	8223	8223
					FEED	87	87	87	79	79	39	39	36	74	74	66	66
	41	Hardened Cast Iron	0.02D	2.0D	Vc	21	21	21	19	19	19	19	17	21	21	19	19
					fz	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.002	0.002	0.002	0.001
					RPM	6685	6685	6685	6048	6048	6048	6048	5411	5570	5570	5040	5040
					FEED	27	27	27	24	24	24	24	22	45	45	40	20

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4G MILL END MILLS

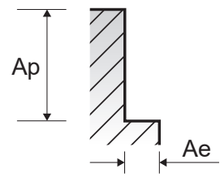
RECOMMENDED CUTTING CONDITIONS

SEME72 SERIES 4 FLUTE - SIDE CUTTING

Vc = m/min.
fz = mm /tooth
RPM = rev./min .
FEED = mm/min.
LOC = Length of Cut

VDI 3323	Parameter	Diameter (Ø)																		
		1.2	1.5	1.5	1.5	1.5	1.5	1.5	2.0	2.0	2.0	2.0	2.0	2.5	2.5	2.5	2.5	2.5	3.0	3.0
	LOC	12	6	8	10	12	14	16	8	10	12	14	16	10	12	16	20	26	10	12
1-5	Vc	55	65	59	59	59	59	52	66	66	60	60	60	71	71	64	64	57	70	70
	fz	0.002	0.004	0.004	0.004	0.003	0.003	0.003	0.006	0.006	0.005	0.005	0.005	0.007	0.007	0.006	0.006	0.005	0.009	0.009
	RPM	14589	13793	12520	12520	12520	12520	11035	10504	10504	9549	9549	9549	9040	9040	8149	8149	7257	7427	7427
	FEED	117	221	200	200	150	150	132	252	252	191	191	191	253	253	196	196	145	267	267
6-8	Vc	55	65	59	59	59	59	52	66	66	60	60	60	71	71	64	64	57	70	70
	fz	0.002	0.004	0.004	0.004	0.003	0.003	0.003	0.006	0.006	0.005	0.005	0.005	0.007	0.007	0.006	0.006	0.005	0.009	0.009
	RPM	14589	13793	12520	12520	12520	12520	11035	10504	10504	9549	9549	9549	9040	9040	8149	8149	7257	7427	7427
	FEED	117	221	200	200	150	150	132	252	252	191	191	191	253	253	196	196	145	267	267
9	Vc	31	37	33	33	33	33	30	38	38	34	34	34	41	41	37	37	32	40	40
	fz	0.002	0.003	0.003	0.002	0.002	0.002	0.002	0.004	0.004	0.004	0.004	0.003	0.005	0.005	0.005	0.004	0.004	0.007	0.007
	RPM	8223	7852	7003	7003	7003	7003	6366	6048	6048	5411	5411	5411	5220	5220	4711	4711	4074	4244	4244
	FEED	66	94	84	56	56	56	51	97	97	87	87	65	104	104	94	75	65	119	119
10 - 11.1	Vc	55	65	59	59	59	59	52	66	66	60	60	60	71	71	64	64	57	70	70
	fz	0.002	0.004	0.004	0.004	0.003	0.003	0.003	0.006	0.006	0.005	0.005	0.005	0.007	0.007	0.006	0.006	0.005	0.009	0.009
	RPM	14589	13793	12520	12520	12520	12520	11035	10504	10504	9549	9549	9549	9040	9040	8149	8149	7257	7427	7427
	FEED	117	221	200	200	150	150	132	252	252	191	191	191	253	253	196	196	145	267	267
11.2	Vc	31	37	33	33	33	33	30	38	38	34	34	34	41	41	37	37	32	40	40
	fz	0.002	0.003	0.003	0.002	0.002	0.002	0.002	0.004	0.004	0.004	0.004	0.003	0.005	0.005	0.005	0.004	0.004	0.007	0.007
	RPM	8223	7852	7003	7003	7003	7003	6366	6048	6048	5411	5411	5411	5220	5220	4711	4711	4074	4244	4244
	FEED	66	94	84	56	56	56	51	97	97	87	87	65	104	104	94	75	65	119	119
15 - 20	Vc	55	65	59	59	59	59	52	66	66	60	60	60	71	71	64	64	57	70	70
	fz	0.002	0.004	0.004	0.004	0.003	0.003	0.003	0.006	0.006	0.005	0.005	0.005	0.007	0.007	0.006	0.006	0.005	0.009	0.009
	RPM	14589	13793	12520	12520	12520	12520	11035	10504	10504	9549	9549	9549	9040	9040	8149	8149	7257	7427	7427
	FEED	117	221	200	200	150	150	132	252	252	191	191	191	253	253	196	196	145	267	267
38.1 - 38.2	Vc	19	23	20	20	20	20	18	24	24	21	21	21	25	25	23	23	20	25	25
	fz	0.001	0.002	0.002	0.002	0.002	0.002	0.002	0.004	0.004	0.003	0.003	0.003	0.005	0.005	0.004	0.004	0.003	0.006	0.006
	RPM	5040	4881	4244	4244	4244	4244	3820	3820	3820	3342	3342	3342	3183	3183	2928	2928	2546	2653	2653
	FEED	20	39	34	34	34	34	31	61	61	40	40	40	64	64	47	47	31	64	64
40	Vc	31	37	33	33	33	33	30	38	38	34	34	34	41	41	37	37	32	40	40
	fz	0.002	0.003	0.003	0.002	0.002	0.002	0.002	0.004	0.004	0.004	0.004	0.003	0.005	0.005	0.005	0.004	0.004	0.007	0.007
	RPM	8223	7852	7003	7003	7003	7003	6366	6048	6048	5411	5411	5411	5220	5220	4711	4711	4074	4244	4244
	FEED	66	94	84	56	56	56	51	97	97	87	87	65	104	104	94	75	65	119	119
41	Vc	19	23	20	20	20	20	18	24	24	21	21	21	25	25	23	23	20	25	25
	fz	0.001	0.002	0.002	0.002	0.002	0.002	0.002	0.004	0.004	0.003	0.003	0.003	0.005	0.005	0.004	0.004	0.003	0.006	0.006
	RPM	5040	4881	4244	4244	4244	4244	3820	3820	3820	3342	3342	3342	3183	3183	2928	2928	2546	2653	2653
	FEED	20	39	34	34	34	34	31	61	61	40	40	40	64	64	47	47	31	64	64

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CARBIDE
HSS
i-Xmill END MILLS
X-1EH END MILLS
4G MILL END MILLS
X-POWER PRO END MILLS
TitaNox-POWER END MILLS
V7 PLUS END MILLS
ALU-CUT END MILLS
K-2 END MILLS
GENERAL CARBIDE END MILLS

4G MILL END MILLS

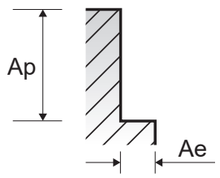
RECOMMENDED CUTTING CONDITIONS

SEME72 SERIES 4 FLUTE - SIDE CUTTING

Vc = m/min.
fz = mm /tooth
RPM = rev./min .
FEED = mm/min.
LOC = Length of Cut

ISO	VDI 3323	Ae(mm)	Ap(mm)	Parameter	Diameter (Ø)														
					3.0	3.0	3.0	3.0	3.0	4.0	4.0	4.0	4.0	4.0	5.0	5.0	5.0	5.0	5.0
				LOC	14	16	20	26	30	12	16	20	26	30	20	25	30	35	40
P	1-5	0.05D	2.5D	Vc	70	63	63	63	63	75	75	75	68	68	80	80	72	72	72
				fz	0.009	0.009	0.008	0.008	0.008	0.014	0.014	0.014	0.013	0.013	0.021	0.021	0.019	0.019	0.017
				RPM	7427	6685	6685	6685	6685	5968	5968	5968	5411	5411	5093	5093	4584	4584	4584
				FEED	267	241	214	214	214	334	334	334	281	281	428	428	348	348	312
	6-8	0.05D	2.5D	Vc	70	63	63	63	63	75	75	75	68	68	80	80	72	72	72
				fz	0.009	0.009	0.008	0.008	0.008	0.014	0.014	0.014	0.013	0.013	0.021	0.021	0.019	0.019	0.017
				RPM	7427	6685	6685	6685	6685	5968	5968	5968	5411	5411	5093	5093	4584	4584	4584
				FEED	267	241	214	214	214	334	334	334	281	281	428	428	348	348	312
	9	0.05D	2.5D	Vc	40	36	36	36	36	43	43	43	39	39	46	46	41	41	41
				fz	0.007	0.007	0.006	0.006	0.006	0.01	0.01	0.01	0.009	0.009	0.015	0.015	0.013	0.013	0.011
				RPM	4244	3820	3820	3820	3820	3422	3422	3422	3104	3104	2928	2928	2610	2610	2610
				FEED	119	107	92	92	92	137	137	137	112	112	176	176	136	136	115
	10-11.1	0.05D	2.5D	Vc	70	63	63	63	63	75	75	75	68	68	80	80	72	72	72
				fz	0.009	0.009	0.008	0.008	0.008	0.014	0.014	0.014	0.013	0.013	0.021	0.021	0.019	0.019	0.017
				RPM	7427	6685	6685	6685	6685	5968	5968	5968	5411	5411	5093	5093	4584	4584	4584
				FEED	267	241	214	214	214	334	334	334	281	281	428	428	348	348	312
	11.2	0.05D	2.5D	Vc	40	36	36	36	36	43	43	43	39	39	46	46	41	41	41
				fz	0.007	0.007	0.006	0.006	0.006	0.01	0.01	0.01	0.009	0.009	0.015	0.015	0.013	0.013	0.011
				RPM	4244	3820	3820	3820	3820	3422	3422	3422	3104	3104	2928	2928	2610	2610	2610
				FEED	119	107	92	92	92	137	137	137	112	112	176	176	136	136	115
K	15-20	0.05D	2.5D	Vc	70	63	63	63	63	75	75	75	68	68	80	80	72	72	72
				fz	0.009	0.009	0.008	0.008	0.008	0.014	0.014	0.014	0.013	0.013	0.021	0.021	0.019	0.019	0.017
				RPM	7427	6685	6685	6685	6685	5968	5968	5968	5411	5411	5093	5093	4584	4584	4584
				FEED	267	241	214	214	214	334	334	334	281	281	428	428	348	348	312
H	38.1 - 38.2	0.02D	2.0D	Vc	25	22	22	22	22	27	27	27	24	24	30	30	27	27	27
				fz	0.006	0.006	0.006	0.005	0.005	0.008	0.008	0.008	0.008	0.008	0.011	0.011	0.01	0.01	0.009
				RPM	2653	2334	2334	2334	2334	2149	2149	2149	1910	1910	1910	1910	1719	1719	1719
				FEED	64	56	56	47	47	69	69	69	61	61	84	84	69	69	62
	40	0.05D	2.5D	Vc	40	36	36	36	36	43	43	43	39	39	46	46	41	41	41
				fz	0.007	0.007	0.006	0.006	0.006	0.01	0.01	0.01	0.009	0.009	0.015	0.015	0.013	0.013	0.011
				RPM	4244	3820	3820	3820	3820	3422	3422	3422	3104	3104	2928	2928	2610	2610	2610
				FEED	119	107	92	92	92	137	137	137	112	112	176	176	136	136	115
	41	0.02D	2.0D	Vc	25	22	22	22	22	27	27	27	24	24	30	30	27	27	27
				fz	0.006	0.006	0.006	0.005	0.005	0.008	0.008	0.008	0.008	0.008	0.011	0.011	0.01	0.01	0.009
				RPM	2653	2334	2334	2334	2334	2149	2149	2149	1910	1910	1910	1910	1719	1719	1719
				FEED	64	56	56	47	47	69	69	69	61	61	84	84	69	69	62

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CARBIDE
HSS
i-Xmill END MILLS
X-1EH END MILLS
4G MILL END MILLS
X-POWER PRO END MILLS
TitaNox-POWER END MILLS
V7 PLUS END MILLS
ALU-CUT END MILLS
K-2 END MILLS
GENERAL CARBIDE END MILLS

4G MILL END MILLS

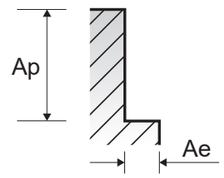
RECOMMENDED CUTTING CONDITIONS

SEME72 SERIES 4 FLUTE - SIDE CUTTING

Vc = m/min.
fz = mm /tooth
RPM = rev./min .
FEED = mm/min.
LOC = Length of Cut

VDI 3323	Parameter	Diameter (Ø)																	
		6.0	6.0	6.0	6.0	6.0	6.0	6.0	8.0	8.0	8.0	8.0	8.0	8.0	10.0	10.0	10.0	10.0	10.0	10.0
	LOC	15	20	25	30	35	40	45	25	30	35	40	45	50	30	35	40	45	50	55
1-5	Vc	83	83	83	83	75	75	75	84	84	84	84	76	76	89	89	89	89	89	80
	fz	0.029	0.029	0.029	0.025	0.025	0.022	0.022	0.041	0.041	0.041	0.035	0.035	0.031	0.049	0.049	0.049	0.042	0.042	0.041
	RPM	4403	4403	4403	4403	3979	3979	3979	3342	3342	3342	3342	3024	3024	2833	2833	2833	2833	2833	2546
	FEED	511	511	511	440	398	350	350	548	548	548	468	423	375	555	555	555	476	476	418
6-8	Vc	83	83	83	83	75	75	75	84	84	84	84	76	76	89	89	89	89	89	80
	fz	0.029	0.029	0.029	0.025	0.025	0.022	0.022	0.041	0.041	0.041	0.035	0.035	0.031	0.049	0.049	0.049	0.042	0.042	0.041
	RPM	4403	4403	4403	4403	3979	3979	3979	3342	3342	3342	3342	3024	3024	2833	2833	2833	2833	2833	2546
	FEED	511	511	511	440	398	350	350	548	548	548	468	423	375	555	555	555	476	476	418
9	Vc	48	48	48	48	43	43	43	48	48	48	48	43	43	52	52	52	52	52	46
	fz	0.021	0.021	0.021	0.018	0.018	0.016	0.016	0.028	0.028	0.028	0.024	0.024	0.021	0.033	0.033	0.033	0.028	0.028	0.028
	RPM	2546	2546	2546	2546	2281	2281	2281	1910	1910	1910	1910	1711	1711	1655	1655	1655	1655	1655	1464
	FEED	214	214	214	183	164	146	146	214	214	214	183	164	144	218	218	218	185	185	164
10 - 11.1	Vc	83	83	83	83	75	75	75	84	84	84	84	76	76	89	89	89	89	89	80
	fz	0.029	0.029	0.029	0.025	0.025	0.022	0.022	0.041	0.041	0.041	0.035	0.035	0.031	0.049	0.049	0.049	0.042	0.042	0.041
	RPM	4403	4403	4403	4403	3979	3979	3979	3342	3342	3342	3342	3024	3024	2833	2833	2833	2833	2833	2546
	FEED	511	511	511	440	398	350	350	548	548	548	468	423	375	555	555	555	476	476	418
11.2	Vc	48	48	48	48	43	43	43	48	48	48	48	43	43	52	52	52	52	52	46
	fz	0.021	0.021	0.021	0.018	0.018	0.016	0.016	0.028	0.028	0.028	0.024	0.024	0.021	0.033	0.033	0.033	0.028	0.028	0.028
	RPM	2546	2546	2546	2546	2281	2281	2281	1910	1910	1910	1910	1711	1711	1655	1655	1655	1655	1655	1464
	FEED	214	214	214	183	164	146	146	214	214	214	183	164	144	218	218	218	185	185	164
15 - 20	Vc	83	83	83	83	75	75	75	84	84	84	84	76	76	89	89	89	89	89	80
	fz	0.029	0.029	0.029	0.025	0.025	0.022	0.022	0.041	0.041	0.041	0.035	0.035	0.031	0.049	0.049	0.049	0.042	0.042	0.041
	RPM	4403	4403	4403	4403	3979	3979	3979	3342	3342	3342	3342	3024	3024	2833	2833	2833	2833	2833	2546
	FEED	511	511	511	440	398	350	350	548	548	548	468	423	375	555	555	555	476	476	418
38.1 - 38.2	Vc	31	31	31	31	28	28	28	32	32	32	32	28	28	32	32	32	32	32	29
	fz	0.017	0.017	0.017	0.014	0.014	0.013	0.013	0.022	0.022	0.022	0.018	0.019	0.017	0.027	0.027	0.027	0.022	0.022	0.023
	RPM	1645	1645	1645	1645	1485	1485	1485	1273	1273	1273	1273	1114	1114	1019	1019	1019	1019	1019	923
	FEED	112	112	112	92	83	77	77	112	112	112	92	85	76	110	110	110	90	90	85
40	Vc	48	48	48	48	43	43	43	48	48	48	48	43	43	52	52	52	52	52	46
	fz	0.021	0.021	0.021	0.018	0.018	0.016	0.016	0.028	0.028	0.028	0.024	0.024	0.021	0.033	0.033	0.033	0.028	0.028	0.028
	RPM	2546	2546	2546	2546	2281	2281	2281	1910	1910	1910	1910	1711	1711	1655	1655	1655	1655	1655	1464
	FEED	214	214	214	183	164	146	146	214	214	214	183	164	144	218	218	218	185	185	164
41	Vc	31	31	31	31	28	28	28	32	32	32	32	28	28	32	32	32	32	32	29
	fz	0.017	0.017	0.017	0.014	0.014	0.013	0.013	0.022	0.022	0.022	0.018	0.019	0.017	0.027	0.027	0.027	0.022	0.022	0.023
	RPM	1645	1645	1645	1645	1485	1485	1485	1273	1273	1273	1273	1114	1114	1019	1019	1019	1019	1019	923
	FEED	112	112	112	92	83	77	77	112	112	112	92	85	76	110	110	110	90	90	85

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4G MILL END MILLS

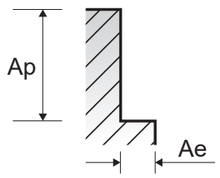
RECOMMENDED CUTTING CONDITIONS

SEME72 SERIES 4 FLUTE - SIDE CUTTING

Vc = m/min.
fz = mm /tooth
RPM = rev./min .
FEED = mm/min.
LOC = Length of Cut

ISO	VDI 3323	Ae(mm)	Ap(mm)	Parameter	Diameter (Ø)															
					10.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	14.0	14.0	16.0	16.0	16.0	16.0	
				LOC	60	35	40	45	50	55	60	65	70	50	60	40	50	60	70	
P	1-5	0.05D	2.5D	Vc	80	87	87	87	87	87	87	78	78	93	93	98	98	98	98	
				fz	0.037	0.047	0.047	0.04	0.04	0.04	0.035	0.035	0.035	0.041	0.041	0.05	0.05	0.042	0.042	
				RPM	2546	2308	2308	2308	2308	2308	2308	2069	2069	2114	2114	1950	1950	1950	1950	
				FEED	377	434	434	369	369	369	323	290	290	347	347	390	390	328	328	
	6-8	0.05D	2.5D	Vc	80	87	87	87	87	87	87	78	78	93	93	98	98	98	98	
				fz	0.037	0.047	0.047	0.04	0.04	0.04	0.035	0.035	0.035	0.041	0.041	0.05	0.05	0.042	0.042	
				RPM	2546	2308	2308	2308	2308	2308	2308	2069	2069	2114	2114	1950	1950	1950	1950	
				FEED	377	434	434	369	369	369	323	290	290	347	347	390	390	328	328	
	9	0.05D	2.5D	Vc	46	52	52	52	52	52	52	47	47	54	54	54	54	54	54	
				fz	0.024	0.034	0.034	0.03	0.03	0.03	0.026	0.026	0.026	0.029	0.029	0.035	0.035	0.03	0.03	
				RPM	1464	1379	1379	1379	1379	1379	1379	1247	1247	1228	1228	1074	1074	1074	1074	
				FEED	141	188	188	166	166	166	143	130	130	142	142	150	150	129	129	
	10-11.1	0.05D	2.5D	Vc	80	87	87	87	87	87	87	78	78	93	93	98	98	98	98	
				fz	0.037	0.047	0.047	0.04	0.04	0.04	0.035	0.035	0.035	0.041	0.041	0.05	0.05	0.042	0.042	
				RPM	2546	2308	2308	2308	2308	2308	2308	2069	2069	2114	2114	1950	1950	1950	1950	
				FEED	377	434	434	369	369	369	323	290	290	347	347	390	390	328	328	
	11.2	0.05D	2.5D	Vc	46	52	52	52	52	52	52	47	47	54	54	54	54	54	54	
				fz	0.024	0.034	0.034	0.03	0.03	0.03	0.026	0.026	0.026	0.029	0.029	0.035	0.035	0.03	0.03	
				RPM	1464	1379	1379	1379	1379	1379	1379	1247	1247	1228	1228	1074	1074	1074	1074	
				FEED	141	188	188	166	166	166	143	130	130	142	142	150	150	129	129	
K	15-20	0.05D	2.5D	Vc	80	87	87	87	87	87	87	78	78	93	93	98	98	98	98	
				fz	0.037	0.047	0.047	0.04	0.04	0.04	0.035	0.035	0.035	0.041	0.041	0.05	0.05	0.042	0.042	
				RPM	2546	2308	2308	2308	2308	2308	2308	2069	2069	2114	2114	1950	1950	1950	1950	
				FEED	377	434	434	369	369	369	323	290	290	347	347	390	390	328	328	
H	38.1 - 38.2	0.02D	2.0D	Vc	29	32	32	32	32	32	32	29	29	33	33	34	34	34	34	
				fz	0.021	0.025	0.025	0.021	0.021	0.021	0.019	0.018	0.018	0.021	0.021	0.026	0.026	0.022	0.022	
				RPM	923	849	849	849	849	849	849	769	769	750	750	676	676	676	676	
				FEED	78	85	85	71	71	71	65	55	55	63	63	70	70	60	60	
	40	0.05D	2.5D	Vc	46	52	52	52	52	52	52	47	47	54	54	54	54	54	54	
				fz	0.024	0.034	0.034	0.03	0.03	0.03	0.026	0.026	0.026	0.029	0.029	0.035	0.035	0.03	0.03	
				RPM	1464	1379	1379	1379	1379	1379	1379	1247	1247	1228	1228	1074	1074	1074	1074	
				FEED	141	188	188	166	166	166	143	130	130	142	142	150	150	129	129	
	41	0.02D	2.0D	Vc	29	32	32	32	32	32	32	29	29	33	33	34	34	34	34	
				fz	0.021	0.025	0.025	0.021	0.021	0.021	0.019	0.018	0.018	0.021	0.021	0.026	0.026	0.022	0.022	
				RPM	923	849	849	849	849	849	849	769	769	750	750	676	676	676	676	
				FEED	78	85	85	71	71	71	65	55	55	63	63	70	70	60	60	

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CARBIDE
HSS
i-Xmill END MILLS
X-1EH END MILLS
4G MILL END MILLS
X-POWER PRO END MILLS
TitaNox-POWER END MILLS
V7 PLUS END MILLS
ALU-CUT END MILLS
K-2 END MILLS
GENERAL CARBIDE END MILLS

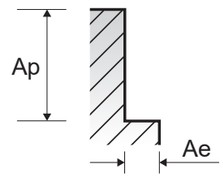
4G MILL END MILLS

RECOMMENDED CUTTING CONDITIONS

SEME72 SERIES 4 FLUTE - SIDE CUTTING

Vc = m/min.
fz = mm /tooth
RPM = rev./min .
FEED = mm/min.
LOC = Length of Cut

VDI 3323	Parameter	Diameter (Ø)																		
		16.0	16.0	16.0	16.0	18.0	18.0	18.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	22.0	22.0	25.0	25.0	25.0	25.0
	LOC	80	90	110	120	50	70	100	50	60	70	80	90	110	120	75	110	70	90	110	120
1-5	Vc	98	88	88	88	95	95	85	89	89	89	89	89	80	80	87	87	86	86	86	86
	fz	0.037	0.037	0.037	0.037	0.049	0.042	0.037	0.048	0.048	0.041	0.041	0.036	0.036	0.036	0.041	0.036	0.049	0.042	0.042	0.036
	RPM	1950	1751	1751	1751	1680	1680	1503	1416	1416	1416	1416	1416	1273	1273	1259	1259	1095	1095	1095	1095
	FEED	289	259	259	259	329	282	222	272	272	232	232	204	183	183	206	181	215	184	184	158
6-8	Vc	98	88	88	88	95	95	85	89	89	89	89	89	80	80	87	87	86	86	86	86
	fz	0.037	0.037	0.037	0.037	0.049	0.042	0.037	0.048	0.048	0.041	0.041	0.036	0.036	0.036	0.041	0.036	0.049	0.042	0.042	0.036
	RPM	1950	1751	1751	1751	1680	1680	1503	1416	1416	1416	1416	1416	1273	1273	1259	1259	1095	1095	1095	1095
	FEED	289	259	259	259	329	282	222	272	272	232	232	204	183	183	206	181	215	184	184	158
9	Vc	54	48	48	48	53	53	48	52	52	52	52	52	46	46	57	57	64	64	64	64
	fz	0.027	0.026	0.026	0.026	0.035	0.029	0.025	0.034	0.034	0.027	0.027	0.024	0.026	0.026	0.027	0.024	0.034	0.027	0.027	0.024
	RPM	1074	955	955	955	937	937	849	828	828	828	828	828	732	732	825	825	815	815	815	815
	FEED	116	99	99	99	131	109	85	113	113	89	89	79	76	76	89	79	111	88	88	78
10 - 11.1	Vc	98	88	88	88	95	95	85	89	89	89	89	89	80	80	87	87	86	86	86	86
	fz	0.037	0.037	0.037	0.037	0.049	0.042	0.037	0.048	0.048	0.041	0.041	0.036	0.036	0.036	0.041	0.036	0.049	0.042	0.042	0.036
	RPM	1950	1751	1751	1751	1680	1680	1503	1416	1416	1416	1416	1416	1273	1273	1259	1259	1095	1095	1095	1095
	FEED	289	259	259	259	329	282	222	272	272	232	232	204	183	183	206	181	215	184	184	158
11.2	Vc	54	48	48	48	53	53	48	52	52	52	52	52	46	46	57	57	64	64	64	64
	fz	0.027	0.026	0.026	0.026	0.035	0.029	0.025	0.034	0.034	0.027	0.027	0.024	0.026	0.026	0.027	0.024	0.034	0.027	0.027	0.024
	RPM	1074	955	955	955	937	937	849	828	828	828	828	828	732	732	825	825	815	815	815	815
	FEED	116	99	99	99	131	109	85	113	113	89	89	79	76	76	89	79	111	88	88	78
15 - 20	Vc	98	88	88	88	95	95	85	89	89	89	89	89	80	80	87	87	86	86	86	86
	fz	0.037	0.037	0.037	0.037	0.049	0.042	0.037	0.048	0.048	0.041	0.041	0.036	0.036	0.036	0.041	0.036	0.049	0.042	0.042	0.036
	RPM	1950	1751	1751	1751	1680	1680	1503	1416	1416	1416	1416	1416	1273	1273	1259	1259	1095	1095	1095	1095
	FEED	289	259	259	259	329	282	222	272	272	232	232	204	183	183	206	181	215	184	184	158
38.1 - 38.2	Vc	34	30	30	30	33	33	30	31	31	31	31	31	28	28	35	35	39	39	39	39
	fz	0.021	0.021	0.021	0.021	0.028	0.023	0.021	0.028	0.028	0.023	0.023	0.02	0.019	0.019	0.023	0.02	0.028	0.023	0.023	0.02
	RPM	676	597	597	597	584	584	531	493	493	493	493	493	446	446	506	506	497	497	497	497
	FEED	57	50	50	50	65	54	45	55	55	45	45	39	34	34	47	41	56	46	46	40
40	Vc	54	48	48	48	53	53	48	52	52	52	52	52	46	46	57	57	64	64	64	64
	fz	0.027	0.026	0.026	0.026	0.035	0.029	0.025	0.034	0.034	0.027	0.027	0.024	0.026	0.026	0.027	0.024	0.034	0.027	0.027	0.024
	RPM	1074	955	955	955	937	937	849	828	828	828	828	828	732	732	825	825	815	815	815	815
	FEED	116	99	99	99	131	109	85	113	113	89	89	79	76	76	89	79	111	88	88	78
41	Vc	34	30	30	30	33	33	30	31	31	31	31	31	28	28	35	35	39	39	39	39
	fz	0.021	0.021	0.021	0.021	0.028	0.023	0.021	0.028	0.028	0.023	0.023	0.02	0.019	0.019	0.023	0.02	0.028	0.023	0.023	0.02
	RPM	676	597	597	597	584	584	531	493	493	493	493	493	446	446	506	506	497	497	497	497
	FEED	57	50	50	50	65	54	45	55	55	45	45	39	34	34	47	41	56	46	46	40



4G MILL END MILLS

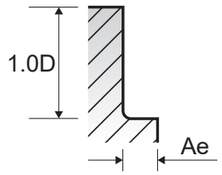
RECOMMENDED CUTTING CONDITIONS

SEME73 SERIES 4 FLUTE - SIDE CUTTING

Vc = m/min. FEED = mm/min.
fz = mm /tooth Ae = mm
RPM = rev./min. LBS = Length Below Shank

ISO	VDI 3323	Material Description	Parameter	Diameter (Ø)															
				1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
			LBS	2	3	4	5	6	7	8	10	12	14	16	18	20	22	26	30	40
P	1-5	Non-alloy steel	Vc	69	69	69	69	62	62	62	62	55	55	41	41	41	21	21	21	7
			fz	0.004	0.004	0.004	0.004	0.003	0.003	0.003	0.003	0.003	0.003	0.002	0.002	0.002	0.002	0.002	0.002	0.002
			RPM	21963	21963	21963	21963	19735	19735	19735	19735	17507	17507	13051	13051	13051	6685	6685	6685	2228
			FEED	351	351	351	351	237	237	237	237	210	210	104	104	104	53	53	53	18
			Ae	0.021	0.021	0.015	0.015	0.008	0.008	0.008	0.005	0.005	0.003	0.003	0.002	0.002	0.002	0.002	0.002	0.002
	6-8	Low alloy steel	Vc	69	69	69	69	62	62	62	62	55	55	41	41	41	21	21	21	7
			fz	0.004	0.004	0.004	0.004	0.003	0.003	0.003	0.003	0.003	0.003	0.002	0.002	0.002	0.002	0.002	0.002	0.002
			RPM	21963	21963	21963	21963	19735	19735	19735	19735	17507	17507	13051	13051	13051	6685	6685	6685	2228
			FEED	351	351	351	351	237	237	237	237	210	210	104	104	104	53	53	53	18
			Ae	0.021	0.021	0.015	0.015	0.008	0.008	0.008	0.005	0.005	0.003	0.003	0.002	0.002	0.002	0.002	0.002	0.002
	9		Vc	42	42	42	42	38	38	38	38	34	34	25	25	25	13	13	13	4
			fz	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.002	0.002	0.002	0.002	0.002	0.002	0.002
			RPM	13369	13369	13369	13369	12096	12096	12096	12096	10823	10823	7958	7958	7958	4138	4138	4138	1273
			FEED	160	160	160	160	145	145	145	145	130	130	64	64	64	33	33	33	10
			Ae	0.016	0.016	0.011	0.011	0.006	0.006	0.006	0.004	0.004	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002
	10-11.1	High alloyed steel, and tool steel	Vc	69	69	69	69	62	62	62	62	55	55	41	41	41	21	21	21	7
			fz	0.004	0.004	0.004	0.004	0.003	0.003	0.003	0.003	0.003	0.003	0.002	0.002	0.002	0.002	0.002	0.002	0.002
			RPM	21963	21963	21963	21963	19735	19735	19735	19735	17507	17507	13051	13051	13051	6685	6685	6685	2228
			FEED	351	351	351	351	237	237	237	237	210	210	104	104	104	53	53	53	18
			Ae	0.021	0.021	0.015	0.015	0.008	0.008	0.008	0.005	0.005	0.003	0.003	0.002	0.002	0.002	0.002	0.002	0.002
	11.2		Vc	42	42	42	42	38	38	38	38	34	34	25	25	25	13	13	13	4
			fz	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.002	0.002	0.002	0.002	0.002	0.002	0.002
			RPM	13369	13369	13369	13369	12096	12096	12096	12096	10823	10823	7958	7958	7958	4138	4138	4138	1273
			FEED	160	160	160	160	145	145	145	145	130	130	64	64	64	33	33	33	10
			Ae	0.016	0.016	0.011	0.011	0.006	0.006	0.006	0.004	0.004	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002
K	15-20	Grey cast iron Nodular cast iron Malleable cast iron	Vc	69	69	69	69	62	62	62	62	55	55	41	41	41	21	21	21	7
			fz	0.004	0.004	0.004	0.004	0.003	0.003	0.003	0.003	0.003	0.003	0.002	0.002	0.002	0.002	0.002	0.002	0.002
			RPM	21963	21963	21963	21963	19735	19735	19735	19735	17507	17507	13051	13051	13051	6685	6685	6685	2228
			FEED	351	351	351	351	237	237	237	237	210	210	104	104	104	53	53	53	18
			Ae	0.021	0.021	0.015	0.015	0.008	0.008	0.008	0.005	0.005	0.003	0.003	0.002	0.002	0.002	0.002	0.002	0.002
H	38.1 - 38.2	Hardened steel	Vc	27	27	27	27	24	24	24	24	21	21	16	16	16	8	8	8	3
			fz	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001
			RPM	8594	8594	8594	8594	7639	7639	7639	7639	6685	6685	5093	5093	5093	2546	2546	2546	955
			FEED	34	34	34	34	31	31	31	31	27	27	20	20	20	10	10	10	4
			Ae	0.013	0.013	0.009	0.009	0.005	0.005	0.005	0.003	0.003	0.002	0.002	0.001	0.001	0.001	0.001	0.001	0.001
	40	Chilled Cast Iron	Vc	42	42	42	42	38	38	38	38	34	34	25	25	25	13	13	13	4
			fz	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.002	0.002	0.002	0.002	0.002	0.002	0.002
			RPM	13369	13369	13369	13369	12096	12096	12096	12096	10823	10823	7958	7958	7958	4138	4138	4138	1273
			FEED	160	160	160	160	145	145	145	145	130	130	64	64	64	33	33	33	10
			Ae	0.016	0.016	0.011	0.011	0.006	0.006	0.006	0.004	0.004	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002
	41	Hardened Cast Iron	Vc	27	27	27	27	24	24	24	24	21	21	16	16	16	8	8	8	3
			fz	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001
			RPM	8594	8594	8594	8594	7639	7639	7639	7639	6685	6685	5093	5093	5093	2546	2546	2546	955
			FEED	34	34	34	34	31	31	31	31	27	27	20	20	20	10	10	10	4
			Ae	0.013	0.013	0.009	0.009	0.005	0.005	0.005	0.003	0.003	0.002	0.002	0.001	0.001	0.001	0.001	0.001	0.001

▶ NEXT PAGE



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4G MILL END MILLS

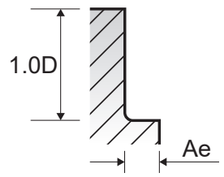
RECOMMENDED CUTTING CONDITIONS

SEME73 SERIES 4 FLUTE - SIDE CUTTING

Vc = m/min. FEED = mm/min.
fz = mm /tooth Ae = mm
RPM = rev./min. LBS = Length Below Shank

VDI 3323	Parameter	Diameter (Ø)																		
		1.0	1.2	1.2	1.2	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	1.5
	LBS	50	4	6	8	10	12	14	16	20	26	30	4	5	6	7	8	10	12	14	16	18	20
1-5	Vc	7	74	74	66	66	66	59	59	44	22	22	80	80	80	80	72	72	72	72	64	64	64
	fz	0.002	0.004	0.004	0.004	0.004	0.004	0.003	0.003	0.003	0.002	0.002	0.005	0.005	0.005	0.005	0.004	0.004	0.004	0.004	0.004	0.004	0.004
	RPM	2228	19629	19629	17507	17507	17507	15650	15650	11671	5836	5836	16977	16977	16977	16977	15279	15279	15279	15279	13581	13581	13581
	FEED	18	314	314	280	280	280	188	188	140	47	47	340	340	340	340	244	244	244	244	217	217	217
	Ae	0.002	0.018	0.018	0.01	0.006	0.006	0.006	0.004	0.003	0.003	0.003	0.032	0.022	0.022	0.022	0.013	0.013	0.013	0.008	0.008	0.008	0.005
6-8	Vc	7	74	74	66	66	66	59	59	44	22	22	80	80	80	80	72	72	72	72	64	64	64
	fz	0.002	0.004	0.004	0.004	0.004	0.004	0.003	0.003	0.003	0.002	0.002	0.005	0.005	0.005	0.005	0.004	0.004	0.004	0.004	0.004	0.004	0.004
	RPM	2228	19629	19629	17507	17507	17507	15650	15650	11671	5836	5836	16977	16977	16977	16977	15279	15279	15279	15279	13581	13581	13581
	FEED	18	314	314	280	280	280	188	188	140	47	47	340	340	340	340	244	244	244	244	217	217	217
	Ae	0.002	0.018	0.018	0.01	0.006	0.006	0.006	0.004	0.003	0.003	0.003	0.032	0.022	0.022	0.022	0.013	0.013	0.013	0.008	0.008	0.008	0.005
9	Vc	4	46	46	41	41	41	36	36	27	14	14	50	50	50	50	45	45	45	45	40	40	40
	fz	0.002	0.004	0.004	0.003	0.003	0.003	0.003	0.003	0.003	0.002	0.002	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004
	RPM	1273	12202	12202	10876	10876	10876	9549	9549	7162	3714	3714	10610	10610	10610	10610	9549	9549	9549	9549	8488	8488	8488
	FEED	10	195	195	131	131	131	115	115	86	30	30	170	170	170	170	153	153	153	153	136	136	136
	Ae	0.002	0.013	0.013	0.008	0.005	0.005	0.005	0.003	0.002	0.002	0.002	0.024	0.017	0.017	0.017	0.009	0.009	0.009	0.006	0.006	0.006	0.004
10 - 11.1	Vc	7	74	74	66	66	66	59	59	44	22	22	80	80	80	80	72	72	72	72	64	64	64
	fz	0.002	0.004	0.004	0.004	0.004	0.004	0.003	0.003	0.003	0.002	0.002	0.005	0.005	0.005	0.005	0.004	0.004	0.004	0.004	0.004	0.004	0.004
	RPM	2228	19629	19629	17507	17507	17507	15650	15650	11671	5836	5836	16977	16977	16977	16977	15279	15279	15279	15279	13581	13581	13581
	FEED	18	314	314	280	280	280	188	188	140	47	47	340	340	340	340	244	244	244	244	217	217	217
	Ae	0.002	0.018	0.018	0.01	0.006	0.006	0.006	0.004	0.003	0.003	0.003	0.032	0.022	0.022	0.022	0.013	0.013	0.013	0.008	0.008	0.008	0.005
11.2	Vc	4	46	46	41	41	41	36	36	27	14	14	50	50	50	50	45	45	45	45	40	40	40
	fz	0.002	0.004	0.004	0.003	0.003	0.003	0.003	0.003	0.003	0.002	0.002	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004
	RPM	1273	12202	12202	10876	10876	10876	9549	9549	7162	3714	3714	10610	10610	10610	10610	9549	9549	9549	9549	8488	8488	8488
	FEED	10	195	195	131	131	131	115	115	86	30	30	170	170	170	170	153	153	153	153	136	136	136
	Ae	0.002	0.013	0.013	0.008	0.005	0.005	0.005	0.003	0.002	0.002	0.002	0.024	0.017	0.017	0.017	0.009	0.009	0.009	0.006	0.006	0.006	0.004
15 - 20	Vc	7	74	74	66	66	66	59	59	44	22	22	80	80	80	80	72	72	72	72	64	64	64
	fz	0.002	0.004	0.004	0.004	0.004	0.004	0.003	0.003	0.003	0.002	0.002	0.005	0.005	0.005	0.005	0.004	0.004	0.004	0.004	0.004	0.004	0.004
	RPM	2228	19629	19629	17507	17507	17507	15650	15650	11671	5836	5836	16977	16977	16977	16977	15279	15279	15279	15279	13581	13581	13581
	FEED	18	314	314	280	280	280	188	188	140	47	47	340	340	340	340	244	244	244	244	217	217	217
	Ae	0.002	0.018	0.018	0.01	0.006	0.006	0.006	0.004	0.003	0.003	0.003	0.032	0.022	0.022	0.022	0.013	0.013	0.013	0.008	0.008	0.008	0.005
38.1 - 38.2	Vc	3	28	28	25	25	25	23	23	17	8	8	31	31	31	31	28	28	28	28	25	25	25
	fz	0.001	0.002	0.002	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.001	0.001	0.001
	RPM	955	7427	7427	6631	6631	6631	6101	6101	4509	2122	2122	6578	6578	6578	6578	5942	5942	5942	5942	5305	5305	5305
	FEED	4	59	59	27	27	27	24	24	18	8	8	53	53	53	53	48	48	48	48	21	21	21
	Ae	0.001	0.011	0.011	0.006	0.004	0.004	0.004	0.002	0.002	0.002	0.002	0.019	0.013	0.013	0.013	0.008	0.008	0.008	0.005	0.005	0.005	0.003
40	Vc	4	46	46	41	41	41	36	36	27	14	14	50	50	50	50	45	45	45	45	40	40	40
	fz	0.002	0.004	0.004	0.003	0.003	0.003	0.003	0.003	0.003	0.002	0.002	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004
	RPM	1273	12202	12202	10876	10876	10876	9549	9549	7162	3714	3714	10610	10610	10610	10610	9549	9549	9549	9549	8488	8488	8488
	FEED	10	195	195	131	131	131	115	115	86	30	30	170	170	170	170	153	153	153	153	136	136	136
	Ae	0.002	0.013	0.013	0.008	0.005	0.005	0.005	0.003	0.002	0.002	0.002	0.024	0.017	0.017	0.017	0.009	0.009	0.009	0.006	0.006	0.006	0.004
41	Vc	3	28	28	25	25	25	23	23	17	8	8	31	31	31	31	28	28	28	28	25	25	25
	fz	0.001	0.002	0.002	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.001	0.001	0.001
	RPM	955	7427	7427	6631	6631	6631	6101	6101	4509	2122	2122	6578	6578	6578	6578	5942	5942	5942	5942	5305	5305	5305
	FEED	4	59	59	27	27	27	24	24	18	8	8	53	53	53	53	48	48	48	48	21	21	21
	Ae	0.001	0.011	0.011	0.006	0.004	0.004	0.004	0.002	0.002	0.002	0.002	0.019	0.013	0.013	0.013	0.008	0.008	0.008	0.005	0.005	0.005	0.003

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4G MILL END MILLS

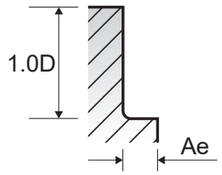
RECOMMENDED CUTTING CONDITIONS

SEME73 SERIES 4 FLUTE - SIDE CUTTING

Vc = m/min. FEED = mm/min.
fz = mm /tooth Ae = mm
RPM = rev./min. LBS = Length Below Shank

ISO	VDI 3323	Parameter	Diameter (Ø)																		
			1.5	1.5	1.5	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.5	2.5
		LBS	22	26	30	6	8	10	12	16	18	20	22	26	30	35	40	45	50	60	8	10
P	1-5	Vc	64	48	48	87	87	87	79	79	79	79	70	70	70	52	52	26	26	26	94	94
		fz	0.004	0.003	0.003	0.006	0.006	0.006	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.004	0.004	0.004	0.004	0.004	0.007	0.007
		RPM	13581	10186	10186	13846	13846	13846	12573	12573	12573	12573	11141	11141	11141	8276	8276	4138	4138	4138	11968	11968
		FEED	217	122	122	332	332	332	251	251	251	251	223	223	223	132	132	66	66	66	335	335
		Ae	0.005	0.003	0.003	0.042	0.029	0.029	0.017	0.017	0.011	0.011	0.011	0.011	0.006	0.004	0.004	0.004	0.004	0.004	0.037	0.037
	6-8	Vc	64	48	48	87	87	87	79	79	79	79	70	70	70	52	52	26	26	26	94	94
		fz	0.004	0.003	0.003	0.006	0.006	0.006	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.004	0.004	0.004	0.004	0.004	0.007	0.007
		RPM	13581	10186	10186	13846	13846	13846	12573	12573	12573	12573	11141	11141	11141	8276	8276	4138	4138	4138	11968	11968
		FEED	217	122	122	332	332	332	251	251	251	251	223	223	223	132	132	66	66	66	335	335
		Ae	0.005	0.003	0.003	0.042	0.029	0.029	0.017	0.017	0.011	0.011	0.011	0.011	0.006	0.004	0.004	0.004	0.004	0.004	0.037	0.037
	9	Vc	40	30	30	57	57	57	51	51	51	51	46	46	46	34	34	17	17	17	60	60
		fz	0.004	0.003	0.003	0.006	0.006	0.006	0.005	0.005	0.005	0.005	0.004	0.004	0.004	0.004	0.004	0.003	0.003	0.003	0.007	0.007
		RPM	8488	6366	6366	9072	9072	9072	8117	8117	8117	8117	7321	7321	7321	5411	5411	2706	2706	2706	7639	7639
		FEED	136	76	76	218	218	218	162	162	162	162	117	117	117	87	87	32	32	32	214	214
		Ae	0.004	0.002	0.002	0.032	0.022	0.022	0.013	0.013	0.008	0.008	0.008	0.008	0.005	0.003	0.003	0.003	0.003	0.003	0.028	0.028
	10-11.1	Vc	64	48	48	87	87	87	79	79	79	79	70	70	70	52	52	26	26	26	94	94
		fz	0.004	0.003	0.003	0.006	0.006	0.006	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.004	0.004	0.004	0.004	0.004	0.007	0.007
		RPM	13581	10186	10186	13846	13846	13846	12573	12573	12573	12573	11141	11141	11141	8276	8276	4138	4138	4138	11968	11968
		FEED	217	122	122	332	332	332	251	251	251	251	223	223	223	132	132	66	66	66	335	335
		Ae	0.005	0.003	0.003	0.042	0.029	0.029	0.017	0.017	0.011	0.011	0.011	0.011	0.006	0.004	0.004	0.004	0.004	0.004	0.037	0.037
	11.2	Vc	40	30	30	57	57	57	51	51	51	51	46	46	46	34	34	17	17	17	60	60
		fz	0.004	0.003	0.003	0.006	0.006	0.006	0.005	0.005	0.005	0.005	0.004	0.004	0.004	0.004	0.004	0.003	0.003	0.003	0.007	0.007
		RPM	8488	6366	6366	9072	9072	9072	8117	8117	8117	8117	7321	7321	7321	5411	5411	2706	2706	2706	7639	7639
		FEED	136	76	76	218	218	218	162	162	162	162	117	117	117	87	87	32	32	32	214	214
		Ae	0.004	0.002	0.002	0.032	0.022	0.022	0.013	0.013	0.008	0.008	0.008	0.008	0.005	0.003	0.003	0.003	0.003	0.003	0.028	0.028
K	15-20	Vc	64	48	48	87	87	87	79	79	79	79	70	70	70	52	52	26	26	26	94	94
		fz	0.004	0.003	0.003	0.006	0.006	0.006	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.004	0.004	0.004	0.004	0.004	0.007	0.007
		RPM	13581	10186	10186	13846	13846	13846	12573	12573	12573	12573	11141	11141	11141	8276	8276	4138	4138	4138	11968	11968
		FEED	217	122	122	332	332	332	251	251	251	251	223	223	223	132	132	66	66	66	335	335
		Ae	0.005	0.003	0.003	0.042	0.029	0.029	0.017	0.017	0.011	0.011	0.011	0.011	0.006	0.004	0.004	0.004	0.004	0.004	0.037	0.037
H	38.1 - 38.2	Vc	25	18	18	38	38	38	34	34	34	34	30	30	30	23	23	11	11	11	35	35
		fz	0.001	0.001	0.001	0.003	0.003	0.003	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.001	0.001	0.001	0.003	0.003
		RPM	5305	3820	3820	6048	6048	6048	5411	5411	5411	5411	4775	4775	4775	3661	3661	1751	1751	1751	4456	4456
		FEED	21	15	15	73	73	73	43	43	43	43	38	38	38	29	29	7	7	7	53	53
		Ae	0.003	0.002	0.002	0.025	0.018	0.018	0.01	0.01	0.006	0.006	0.006	0.006	0.004	0.003	0.003	0.003	0.003	0.003	0.022	0.022
	40	Vc	40	30	30	57	57	57	51	51	51	51	46	46	46	34	34	17	17	17	60	60
		fz	0.004	0.003	0.003	0.006	0.006	0.006	0.005	0.005	0.005	0.005	0.004	0.004	0.004	0.004	0.004	0.003	0.003	0.003	0.007	0.007
		RPM	8488	6366	6366	9072	9072	9072	8117	8117	8117	8117	7321	7321	7321	5411	5411	2706	2706	2706	7639	7639
		FEED	136	76	76	218	218	218	162	162	162	162	117	117	117	87	87	32	32	32	214	214
		Ae	0.004	0.002	0.002	0.032	0.022	0.022	0.013	0.013	0.008	0.008	0.008	0.008	0.005	0.003	0.003	0.003	0.003	0.003	0.028	0.028
	41	Vc	25	18	18	38	38	38	34	34	34	34	30	30	30	23	23	11	11	11	35	35
		fz	0.001	0.001	0.001	0.003	0.003	0.003	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.001	0.001	0.001	0.003	0.003
		RPM	5305	3820	3820	6048	6048	6048	5411	5411	5411	5411	4775	4775	4775	3661	3661	1751	1751	1751	4456	4456
		FEED	21	15	15	73	73	73	43	43	43	43	38	38	38	29	29	7	7	7	53	53
		Ae	0.003	0.002	0.002	0.025	0.018	0.018	0.01	0.01	0.006	0.006	0.006	0.006	0.004	0.003	0.003	0.003	0.003	0.003	0.022	0.022

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4G MILL END MILLS

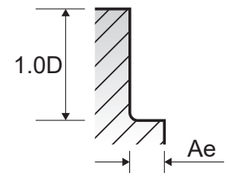
RECOMMENDED CUTTING CONDITIONS

SEME73 SERIES 4 FLUTE - SIDE CUTTING

Vc = m/min. FEED = mm/min.
fz = mm /tooth Ae = mm
RPM = rev./min. LBS = Length Below Shank

VDI 3323	Parameter	Diameter (Ø)																			
		2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
	LBS	12	14	16	18	20	22	26	30	35	40	45	50	6	8	10	12	14	16	18	20	22	26
1-5	Vc	94	85	85	85	85	85	75	75	75	57	57	57	101	101	101	101	101	91	91	91	91	91
	fz	0.007	0.007	0.007	0.007	0.007	0.007	0.006	0.006	0.006	0.005	0.005	0.005	0.009	0.009	0.009	0.009	0.009	0.008	0.008	0.008	0.008	0.008
	RPM	11968	10823	10823	10823	10823	10823	9549	9549	9549	7257	7257	7257	10716	10716	10716	10716	10716	9655	9655	9655	9655	9655
	FEED	335	303	303	303	303	303	229	229	229	145	145	145	386	386	386	386	386	309	309	309	309	309
	Ae	0.037	0.021	0.021	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	0.044	0.025	0.025	0.025	0.025	0.016
6-8	Vc	94	85	85	85	85	85	75	75	75	57	57	57	101	101	101	101	101	91	91	91	91	91
	fz	0.007	0.007	0.007	0.007	0.007	0.007	0.006	0.006	0.006	0.005	0.005	0.005	0.009	0.009	0.009	0.009	0.009	0.008	0.008	0.008	0.008	0.008
	RPM	11968	10823	10823	10823	10823	10823	9549	9549	9549	7257	7257	7257	10716	10716	10716	10716	10716	9655	9655	9655	9655	9655
	FEED	335	303	303	303	303	303	229	229	229	145	145	145	386	386	386	386	386	309	309	309	309	309
	Ae	0.037	0.021	0.021	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	0.044	0.025	0.025	0.025	0.025	0.016
9	Vc	60	54	54	54	54	54	48	48	48	36	36	36	63	63	63	63	63	57	57	57	57	57
	fz	0.007	0.007	0.007	0.007	0.007	0.007	0.006	0.006	0.006	0.005	0.005	0.005	0.009	0.009	0.009	0.009	0.009	0.008	0.008	0.008	0.008	0.008
	RPM	7639	6875	6875	6875	6875	6875	6112	6112	6112	4584	4584	4584	6685	6685	6685	6685	6685	6048	6048	6048	6048	6048
	FEED	214	193	193	193	193	193	147	147	147	92	92	92	241	241	241	241	241	194	194	194	194	194
	Ae	0.028	0.016	0.016	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	0.033	0.019	0.019	0.019	0.019	0.012
10 - 11.1	Vc	94	85	85	85	85	85	75	75	75	57	57	57	101	101	101	101	101	91	91	91	91	91
	fz	0.007	0.007	0.007	0.007	0.007	0.007	0.006	0.006	0.006	0.005	0.005	0.005	0.009	0.009	0.009	0.009	0.009	0.008	0.008	0.008	0.008	0.008
	RPM	11968	10823	10823	10823	10823	10823	9549	9549	9549	7257	7257	7257	10716	10716	10716	10716	10716	9655	9655	9655	9655	9655
	FEED	335	303	303	303	303	303	229	229	229	145	145	145	386	386	386	386	386	309	309	309	309	309
	Ae	0.037	0.021	0.021	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	0.044	0.025	0.025	0.025	0.025	0.016
11.2	Vc	60	54	54	54	54	54	48	48	48	36	36	36	63	63	63	63	63	57	57	57	57	57
	fz	0.007	0.007	0.007	0.007	0.007	0.007	0.006	0.006	0.006	0.005	0.005	0.005	0.009	0.009	0.009	0.009	0.009	0.008	0.008	0.008	0.008	0.008
	RPM	7639	6875	6875	6875	6875	6875	6112	6112	6112	4584	4584	4584	6685	6685	6685	6685	6685	6048	6048	6048	6048	6048
	FEED	214	193	193	193	193	193	147	147	147	92	92	92	241	241	241	241	241	194	194	194	194	194
	Ae	0.028	0.016	0.016	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	0.033	0.019	0.019	0.019	0.019	0.012
15 - 20	Vc	94	85	85	85	85	85	75	75	75	57	57	57	101	101	101	101	101	91	91	91	91	91
	fz	0.007	0.007	0.007	0.007	0.007	0.007	0.006	0.006	0.006	0.005	0.005	0.005	0.009	0.009	0.009	0.009	0.009	0.008	0.008	0.008	0.008	0.008
	RPM	11968	10823	10823	10823	10823	10823	9549	9549	9549	7257	7257	7257	10716	10716	10716	10716	10716	9655	9655	9655	9655	9655
	FEED	335	303	303	303	303	303	229	229	229	145	145	145	386	386	386	386	386	309	309	309	309	309
	Ae	0.037	0.021	0.021	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	0.044	0.025	0.025	0.025	0.025	0.016
38.1 - 38.2	Vc	35	32	32	32	32	32	28	28	28	21	21	21	38	38	38	38	38	34	34	34	34	34
	fz	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.002	0.002	0.002	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004
	RPM	4456	4074	4074	4074	4074	4074	3565	3565	3565	2674	2674	2674	4032	4032	4032	4032	4032	3608	3608	3608	3608	3608
	FEED	53	49	49	49	49	49	43	43	43	21	21	21	65	65	65	65	65	58	58	58	58	58
	Ae	0.022	0.013	0.013	0.013	0.013	0.008	0.008	0.008	0.005	0.005	0.003	0.003	0.038	0.038	0.026	0.026	0.026	0.015	0.015	0.015	0.015	0.009
40	Vc	60	54	54	54	54	54	48	48	48	36	36	36	63	63	63	63	63	57	57	57	57	57
	fz	0.007	0.007	0.007	0.007	0.007	0.007	0.006	0.006	0.006	0.005	0.005	0.005	0.009	0.009	0.009	0.009	0.009	0.008	0.008	0.008	0.008	0.008
	RPM	7639	6875	6875	6875	6875	6875	6112	6112	6112	4584	4584	4584	6685	6685	6685	6685	6685	6048	6048	6048	6048	6048
	FEED	214	193	193	193	193	193	147	147	147	92	92	92	241	241	241	241	241	194	194	194	194	194
	Ae	0.028	0.016	0.016	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	0.033	0.019	0.019	0.019	0.019	0.012
41	Vc	35	32	32	32	32	32	28	28	28	21	21	21	38	38	38	38	38	34	34	34	34	34
	fz	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.002	0.002	0.002	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004
	RPM	4456	4074	4074	4074	4074	4074	3565	3565	3565	2674	2674	2674	4032	4032	4032	4032	4032	3608	3608	3608	3608	3608
	FEED	53	49	49	49	49	49	43	43	43	21	21	21	65	65	65	65	65	58	58	58	58	58
	Ae	0.022	0.013	0.013	0.013	0.013	0.008	0.008	0.008	0.005	0.005	0.003	0.003	0.038	0.038	0.026	0.026	0.026	0.015	0.015	0.015	0.015	0.009

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4G MILL END MILLS

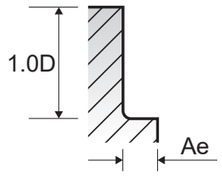
RECOMMENDED CUTTING CONDITIONS

SEME73 SERIES 4 FLUTE - SIDE CUTTING

Vc = m/min. FEED = mm/min.
f z = mm/tooth Ae = mm
RPM = rev./min. LBS = Length Below Shank

ISO	VDI 3323	Parameter	Diameter (Ø)																			
			3.0	3.0	3.0	3.0	3.0	3.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
			LBS	30	35	40	45	50	60	8	10	12	14	16	18	20	22	26	30	35	40	45	50
P	1-5	Vc	91	81	81	81	61	61	114	114	114	114	114	114	114	103	103	103	103	103	91	91
		fz	0.008	0.007	0.007	0.007	0.006	0.006	0.019	0.019	0.019	0.019	0.019	0.019	0.019	0.017	0.017	0.017	0.017	0.017	0.015	0.015
		RPM	9655	8594	8594	8594	6472	6472	9072	9072	9072	9072	9072	9072	9072	8196	8196	8196	8196	8196	7242	7242
		FEED	309	241	241	241	155	155	689	689	689	689	689	689	689	557	557	557	557	557	434	434
		Ae	0.016	0.016	0.009	0.009	0.006	0.006	0.084	0.084	0.084	0.059	0.059	0.059	0.059	0.034	0.034	0.034	0.021	0.021	0.021	0.021
	6-8	Vc	91	81	81	81	61	61	114	114	114	114	114	114	114	103	103	103	103	103	91	91
		fz	0.008	0.007	0.007	0.007	0.006	0.006	0.019	0.019	0.019	0.019	0.019	0.019	0.019	0.017	0.017	0.017	0.017	0.017	0.015	0.015
		RPM	9655	8594	8594	8594	6472	6472	9072	9072	9072	9072	9072	9072	9072	8196	8196	8196	8196	8196	7242	7242
		FEED	309	241	241	241	155	155	689	689	689	689	689	689	689	557	557	557	557	557	434	434
		Ae	0.016	0.016	0.009	0.009	0.006	0.006	0.084	0.084	0.084	0.059	0.059	0.059	0.059	0.034	0.034	0.034	0.021	0.021	0.021	0.021
	9	Vc	57	50	50	50	38	38	70	70	70	70	70	70	70	63	63	63	63	63	56	56
		fz	0.008	0.007	0.007	0.007	0.006	0.006	0.019	0.019	0.019	0.019	0.019	0.019	0.019	0.017	0.017	0.017	0.017	0.017	0.015	0.015
		RPM	6048	5305	5305	5305	4032	4032	5570	5570	5570	5570	5570	5570	5570	5013	5013	5013	5013	5013	4456	4456
		FEED	194	149	149	149	97	97	423	423	423	423	423	423	423	341	341	341	341	341	267	267
		Ae	0.012	0.012	0.007	0.007	0.005	0.005	0.063	0.063	0.063	0.044	0.044	0.044	0.044	0.025	0.025	0.025	0.016	0.016	0.016	0.016
	10-11.1	Vc	91	81	81	81	61	61	114	114	114	114	114	114	114	103	103	103	103	103	91	91
		fz	0.008	0.007	0.007	0.007	0.006	0.006	0.019	0.019	0.019	0.019	0.019	0.019	0.019	0.017	0.017	0.017	0.017	0.017	0.015	0.015
		RPM	9655	8594	8594	8594	6472	6472	9072	9072	9072	9072	9072	9072	9072	8196	8196	8196	8196	8196	7242	7242
		FEED	309	241	241	241	155	155	689	689	689	689	689	689	689	557	557	557	557	557	434	434
		Ae	0.016	0.016	0.009	0.009	0.006	0.006	0.084	0.084	0.084	0.059	0.059	0.059	0.059	0.034	0.034	0.034	0.021	0.021	0.021	0.021
	11.2	Vc	57	50	50	50	38	38	70	70	70	70	70	70	70	63	63	63	63	63	56	56
		fz	0.008	0.007	0.007	0.007	0.006	0.006	0.019	0.019	0.019	0.019	0.019	0.019	0.019	0.017	0.017	0.017	0.017	0.017	0.015	0.015
		RPM	6048	5305	5305	5305	4032	4032	5570	5570	5570	5570	5570	5570	5570	5013	5013	5013	5013	5013	4456	4456
		FEED	194	149	149	149	97	97	423	423	423	423	423	423	423	341	341	341	341	341	267	267
		Ae	0.012	0.012	0.007	0.007	0.005	0.005	0.063	0.063	0.063	0.044	0.044	0.044	0.044	0.025	0.025	0.025	0.016	0.016	0.016	0.016
K	15-20	Vc	91	81	81	81	61	61	114	114	114	114	114	114	114	103	103	103	103	103	91	91
		fz	0.008	0.007	0.007	0.007	0.006	0.006	0.019	0.019	0.019	0.019	0.019	0.019	0.019	0.017	0.017	0.017	0.017	0.017	0.015	0.015
		RPM	9655	8594	8594	8594	6472	6472	9072	9072	9072	9072	9072	9072	9072	8196	8196	8196	8196	8196	7242	7242
		FEED	309	241	241	241	155	155	689	689	689	689	689	689	689	557	557	557	557	557	434	434
		Ae	0.016	0.016	0.009	0.009	0.006	0.006	0.084	0.084	0.084	0.059	0.059	0.059	0.059	0.034	0.034	0.034	0.021	0.021	0.021	0.021
H	38.1 - 38.2	Vc	34	30	30	30	23	23	44	44	44	44	44	44	44	40	40	40	40	40	35	35
		fz	0.004	0.003	0.003	0.003	0.003	0.003	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.004	0.004	0.004	0.004	0.004	0.004	0.004
		RPM	3608	3183	3183	3183	2440	2440	3501	3501	3501	3501	3501	3501	3501	3183	3183	3183	3183	3183	2785	2785
		FEED	58	38	38	38	29	29	70	70	70	70	70	70	70	51	51	51	51	51	45	45
		Ae	0.009	0.009	0.006	0.006	0.004	0.004	0.05	0.05	0.05	0.035	0.035	0.035	0.035	0.02	0.02	0.02	0.013	0.013	0.013	0.013
	40	Vc	57	50	50	50	38	38	70	70	70	70	70	70	70	63	63	63	63	63	56	56
		fz	0.008	0.007	0.007	0.007	0.006	0.006	0.019	0.019	0.019	0.019	0.019	0.019	0.019	0.017	0.017	0.017	0.017	0.017	0.015	0.015
		RPM	6048	5305	5305	5305	4032	4032	5570	5570	5570	5570	5570	5570	5570	5013	5013	5013	5013	5013	4456	4456
		FEED	194	149	149	149	97	97	423	423	423	423	423	423	423	341	341	341	341	341	267	267
		Ae	0.012	0.012	0.007	0.007	0.005	0.005	0.063	0.063	0.063	0.044	0.044	0.044	0.044	0.025	0.025	0.025	0.016	0.016	0.016	0.016
	41	Vc	34	30	30	30	23	23	44	44	44	44	44	44	44	40	40	40	40	40	35	35
		fz	0.004	0.003	0.003	0.003	0.003	0.003	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.004	0.004	0.004	0.004	0.004	0.004	0.004
		RPM	3608	3183	3183	3183	2440	2440	3501	3501	3501	3501	3501	3501	3501	3183	3183	3183	3183	3183	2785	2785
		FEED	58	38	38	38	29	29	70	70	70	70	70	70	70	51	51	51	51	51	45	45
		Ae	0.009	0.009	0.006	0.006	0.004	0.004	0.05	0.05	0.05	0.035	0.035	0.035	0.035	0.02	0.02	0.02	0.013	0.013	0.013	0.013

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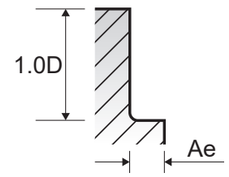
4G MILL END MILLS

RECOMMENDED CUTTING CONDITIONS

SEME73 SERIES 4 FLUTE - SIDE CUTTING

Vc = m/min. FEED = mm/min.
fz = mm /tooth Ae = mm
RPM = rev./min. LBS = Length Below Shank

VDI 3323	Parameter	Diameter (Ø)																				
		4.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	6.0	6.0	6.0	6.0	8.0	8.0	8.0	10.0	10.0	10.0	12.0	12.0	12.0
	LBS	60	16	20	26	30	35	40	50	60	15	20	30	32	25	30	42	30	35	45	35	40	50
1-5	Vc	91	119	119	107	107	107	107	107	95	126	126	126	113	127	127	114	123	123	123	124	124	124
	fz	0.015	0.024	0.024	0.022	0.022	0.022	0.022	0.022	0.019	0.03	0.03	0.03	0.027	0.042	0.042	0.038	0.047	0.047	0.047	0.047	0.047	0.047
	RPM	7242	7576	7576	6812	6812	6812	6812	6812	6048	6685	6685	6685	5995	5053	5053	4536	3915	3915	3915	3289	3289	3289
	FEED	434	727	727	599	599	599	599	599	460	802	802	802	647	849	849	689	736	736	736	618	618	618
	Ae	0.013	0.074	0.074	0.042	0.042	0.042	0.042	0.026	0.026	0.126	0.088	0.088	0.05	0.118	0.118	0.067	0.21	0.147	0.147	0.252	0.176	0.176
6-8	Vc	91	119	119	107	107	107	107	107	95	126	126	126	113	127	127	114	123	123	123	124	124	124
	fz	0.015	0.024	0.024	0.022	0.022	0.022	0.022	0.022	0.019	0.03	0.03	0.03	0.027	0.042	0.042	0.038	0.047	0.047	0.047	0.047	0.047	0.047
	RPM	7242	7576	7576	6812	6812	6812	6812	6812	6048	6685	6685	6685	5995	5053	5053	4536	3915	3915	3915	3289	3289	3289
	FEED	434	727	727	599	599	599	599	599	460	802	802	802	647	849	849	689	736	736	736	618	618	618
	Ae	0.013	0.074	0.074	0.042	0.042	0.042	0.042	0.026	0.026	0.126	0.088	0.088	0.05	0.118	0.118	0.067	0.21	0.147	0.147	0.252	0.176	0.176
9	Vc	56	71	71	64	64	64	64	64	57	76	76	76	68	76	76	68	75	75	75	76	76	76
	fz	0.015	0.024	0.024	0.021	0.021	0.021	0.021	0.021	0.019	0.03	0.03	0.03	0.027	0.037	0.037	0.034	0.038	0.038	0.038	0.037	0.037	0.037
	RPM	4456	4520	4520	4074	4074	4074	4074	4074	3629	4032	4032	4032	3608	3024	3024	2706	2387	2387	2387	2016	2016	2016
	FEED	267	434	434	342	342	342	342	342	276	484	484	484	390	448	448	368	363	363	363	298	298	298
	Ae	0.009	0.055	0.055	0.032	0.032	0.032	0.032	0.02	0.02	0.095	0.066	0.066	0.038	0.088	0.088	0.05	0.158	0.11	0.11	0.189	0.132	0.132
10 - 11.1	Vc	91	119	119	107	107	107	107	107	95	126	126	126	113	127	127	114	123	123	123	124	124	124
	fz	0.015	0.024	0.024	0.022	0.022	0.022	0.022	0.022	0.019	0.03	0.03	0.03	0.027	0.042	0.042	0.038	0.047	0.047	0.047	0.047	0.047	0.047
	RPM	7242	7576	7576	6812	6812	6812	6812	6812	6048	6685	6685	6685	5995	5053	5053	4536	3915	3915	3915	3289	3289	3289
	FEED	434	727	727	599	599	599	599	599	460	802	802	802	647	849	849	689	736	736	736	618	618	618
	Ae	0.013	0.074	0.074	0.042	0.042	0.042	0.042	0.026	0.026	0.126	0.088	0.088	0.05	0.118	0.118	0.067	0.21	0.147	0.147	0.252	0.176	0.176
11.2	Vc	56	71	71	64	64	64	64	64	57	76	76	76	68	76	76	68	75	75	75	76	76	76
	fz	0.015	0.024	0.024	0.021	0.021	0.021	0.021	0.021	0.019	0.03	0.03	0.03	0.027	0.037	0.037	0.034	0.038	0.038	0.038	0.037	0.037	0.037
	RPM	4456	4520	4520	4074	4074	4074	4074	4074	3629	4032	4032	4032	3608	3024	3024	2706	2387	2387	2387	2016	2016	2016
	FEED	267	434	434	342	342	342	342	342	276	484	484	484	390	448	448	368	363	363	363	298	298	298
	Ae	0.009	0.055	0.055	0.032	0.032	0.032	0.032	0.02	0.02	0.095	0.066	0.066	0.038	0.088	0.088	0.05	0.158	0.11	0.11	0.189	0.132	0.132
15 - 20	Vc	91	119	119	107	107	107	107	107	95	126	126	126	113	127	127	114	123	123	123	124	124	124
	fz	0.015	0.024	0.024	0.022	0.022	0.022	0.022	0.022	0.019	0.03	0.03	0.03	0.027	0.042	0.042	0.038	0.047	0.047	0.047	0.047	0.047	0.047
	RPM	7242	7576	7576	6812	6812	6812	6812	6812	6048	6685	6685	6685	5995	5053	5053	4536	3915	3915	3915	3289	3289	3289
	FEED	434	727	727	599	599	599	599	599	460	802	802	802	647	849	849	689	736	736	736	618	618	618
	Ae	0.013	0.074	0.074	0.042	0.042	0.042	0.042	0.026	0.026	0.126	0.088	0.088	0.05	0.118	0.118	0.067	0.21	0.147	0.147	0.252	0.176	0.176
38.1 - 38.2	Vc	35	44	44	39	39	39	39	39	35	45	45	45	41	51	51	45	51	51	51	53	53	53
	fz	0.004	0.008	0.008	0.007	0.007	0.007	0.007	0.007	0.006	0.01	0.01	0.01	0.009	0.016	0.016	0.015	0.016	0.016	0.016	0.017	0.017	0.017
	RPM	2785	2801	2801	2483	2483	2483	2483	2483	2228	2387	2387	2387	2175	2029	2029	1790	1623	1623	1623	1406	1406	1406
	FEED	45	90	90	70	70	70	70	70	53	95	95	95	78	130	130	107	104	104	104	96	96	96
	Ae	0.008	0.044	0.044	0.025	0.025	0.025	0.025	0.016	0.016	0.076	0.053	0.053	0.03	0.071	0.071	0.04	0.126	0.088	0.088	0.151	0.106	0.106
40	Vc	56	71	71	64	64	64	64	64	57	76	76	76	68	76	76	68	75	75	75	76	76	76
	fz	0.015	0.024	0.024	0.021	0.021	0.021	0.021	0.021	0.019	0.03	0.03	0.03	0.027	0.037	0.037	0.034	0.038	0.038	0.038	0.037	0.037	0.037
	RPM	4456	4520	4520	4074	4074	4074	4074	4074	3629	4032	4032	4032	3608	3024	3024	2706	2387	2387	2387	2016	2016	2016
	FEED	267	434	434	342	342	342	342	342	276	484	484	484	390	448	448	368	363	363	363	298	298	298
	Ae	0.009	0.055	0.055	0.032	0.032	0.032	0.032	0.02	0.02	0.095	0.066	0.066	0.038	0.088	0.088	0.05	0.158	0.11	0.11	0.189	0.132	0.132
41	Vc	35	44	44	39	39	39	39	39	35	45	45	45	41	51	51	45	51	51	51	53	53	53
	fz	0.004	0.008	0.008	0.007	0.007	0.007	0.007	0.007	0.006	0.01	0.01	0.01	0.009	0.016	0.016	0.015	0.016	0.016	0.016	0.017	0.017	0.017
	RPM	2785	2801	2801	2483	2483	2483	2483	2483	2228	2387	2387	2387	2175	2029	2029	1790	1623	1623	1623	1406	1406	1406
	FEED	45	90	90	70	70	70	70	70	53	95	95	95	78	130	130	107	104	104	104	96	96	96
	Ae	0.008	0.044	0.044	0.025	0.025	0.025	0.025	0.016	0.016	0.076	0.053	0.053	0.03	0.071	0.071	0.04	0.126	0.088	0.088	0.151	0.106	0.106



CARBIDE
HSS
i-Xmill END MILLS
X-1EH END MILLS
4G MILL END MILLS
X-POWER PRO END MILLS
TitaNox-POWER END MILLS
V7 PLUS END MILLS
ALU-CUT END MILLS
K-2 END MILLS
GENERAL CARBIDE END MILLS

4G MILL END MILLS

RECOMMENDED CUTTING CONDITIONS

SEME75 SERIES 6 FLUTE - SIDE CUTTING

Vc = m/min.
fz = mm /tooth
RPM = rev./min .
FEED = mm/min.
LOC = Length of Cut

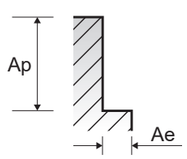
NORMAL SPEED

ISO	VDI 3323	Material Description	Ae(mm)	Ap(mm)	Parameter	Diameter (Ø)									
						6.0	6.0	6.0	8.0	8.0	8.0	8.0	10.0	10.0	10.0
					LOC	15	20	30	20	30	35	40	25	30	40
P	1-5	Non-alloy steel	0.1D	1.5D	Vc	110	110	110	111	111	111	111	111	111	111
					fz	0.06	0.06	0.051	0.079	0.079	0.079	0.067	0.099	0.099	0.099
					RPM	5836	5836	5836	4417	4417	4417	4417	3533	3533	3533
					FEED	2101	2101	1786	2093	2093	2093	1775	2099	2099	2099
	6-8	Low alloy steel	0.1D	1.5D	Vc	110	110	110	111	111	111	111	111	111	111
					fz	0.06	0.06	0.051	0.079	0.079	0.079	0.067	0.099	0.099	0.099
					RPM	5836	5836	5836	4417	4417	4417	4417	3533	3533	3533
					FEED	2101	2101	1786	2093	2093	2093	1775	2099	2099	2099
	9		0.05D	1.5D	Vc	77	77	77	78	78	78	78	76	76	76
					fz	0.059	0.059	0.05	0.078	0.078	0.078	0.066	0.099	0.099	0.099
					RPM	4085	4085	4085	3104	3104	3104	3104	2419	2419	2419
					FEED	1446	1446	1225	1452	1452	1452	1229	1437	1437	1437
	10-11.1	High alloyed steel, and tool steel	0.1D	1.5D	Vc	110	110	110	111	111	111	111	111	111	111
					fz	0.06	0.06	0.051	0.079	0.079	0.079	0.067	0.099	0.099	0.099
					RPM	5836	5836	5836	4417	4417	4417	4417	3533	3533	3533
					FEED	2101	2101	1786	2093	2093	2093	1775	2099	2099	2099
	11.2		0.05D	1.5D	Vc	77	77	77	78	78	78	78	76	76	76
					fz	0.059	0.059	0.05	0.078	0.078	0.078	0.066	0.099	0.099	0.099
					RPM	4085	4085	4085	3104	3104	3104	3104	2419	2419	2419
					FEED	1446	1446	1225	1452	1452	1452	1229	1437	1437	1437
K	15-20	Grey cast iron Nodular cast iron Malleable cast iron	0.1D	1.5D	Vc	110	110	110	111	111	111	111	111	111	111
					fz	0.06	0.06	0.051	0.079	0.079	0.079	0.067	0.099	0.099	0.099
					RPM	5836	5836	5836	4417	4417	4417	4417	3533	3533	3533
					FEED	2101	2101	1786	2093	2093	2093	1775	2099	2099	2099
H	38.1 - 38.2	Hardened steel	0.05D	1.0D	Vc	31	31	31	31	31	31	31	33	33	33
					fz	0.022	0.022	0.019	0.03	0.03	0.03	0.026	0.035	0.035	0.035
					RPM	1645	1645	1645	1233	1233	1233	1233	1050	1050	1050
					FEED	217	217	187	222	222	222	192	221	221	221
	40	Chilled Cast Iron	0.05D	1.5D	Vc	77	77	77	78	78	78	78	76	76	76
					fz	0.059	0.059	0.05	0.078	0.078	0.078	0.066	0.099	0.099	0.099
					RPM	4085	4085	4085	3104	3104	3104	3104	2419	2419	2419
					FEED	1446	1446	1225	1452	1452	1452	1229	1437	1437	1437
	41	Hardened Cast Iron	0.05D	1.0D	Vc	31	31	31	31	31	31	31	33	33	33
					fz	0.022	0.022	0.019	0.03	0.03	0.03	0.026	0.035	0.035	0.035
					RPM	1645	1645	1645	1233	1233	1233	1233	1050	1050	1050
					FEED	217	217	187	222	222	222	192	221	221	221

HIGH SPEED

ISO	VDI 3323	Material Description	Ae(mm)	Ap(mm)	Parameter	Diameter (Ø)									
						6.0	6.0	6.0	8.0	8.0	8.0	8.0	10.0	10.0	10.0
					LOC	15	20	30	20	30	35	40	25	30	40
P	11.2	High alloyed steel, and tool steel	0.05D	1.5D	Vc	333	333	333	333	333	333	333	329	329	329
					fz	0.06	0.06	0.051	0.081	0.081	0.081	0.068	0.1	0.1	0.1
					RPM	17666	17666	17666	13250	13250	13250	13250	10472	10472	10472
					FEED	6360	6360	5406	6439	6439	6439	5406	6283	6283	6283
H	38.1 - 38.2	Hardened steel	0.05D	1.0D	Vc	166	166	166	166	166	166	166	166	166	166
					fz	0.061	0.061	0.051	0.081	0.081	0.081	0.069	0.101	0.101	0.101
					RPM	8807	8807	8807	6605	6605	6605	6605	5284	5284	5284
					FEED	3223	3223	2695	3210	3210	3210	2734	3202	3202	3202
	40	Chilled Cast Iron	0.05D	1.5D	Vc	333	333	333	333	333	333	333	329	329	329
					fz	0.06	0.06	0.051	0.081	0.081	0.081	0.068	0.1	0.1	0.1
					RPM	17666	17666	17666	13250	13250	13250	13250	10472	10472	10472
					FEED	6360	6360	5406	6439	6439	6439	5406	6283	6283	6283
	41	Hardened Cast Iron	0.05D	1.0D	Vc	166	166	166	166	166	166	166	166	166	166
					fz	0.061	0.061	0.051	0.081	0.081	0.081	0.069	0.101	0.101	0.101
					RPM	8807	8807	8807	6605	6605	6605	6605	5284	5284	5284
					FEED	3223	3223	2695	3210	3210	3210	2734	3202	3202	3202

▶ NEXT PAGE



4G MILL END MILLS

RECOMMENDED CUTTING CONDITIONS

SEME75 SERIES 6 FLUTE - SIDE CUTTING

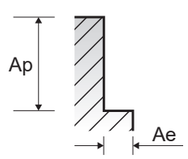
Vc = m/min.
fz = mm /tooth
RPM = rev./min .
FEED = mm/min.
LOC = Length of Cut

NORMAL SPEED

VDI 3323	Parameter	Diameter (Ø)													
		10.0	12.0	12.0	12.0	12.0	16.0	16.0	16.0	16.0	16.0	20.0	20.0	20.0	20.0
	LOC	50	30	40	50	60	40	50	60	90	110	45	60	70	110
1-5	Vc	111	112	112	112	112	111	111	111	100	100	111	111	111	100
	fz	0.084	0.099	0.099	0.084	0.074	0.1	0.1	0.085	0.075	0.075	0.1	0.1	0.085	0.075
	RPM	3533	2971	2971	2971	2971	2208	2208	2208	1989	1989	1767	1767	1767	1592
	FEED	1781	1765	1765	1497	1319	1325	1325	1126	895	895	1060	1060	901	716
6-8	Vc	111	112	112	112	112	111	111	111	100	100	111	111	111	100
	fz	0.084	0.099	0.099	0.084	0.074	0.1	0.1	0.085	0.075	0.075	0.1	0.1	0.085	0.075
	RPM	3533	2971	2971	2971	2971	2208	2208	2208	1989	1989	1767	1767	1767	1592
	FEED	1781	1765	1765	1497	1319	1325	1325	1126	895	895	1060	1060	901	716
9	Vc	76	79	79	79	79	78	78	78	70	70	77	77	77	68
	fz	0.084	0.097	0.097	0.082	0.073	0.099	0.099	0.085	0.075	0.075	0.099	0.099	0.084	0.075
	RPM	2419	2096	2096	2096	2096	1552	1552	1552	1393	1393	1225	1225	1225	1082
	FEED	1219	1220	1220	1031	918	922	922	791	627	627	728	728	618	487
10 - 11.1	Vc	111	112	112	112	112	111	111	111	100	100	111	111	111	100
	fz	0.084	0.099	0.099	0.084	0.074	0.1	0.1	0.085	0.075	0.075	0.1	0.1	0.085	0.075
	RPM	3533	2971	2971	2971	2971	2208	2208	2208	1989	1989	1767	1767	1767	1592
	FEED	1781	1765	1765	1497	1319	1325	1325	1126	895	895	1060	1060	901	716
11.2	Vc	76	79	79	79	79	78	78	78	70	70	77	77	77	68
	fz	0.084	0.097	0.097	0.082	0.073	0.099	0.099	0.085	0.075	0.075	0.099	0.099	0.084	0.075
	RPM	2419	2096	2096	2096	2096	1552	1552	1552	1393	1393	1225	1225	1225	1082
	FEED	1219	1220	1220	1031	918	922	922	791	627	627	728	728	618	487
15 - 20	Vc	111	112	112	112	112	111	111	111	100	100	111	111	111	100
	fz	0.084	0.099	0.099	0.084	0.074	0.1	0.1	0.085	0.075	0.075	0.1	0.1	0.085	0.075
	RPM	3533	2971	2971	2971	2971	2208	2208	2208	1989	1989	1767	1767	1767	1592
	FEED	1781	1765	1765	1497	1319	1325	1325	1126	895	895	1060	1060	901	716
38.1 - 38.2	Vc	33	33	33	33	33	34	34	34	31	31	33	33	33	30
	fz	0.03	0.036	0.036	0.031	0.027	0.034	0.034	0.029	0.026	0.026	0.037	0.037	0.032	0.028
	RPM	1050	875	875	875	875	676	676	676	617	617	525	525	525	477
	FEED	189	189	189	163	142	138	138	118	96	96	117	117	101	80
40	Vc	76	79	79	79	79	78	78	78	70	70	77	77	77	68
	fz	0.084	0.097	0.097	0.082	0.073	0.099	0.099	0.085	0.075	0.075	0.099	0.099	0.084	0.075
	RPM	2419	2096	2096	2096	2096	1552	1552	1552	1393	1393	1225	1225	1225	1082
	FEED	1219	1220	1220	1031	918	922	922	791	627	627	728	728	618	487
41	Vc	33	33	33	33	33	34	34	34	31	31	33	33	33	30
	fz	0.03	0.036	0.036	0.031	0.027	0.034	0.034	0.029	0.026	0.026	0.037	0.037	0.032	0.028
	RPM	1050	875	875	875	875	676	676	676	617	617	525	525	525	477
	FEED	189	189	189	163	142	138	138	118	96	96	117	117	101	80

HIGH SPEED

VDI 3323	Parameter	Diameter (Ø)													
		10.0	12.0	12.0	12.0	12.0	16.0	16.0	16.0	16.0	16.0	20.0	20.0	20.0	20.0
	LOC	50	30	40	50	60	40	50	60	90	110	45	60	70	110
11.2	Vc	329	333	333	333	333	333	333	333	299	299	332	332	332	299
	fz	0.085	0.1	0.1	0.085	0.075	0.1	0.1	0.085	0.075	0.075	0.101	0.101	0.086	0.076
	RPM	10472	8833	8833	8833	8833	6625	6625	6625	5948	5948	5284	5284	5284	4759
	FEED	5341	5300	5300	4505	3975	3975	3975	3379	2677	2677	3202	3202	2727	2170
38.1 - 38.2	Vc	166	166	166	166	166	167	167	167	150	150	166	166	166	150
	fz	0.086	0.1	0.1	0.085	0.075	0.1	0.1	0.085	0.075	0.075	0.097	0.097	0.083	0.073
	RPM	5284	4403	4403	4403	4403	3322	3322	3322	2984	2984	2642	2642	2642	2387
	FEED	2727	2642	2642	2246	1981	1993	1993	1694	1343	1343	1538	1538	1316	1046
40	Vc	329	333	333	333	333	333	333	333	299	299	332	332	332	299
	fz	0.085	0.1	0.1	0.085	0.075	0.1	0.1	0.085	0.075	0.075	0.101	0.101	0.086	0.076
	RPM	10472	8833	8833	8833	8833	6625	6625	6625	5948	5948	5284	5284	5284	4759
	FEED	5341	5300	5300	4505	3975	3975	3975	3379	2677	2677	3202	3202	2727	2170
41	Vc	166	166	166	166	166	167	167	167	150	150	166	166	166	150
	fz	0.086	0.1	0.1	0.085	0.075	0.1	0.1	0.085	0.075	0.075	0.097	0.097	0.083	0.073
	RPM	5284	4403	4403	4403	4403	3322	3322	3322	2984	2984	2642	2642	2642	2387
	FEED	2727	2642	2642	2246	1981	1993	1993	1694	1343	1343	1538	1538	1316	1046



CARBIDE
HSS
i-Xmill END MILLS
X-1EH END MILLS
4G MILL END MILLS
X-POWER PRO END MILLS
TitaNox-POWER END MILLS
V7 PLUS END MILLS
ALU-CUT END MILLS
K-2 END MILLS
GENERAL CARBIDE END MILLS

Global Cutting Tool Leader **YG-1**



MILLING

Leading Through Innovation



SOLID CARBIDE

X-POWER PRO

END MILLS

- For Pre-Hardened Steels up to HRc55

SELECTION GUIDE

MILLING TOOLS

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.C260

SERIES	GMH35
FLUTE	4
HELIX ANGLE	30°
CUTTING EDGE SHAPE	SQUARE
SIZE MIN	D1.0
SIZE MAX	D20.0
PAGE	C259
	SHORT LENGTH
	Y-Coating



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		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		Ni or Co Based	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	Hardened steel		Hardened	550	55	○
	39			Hardened	630	60	
	40	Chilled Cast Iron		Cast	400	42	◎
	41	Hardened Cast Iron		Hardened	550	55	○

X-POWER PRO END MILLS

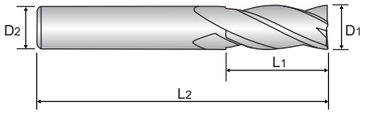
PLAIN SHANK **GMH35 SERIES**

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.







CARBIDE | 4 | 30° | PLAIN | Y Coating | p.C260

Unit : mm

EDP No.	Mill Diameter D1	Shank Diameter D2	Length of Cut L1	Overall Length L2
GMH35010	1.0	4	3	50
GMH35015	1.5	4	4	50
GMH35020	2.0	4	6	50
GMH35025	2.5	4	8	50
GMH35030	3.0	4	8	50
GMH35901	3.0	6	8	50
GMH35040	4.0	4	11	50
GMH35902	4.0	6	11	50
GMH35050	5.0	6	13	50
GMH35060	6.0	6	16	50
GMH35080	8.0	8	20	60
GMH35100	10.0	10	25	75
GMH35120	12.0	12	32	75
GMH35160	16.0	16	40	100
GMH35200	20.0	20	45	100

Mill Dia.Tolerance (mm)	Shank Dia.Tolerance
0 ~ - 0.03	h5

◎ : 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																		○		◎	○

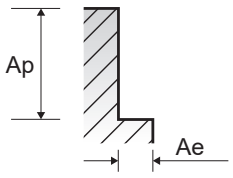
X-POWER PRO END MILLS

RECOMMENDED CUTTING CONDITIONS

GMH35 SERIES 4 FLUTE - SIDE CUTTING

Vc = (m/min.)
fz = (mm/tooth)
RPM = (rev./min.)
FEED = (mm/min.)

ISO	VDI 3323	Material Description	Ae(mm)	Ap(mm)	Parameter	Diameter (Ø) 1.0	1.5	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	0.05D	1.0D	Vc	70	75	80	95	105	110	115	120	115	115	125	120
					fz	0.003	0.004	0.006	0.009	0.019	0.024	0.03	0.042	0.047	0.047	0.047	0.048
					RPM	22280	15950	12732	10080	8356	7003	6101	4775	3661	3050	2487	1910
					FEED	240	280	306	363	635	672	732	802	688	573	468	367
	5		0.05D	1.0D	Vc	50	55	55	60	65	65	70	70	70	70	75	75
					fz	0.003	0.004	0.006	0.009	0.019	0.024	0.031	0.038	0.037	0.037	0.037	0.038
					RPM	15920	10610	8754	6366	5173	4138	3714	2785	2228	1857	1492	1194
					FEED	160	175	210	229	393	397	460	423	330	275	221	181
	6-7	Low alloy steel	0.05D	1.0D	Vc	70	75	80	95	105	110	115	120	115	115	125	120
					fz	0.003	0.004	0.006	0.009	0.019	0.024	0.03	0.042	0.047	0.047	0.047	0.048
					RPM	22280	15950	12732	10080	8356	7003	6101	4775	3661	3050	2487	1910
					FEED	240	280	306	363	635	672	732	802	688	573	468	367
	8-9		0.05D	1.0D	Vc	50	55	55	60	65	65	70	70	70	70	75	75
					fz	0.003	0.004	0.006	0.009	0.019	0.024	0.031	0.038	0.037	0.037	0.037	0.038
					RPM	15920	10610	8754	6366	5173	4138	3714	2785	2228	1857	1492	1194
					FEED	160	175	210	229	393	397	460	423	330	275	221	181
	10	High alloyed steel, and tool steel	0.05D	1.0D	Vc	70	75	80	95	105	110	115	120	115	115	125	120
					fz	0.003	0.004	0.006	0.009	0.019	0.024	0.03	0.042	0.047	0.047	0.047	0.048
					RPM	22280	15950	12732	10080	8356	7003	6101	4775	3661	3050	2487	1910
					FEED	240	280	306	363	635	672	732	802	688	573	468	367
	11.1 - 11.2		0.05D	1.0D	Vc	50	55	55	60	65	65	70	70	70	70	75	75
					fz	0.003	0.004	0.006	0.009	0.019	0.024	0.031	0.038	0.037	0.037	0.037	0.038
					RPM	15920	10610	8754	6366	5173	4138	3714	2785	2228	1857	1492	1194
					FEED	160	175	210	229	393	397	460	423	330	275	221	181
M	14.1	Stainless steel	0.05D	1.0D	Vc	40	40	45	50	55	55	60	60	60	55	60	60
					fz	0.003	0.004	0.005	0.009	0.018	0.024	0.029	0.041	0.045	0.044	0.046	0.045
					RPM	12740	8485	7162	5305	4377	3501	3183	2387	1910	1459	1194	955
					FEED	130	140	143	191	315	336	369	392	344	257	220	172
K	15-20	Grey cast iron Nodular cast iron Malleable cast iron	0.05D	1.0D	Vc	70	75	80	95	105	110	115	120	115	115	125	120
					fz	0.003	0.005	0.006	0.009	0.019	0.024	0.03	0.042	0.047	0.047	0.047	0.048
					RPM	22290	15920	12732	10080	8356	7003	6101	4775	3661	3050	2487	1910
					FEED	270	295	306	363	635	672	732	802	688	573	468	367
H	38.1 - 38.2	Hardened steel	0.05D	1.0D	Vc	30	30	35	35	40	40	40	45	50	50	50	50
					fz	0.002	0.002	0.002	0.004	0.005	0.008	0.010	0.017	0.016	0.017	0.016	0.015
					RPM	9550	6370	5570	3714	3183	2546	2122	1790	1592	1326	995	796
					FEED	55	55	45	59	64	81	85	122	102	90	64	48
	40	Chilled Cast Iron	0.05D	1.0D	Vc	50	55	55	60	65	65	70	70	70	70	75	75
					fz	0.003	0.004	0.006	0.009	0.019	0.024	0.031	0.038	0.037	0.037	0.037	0.038
					RPM	15920	10610	8754	6366	5173	4138	3714	2785	2228	1857	1492	1194
					FEED	160	175	210	229	393	397	460	423	330	275	221	181
	41	Hardened Cast Iron	0.05D	1.0D	Vc	30	30	35	35	40	40	40	45	50	50	50	50
					fz	0.002	0.002	0.002	0.004	0.005	0.008	0.010	0.017	0.016	0.017	0.016	0.015
					RPM	9550	6370	5570	3714	3183	2546	2122	1790	1592	1326	995	796
					FEED	55	55	45	59	64	81	85	122	102	90	64	48



YG

Leading Through Innovation



SOLID CARBIDE

TitaNox-POWER
END MILLS

- High Speed Machining for Exotic Materials: Titanium, Inconel and Stainless Steels

SELECTION GUIDE

YG MILLING TOOLS

SOLID CARBIDE
TitaNox-POWER END MILLS

High Speed Machining for Exotic Materials:
Titanium, Inconel and Stainless Steels

Please visit globalyg1.com/mat for material search

◎ : Excellent ○ : Good

Recommended cutting conditions : p.C267

ISO	VDI 3323	Material Description	Composition / Structure / Heat Treatment		HB	HRc	GMG40	GMG30
		SERIES					GMG40	GMG30
		FLUTE					4	5
		HELIX ANGLE					43°/45°	43°/44°/45°
		CUTTING EDGE SHAPE					CORNER RADIUS	CORNER RADIUS
		SIZE MIN					D6.0	D6.0
		SIZE MAX					D25.0	D25.0
		PAGE					C263	C265
							LONG LENGTH DOUBLE CORE	LONG LENGTH
							Y-Coating	Y-Coating
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		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		Ni or Co Based	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	Hardened steel		Hardened	550	55		
	39			Hardened	630	60		
	40	Chilled Cast Iron		Cast	400	42		
	41	Hardened Cast Iron		Hardened	550	55		

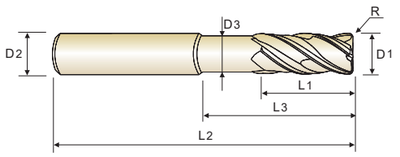
YG TitaNox-POWER END MILLS

PLAIN SHANK **GMG40 SERIES**

CARBIDE, 4 FLUTE CORNER RADIUS with DOUBLE CORE

▶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.C267-268

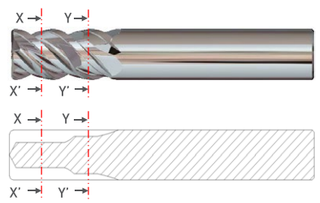
Unit : mm

EDP No.	Corner Radius R	Mill Diameter D_1	Shank Diameter D_2	Length of Cut L_1	Length Below Shank L_3	Overall Length L_2	Neck Diameter D_3
GMG40060	R0.5	**6.0**	6	13	20	57	5.5
GMG40901	R1.0	**6.0**	6	13	20	57	5.5
GMG40080	R0.5	**8.0**	8	19	25	63	7.5
GMG40902	R1.0	**8.0**	8	19	25	63	7.5
GMG40903	R1.5	**8.0**	8	19	25	63	7.5
GMG40904	R2.0	**8.0**	8	19	25	63	7.5
GMG40100	R0.5	**10.0**	10	22	30	72	9.2
GMG40905	R1.0	**10.0**	10	22	30	72	9.2
GMG40906	R1.5	**10.0**	10	22	30	72	9.2
GMG40907	R2.0	**10.0**	10	22	30	72	9.2
GMG40120	R0.5	**12.0**	12	26	35	83	11.0
GMG40908	R1.0	**12.0**	12	26	35	83	11.0
GMG40909	R1.5	**12.0**	12	26	35	83	11.0
GMG40910	R2.0	**12.0**	12	26	35	83	11.0
GMG40911	R3.0	**12.0**	12	26	35	83	11.0
GMG40140	R1.0	**14.0**	14	26	35	83	13.0
GMG40912	R2.0	**14.0**	14	26	35	83	13.0
GMG40160	R1.0	**16.0**	16	35	43	92	15.0

Mill Dia.Tolerance (mm)	Shank Dia.Tolerance
0 ~ - 0.03	h5 * Shank Dia.≥Ø12 : h6

▶ NEXT PAGE

◆ **2 STEP CORE**





<SECTION X-X'>
EXCELLENT CHIP EVACUATION



<SECTION Y-Y'>
HIGHER RIGIDITY

◎ : 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											○	○	○	○	○	◎	◎					

TitaNox-POWER END MILLS

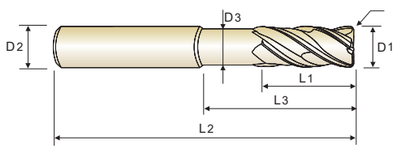
PLAIN SHANK **GMG40** SERIES

CARBIDE, 4 FLUTE CORNER RADIUS with DOUBLE CORE

▶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.







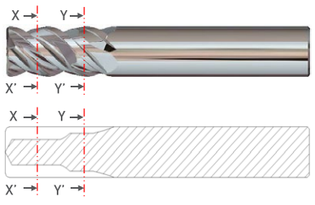
CARBIDE | 4 | 43°/45° | PLAIN | γ Coating | p.C267-268

Unit : mm

EDP No.	Corner Radius	Mill Diameter	Shank Diameter	Length of Cut	Length Below Shank	Overall Length	Neck Diameter
	R	D_1	D_2	L_1	L_3	L_2	D_3
GMG40913	R1.5	**16.0**	16	35	43	92	15.0
GMG40914	R2.0	**16.0**	16	35	43	92	15.0
GMG40915	R3.0	**16.0**	16	35	43	92	15.0
GMG40916	R4.0	**16.0**	16	35	43	92	15.0
GMG40200	R1.0	**20.0**	20	44	56	110	19.0
GMG40917	R1.5	**20.0**	20	44	56	110	19.0
GMG40918	R2.0	**20.0**	20	44	56	110	19.0
GMG40919	R3.0	**20.0**	20	44	56	110	19.0
GMG40920	R3.5	**20.0**	20	44	56	110	19.0
GMG40921	R4.0	**20.0**	20	44	56	110	19.0
GMG40250	R1.0	**25.0**	25	55	70	130	24.0
GMG40922	R1.5	**25.0**	25	55	70	130	24.0
GMG40923	R2.0	**25.0**	25	55	70	130	24.0
GMG40924	R3.0	**25.0**	25	55	70	130	24.0
GMG40925	R4.0	**25.0**	25	55	70	130	24.0

Mill Dia.Tolerance (mm)	Shank Dia.Tolerance
0 ~ - 0.03	h5 * Shank Dia.≥Ø12 : h6

◆ **2 STEP CORE**





<SECTION X-X'>
EXCELLENT CHIP EVACUATION



<SECTION Y-Y'>
HIGHER RIGIDITY

◎ : 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											○	○	○	○	○	◎	◎															

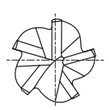
TitaNox-POWER END MILLS

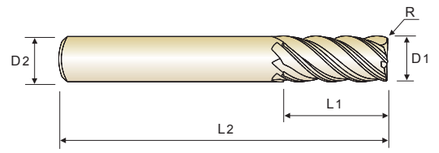
PLAIN SHANK **GMG30** SERIES

CARBIDE, 5 FLUTE CORNER RADIUS LONG LENGTH

▶ Excellent performance results and long tool life when machining Titanium and other tough materials.
▶ This tool has high rigidity of flute so that is possible to use for heavy profile and high speed milling.
▶ For protecting corner chipping of end teeth, corner radius & chamfer are adopted.







CARBIDE | 5 | 43°/44°/45° | PLAIN | γ Coating | p.C269

Unit : mm

EDP No.	Corner Radius	Mill Diameter	Shank Diameter	Length of Cut	Overall Length
	R	D_1	D_2	L_1	L_2
GMG30060	R0.3	**6.0**	6	13	57
GMG30901	R0.5	**6.0**	6	13	57
GMG30902	R1.0	**6.0**	6	13	57
GMG30080	R0.5	**8.0**	8	19	63
GMG30903	R1.0	**8.0**	8	19	63
GMG30904	R1.5	**8.0**	8	19	63
GMG30905	R2.0	**8.0**	8	19	63
GMG30100	R0.5	**10.0**	10	22	72
GMG30906	R1.0	**10.0**	10	22	72
GMG30907	R1.5	**10.0**	10	22	72
GMG30908	R2.0	**10.0**	10	22	72
GMG30120	R0.5	**12.0**	12	26	83
GMG30909	R1.0	**12.0**	12	26	83
GMG30910	R1.5	**12.0**	12	26	83
GMG30911	R2.0	**12.0**	12	26	83
GMG30912	R2.5	**12.0**	12	26	83
GMG30913	R3.0	**12.0**	12	26	83
GMG30160	R1.0	**16.0**	16	36	92
GMG30914	R1.5	**16.0**	16	36	92
GMG30915	R2.0	**16.0**	16	36	92
GMG30916	R2.5	**16.0**	16	36	92
GMG30917	R3.0	**16.0**	16	36	92

▶ NEXT PAGE

Mill Dia.Tolerance (mm)	Shank Dia.Tolerance
0 ~ - 0.03	h5 * Shank Dia.≥Ø12 : h6

◎ : Excellent ○ : Good

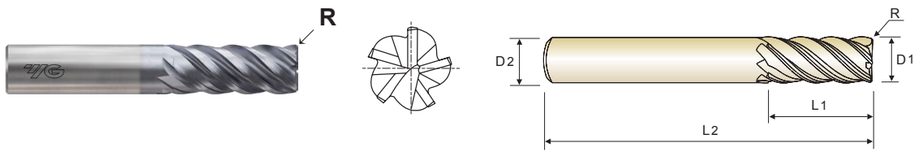
ISO	P																			M						K						
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel			Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron												
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20												
HRc		13	25	28	32	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											○	○	○	○	○	◎	◎															

TitaNox-POWER END MILLS

PLAIN SHANK **GMG30 SERIES**

CARBIDE, 5 FLUTE CORNER RADIUS LONG LENGTH

- ▶ Excellent performance results and long tool life when machining Titanium and other tough materials.
- ▶ This tool has high rigidity of flute so that is possible to use for heavy profile and high speed milling.
- ▶ For protecting corner chipping of end teeth, corner radius & chamfer are adopted.



CARBIDE | 5 | 43°/44°/45° | PLAIN | Y Coating | p.C269

Unit : mm

EDP No.	Corner Radius R	Mill Diameter D1	Shank Diameter D2	Length of Cut L1	Overall Length L2
GMG30918	R4.0	**16.0**	16	36	92
GMG30200	R1.0	**20.0**	20	44	104
GMG30919	R1.5	**20.0**	20	44	104
GMG30920	R2.0	**20.0**	20	44	104
GMG30921	R2.5	**20.0**	20	44	104
GMG30922	R3.0	**20.0**	20	44	104
GMG30923	R4.0	**20.0**	20	44	104
GMG30924	R5.0	**20.0**	20	44	104
GMG30250	R1.0	**25.0**	25	54	121
GMG30925	R1.5	**25.0**	25	54	121
GMG30926	R2.0	**25.0**	25	54	121
GMG30927	R2.5	**25.0**	25	54	121
GMG30928	R3.0	**25.0**	25	54	121
GMG30929	R4.0	**25.0**	25	54	121
GMG30930	R5.0	**25.0**	25	54	121

Mill Dia.Tolerance (mm)	Shank Dia.Tolerance
0 ~ - 0.03	h5 * Shank Dia.≥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	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	○	○	○	○	○	○	○	○	○	○	○	◎	◎	◎	○	○	○	○	○	○

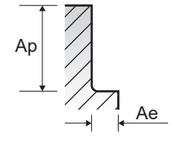
ISO	N										S							H		
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	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											○	○	○	○	○	◎	◎				

RECOMMENDED CUTTING CONDITIONS

GMG40 SERIES — 4 FLUTES CORNER RADIUS - SIDE CUTTING

Vc = (m/min.)
fz = (mm/tooth)
RPM = (rev./min.)
FEED = (mm/min.)

ISO	VDI 3323	Material Description	Ae(mm)	Ap(mm)	Parameter	Diameter (Ø) 6.0	8.0	10.0	12.0	14.0	16.0	20.0	25.0
P	1-4	Non-alloy steel	0.4D	1.0D	Vc	160	160	160	160	160	160	160	160
					fz	0.027	0.035	0.042	0.053	0.058	0.063	0.077	0.084
					RPM	8488	6366	5093	4244	3638	3183	2546	2037
					FEED	917	891	856	900	844	802	784	684
	5		0.4D	1.0D	Vc	150	150	150	150	150	150	150	150
					fz	0.025	0.035	0.042	0.049	0.056	0.063	0.070	0.084
					RPM	7958	5968	4775	3979	3410	2984	2387	1910
					FEED	796	836	802	780	764	752	668	642
	6-7	Low alloy steel	0.4D	1.0D	Vc	160	160	160	160	160	160	160	160
					fz	0.027	0.035	0.042	0.053	0.058	0.063	0.077	0.084
					RPM	8488	6366	5093	4244	3638	3183	2546	2037
					FEED	917	891	856	900	844	802	784	684
	8		0.4D	1.0D	Vc	150	150	150	150	150	150	150	150
					fz	0.025	0.035	0.042	0.049	0.056	0.063	0.070	0.084
					RPM	7958	5968	4775	3979	3410	2984	2387	1910
					FEED	796	836	802	780	764	752	668	642
	9		0.4D	1.0D	Vc	150	150	150	150	150	150	150	150
					fz	0.027	0.035	0.046	0.053	0.060	0.067	0.077	0.084
					RPM	7958	5968	4775	3979	3410	2984	2387	1910
					FEED	859	836	879	844	819	800	735	642
	10-11.1	High alloyed steel, and tool steel	0.4D	1.0D	Vc	150	150	150	150	150	150	150	150
					fz	0.027	0.035	0.046	0.053	0.060	0.067	0.077	0.084
					RPM	7958	5968	4775	3979	3410	2984	2387	1910
					FEED	859	836	879	844	819	800	735	642
M	12-13		0.4D	1.0D	Vc	155	155	155	155	155	155	155	155
					fz	0.034	0.046	0.057	0.067	0.076	0.086	0.095	0.114
					RPM	8223	6167	4934	4112	3524	3084	2467	1974
					FEED	1118	1135	1125	1102	1071	1061	937	900
	14.1	Stainless steel	0.4D	1.0D	Vc	105	105	105	105	105	105	105	105
					fz	0.025	0.034	0.042	0.048	0.055	0.062	0.071	0.081
					RPM	5570	4178	3342	2785	2387	2089	1671	1337
					FEED	557	568	561	535	525	518	475	433
	14.2		0.4D	0.6D	Vc	44	44	44	44	44	44	44	44
					fz	0.016	0.021	0.027	0.032	0.036	0.040	0.046	0.052
					RPM	2334	1751	1401	1167	1000	875	700	560
					FEED	149	147	151	149	144	140	129	117
K	15-20	Grey cast iron	0.4D	1.0D	Vc	175	175	175	175	175	175	175	175
					fz	0.021	0.028	0.035	0.042	0.048	0.053	0.060	0.070
					RPM	9284	6963	5570	4642	3979	3482	2785	2228
					FEED	780	780	780	780	764	738	668	624
S	31-35	Heat Resistant Super Alloys	0.3D	0.6D	Vc	32	32	32	32	32	32	32	32
					fz	0.020	0.026	0.032	0.038	0.044	0.048	0.055	0.065
					RPM	1698	1273	1019	849	728	637	509	407
					FEED	136	132	130	129	128	122	112	106
	36-37	Titanium Alloys	0.4D	1.0D	Vc	70	70	70	70	70	70	70	70
					fz	0.034	0.048	0.057	0.067	0.076	0.086	0.095	0.114
					RPM	3714	2785	2228	1857	1592	1393	1114	891
					FEED	505	535	508	498	484	479	423	406



TitaNox-POWER END MILLS

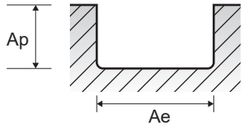
RECOMMENDED CUTTING CONDITIONS

GMG40 SERIES

4 FLUTES CORNER RADIUS - SLOTTING

Vc = (m/min.)
fz = (mm/tooth)
RPM = (rev./min.)
FEED = (mm/min.)

ISO	VDI 3323	Material Description	Ae(mm)	Ap(mm)	Parameter	Diameter (Ø) 6.0	8.0	10.0	12.0	14.0	16.0	20.0	25.0
P	1-4	Non-alloy steel	1.0D	1.0D	Vc	125	125	125	125	125	125	125	125
					fz	0.025	0.034	0.042	0.049	0.056	0.063	0.070	0.084
					RPM	6631	4974	3979	3316	2842	2487	1989	1592
					FEED	663	676	668	650	637	627	557	535
	5		1.0D	1.0D	Vc	120	120	120	120	120	120	120	120
					fz	0.025	0.034	0.042	0.049	0.056	0.063	0.070	0.077
					RPM	6366	4775	3820	3183	2728	2387	1910	1528
					FEED	637	649	642	624	611	602	535	471
	6-7	Low alloy steel	1.0D	1.0D	Vc	125	125	125	125	125	125	125	125
					fz	0.025	0.034	0.042	0.049	0.056	0.063	0.070	0.084
					RPM	6631	4974	3979	3316	2842	2487	1989	1592
					FEED	663	676	668	650	637	627	557	535
	8-9		1.0D	1.0D	Vc	120	120	120	120	120	120	120	120
					fz	0.025	0.034	0.042	0.049	0.056	0.063	0.070	0.077
					RPM	6366	4775	3820	3183	2728	2387	1910	1528
					FEED	637	649	642	624	611	602	535	471
	10-11.1	High alloyed steel, and tool steel	1.0D	1.0D	Vc	120	120	120	120	120	120	120	120
					fz	0.027	0.035	0.042	0.053	0.058	0.063	0.077	0.084
					RPM	6366	4775	3820	3183	2728	2387	1910	1528
					FEED	688	668	642	675	633	602	588	513
M	12-13	Stainless steel	1.0D	1.0D	Vc	125	125	125	125	125	125	125	125
					fz	0.034	0.046	0.057	0.067	0.074	0.081	0.095	0.105
					RPM	6631	4974	3979	3316	2842	2487	1989	1592
					FEED	902	915	907	889	841	806	756	668
	14.1		1.0D	1.0D	Vc	85	85	85	85	85	85	85	85
					fz	0.025	0.034	0.042	0.048	0.055	0.062	0.071	0.081
					RPM	4509	3382	2706	2255	1933	1691	1353	1082
					FEED	451	460	455	433	425	419	384	351
	14.2		1.0D	0.5D	Vc	36	36	36	36	36	36	36	36
					fz	0.016	0.021	0.027	0.032	0.036	0.040	0.046	0.052
					RPM	1910	1432	1146	955	819	716	573	458
					FEED	122	120	124	122	118	115	105	95
K	15-20	Grey cast iron	1.0D	1.0D	Vc	140	140	140	140	140	140	140	140
					fz	0.021	0.028	0.035	0.042	0.048	0.053	0.060	0.067
					RPM	7427	5570	4456	3714	3183	2785	2228	1783
					FEED	624	624	624	624	611	590	535	478
S	31-35	Heat Resistant Super Alloys	1.0D	0.4D	Vc	25	25	25	25	25	25	25	25
					fz	0.018	0.024	0.030	0.036	0.040	0.044	0.050	0.055
					RPM	1326	995	796	663	568	497	398	318
					FEED	95	95	95	95	91	88	80	70
	36-37	Titanium Alloys	1.0D	1.0D	Vc	55	55	55	55	55	55	55	55
					fz	0.034	0.046	0.057	0.067	0.076	0.086	0.095	0.105
					RPM	2918	2188	1751	1459	1251	1094	875	700
					FEED	397	403	399	391	380	376	333	294



TitaNox-POWER END MILLS

RECOMMENDED CUTTING CONDITIONS

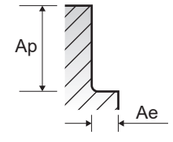
GMG30 SERIES

5 FLUTES CORNER RADIUS - SIDE CUTTING

Vc = (m/min.)
fz = (mm/tooth)
RPM = (rev./min.)
FEED = (mm/min.)

ISO	VDI 3323	Material Description	Ae(mm)	Ap(mm)	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(*)	Vc	144	144	144	144	144	144	144	144	144
					fz	0.034	0.038	0.050	0.063	0.069	0.076	0.083	0.089	0.101
					RPM	7639	5730	4584	3820	3274	2865	2546	2292	1833
					FEED	1299	1089	1146	1203	1130	1089	1057	1020	926
	5		0.3D	1.5D(*)	Vc	101	101	101	101	101	101	101	101	101
					fz	0.034	0.038	0.050	0.063	0.069	0.076	0.083	0.089	0.101
					RPM	5358	4019	3215	2679	2296	2009	1786	1607	1286
					FEED	911	764	804	844	792	764	741	715	649
	6-7	Low alloy steel	0.3D	1.5D(*)	Vc	144	144	144	144	144	144	144	144	144
					fz	0.034	0.038	0.050	0.063	0.069	0.076	0.083	0.089	0.101
					RPM	7639	5730	4584	3820	3274	2865	2546	2292	1833
					FEED	1299	1089	1146	1203	1130	1089	1057	1020	926
	8-9		0.3D	1.5D(*)	Vc	101	101	101	101	101	101	101	101	101
					fz	0.034	0.038	0.050	0.063	0.069	0.076	0.083	0.089	0.101
					RPM	5358	4019	3215	2679	2296	2009	1786	1607	1286
					FEED	911	764	804	844	792	764	741	715	649
	10-11.1	High alloyed steel, and tool steel	0.3D	1.5D(*)	Vc	60	60	60	60	60	60	60	60	60
					fz	0.024	0.027	0.035	0.044	0.049	0.054	0.058	0.062	0.071
					RPM	3183	2387	1910	1592	1364	1194	1061	955	764
					FEED	382	322	334	350	334	322	308	296	271
M	12-13	Stainless steel	0.3D	1.5D(*)	Vc	117	117	117	117	117	117	117	117	117
					fz	0.024	0.025	0.030	0.046	0.051	0.054	0.057	0.061	0.071
					RPM	6207	4655	3724	3104	2660	2328	2069	1862	1490
					FEED	745	582	559	714	678	628	590	568	529
	14.1		0.3D	1.5D(*)	Vc	82	82	82	82	82	82	82	82	82
					fz	0.030	0.032	0.038	0.063	0.065	0.069	0.070	0.076	0.088
					RPM	4350	3263	2610	2175	1864	1631	1450	1305	1044
					FEED	653	522	496	685	606	563	508	496	459
	14.2		0.3D	1.5D(*)	Vc	59	59	59	59	59	59	59	59	59
					fz	0.030	0.032	0.038	0.063	0.065	0.069	0.070	0.076	0.088
					RPM	3130	2348	1878	1565	1341	1174	1043	939	751
					FEED	470	376	357	493	436	405	365	357	331
K	15-20	Grey cast iron	0.3D	1.5D(*)	Vc	106	106	106	106	106	106	106	106	106
					fz	0.043	0.048	0.063	0.079	0.087	0.096	0.103	0.111	0.126
					RPM	5623	4218	3374	2812	2410	2109	1874	1687	1350
					FEED	1209	1012	1063	1111	1048	1012	965	936	850
S	31-35	Heat Resistant Super Alloys	0.1D	1.5D	Vc	31	31	31	31	31	31	31	31	31
					fz	0.021	0.022	0.027	0.044	0.046	0.048	0.049	0.053	0.062
					RPM	1645	1233	987	822	705	617	548	493	395
					FEED	173	136	133	181	162	148	134	131	122
	36-37	Titanium Alloys	0.3D	1.5D(*)	Vc	69	69	69	69	69	69	69	69	69
					fz	0.027	0.029	0.034	0.057	0.059	0.062	0.063	0.069	0.079
					RPM	3661	2745	2196	1830	1569	1373	1220	1098	879
					FEED	494	398	373	522	463	426	384	379	347

* 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.
* Reduce speed and feed recommendations for materials harder than listed.
* Above recommendations are based on ideal conditions.
  Adjust parameters accordingly for smaller taper machining centers or less rigid conditions.



Global Cutting Tool Leader **YG-1**



MILLING

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SOLID CARBIDE

V7 PLUS END MILLS

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

SELECTION GUIDE

MILLING TOOLS

SOLID CARBIDE V7 PLUS END MILLS

High performance carbide end mills
for Steels, Cast Iron and Stainless Steels

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◎ : Excellent ○ : Good

Recommended cutting conditions : p.C279

SERIES	GMH65	GMF66	GMH67	GMH68
FLUTE	4	4	4	4
HELIX ANGLE	35°/37° (MULTIPLE HELIX)	35°/37° (MULTIPLE HELIX)	35°/37° (MULTIPLE HELIX)	35°/37° (MULTIPLE HELIX)
CUTTING EDGE SHAPE	CORNER RADIUS	SQUARE	SQUARE	SQUARE
SIZE MIN	D1.0	D3.0	D1.0	D1.0
SIZE MAX	D25.0	D20.0	D20.0	D20.0
PAGE	C274	C276	C277	C278
	LONG LENGTH	SHORT LENGTH	LONG LENGTH	LONG LENGTH
	Y-Coating	Y-Coating	Y-Coating	Y-Coating



ISO	VDI 3323	Material Description	Composition / Structure / Heat Treatment		HB	HRc	GMH65	GMF66	GMH67	GMH68	
P	1	Non-alloy steel	About 0.15% C	Annealed	125		◎	◎	◎	◎	1
	2		About 0.45% C	Annealed	190	13	◎	◎	◎	◎	2
	3		About 0.45% C	Quenched & Tempered	250	25	◎	◎	◎	◎	3
	4		About 0.75% C	Annealed	270	28	◎	◎	◎	◎	4
	5		About 0.75% C	Quenched & Tempered	300	32	◎	◎	◎	◎	5
	6	Low alloy steel		Annealed	180	10	◎	◎	◎	◎	6
	7			Quenched & Tempered	275	29	◎	◎	◎	◎	7
	8			Quenched & Tempered	300	32	◎	◎	◎	◎	8
	9			Quenched & Tempered	350	38	◎	◎	◎	◎	9
	10	High alloyed steel, and tool steel		Annealed	200	15	◎	◎	◎	◎	10
	11			Quenched & Tempered	325	35	◎	◎	◎	◎	11
M	12	Stainless steel	Ferritic / Martensitic	Annealed	200	15	◎	◎	◎	◎	12
	13		Martensitic	Quenched & Tempered	240	23	◎	◎	◎	◎	13
	14		Austenitic		180	10	◎	◎	◎	◎	14
K	15	Grey cast iron	Pearlitic / ferritic		180	10	◎	◎	◎	◎	15
	16		Pearlitic (Martensitic)		260	26	◎	◎	◎	◎	16
	17	Nodular cast iron	Ferritic		160	3	◎	◎	◎	◎	17
	18		Pearlitic		250	25	◎	◎	◎	◎	18
	19	Malleable cast iron	Ferritic		130		◎	◎	◎	◎	19
	20		Pearlitic		230	21	◎	◎	◎	◎	20
N	21	Aluminum-wrought alloy	Not Curable		60						21
	22		Curable	Hardened	100						22
	23	Aluminum-cast, alloyed	≤ 12% Si, Not Curable		75						23
	24		≤ 12% Si, Curable	Hardened	90						24
	25		> 12% Si, Not Curable		130						25
	26	Copper and Copper Alloys (Bronze / Brass)	Cutting Alloys, PB>1%		110						26
	27		CuZn, CuSnZn (Brass)		90						27
	28		CuSn, lead-free copper and electrolytic copper		100						28
	29	Non Metallic Materials	Duroplastic, Fiber Reinforced Plastic								29
	30		Rubber, Wood, etc.								30
S	31	Heat Resistant Super Alloys	Fe Based	Annealed	200	15	○	○	○	○	31
	32			Cured	280	30	○	○	○	○	32
	33		Ni or Co Based	Annealed	250	25	○	○	○	○	33
	34			Cured	350	38	○	○	○	○	34
	35			Cast	320	34	○	○	○	○	35
	36	Titanium Alloys	Pure Titanium		400 Rm		○	○	○	○	36
	37		Alpha + Beta Alloys	Hardened	1050 Rm		○	○	○	○	37
H	38	Hardened steel		Hardened	550	55					38
	39			Hardened	630	60					39
	40	Chilled Cast Iron		Cast	400	42					40
	41	Hardened Cast Iron		Hardened	550	55					41

CARBIDE
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X-1EH END MILLS
4G MILL END MILLS
X-POWER PRO END MILLS
TitaNox-POWER END MILLS
V7 PLUS END MILLS
ALU-CUT END MILLS
K-2 END MILLS
GENERAL CARBIDE END MILLS

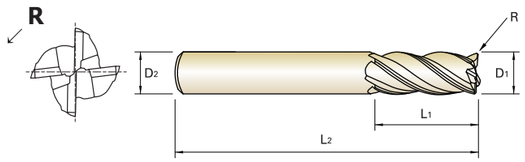
V7 PLUS END MILLS

PLAIN SHANK **GMH65 SERIES**

CARBIDE, 4 FLUTE CORNER RADIUS LONG LENGTH

▶Special flute geometry and multiple helix eliminate vibrations
▶Excellent performance for Stainless Steels, Mild Steels, Cast Iron, Low/Medium hardness materials under HRc40





CARBIDE | 4 | 37° | 35°/37° | PLAIN | Y Coating | p.C279

D < Ø3 D ≥ Ø3

Unit : mm

EDP No.	Corner Radius	Mill Diameter	Shank Diameter	Length of Cut	Overall Length
	R	D1	D2	L1	L2
GMH65010	R0.1	1.0	6	2.5	50
GMH65015	R0.1	1.5	6	4	50
GMH65020	R0.1	2.0	6	6	50
GMH65030	R0.2	3.0	6	8	50
GMH6503003	R0.3	3.0	6	8	50
GMH6503005	R0.5	3.0	6	8	50
GMH65040	R0.2	4.0	6	10	50
GMH6504003	R0.3	4.0	6	10	50
GMH6504005	R0.5	4.0	6	10	50
GMH65050	R0.2	5.0	6	15	60
GMH6505003	R0.3	5.0	6	15	60
GMH6505005	R0.5	5.0	6	15	60
GMH65060	R0.3	6.0	6	15	60
GMH6506005	R0.5	6.0	6	15	60
GMH6506010	R1.0	6.0	6	15	60
GMH65080	R0.3	8.0	8	20	70
GMH6508005	R0.5	8.0	8	20	70
GMH6508010	R1.0	8.0	8	20	70
GMH65100	R0.3	10.0	10	25	75
GMH6510005	R0.5	10.0	10	25	75
GMH6510010	R1.0	10.0	10	25	75
GMH65120	R0.5	12.0	12	30	80
GMH6512010	R1.0	12.0	12	30	80
GMH6512020	R2.0	12.0	12	30	80

▶ NEXT PAGE

Size	Mill Dia.Tolerance (mm)	Shank Dia.Tolerance
up to Ø12	0 ~ - 0.02	h5
over Ø12	0 ~ - 0.03	* Shank Dia.≥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	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											○	○	○	○	○	○	○				

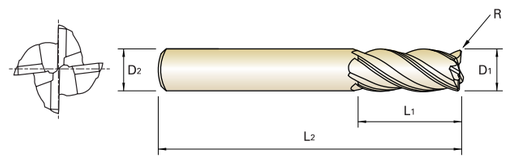
V7 PLUS END MILLS

PLAIN SHANK GMH65 SERIES

CARBIDE, 4 FLUTE CORNER RADIUS LONG LENGTH

▶Special flute geometry and multiple helix eliminate vibrations
▶Excellent performance for Stainless Steels, Mild Steels, Cast Iron, Low/Medium hardness materials under HRc40





CARBIDE | 4 | 37° | 35°/37° | PLAIN | Y Coating | p.C279

D < Ø3 D ≥ Ø3

Unit : mm

EDP No.	Corner Radius	Mill Diameter	Shank Diameter	Length of Cut	Overall Length
	R	D1	D2	L1	L2
GMH65160	R0.5	16.0	16	40	100
GMH6516010	R1.0	16.0	16	40	100
GMH6516020	R2.0	16.0	16	40	100
GMH6516030K	R3.0	16	16	40	100
GMH6516030	R3.0	16.0	16	40	100
GMH65200	R0.5	20.0	20	45	100
GMH6520010	R1.0	20.0	20	45	100
GMH6520020	R2.0	20.0	20	45	100
GMH6520030	R3.0	20.0	20	45	100
GMH6525010	R1.0	25.0	20	50	120

Size	Mill Dia.Tolerance (mm)	Shank Dia.Tolerance
up to Ø12	0 ~ - 0.02	h5
over Ø12	0 ~ - 0.03	* Shank Dia.≥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	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	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎

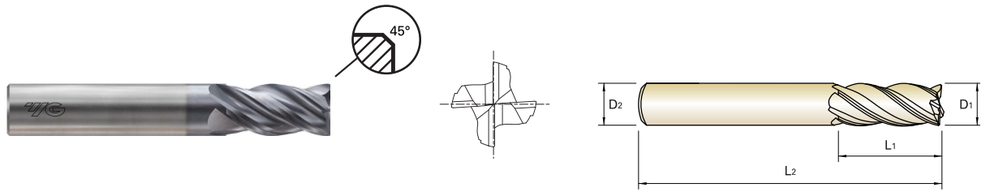
ISO	N										S							H		
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	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											○	○	○	○	○	○	○				

V7 PLUS END MILLS

PLAIN SHANK **GMF66** SERIES

CARBIDE, 4 FLUTE SHORT LENGTH

▶Special flute geometry and multiple helix eliminate vibrations
▶Excellent performance for Stainless Steels, Mild Steels, Cast Iron, Low/Medium hardness materials under HRc40

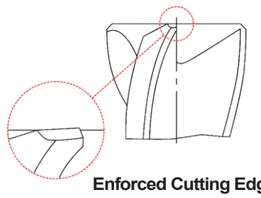


CARBIDE | 4 | 35°/37° | PLAIN | C x 45° | Y Coating | p.C279

Unit : mm

EDP No.	Mill Diameter D1	Shank Diameter D2	Length of Cut L1	Overall Length L2	Chamfer
GMF66030	3.0	6	6	50	0.10
GMF66901	3.0	4	6	50	0.10
GMF66040	4.0	6	8	50	0.15
GMF66902	4.0	4	8	50	0.15
GMF66050	5.0	6	10	50	0.15
GMF66060	6.0	6	12	50	0.20
GMF66080	8.0	8	16	60	0.20
GMF66100	10.0	10	20	75	0.30
GMF66120	12.0	12	24	75	0.35
GMF66160	16.0	16	32	100	0.40
GMF66200	20.0	20	40	100	0.50

Size	Mill Dia.Tolerance (mm)	Shank Dia.Tolerance
up to Ø12	0 ~ - 0.02	h5
over Ø12	0 ~ - 0.03	* Shank Dia.≥Ø12 : h6



Enforced Cutting Edge

◎ : 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											○	○	○	○	○	○	○				

V7 PLUS END MILLS

PLAIN SHANK **GMH67** SERIES

CARBIDE, 4 FLUTE LONG LENGTH

▶Special flute geometry and multiple helix eliminate vibrations
▶Excellent performance for Stainless Steels, Mild Steels, Cast Iron, Low/Medium hardness materials under HRc40

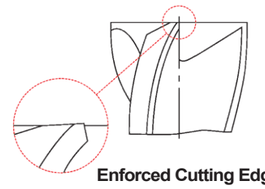


CARBIDE | 4 | 37° (D < Ø3) | 35°/37° (D ≥ Ø3) | PLAIN | Y Coating | p.C279

Unit : mm

EDP No.	Mill Diameter D1	Shank Diameter D2	Length of Cut L1	Overall Length L2
GMH67010	1.0	6	2.5	50
GMH67015	1.5	6	4	50
GMH67020	2.0	6	6	50
GMH67030	3.0	6	8	50
GMH67040	4.0	6	10	50
GMH67050	5.0	6	15	60
GMH67060	6.0	6	15	60
GMH67080	8.0	8	20	70
GMH67100	10.0	10	25	75
GMH67120	12.0	12	30	80
GMH67160	16.0	16	40	100
GMH67200	20.0	20	45	100

Size	Mill Dia.Tolerance (mm)	Shank Dia.Tolerance
up to Ø12	0 ~ - 0.02	h5
over Ø12	0 ~ - 0.03	* Shank Dia.≥Ø12 : h6



Enforced Cutting Edge

◎ : 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	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎

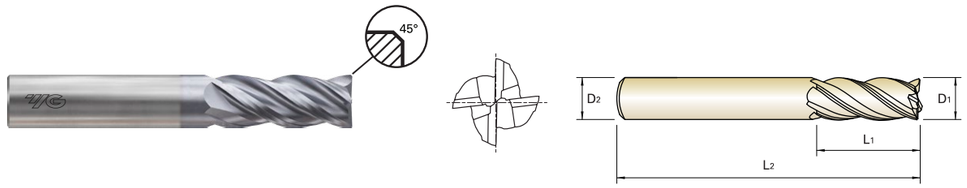
ISO	N										S							H		
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	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											○	○	○	○	○	○	○				

V7 PLUS END MILLS

PLAIN SHANK **GMH68** SERIES

CARBIDE, 4 FLUTE LONG LENGTH

▶Special flute geometry and multiple helix eliminate vibrations
▶Excellent performance for Stainless Steels, Mild Steels, Cast Iron, Low/Medium hardness materials under HRc40

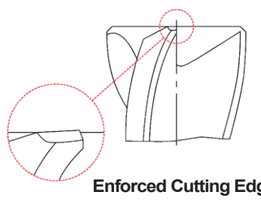


CARBIDE | 4 | 37° (D < Ø3) | 35°/37° (D ≥ Ø3) | PLAIN | C x 45° | Y Coating | p.C279

Unit : mm

EDP No.	Mill Diameter D1	Shank Diameter D2	Length of Cut L1	Overall Length L2	Chamfer
GMH68010	1.0	6	2.5	50	0.03
GMH68015	1.5	6	4	50	0.05
GMH68020	2.0	6	6	50	0.075
GMH68030	3.0	6	8	50	0.1
GMH68040	4.0	6	10	50	0.15
GMH68050	5.0	6	15	60	0.15
GMH68060	6.0	6	15	60	0.2
GMH68080	8.0	8	20	70	0.2
GMH68100	10.0	10	25	75	0.3
GMH68120	12.0	12	30	80	0.35
GMH68140	14.0	16	35	100	0.4
GMH68160	16.0	16	40	100	0.4
GMH68180	18.0	16	45	100	0.5
GMH68200	20.0	20	45	100	0.5

Size	Mill Dia.Tolerance (mm)	Shank Dia.Tolerance
up to Ø12	0 ~ - 0.02	h5
over Ø12	0 ~ - 0.03	* Shank Dia.≥Ø12 : h6



Enforced Cutting Edge

◎ : 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											○	○	○	○	○	○	○				

V7 PLUS END MILLS

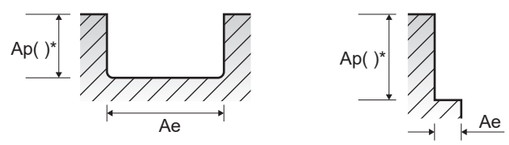
RECOMMENDED CUTTING CONDITIONS

GMH65, GMF66 GMH67, GMH68 — 4 FLUTE - SIDE CUTTING / SLOTTING

Vc = (m/min.)
fz = (mm/tooth)
RPM = (rev./min.)
FEED = (mm/min.)

ISO	VDI 3323	Material Description	Ae Side	Ae Slotting	Ap Side	Ap Slotting	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	1.0D	1.5D (1.2D)	1.0D (0.8D)	Vc	152	152	152	152	152	168	168	168	168	168	168	168
							fz	0.005	0.008	0.011	0.016	0.027	0.038	0.047	0.049	0.053	0.059	0.065	0.064
							RPM	16128	12096	9677	8064	6048	5348	4456	3820	3342	2971	2674	2139
							FEED	323	387	426	516	653	813	838	749	709	701	695	548
	5		0.5D	1.0D	1.5D (1.2D)	1.0D (0.8D)	Vc	107	107	107	107	107	117	117	117	117	117	117	117
							fz	0.005	0.008	0.011	0.016	0.027	0.038	0.047	0.049	0.053	0.059	0.065	0.064
							RPM	11353	8515	6812	5677	4257	3724	3104	2660	2328	2069	1862	1490
							FEED	227	272	300	363	460	566	583	521	493	488	484	381
	6-7	Low alloy steel	0.5D	1.0D	1.5D (1.2D)	1.0D (0.8D)	Vc	152	152	152	152	152	168	168	168	168	168	168	168
							fz	0.005	0.008	0.011	0.016	0.027	0.038	0.047	0.049	0.053	0.059	0.065	0.064
							RPM	16128	12096	9677	8064	6048	5348	4456	3820	3342	2971	2674	2139
							FEED	323	387	426	516	653	813	838	749	709	701	695	548
	8-9		0.5D	1.0D	1.5D (1.2D)	1.0D (0.8D)	Vc	107	107	107	107	107	117	117	117	117	117	117	117
							fz	0.005	0.008	0.011	0.016	0.027	0.038	0.047	0.049	0.053	0.059	0.065	0.064
							RPM	11353	8515	6812	5677	4257	3724	3104	2660	2328	2069	1862	1490
							FEED	227	272	300	363	460	566	583	521	493	488	484	381
	10-11.1	High alloyed steel, and tool steel	0.5D	1.0D	1.5D (1.2D)	1.0D (0.8D)	Vc	64	64	64	64	64	70	70	70	70	70	70	70
							fz	0.003	0.006	0.008	0.011	0.019	0.027	0.032	0.034	0.037	0.041	0.045	0.045
							RPM	6791	5093	4074	3395	2546	2228	1857	1592	1393	1238	1114	891
							FEED	81	122	130	149	194	241	238	216	206	203	201	160
M	12-13	Stainless steel	0.5D	1.0D	1.5D (1.2D)	1.0D (0.8D)	Vc	148	148	148	148	148	148	148	148	148	148	148	148
							fz	0.004	0.006	0.009	0.013	0.022	0.034	0.039	0.042	0.045	0.05	0.055	0.055
							RPM	15703	11777	9422	7852	5889	4711	3926	3365	2944	2617	2355	1884
							FEED	251	283	339	408	518	641	612	565	530	523	518	415
	14.1		0.5D	1.0D	1.5D (1.2D)	1.0D (0.8D)	Vc	106	106	106	106	106	106	106	106	106	106	106	106
							fz	0.005	0.008	0.013	0.018	0.028	0.048	0.055	0.059	0.062	0.07	0.077	0.077
							RPM	11247	8435	6748	5623	4218	3374	2812	2410	2109	1874	1687	1350
							FEED	225	270	351	405	472	648	619	569	523	525	520	416
	14.2		0.5D	1.0D	1.5D (1.2D)	1.0D (0.8D)	Vc	95	95	95	95	95	95	95	95	95	95	95	95
							fz	0.005	0.008	0.013	0.018	0.028	0.048	0.055	0.059	0.062	0.069	0.076	0.076
							RPM	10080	7560	6048	5040	3780	3024	2520	2160	1890	1680	1512	1210
							FEED	202	242	314	363	423	581	554	510	469	464	460	368
K	15-20	Grey cast iron	0.5D	1.0D	1.5D (1.2D)	1.0D (0.8D)	Vc	112	112	112	112	112	123	123	123	123	123	123	123
							fz	0.006	0.01	0.014	0.02	0.034	0.048	0.058	0.061	0.065	0.073	0.081	0.079
							RPM	11884	8913	7130	5942	4456	3915	3263	2797	2447	2175	1958	1566
							FEED	285	357	399	475	606	752	757	682	636	635	634	495
S	31-35	Heat Resistant Super Alloys	0.25D	1.0D	1.0D	0.5D	Vc	26	26	26	26	26	26	26	26	26	26	26	26
							fz	0.005	0.007	0.008	0.012	0.019	0.033	0.038	0.04	0.043	0.048	0.054	0.052
							RPM	2759	2069	1655	1379	1035	828	690	591	517	460	414	331
							FEED	55	58	53	66	79	109	105	95	89	88	89	69
	36-37	Titanium Alloys	0.4D	1.0D	1.0D	0.5D	Vc	58	58	58	58	58	58	58	58	58	58	58	58
							fz	0.004	0.007	0.011	0.016	0.025	0.042	0.05	0.053	0.055	0.062	0.068	0.069
							RPM	6154	4615	3692	3077	2308	1846	1538	1319	1154	1026	923	738
							FEED	98	129	162	197	231	310	308	280	254	254	251	204

*( ) : Short length



Global Cutting Tool Leader **YG-1**



MILLING

Leading Through Innovation



SOLID CARBIDE

ALU-CUT END MILLS

- Aluminium Alloys and Silent Cutting

SELECTION GUIDE

MILLING TOOLS

SERIES	E5D70
FLUTE	3
HELIX ANGLE	45°
CUTTING EDGE SHAPE	SQUARE
SIZE MIN	D1.0
SIZE MAX	D20.0
PAGE	C283
	-
	Uncoated

SOLID CARBIDE
ALU-CUT END MILLS
Aluminium Alloys and Silent Cutting



Please visit globalyg1.com/mat for material search

◎ : Excellent ○ : Good

Recommended cutting conditions : p.C289

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		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		Ni or Co Based	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	Hardened steel		Hardened	550	55	
	39			Hardened	630	60	
	40	Chilled Cast Iron		Cast	400	42	
	41	Hardened Cast Iron		Hardened	550	55	

ALU-CUT END MILLS

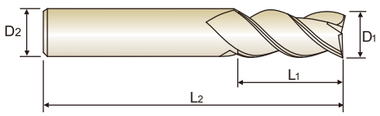
PLAIN SHANK **E5D70 SERIES**

CARBIDE, 3 FLUTE 45° HELIX

- ▶ Suitable for workpieces of nonferrous metals including Aluminum and Aluminum Alloys
- ▶ Improvement of surface roughness of workpieces and wearresistance due to Mirror grinding of cutting edges
- ▶ Special cutting edges for minimization of vibration
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- ▶ Available various cutting length tools







CARBIDE | 3 | 45° | PLAIN | UNCOATED

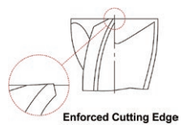
p.C289

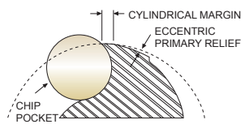
Unit : mm

EDP No.	Mill Diameter D1	Shank Diameter D2	Length of Cut L1	Overall Length L2
E5D7001002	1.0	6	2	40
E5D70010025	1.0	6	2.5	40
E5D70010	1.0	6	3	50
E5D7001004	1.0	6	4	60
E5D7001005	1.0	6	5	60
E5D7001006	1.0	6	6	60
E5D70012	1.2	6	4	50
E5D7001503	1.5	6	3	40
E5D7001504	1.5	6	4	40
E5D70015	1.5	6	5	50
E5D7001506	1.5	6	6	60
E5D7001508	1.5	6	8	60
E5D7001510	1.5	6	10	60
E5D7001512	1.5	6	12	60
E5D7002003	2.0	6	3	40
E5D7002005	2.0	6	5	50
E5D7002007	2.0	6	7	50
E5D70020	2.0	6	6	50
E5D7002008	2.0	6	8	60
E5D7002010	2.0	6	10	60
E5D7002012	2.0	6	12	60
E5D7002014	2.0	6	14	60
E5D7002016	2.0	6	16	60
E5D7002508	2.5	6	8	40

▶ NEXT PAGE

Mill Dia.Tolerance (mm)	Shank Dia.Tolerance
0 ~ - 0.015	h5





◎ : 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	◎	◎	◎	◎	◎																

ALU-CUT END MILLS

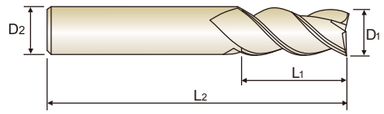
PLAIN SHANK **E5D70 SERIES**

CARBIDE, 3 FLUTE 45° HELIX

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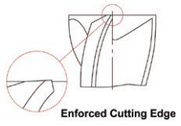


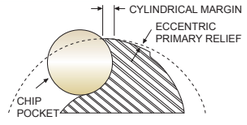
CARBIDE | 3 | 45° | PLAIN p.C289

Unit : mm

EDP No.	Mill Diameter D1	Shank Diameter D2	Length of Cut L1	Overall Length L2
E5D70025	2.5	6	10	55
E5D7002504	2.5	6	4	40
E5D7002512	2.5	6	12	60
E5D7002515	2.5	6	15	60
E5D7003004	3.0	6	4	45
E5D7003008	3.0	6	8	45
E5D7003012	3.0	6	12	60
E5D70030	3.0	6	11	55
E5D7003015	3.0	6	15	65
E5D7003020	3.0	6	20	70
E5D7003025	3.0	6	25	75
E5D7003030	3.0	6	30	80
E5D70035	3.5	6	12	55
E5D7003506	3.5	6	6	50
E5D7004005	4.0	6	5	45
E5D7004006	4.0	6	6	45
E5D7004008	4.0	6	8	45
E5D7004011	4.0	6	11	45
E5D70040	4.0	6	13	55
E5D7004016	4.0	6	16	65
E5D7004020	4.0	6	20	70
E5D7004026	4.0	6	26	75
E5D7004030	4.0	6	30	80
E5D70045	4.5	6	15	55

Mill Dia.Tolerance (mm)	Shank Dia.Tolerance
0 ~ - 0.015	h5


Enforced Cutting Edge



▶ 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	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	◎	◎	◎	◎	◎																

ALU-CUT END MILLS

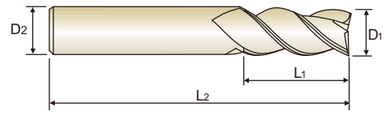
PLAIN SHANK E5D70 SERIES

CARBIDE, 3 FLUTE 45° HELIX

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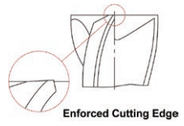


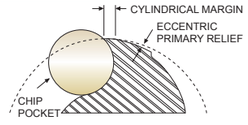
CARBIDE | 3 | 45° | PLAIN p.C289

Unit : mm

EDP No.	Mill Diameter D1	Shank Diameter D2	Length of Cut L1	Overall Length L2
E5D7004512	4.5	6	12	50
E5D7004518	4.5	6	18	55
E5D7005006	5.0	6	6	45
E5D7005013	5.0	6	13	50
E5D7005020	5.0	6	20	55
E5D70050	5.0	6	17	55
E5D7005022	5.0	6	22	60
E5D7005025	5.0	6	25	70
E5D7005030	5.0	6	30	75
E5D7005035	5.0	6	35	80
E5D7005040	5.0	6	40	85
E5D7005045	5.0	6	45	90
E5D70055	5.5	6	17	55
E5D7006007	6.0	6	7	50
E5D7006013	6.0	6	13	50
E5D70060	6.0	6	17	60
E5D7006022	6.0	6	22	60
E5D7006025	6.0	6	25	70
E5D7006030	6.0	6	30	75
E5D7006035	6.0	6	35	80
E5D7006042	6.0	6	42	90
E5D7006050	6.0	6	50	100
E5D70070	7.0	8	22	65
E5D7008009	8.0	8	9	60

Mill Dia.Tolerance (mm)	Shank Dia.Tolerance
0 ~ - 0.015	h5


Enforced Cutting Edge



▶ 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	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	◎	◎	◎	◎	◎																

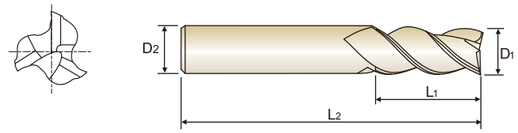
ALU-CUT END MILLS

PLAIN SHANK **E5D70 SERIES**

CARBIDE, 3 FLUTE 45° HELIX

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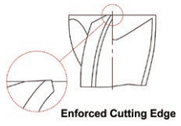


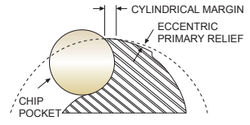
CARBIDE | 3 | 45° | PLAIN p.C289

Unit : mm

EDP No.	Mill Diameter D1	Shank Diameter D2	Length of Cut L1	Overall Length L2
E5D7008012	8.0	8	12	60
E5D7008019	8.0	8	19	60
E5D70080	8.0	8	22	70
E5D7008028	8.0	8	28	80
E5D7008030	8.0	8	30	80
E5D7008035	8.0	8	35	85
E5D7008040	8.0	8	40	90
E5D7008045	8.0	8	45	95
E5D7008050	8.0	8	50	100
E5D7008055	8.0	8	55	105
E5D7008060	8.0	8	60	110
E5D7008065	8.0	8	65	110
E5D70090	9.0	10	27	70
E5D7010011	10.0	10	11	65
E5D7010015	10.0	10	15	65
E5D7010022	10.0	10	22	65
E5D70100	10.0	10	27	75
E5D7010032	10.0	10	32	90
E5D7010035	10.0	10	35	90
E5D7010040	10.0	10	40	90
E5D7010045	10.0	10	45	100
E5D7010050	10.0	10	50	100
E5D7010055	10.0	10	55	110
E5D7010060	10.0	10	60	110

Mill Dia.Tolerance (mm)	Shank Dia.Tolerance
0 ~ - 0.015	h5





▶ NEXT PAGE

◎ : Excellent ○ : Good

ISO	P																			
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	◎	◎	◎	◎	◎																

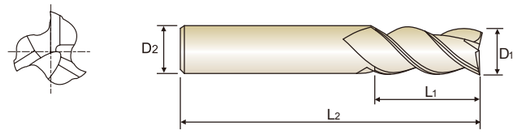
ALU-CUT END MILLS

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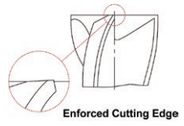


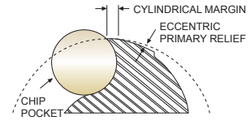
CARBIDE | 3 | 45° | PLAIN p.C289

Unit : mm

EDP No.	Mill Diameter D1	Shank Diameter D2	Length of Cut L1	Overall Length L2
E5D7010065	10.0	10	65	120
E5D7012013	12.0	12	13	70
E5D7012026	12.0	12	26	70
E5D7012035	12.0	12	35	80
E5D70120	12.0	12	32	80
E5D7012040	12.0	12	40	95
E5D7012045	12.0	12	45	100
E5D7012050	12.0	12	50	100
E5D7012055	12.0	12	55	110
E5D7012060	12.0	12	60	110
E5D7012065	12.0	12	65	120
E5D7012070	12.0	12	70	120
E5D7012075	12.0	12	75	135
E5D7012080	12.0	12	80	140
E5D70140	14.0	14	37	90
E5D7014016S	14.0	16	37	90
E5D7014045	14.0	14	45	110
E5D7016018	16.0	16	18	90
E5D7016032	16.0	16	32	90
E5D70160	16.0	16	42	100
E5D7016052	16.0	16	52	105
E5D7016055	16.0	16	55	110
E5D7016065	16.0	16	65	130
E5D7016075	16.0	16	75	150

Mill Dia.Tolerance (mm)	Shank Dia.Tolerance
0 ~ - 0.015	h5





▶ 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	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	◎	◎	◎	◎	◎																

ALU-CUT END MILLS

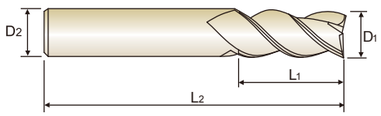
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- ▶ Very small toelrance of cutting diameters
- ▶ Available various cutting length tools







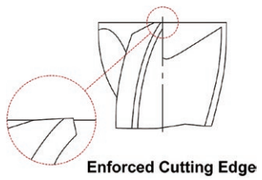
CARBIDE | 3 | 45° | PLAIN

p.C289

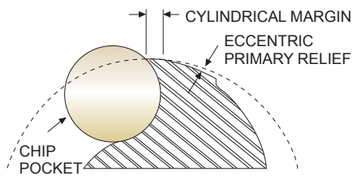
Unit : mm

EDP No.	Mill Diameter D1	Shank Diameter D2	Length of Cut L1	Overall Length L2
E5D7016085	16.0	16	85	160
E5D7016095	16.0	16	95	180
E5D70160105	16.0	16	105	190
E5D70160115	16.0	16	115	200
E5D70180	18.0	16	48	100
E5D7020022	20.0	20	22	90
E5D7020038	20.0	20	38	90
E5D70200	20.0	20	48	100
E5D7020055	20.0	20	55	110
E5D7020065	20.0	20	65	130
E5D7020075	20.0	20	75	150
E5D7020085	20.0	20	85	160
E5D7020095	20.0	20	95	180
E5D70200105	20.0	20	105	190
E5D70200115	20.0	20	115	200
E5D70200125	20.0	20	125	220

Mill Dia.Tolerance (mm)	Shank Dia.Tolerance
0 ~ - 0.015	h5



Enforced Cutting Edge



◎ : 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	◎	◎	◎	◎	◎																

ALU-CUT END MILLS

RECOMMENDED CUTTING CONDITIONS

E5D70 SERIES 3 FLUTE

Vc = m/min.
fz = mm/tooth
RPM = rev./min.
FEED = mm/min.

SLOTTING

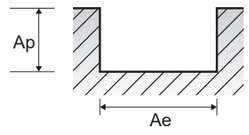
ISO	VDI 3323	Material Description	Ae(mm)	Ap(mm)	Parameter	Diameter (Ø) 1.0	1.2	1.5	2.0	2.5	3.0	3.5	4.0	4.5	5.0
N	21-22	Aluminum-wrought alloy	0.15D	2.5D	Vc	53	60	61	63	63	66	77	88	99	110
					fz	0.011	0.011	0.013	0.013	0.016	0.017	0.017	0.021	0.024	0.024
					RPM	17000	16000	13000	10000	8000	7000	7000	7000	7000	7000
					FEED	550	550	500	400	380	350	350	441	500	504
	23-25	Aluminum-cast, alloyed	0.15D	2.5D	Vc	53	60	61	63	63	66	77	88	99	110
					fz	0.011	0.011	0.013	0.013	0.016	0.017	0.017	0.021	0.024	0.024
					RPM	17000	16000	13000	10000	8000	7000	7000	7000	7000	7000
					FEED	550	550	500	400	380	350	350	441	500	504

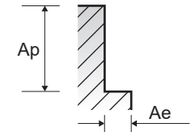
ISO	VDI 3323	Material Description	Ae(mm)	Ap(mm)	Parameter	Diameter (Ø) 5.5	6.0	7.0	8.0	9.0	10.0	12.0	14.0	16.0	18.0	20.0
N	21-22	Aluminum-wrought alloy	0.15D	2.5D	Vc	121	132	132	141	158	176	211	185	211	158	176
					fz	0.029	0.029	0.039	0.042	0.048	0.051	0.063	0.072	0.075	0.083	0.096
					RPM	7000	7000	6000	5600	5600	5600	5600	4200	4200	2800	2800
					FEED	605	606	700	700	800	854	1050	903	945	700	805
	23-25	Aluminum-cast, alloyed	0.15D	2.5D	Vc	121	132	132	141	158	176	211	185	211	158	176
					fz	0.029	0.029	0.039	0.042	0.048	0.051	0.063	0.072	0.075	0.083	0.096
					RPM	7000	7000	6000	5600	5600	5600	5600	4200	4200	2800	2800
					FEED	605	606	700	700	800	854	1050	903	945	700	805

SIDE CUTTING

ISO	VDI 3323	Material Description	Ae(mm)	Ap(mm)	Parameter	Diameter (Ø) 1.0	1.2	1.5	2.0	2.5	3.0	3.5	4.0	4.5	5.0
N	21-22	Aluminum-wrought alloy	0.15D	2.5D	Vc	53	60	61	63	63	66	77	88	99	110
					fz	0.018	0.018	0.022	0.021	0.022	0.022	0.026	0.026	0.029	0.031
					RPM	17000	16000	13000	10000	8000	7000	7000	7000	7000	7000
					FEED	900	850	850	640	520	455	550	546	600	651
	23-25	Aluminum-cast, alloyed	0.15D	2.5D	Vc	53	60	61	63	63	66	77	88	99	110
					fz	0.018	0.018	0.022	0.021	0.022	0.022	0.026	0.026	0.029	0.031
					RPM	17000	16000	13000	10000	8000	7000	7000	7000	7000	7000
					FEED	900	850	850	640	520	455	550	546	600	651

ISO	VDI 3323	Material Description	Ae(mm)	Ap(mm)	Parameter	Diameter (Ø) 5.5	6.0	7.0	8.0	9.0	10.0	12.0	14.0	16.0	18.0	20.0
N	21-22	Aluminum-wrought alloy	0.15D	2.5D	Vc	121	132	132	141	158	176	211	185	211	158	176
					fz	0.033	0.036	0.046	0.051	0.054	0.063	0.053	0.088	0.096	0.108	0.114
					RPM	7000	7000	6000	5600	5600	5600	5600	4200	4200	2800	2800
					FEED	700	756	820	861	900	1050	882	1106	1211	910	956
	23-25	Aluminum-cast, alloyed	0.15D	2.5D	Vc	121	132	132	141	158	176	211	185	211	158	176
					fz	0.033	0.036	0.046	0.051	0.054	0.063	0.053	0.088	0.096	0.108	0.114
					RPM	7000	7000	6000	5600	5600	5600	5600	4200	4200	2800	2800
					FEED	700	756	820	861	900	1050	882	1106	1211	910	956





Global Cutting Tool Leader **YG-1**



MILLING

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Leading Through Innovation



SOLID CARBIDE

K-2 PLUS
END MILLS

- General Purpose / Conventional or High Speed Milling / Wet & Dry Cutting

SELECTION GUIDE

YG MILLING TOOLS

SOLID CARBIDE K-2 PLUS END MILLS

General Purpose
Conventional or High Speed Milling, Wet & Dry Cutting

Please visit globalyg1.com/mat for material search

◎ : Excellent ○ : Good

Recommended cutting conditions : p.C304

						K-2 Plus		
					SERIES	EMC56	EMC62	EMC52
					FLUTE	2	4	2
					HELIX ANGLE	30°	30°	35°
					CUTTING EDGE SHAPE	BALL NOSE	CORNER RADIUS	SQUARE
					SIZE MIN	R0.1	D3.0	D1.0
					SIZE MAX	R10.0	D12.0	D20.0
					PAGE	C294	C295	C297
						SHORT LENGTH	-	SHORT LENGTH
						TiAlN	TiAlN	TiAlN
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		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		Ni or Co Based	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	Hardened steel		Hardened	550	55	○	○	○
	39			Hardened	630	60			
	40	Chilled Cast Iron		Cast	400	42	○	○	○
	41	Hardened Cast Iron		Hardened	550	55			



K-2 Plus					
E5C72	E5C74	EMC54	EMC55	EMC69	
3	3	4	4	4-6	
45°	45°	35°	35°	45°	
SQUARE	SQUARE	SQUARE	SQUARE	ROUGHING	
D1.0	D3.0	D1.0	D2.0	D6.0	
D20.0	D20.0	D20.0	D20.0	D20.0	
C298	C299	C301	C302	C303	
SHORT LENGTH	LONG LENGTH	SHORT LENGTH	LONG LENGTH	FINE	
Uncoated	Uncoated	TiAlN	TiAlN	X-Coating	
		◎	◎	○	1
		◎	◎	○	2
		◎	◎	◎	3
		◎	◎	◎	4
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					41

CARBIDE
HSS
i-Xmill END MILLS
X-1EH END MILLS
4G MILL END MILLS
X-POWER PRO END MILLS
TitaNox-POWER END MILLS
V7 PLUS END MILLS
ALU-CUT END MILLS
K-2 END MILLS
GENERAL CARBIDE END MILLS

K-2 Plus END MILLS

PLAIN SHANK **EMC56** SERIES

CARBIDE, 2 FLUTE SHORT LENGTH BALL NOSE

- ▶ Designed for general purposes to carbon steels, tool steels, alloy steels and stainless steels.
- ▶ Suitable for high speed machining in wet or dry condition.
- ▶ Designed for milling of radius bottom slots, fillets and special contours.
- ▶ Application in high speed machining, wet and dry cutting conditions.



CARBIDE | 2 | 30° | R ±0.01 | R ±0.02 | PLAIN | TiAlN

R1.0 - R3 R3.5 - R10

p.C304

Unit : mm

EDP No.	Radius of Ball Nose R	Mill Diameter	Shank Diameter	Length of Cut	Overall Length
EMC56002	R0.1	0.2	4	0.4	50
EMC56003	R0.15	0.3	4	0.6	50
EMC56004	R0.2	0.4	4	0.8	50
EMC56005	R0.25	0.5	4	1.0	50
EMC56006	R0.3	0.6	4	1.2	50
EMC56008	R0.4	0.8	4	1.6	50
EMC56010	R0.5	1.0	4	2.0	50
EMC56015	R0.75	1.5	4	4.0	50
EMC56020	R1.0	2.0	4	5.0	50
EMC56025	R1.25	2.5	4	6.0	50
EMC56030	R1.5	3.0	4	6.0	50
EMC56901	R1.5	3.0	6	6.0	50
EMC56040	R2.0	4.0	4	8.0	50
EMC56902	R2.0	4.0	6	8.0	50
EMC56050	R2.5	5.0	6	10.0	50
EMC56060	R3.0	6.0	6	12.0	50
EMC56070	R3.5	7.0	8	14.0	60
EMC56080	R4.0	8.0	8	14.0	60
EMC56090	R4.5	9.0	10	18.0	75
EMC56100	R5.0	10.0	10	20.0	75
EMC56120	R6.0	12.0	12	24.0	75
EMC56160	R8.0	16.0	16	32.0	100
EMC56200	R10.0	20.0	20	40.0	100

Mill Dia.Tolerance (mm)	Shank Dia.Tolerance
0 ~ - 0.03	h5

◎ : 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	○	○	○	○	○	○	○	○	○											○	

K-2 Plus END MILLS

PLAIN SHANK **EMC62** SERIES

CARBIDE, 4 FLUTE CORNER RADIUS

- ▶ Designed for general purposes to carbon steels, tool steels, alloy steels and stainless steels.
- ▶ Suitable for high speed machining in wet or dry condition.
- ▶ 4 flute allows for better work piece finishes.
- ▶ Corner radius against chipping in high speed machining.
- ▶ Application in high speed machining, wet and dry cutting conditions.





CARBIDE | 4 | 30° | R ±0.02 | PLAIN | TiAlN

p.C305

Unit : mm

EDP No.	Corner Radius R	Mill Diameter	Shank Diameter	Length of Cut	Overall Length
EMC6203002	R0.2	3.0	6	10	70
EMC6203003	R0.3	3.0	6	10	70
EMC6203005	R0.5	3.0	6	10	70
EMC6204002	R0.2	4.0	6	12	70
EMC6204003	R0.3	4.0	6	12	70
EMC6204005	R0.5	4.0	6	12	70
EMC6204010	R1.0	4.0	6	12	70
EMC6205002	R0.2	5.0	6	15	80
EMC6205003	R0.3	5.0	6	15	80
EMC6205005	R0.5	5.0	6	15	80
EMC6205010	R1.0	5.0	6	15	80
EMC6206002	R0.2	6.0	6	15	90
EMC6206003	R0.3	6.0	6	15	90
EMC6206005	R0.5	6.0	6	15	90
EMC6206010	R1.0	6.0	6	15	90
EMC6208003	R0.3	8.0	8	20	100
EMC6208005	R0.5	8.0	8	20	100
EMC6208010	R1.0	8.0	8	20	100
EMC6208015	R1.5	8.0	8	20	100
EMC6208020	R2.0	8.0	8	20	100

▶ NEXT PAGE

Mill Dia.Tolerance (mm)	Shank Dia.Tolerance
0 ~ - 0.03	h5

◎ : 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																		○		○	

K-2 Plus END MILLS

PLAIN SHANK **EMC62** SERIES

CARBIDE, 4 FLUTE CORNER RADIUS

- ▶ Designed for general purposes to carbon steels, tool steels, alloy steels and stainless steels.
- ▶ Suitable for high speed machining in wet or dry condition.
- ▶ 4 flute allows for better work piece finishes.
- ▶ Corner radius against chipping in high speed machining.
- ▶ Application in high speed machining, wet and dry cutting conditions.



CARBIDE | 4 | 30° | R ±0.02 | PLAIN | TiAlN p.C305

Unit : mm

EDP No.	Corner Radius R	Mill Diameter	Shank Diameter	Length of Cut	Overall Length
EMC6210003	R0.3	10.0	10	25	100
EMC6210005	R0.5	10.0	10	25	100
EMC6210010	R1.0	10.0	10	25	100
EMC6210015	R1.5	10.0	10	25	100
EMC6210020	R2.0	10.0	10	25	100
EMC6210025	R2.5	10.0	10	25	100
EMC6212005	R0.5	12.0	12	30	110
EMC6212010	R1.0	12.0	12	30	110
EMC6212015	R1.5	12.0	12	30	110
EMC6212020	R2.0	12.0	12	30	110
EMC6212025	R2.5	12.0	12	30	110
EMC6212030	R3.0	12.0	12	30	110

Mill Dia.Tolerance (mm)	Shank Dia.Tolerance
0 ~ - 0.03	h5

CARBIDE
HSS
i-Xmill END MILLS
X-1EH END MILLS
4G MILL END MILLS
X-POWER PRO END MILLS
TitaNox-POWER END MILLS
V7 PLUS END MILLS
ALU-CUT END MILLS
K-2 END MILLS
GENERAL CARBIDE END MILLS

K-2 Plus END MILLS

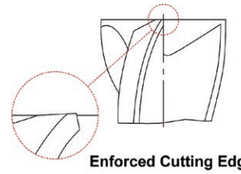
PLAIN SHANK **EMC52** SERIES

CARBIDE, 2 FLUTE 35° HELIX SHORT LENGTH

- ▶ Designed for general purposes to carbon steels, tool steels, alloy steels and stainless steels.
- ▶ Suitable for high speed machining in wet or dry condition.
- ▶ Application in high speed machining, wet and dry cutting conditions.







CARBIDE | 2 | 35° | PLAIN | TiAlN p.C306

Unit : mm

EDP No.	Mill Diameter	Shank Diameter	Length of Cut	Overall Length
EMC52010	1.0	4	3	50
EMC52015	1.5	4	4	50
EMC52020	2.0	4	6	50
EMC52025	2.5	4	8	50
EMC52030	3.0	4	8	50
EMC52901	3.0	6	8	50
EMC52035	3.5	4	10	50
EMC52902	3.5	6	10	50
EMC52040	4.0	4	11	50
EMC52903	4.0	6	11	50
EMC52045	4.5	6	11	50
EMC52050	5.0	6	13	50
EMC52055	5.5	6	13	50
EMC52060	6.0	6	16	50
EMC52065	6.5	8	16	60
EMC52070	7.0	8	20	60
EMC52075	7.5	8	20	60
EMC52080	8.0	8	20	60
EMC52085	8.5	10	20	75
EMC52090	9.0	10	20	75
EMC52095	9.5	10	22	75
EMC52100	10.0	10	25	75
EMC52110	11.0	12	30	75
EMC52120	12.0	12	32	75
EMC52140	14.0	16	40	100
EMC52160	16.0	16	40	100
EMC52180	18.0	20	40	100
EMC52200	20.0	20	45	100

Mill Dia.Tolerance (mm)	Shank Dia.Tolerance
0 ~ - 0.03	h5

◎ : 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	○	○	○	○	○													○		○	

K-2 Plus END MILLS

E5C72 SERIES

CARBIDE, 3 FLUTE 45° HELIX SHORT LENGTH

- ▶ Applied for aluminum and aluminum alloy.
- ▶ Designed to minimize vibration.
- ▶ Fine surface roughness caused by "Mirror Face" of cutting edge.
- ▶ Precision of cutting diameter tolerance.





CARBIDE | 3 | 45° | PLAIN | UNCOATED p.C309

Unit : mm

EDP No.	Mill Diameter	Shank Diameter	Length of Cut	Overall Length
E5C72010	1.0	6	3	50
E5C72015	1.5	6	5	50
E5C72020	2.0	6	6	50
E5C72025	2.5	6	8	50
E5C72030	3.0	6	11	50
E5C72040	4.0	6	13	50
E5C72050	5.0	6	17	55
E5C72060	6.0	6	17	55
E5C72070	7.0	8	22	65
E5C72080	8.0	8	22	65
E5C72090	9.0	10	27	70
E5C72100	10.0	10	27	70
E5C72120	12.0	12	32	80
E5C72140	14.0	14	37	85
E5C72160	16.0	16	42	100
E5C72180	18.0	16	48	110
E5C72200	20.0	20	48	110

Mill Dia.Tolerance (mm)
– 0.020 ~ 0

◎ : 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	◎	◎	◎	◎																	

K-2 Plus END MILLS

E5C74 SERIES

CARBIDE, 3 FLUTE 45° HELIX EX-LONG LENGTH

- ▶ Applied for aluminum and aluminum alloy.
- ▶ Designed to minimize vibration.
- ▶ Fine surface roughness caused by "Mirror Face" of cutting edge.
- ▶ Precision of cutting diameter tolerance.





CARBIDE | 3 | 45° | PLAIN | UNCOATED p.C309

Unit : mm

EDP No.	Mill Diameter	Shank Diameter	Length of Cut	Overall Length
E5C74030015	3.0	6	15	65
E5C74030020	3.0	6	20	70
E5C74030025	3.0	6	25	75
E5C74040020	4.0	6	20	70
E5C74040025	4.0	6	25	75
E5C74040030	4.0	6	30	80
E5C74050025	5.0	6	25	70
E5C74050030	5.0	6	30	75
E5C74050035	5.0	6	35	80
E5C74050040	5.0	6	40	85
E5C74060025	6.0	6	25	70
E5C74060030	6.0	6	30	75
E5C74060035	6.0	6	35	80
E5C74060042	6.0	6	42	90
E5C74080030	8.0	8	30	80
E5C74080035	8.0	8	35	85
E5C74080040	8.0	8	40	90
E5C74080045	8.0	8	45	95
E5C74080050	8.0	8	50	100
E5C74080055	8.0	8	55	105
E5C74100035	10.0	10	35	90
E5C74100045	10.0	10	45	100
E5C74100055	10.0	10	55	110
E5C74100065	10.0	10	65	120

▶ 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	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	◎	◎	◎	◎																	

K-2 Plus END MILLS

E5C74 SERIES

CARBIDE, 3 FLUTE 45° HELIX EX-LONG LENGTH

- ▶ Applied for aluminum and aluminum alloy.
- ▶ Designed to minimize vibration.
- ▶ Fine surface roughness caused by "Mirror Face" of cutting edge.
- ▶ Precision of cutting diameter tolerance.





CARBIDE | 3 | 45° | PLAIN | UNCOATED p.C309

Unit : mm

EDP No.	Mill Diameter	Shank Diameter	Length of Cut	Overall Length
E5C74120040	12.0	12	40	95
E5C74120045	12.0	12	45	100
E5C74120055	12.0	12	55	110
E5C74120060	12.0	12	60	110
E5C74120065	12.0	12	65	120
E5C74120075	12.0	12	75	135
E5C74160055	16.0	16	55	120
E5C74160065	16.0	16	65	135
E5C74160075	16.0	16	75	150
E5C74160085	16.0	16	85	160
E5C74160095	16.0	16	95	180
E5C74160105	16.0	16	105	190
E5C74160115	16.0	16	115	200
E5C74200055	20.0	20	55	125
E5C74200065	20.0	20	65	140
E5C74200075	20.0	20	75	150
E5C74200085	20.0	20	85	160
E5C74200095	20.0	20	95	180
E5C74200105	20.0	20	105	190
E5C74200115	20.0	20	115	200
E5C74200125	20.0	20	125	220

Mill Dia.Tolerance (mm)
– 0.020 ~ 0

◎ : 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	◎	◎	◎	◎																	

K-2 Plus END MILLS

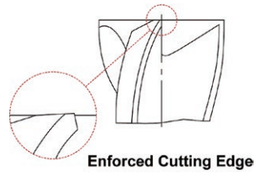
PLAIN SHANK EMC54 SERIES

CARBIDE, 4 FLUTE 35° HELIX SHORT LENGTH

- ▶ Designed for general purposes to carbon steels, tool steels, alloy steels and stainless steels.
- ▶ Suitable for high speed machining in wet or dry condition.
- ▶ 4 flute allows for better work piece finishes.
- ▶ Application in high speed machining, wet and dry cutting conditions.







Enforced Cutting Edge

CARBIDE | 4 | 35° | PLAIN | TiAlN p.C307

Unit : mm

EDP No.	Mill Diameter	Shank Diameter	Length of Cut	Overall Length
EMC54010	1.0	4	3	50
EMC54015	1.5	4	4	50
EMC54020	2.0	4	6	50
EMC54025	2.5	4	8	50
EMC54030	3.0	4	8	50
EMC54901	3.0	6	8	50
EMC54035	3.5	4	10	50
EMC54902	3.5	6	10	50
EMC54040	4.0	4	11	50
EMC54903	4.0	6	11	50
EMC54045	4.5	6	11	50
EMC54050	5.0	6	13	50
EMC54055	5.5	6	13	50
EMC54060	6.0	6	16	50
EMC54065	6.5	8	16	60
EMC54070	7.0	8	20	60
EMC54075	7.5	8	20	60
EMC54080	8.0	8	20	60
EMC54085	8.5	10	20	75
EMC54090	9.0	10	20	75
EMC54095	9.5	10	22	75
EMC54100	10.0	10	25	75
EMC54110	11.0	12	30	75
EMC54120	12.0	12	32	75
EMC54140	14.0	16	40	100
EMC54160	16.0	16	40	100
EMC54180	18.0	20	40	100
EMC54200	20.0	20	45	100

Mill Dia.Tolerance (mm)	Shank Dia.Tolerance
0 ~ - 0.03	h5

◎ : 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	○	○	○	○	○													○		○	

K-2 Plus END MILLS

PLAIN SHANK **EMC55** SERIES

CARBIDE, 4 FLUTE 35° HELIX LONG LENGTH

- ▶ Designed for general purposes to carbon steels, tool steels, alloy steels and stainless steels.
- ▶ Suitable for high speed machining in wet or dry condition.
- ▶ 4 flute allows for better work piece finishes.
- ▶ Application in high speed machining, wet and dry cutting conditions.



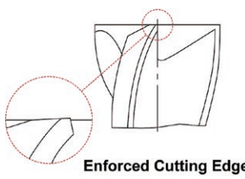


CARBIDE | 4 | 35° | PLAIN | TiAlN p.C307

Unit : mm

EDP No.	Mill Diameter	Shank Diameter	Length of Cut	Overall Length
EMC55020	2.0	4	10	50
EMC55030	3.0	4	15	60
EMC55901	3.0	6	15	60
EMC55040	4.0	4	20	60
EMC55902	4.0	6	20	60
EMC55050	5.0	6	25	75
EMC55060	6.0	6	30	75
EMC55080	8.0	8	35	100
EMC55100	10.0	10	45	100
EMC55120	12.0	12	45	100
EMC55140	14.0	14	70	150
EMC55903	14.0	16	70	150
EMC55160	16.0	16	70	150
EMC55180	18.0	20	75	150
EMC55200	20.0	20	75	150

Mill Dia.Tolerance (mm)	Shank Dia.Tolerance
0 ~ - 0.03	h5



Enforced Cutting Edge

◎ : 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	○	○	○	○	○													○		○	

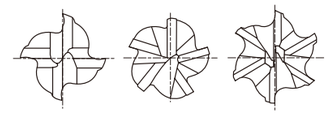
K-2 Plus END MILLS

PLAIN SHANK **EMC69** SERIES

CARBIDE, MULTI FLUTE 45° HELIX ROUGHING-FINE

- ▶ Suitable for rough machining of stainless steels, Ti, Ni, Inconel etc.
- ▶ Fine pitch wave for high speed machining..





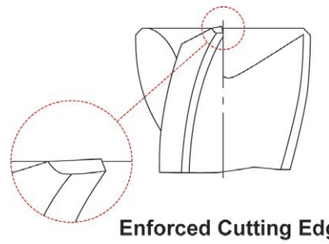
CARBIDE | HR | 4-6 | 45° | PLAIN | C x 45° | X Coating p.C308

Unit : mm

EDP No.	Mill Diameter h10	Shank Diameter h5	Length of Cut	Overall Length	No. of Flute	Chamfer
EMC69060	6.0	6	13	60	4	0.15
EMC69080	8.0	8	19	65	4	0.18
EMC69090	9.0	10	20	70	4	0.18
EMC69100	10.0	10	22	70	4	0.20
EMC69120	12.0	12	26	80	4	0.20
EMC69160	16.0	16	42	110	5	0.20
EMC69200	20.0	20	48	110	6	0.20

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
h5	0 - 4	0 - 5	0 - 6	0 - 8	0 - 9



Enforced Cutting Edge

◎ : 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											○	○	○	○	○	○	○			◎	

K-2 Plus END MILLS

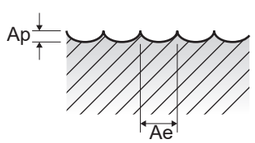
RECOMMENDED CUTTING CONDITIONS

EMC56 SERIES — 2 FLUTE BALL NOSE

Vc = m/min.
fz = mm/tooth
RPM = rev./min.
FEED = mm/min.

ISO	VDI 3323	Material Description	Ae(mm)	Ap(mm)	Parameter	Diameter (Ø) 2.0	3.0	4.0	5.0	6.0	8.0	10.0	12.0	14.0	16.0	18.0	20.0
P	1-4	Non-alloy steel	-	0.2D	Vc	78	107	112	123	137	153	171	188	199	205	215	223
					fz	0.026	0.025	0.035	0.045	0.060	0.089	0.122	0.150	0.165	0.180	0.188	0.201
					RPM	12350	11400	8950	7800	7250	6100	5450	4990	4530	4085	3800	3550
					FEED	640	575	630	700	870	1090	1330	1500	1495	1470	1425	1425
					Ae	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.3
	5		-	0.2D	Vc	57	83	90	97	111	123	137	149	158	161	170	176
					fz	0.023	0.022	0.031	0.040	0.060	0.080	0.100	0.120	0.128	0.141	0.148	0.158
					RPM	9150	8850	7150	6200	5900	4900	4350	3950	3600	3200	3000	2800
					FEED	415	390	450	490	705	785	870	950	925	905	890	885
					Ae	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.3
	6-7	Low alloy steel	-	0.2D	Vc	78	107	112	123	137	153	171	188	199	205	215	223
					fz	0.026	0.025	0.035	0.045	0.060	0.089	0.122	0.150	0.165	0.180	0.188	0.201
					RPM	12350	11400	8950	7800	7250	6100	5450	4990	4530	4085	3800	3550
					FEED	640	575	630	700	870	1090	1330	1500	1495	1470	1425	1425
					Ae	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.3
	8-9		-	0.2D	Vc	57	83	90	97	111	123	137	149	158	161	170	176
					fz	0.023	0.022	0.031	0.040	0.060	0.080	0.100	0.120	0.128	0.141	0.148	0.158
					RPM	9150	8850	7150	6200	5900	4900	4350	3950	3600	3200	3000	2800
					FEED	415	390	450	490	705	785	870	950	925	905	890	885
					Ae	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.3
	10	High alloyed steel, and tool steel	-	0.2D	Vc	78	107	112	123	137	153	171	188	199	205	215	223
					fz	0.026	0.025	0.035	0.045	0.060	0.089	0.122	0.150	0.165	0.180	0.188	0.201
					RPM	12350	11400	8950	7800	7250	6100	5450	4990	4530	4085	3800	3550
					FEED	640	575	630	700	870	1090	1330	1500	1495	1470	1425	1425
					Ae	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.3
	11.1 - 11.2		-	0.2D	Vc	57	83	90	97	111	123	137	149	158	161	170	176
					fz	0.023	0.022	0.031	0.040	0.060	0.080	0.100	0.120	0.128	0.141	0.148	0.158
					RPM	9150	8850	7150	6200	5900	4900	4350	3950	3600	3200	3000	2800
					FEED	415	390	450	490	705	785	870	950	925	905	890	885
					Ae	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.3
K	15-20	Grey cast iron Nodular cast iron Malleable cast iron	0.7D	0.3D	Vc	66	66	65	65	64	63	64	66	62	65	62	66
					fz	0.010	0.016	0.028	0.040	0.053	0.092	0.112	0.131	0.164	0.177	0.209	0.200
					RPM	10500	7050	5150	4150	3400	2500	2050	1750	1400	1300	1100	1050
					FEED	220	230	285	330	360	460	460	460	460	460	460	420
					Ae	-	-	-	-	-	-	-	-	-	-	-	-
N	21~22	Aluminum-wrought alloy	0.7D	0.3D	Vc	194	193	194	190	194	199	193	194	189	194	192	185
					fz	0.006	0.010	0.013	0.019	0.023	0.034	0.044	0.061	0.073	0.070	0.079	0.092
					RPM	30800	20500	15400	12100	10300	7900	6150	5150	4300	3850	3400	2950
					FEED	395	395	395	470	470	540	540	630	630	540	540	540
					Ae	-	-	-	-	-	-	-	-	-	-	-	-
	23~25	Aluminum-cast, alloyed	0.7D	0.3D	Vc	194	193	194	190	194	199	193	194	189	194	192	185
					fz	0.006	0.010	0.013	0.019	0.023	0.034	0.044	0.061	0.073	0.070	0.079	0.092
					RPM	30800	20500	15400	12100	10300	7900	6150	5150	4300	3850	3400	2950
					FEED	395	395	395	470	470	540	540	630	630	540	540	540
					Ae												
H	38.1	Hardened steel	-	0.2D	Vc	25	36	45	49	51	52	55	57	57	58	59	60
					fz	0.016	0.016	0.021	0.024	0.030	0.046	0.054	0.070	0.081	0.091	0.100	0.111
					RPM	4000	3800	3600	3100	2700	2050	1750	1500	1300	1150	1050	950
					FEED	125	125	150	150	160	190	190	210	210	210	210	210
					Ae	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.3
	40	Chilled Cast Iron	-	0.2D	Vc	57	83	90	97	111	123	137	149	158	161	170	176
					fz	0.023	0.022	0.031	0.040	0.060	0.080	0.100	0.120	0.128	0.141	0.148	0.158
					RPM	9150	8850	7150	6200	5900	4900	4350	3950	3600	3200	3000	2800
					FEED	415	390	450	490	705	785	870	950	925	905	890	885
					Ae	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.3

※ The FEED, in long & extra long types, should be reduced by around 50%



CARBIDE
HSS
i-Xmill END MILLS
X-1EH END MILLS
4G MILL END MILLS
X-POWER PRO END MILLS
TitaNox-POWER END MILLS
V7 PLUS END MILLS
ALU-CUT END MILLS
K-2 END MILLS
GENERAL CARBIDE END MILLS

K-2 Plus END MILLS

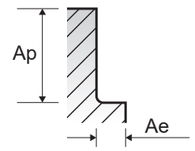
RECOMMENDED CUTTING CONDITIONS

EMC62 SERIES — 4 FLUTE CORNER- SIDE CUTTING

Vc = m/min.
fz = mm/tooth
RPM = rev./min.
FEED = mm/min.

ISO	VDI 3323	Material Description	Ae(mm)	Ap(mm)	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	2.0D	Vc	59	63	68	70	71	61	61	81	74
					fz	0.007	0.011	0.013	0.015	0.021	0.031	0.029	0.026	0.026
					RPM	6255	5040	4320	3735	2835	1935	1620	1620	1170
					FEED	180	220	225	225	240	240	190	170	120
	5		0.05D	2.0D	Vc	38	41	43	45	45	48	51	50	48
					fz	0.008	0.012	0.017	0.020	0.026	0.031	0.031	0.033	0.031
					RPM	4050	3240	2745	2385	1800	1530	1350	990	770
					FEED	135	150	190	190	190	190	170	130	95
	6-7	Low alloy steel	0.05D	2.0D	Vc	59	63	68	70	71	61	61	81	74
					fz	0.007	0.011	0.013	0.015	0.021	0.031	0.029	0.026	0.026
					RPM	6255	5040	4320	3735	2835	1935	1620	1620	1170
					FEED	180	220	225	225	240	240	190	170	120
	8-9		0.05D	2.0D	Vc	38	41	43	45	45	48	51	50	48
					fz	0.008	0.012	0.017	0.020	0.026	0.031	0.031	0.033	0.031
					RPM	4050	3240	2745	2385	1800	1530	1350	990	770
					FEED	135	150	190	190	190	190	170	130	95
	10	High alloyed steel, and tool steel	0.05D	2.0D	Vc	59	63	68	70	71	61	61	81	74
					fz	0.007	0.011	0.013	0.015	0.021	0.031	0.029	0.026	0.026
					RPM	6255	5040	4320	3735	2835	1935	1620	1620	1170
					FEED	180	220	225	225	240	240	190	170	120
	11.1 - 11.2		0.05D	2.0D	Vc	38	41	43	45	45	48	51	50	48
					fz	0.008	0.012	0.017	0.020	0.026	0.031	0.031	0.033	0.031
					RPM	4050	3240	2745	2385	1800	1530	1350	990	770
					FEED	135	150	190	190	190	190	170	130	95
H	38.1 - 38.2	Hardened steel	0.02D	2.0D	Vc	28	31	33	35	36	35	36	38	35
					fz	0.008	0.010	0.013	0.015	0.019	0.024	0.025	0.026	0.027
					RPM	2970	2430	2115	1845	1440	1125	945	760	560
					FEED	90	95	110	110	110	110	95	80	60
	40	Chilled Cast Iron	0.05D	2.0D	Vc	38	41	43	45	45	48	51	50	48
					fz	0.008	0.012	0.017	0.020	0.026	0.031	0.031	0.033	0.031
					RPM	4050	3240	2745	2385	1800	1530	1350	990	770
					FEED	135	150	190	190	190	190	170	130	95
	41	Hardened Cast Iron	0.02D	2.0D	Vc	28	31	33	35	36	35	36	38	35
					fz	0.008	0.010	0.013	0.015	0.019	0.024	0.025	0.026	0.027
					RPM	2970	2430	2115	1845	1440	1125	945	760	560
					FEED	90	95	110	110	110	110	95	80	60

※ The FEED, in long & extra long types, should be reduced by around 50%



K-2 Plus END MILLS

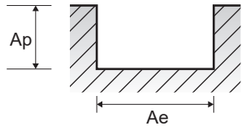
RECOMMENDED CUTTING CONDITIONS

EMC52 SERIES — 2 FLUTE - SLOTTING

Vc = m/min.
fz = mm/tooth
RPM = rev./min.
FEED = mm/min.

ISO	VDI 3323	Material Description	Ae(mm)	Ap(mm)	Parameter	Diameter (Ø) 1.0	1.5	2.0	3.0	4.0	5.0	6.0	8.0	10.0	12.0	14.0	16.0	20.0
P	1-4	Non-alloy steel	1.0D	Up to D3 : 0.2D D3~D20 : 0.5D	Vc	45	44	49	57	65	68	72	72	69	70	75	75	72
					fz	0.004	0.008	0.010	0.015	0.025	0.031	0.039	0.057	0.064	0.065	0.063	0.062	0.063
					RPM	14300	9350	7850	6100	5150	4300	3800	2850	2200	1850	1700	1500	1150
					FEED	105	150	160	180	255	270	300	325	280	240	215	185	145
	5		1.0D	Up to D3 : 0.2D D3~D20 : 0.5D	Vc	27	26	32	36	40	40	43	43	42	43	46	48	44
					fz	0.004	0.008	0.010	0.016	0.025	0.031	0.041	0.050	0.050	0.048	0.048	0.050	0.050
					RPM	8500	5550	5150	3800	3150	2550	2300	1700	1350	1150	1050	950	700
					FEED	65	85	100	120	155	160	190	170	135	110	100	95	70
	6-7	Low alloy steel	1.0D	Up to D3 : 0.2D D3~D20 : 0.5D	Vc	45	44	49	57	65	68	72	72	69	70	75	75	72
					fz	0.004	0.008	0.010	0.015	0.025	0.031	0.039	0.057	0.064	0.065	0.063	0.062	0.063
					RPM	14300	9350	7850	6100	5150	4300	3800	2850	2200	1850	1700	1500	1150
					FEED	105	150	160	180	255	270	300	325	280	240	215	185	145
	8-9		1.0D	Up to D3 : 0.2D D3~D20 : 0.5D	Vc	27	26	32	36	40	40	43	43	42	43	46	48	44
					fz	0.004	0.008	0.010	0.016	0.025	0.031	0.041	0.050	0.050	0.048	0.048	0.050	0.050
					RPM	8500	5550	5150	3800	3150	2550	2300	1700	1350	1150	1050	950	700
					FEED	65	85	100	120	155	160	190	170	135	110	100	95	70
	10	High alloyed steel, and tool steel	1.0D	Up to D3 : 0.2D D3~D20 : 0.5D	Vc	45	44	49	57	65	68	72	72	69	70	75	75	72
					fz	0.004	0.008	0.010	0.015	0.025	0.031	0.039	0.057	0.064	0.065	0.063	0.062	0.063
					RPM	14300	9350	7850	6100	5150	4300	3800	2850	2200	1850	1700	1500	1150
					FEED	105	150	160	180	255	270	300	325	280	240	215	185	145
	11.1 ~ 11.2		1.0D	Up to D3 : 0.2D D3~D20 : 0.5D	Vc	27	26	32	36	40	40	43	43	42	43	46	48	44
					fz	0.004	0.008	0.010	0.016	0.025	0.031	0.041	0.050	0.050	0.048	0.048	0.050	0.050
					RPM	8500	5550	5150	3800	3150	2550	2300	1700	1350	1150	1050	950	700
					FEED	65	85	100	120	155	160	190	170	135	110	100	95	70
M	14.1	Stainless steel	1.0D	Up to D3 : 0.2D D3~D20 : 0.5D	Vc	22	26	27	30	33	34	37	36	36	36	37	35	35
					fz	0.003	0.007	0.009	0.016	0.025	0.031	0.040	0.053	0.059	0.058	0.059	0.068	0.064
					RPM	7150	5600	4300	3150	2650	2150	1950	1450	1150	950	850	700	550
					FEED	50	80	80	100	130	135	155	155	135	110	100	95	70
K	15-20	Grey cast iron Nodular cast iron Malleable cast iron	1.0D	1.0D	Vc	59	57	59	57	58	57	56	55	58	55	57	55	57
					fz	0.005	0.008	0.012	0.018	0.024	0.030	0.043	0.063	0.077	0.102	0.119	0.145	0.189
					RPM	18700	12100	9350	6050	4600	3650	2950	2200	1850	1450	1300	1100	900
					FEED	205	205	220	220	220	220	255	275	285	295	310	320	340
N	21~22	Aluminum-wrought alloy	1.0D	1.0D	Vc	138	130	138	145	138	144	143	143	145	141	145	143	138
					fz	0.004	0.007	0.010	0.015	0.021	0.025	0.032	0.043	0.053	0.065	0.073	0.085	0.110
					RPM	44000	27500	22000	15400	11000	9150	7600	5700	4600	3750	3300	2850	2200
					FEED	330	385	460	460	460	460	485	485	485	485	485	485	485
	23~25	Aluminum-cast, alloyed	1.0D	1.0D	Vc	138	130	138	145	138	144	143	143	145	141	145	143	138
					fz	0.004	0.007	0.010	0.015	0.021	0.025	0.032	0.043	0.053	0.065	0.073	0.085	0.110
					RPM	44000	27500	22000	15400	11000	9150	7600	5700	4600	3750	3300	2850	2200
					FEED	330	385	460	460	460	460	485	485	485	485	485	485	485
H	38.1	Hardened steel	1.0D	Up to D3 : 0.2D D3~D20 : 0.5D	Vc	27	26	32	36	40	40	43	43	42	43	46	48	44
					fz	0.004	0.008	0.010	0.016	0.025	0.031	0.041	0.050	0.050	0.048	0.048	0.050	0.050
					RPM	8500	5550	5150	3800	3150	2550	2300	1700	1350	1150	1050	950	700
					FEED	65	85	100	120	155	160	190	170	135	110	100	95	70
	40	Chilled Cast Iron	1.0D	Up to D3 : 0.2D D3~D20 : 0.5D	Vc	27	26	32	36	40	40	43	43	42	43	46	48	44
					fz	0.004	0.008	0.010	0.016	0.025	0.031	0.041	0.050	0.050	0.048	0.048	0.050	0.050
					RPM	8500	5550	5150	3800	3150	2550	2300	1700	1350	1150	1050	950	700
					FEED	65	85	100	120	155	160	190	170	135	110	100	95	70

※ The FEED, in long & extra long types, should be reduced by around 50%



K-2 Plus END MILLS

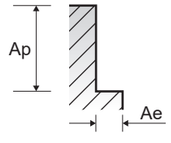
RECOMMENDED CUTTING CONDITIONS

EMC54, EMC55 SERIES — 4 FLUTE - SIDE CUTTING

Vc = m/min.
fz = mm/tooth
RPM = rev./min.
FEED = mm/min.

ISO	VDI 3323	Material Description	Ae(mm)	Ap(mm)	Parameter	Diameter (Ø) 1.0	1.5	2.0	3.0	4.0	5.0	6.0	8.0	10.0	12.0	14.0	16.0	20.0
P	1-4	Non-alloy steel	0.1D	1.0D	Vc	55	56	62	72	81	84	90	89	86	89	92	93	91
					fz	0.002	0.005	0.006	0.009	0.019	0.024	0.029	0.043	0.047	0.047	0.047	0.047	0.047
					RPM	17600	11800	9850	7600	6450	5350	4750	3550	2750	2350	2100	1850	1450
					FEED	150	215	240	270	485	510	560	605	520	440	395	350	270
	5		0.1D	1.0D	Vc	32	33	41	45	50	50	54	54	53	55	57	58	57
					fz	0.002	0.004	0.006	0.009	0.019	0.024	0.031	0.038	0.038	0.037	0.038	0.037	0.038
					RPM	10250	7050	6450	4750	3950	3200	2850	2150	1700	1450	1300	1150	900
					FEED	85	115	145	170	300	305	350	325	255	215	195	170	135
	6-7	Low alloy steel	0.1D	1.0D	Vc	55	56	62	72	81	84	90	89	86	89	92	93	91
					fz	0.002	0.005	0.006	0.009	0.019	0.024	0.029	0.043	0.047	0.047	0.047	0.047	0.047
					RPM	17600	11800	9850	7600	6450	5350	4750	3550	2750	2350	2100	1850	1450
					FEED	150	215	240	270	485	510	560	605	520	440	395	350	270
	8-9		0.1D	1.0D	Vc	32	33	41	45	50	50	54	54	53	55	57	58	57
					fz	0.002	0.004	0.006	0.009	0.019	0.024	0.031	0.038	0.038	0.037	0.038	0.037	0.038
					RPM	10250	7050	6450	4750	3950	3200	2850	2150	1700	1450	1300	1150	900
					FEED	85	115	145	170	300	305	350	325	255	215	195	170	135
	10	High alloyed steel, and tool steel	0.1D	1.0D	Vc	55	56	62	72	81	84	90	89	86	89	92	93	91
					fz	0.002	0.005	0.006	0.009	0.019	0.024	0.029	0.043	0.047	0.047	0.047	0.047	0.047
					RPM	17600	11800	9850	7600	6450	5350	4750	3550	2750	2350	2100	1850	1450
					FEED	150	215	240	270	485	510	560	605	520	440	395	350	270
	11.1 ~ 11.2		0.1D	1.0D	Vc	32	33	41	45	50	50	54	54	53	55	57	58	57
					fz	0.002	0.004	0.006	0.009	0.019	0.024	0.031	0.038	0.038	0.037	0.038	0.037	0.038
					RPM	10250	7050	6450	4750	3950	3200	2850	2150	1700	1450	1300	1150	900
					FEED	85	115	145	170	300	305	350	325	255	215	195	170	135
M	14.1	Stainless steel	0.1D	1.0D	Vc	27	33	34	37	41	42	45	45	46	43	46	48	44
					fz	0.002	0.004	0.006	0.009	0.018	0.024	0.029	0.042	0.044	0.045	0.045	0.045	0.046
					RPM	8650	7050	5350	3950	3300	2700	2400	1800	1450	1150	1050	950	700
					FEED	75	120	120	145	240	255	280	300	255	205	190	170	130
K	15-20	Grey cast iron Nodular cast iron Malleable cast iron	0.1D	1.5D	Vc	59	57	59	57	58	57	56	55	58	55	57	55	57
					fz	0.008	0.013	0.017	0.026	0.035	0.044	0.065	0.093	0.116	0.155	0.182	0.220	0.288
					RPM	18700	12100	9350	6050	4600	3650	2950	2200	1850	1450	1300	1100	900
					FEED	620	620	640	640	640	640	770	815	860	900	945	970	1035
N	21~22	Aluminum-wrought alloy	0.1D	1.5D	Vc	138	130	138	145	138	144	143	143	145	141	145	143	138
					fz	0.006	0.011	0.015	0.021	0.030	0.036	0.047	0.063	0.078	0.095	0.108	0.125	0.163
					RPM	44000	27500	22000	15400	11000	9150	7600	5700	4600	3750	3300	2850	2200
					FEED	1050	1160	1320	1320	1320	1320	1430	1430	1430	1430	1430	1430	1430
	23~25	Aluminum-cast, alloyed	0.1D	1.5D	Vc	138	130	138	145	138	144	143	143	145	141	145	143	138
					fz	0.006	0.011	0.015	0.021	0.030	0.036	0.047	0.063	0.078	0.095	0.108	0.125	0.163
					RPM	44000	27500	22000	15400	11000	9150	7600	5700	4600	3750	3300	2850	2200
					FEED	1050	1160	1320	1320	1320	1320	1430	1430	1430	1430	1430	1430	1430
H	38.1	Hardened steel	0.1D	1.0D	Vc	32	33	41	45	50	50	54	54	53	55	57	58	57
					fz	0.002	0.004	0.006	0.009	0.019	0.024	0.031	0.038	0.038	0.037	0.038	0.037	0.038
					RPM	10250	7050	6450	4750	3950	3200	2850	2150	1700	1450	1300	1150	900
					FEED	85	115	145	170	300	305	350	325	255	215	195	170	135
	40	Chilled Cast Iron	0.1D	1.0D	Vc	32	33	41	45	50	50	54	54	53	55	57	58	57
					fz	0.002	0.004	0.006	0.009	0.019	0.024	0.031	0.038	0.038	0.037	0.038	0.037	0.038
					RPM	10250	7050	6450	4750	3950	3200	2850	2150	1700	1450	1300	1150	900
					FEED	85	115	145	170	300	305	350	325	255	215	195	170	135

※ The FEED, in long & extra long types, should be reduced by around 50%



CARBIDE
HSS
i-Xmill END MILLS
X-1EH END MILLS
4G MILL END MILLS
X-POWER PRO END MILLS
TitaNox-POWER END MILLS
V7 PLUS END MILLS
ALU-CUT END MILLS
K-2 END MILLS
GENERAL

K-2 Plus END MILLS

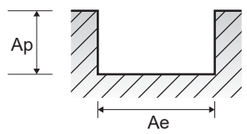
RECOMMENDED CUTTING CONDITIONS

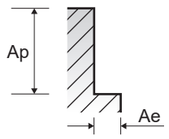
EMC69 SERIES — Multi Flute Roughing - SLOTTING / SIDE CUTTING

Vc = m/min.
fz = mm/tooth
RPM = rev./min.
FEED = mm/min.

ISO	VDI 3323	Ae(mm)	Ap(mm)	Parameter	SLOTTING 槽铣削 - Diameter (Ø) 6.0	8.0	10.0	12.0	16.0	20.0	Ae(mm)	Ap(mm)	Parameter	SIDE CUTTING 侧铣削 - Diameter (Ø) 6.0	8.0	10.0	12.0	16.0	20.0
P	1-4	1.0D	0.5D	Vc	278	275	273	285	285	285	0.3D	1.5D	Vc	278	275	273	285	285	285
				fz	0.041	0.055	0.069	0.082	0.088	0.083			fz	0.041	0.055	0.069	0.082	0.088	0.083
				RPM	14740	10960	8690	7560	5670	4540			RPM	14740	10960	8690	7560	5670	4540
				FEED	2410	2410	2410	2490	2490	2250			FEED	2410	2410	2410	2490	2490	2250
	5	1.0D	0.5D	Vc	221	218	226	214	228	214	0.3D	1.5D	Vc	221	218	226	214	228	214
				fz	0.019	0.025	0.030	0.037	0.035	0.029			fz	0.019	0.025	0.030	0.037	0.035	0.029
				RPM	11720	8690	7180	5670	4540	3400			RPM	11720	8690	7180	5670	4540	3400
				FEED	870	870	870	830	790	585			FEED	870	870	870	830	790	590
	6-7	1.0D	0.5D	Vc	278	275	273	285	285	285	0.3D	1.5D	Vc	278	275	273	285	285	285
				fz	0.041	0.055	0.069	0.082	0.088	0.083			fz	0.041	0.055	0.069	0.082	0.088	0.083
				RPM	14740	10960	8690	7560	5670	4540			RPM	14740	10960	8690	7560	5670	4540
				FEED	2410	2410	2410	2490	2490	2250			FEED	2410	2410	2410	2490	2490	2250
	8-9	1.0D	0.5D	Vc	221	218	226	214	228	214	0.3D	1.5D	Vc	221	218	226	214	228	214
				fz	0.019	0.025	0.030	0.037	0.035	0.029			fz	0.019	0.025	0.030	0.037	0.035	0.029
				RPM	11720	8690	7180	5670	4540	3400			RPM	11720	8690	7180	5670	4540	3400
				FEED	870	870	870	830	790	585			FEED	870	870	870	830	790	590
	10	1.0D	0.5D	Vc	278	275	273	285	285	285	0.3D	1.5D	Vc	278	275	273	285	285	285
				fz	0.041	0.055	0.069	0.082	0.088	0.083			fz	0.041	0.055	0.069	0.082	0.088	0.083
				RPM	14740	10960	8690	7560	5670	4540			RPM	14740	10960	8690	7560	5670	4540
				FEED	2410	2410	2410	2490	2490	2250			FEED	2410	2410	2410	2490	2490	2250
	11.1 - 11.2	1.0D	0.5D	Vc	221	218	226	214	228	214	0.3D	1.5D	Vc	221	218	226	214	228	214
				fz	0.019	0.025	0.030	0.037	0.035	0.029			fz	0.019	0.025	0.030	0.037	0.035	0.029
				RPM	11720	8690	7180	5670	4540	3400			RPM	11720	8690	7180	5670	4540	3400
				FEED	870	870	870	830	790	585			FEED	870	870	870	830	790	590
M	14.1	1.0D	-	Vc	150	150	151	150	157	143	-	1.5D	Vc	150	150	151	150	157	143
				fz	0.019	0.025	0.031	0.037	0.034	0.027			fz	0.019	0.025	0.031	0.037	0.034	0.027
				RPM	7940	5950	4820	3970	3120	2270			RPM	7940	5950	4820	3970	3120	2270
				FEED	600	600	590	590	530	370			FEED	600	600	590	590	530	370
				Ap	0.25D	0.25D	0.25D	0.15D	0.15D	0.10D			Ae	0.25D	0.25D	0.25D	0.15D	0.15D	0.10D
S	31-35	1.0D	0.5D	Vc	51	51	46	51	45	46	0.05D	1.0D	Vc	51	51	46	51	45	46
				fz	0.024	0.030	0.045	0.048	0.033	0.030			fz	0.024	0.030	0.045	0.048	0.033	0.030
				RPM	2700	2025	1460	1350	900	740			RPM	2700	2025	1460	1350	900	740
				FEED	260	240	260	260	150	135			FEED	260	240	260	260	150	135
H	40	1.0D	0.3D	Vc	221	218	226	214	228	214	0.3D	1.0D	Vc	221	218	226	214	228	214
				fz	0.019	0.025	0.030	0.037	0.035	0.029			fz	0.019	0.025	0.030	0.037	0.035	0.029
				RPM	11720	8690	7180	5670	4540	3400			RPM	11720	8690	7180	5670	4540	3400
				FEED	870	870	870	830	790	585			FEED	870	870	870	830	790	590

※ The FEED, in long & extra long types, should be reduced by around 50%





CARBIDE
HSS
i-Xmill END MILLS
X-1EH END MILLS
4G MILL END MILLS
X-POWER PRO END MILLS
TitaNox-POWER END MILLS
V7 PLUS END MILLS
ALU-CUT END MILLS
K-2 END MILLS
GENERAL CARBIDE END MILLS

K-2 Plus END MILLS

RECOMMENDED CUTTING CONDITIONS

E5C72 SERIES — 3 FLUTE

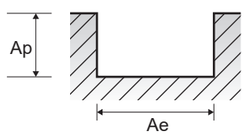
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fz = mm/tooth
RPM = rev./min.
FEED = mm/min.

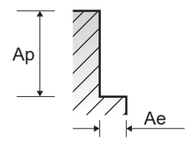
SLOTTING

ISO	VDI 3323	Material Description	Ae(mm)	Ap(mm)	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	Aluminum-wrought alloy	1.0D	0.2D	Vc	85	113	141	170	181	226	271	238	271	204	226
					fz	0.017	0.021	0.024	0.029	0.042	0.051	0.063	0.073	0.075	0.074	0.096
					RPM	9000	9000	9000	9000	7200	7200	7200	5400	5400	3600	3600
					FEED	450	570	650	780	900	1100	1350	1180	1215	800	1035
	22		1.0D	0.2D	Vc	85	113	141	170	181	226	271	238	271	204	226
					fz	0.017	0.021	0.024	0.029	0.042	0.051	0.063	0.073	0.075	0.074	0.096
					RPM	9000	9000	9000	9000	7200	7200	7200	5400	5400	3600	3600
					FEED	450	570	650	780	900	1100	1350	1180	1215	800	1035
	23	Aluminum-cast, alloyed	1.0D	0.2D	Vc	55	74	92	110	118	147	176	154	176	132	147
					fz	0.017	0.021	0.024	0.029	0.042	0.051	0.063	0.073	0.075	0.074	0.096
					RPM	5850	5850	5850	5850	4680	4680	4680	3510	3510	2340	2340
					FEED	295	370	425	505	585	715	880	765	790	520	675
	24		1.0D	0.2D	Vc	55	74	92	110	118	147	176	154	176	132	147
					fz	0.017	0.021	0.024	0.029	0.042	0.051	0.063	0.073	0.075	0.074	0.096
					RPM	5850	5850	5850	5850	4680	4680	4680	3510	3510	2340	2340
					FEED	295	370	425	505	585	715	880	765	790	520	675

SIDE CUTTING

ISO	VDI 3323	Material Description	Ae(mm)	Ap(mm)	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	Aluminum-wrought alloy	0.15D	2.5D	Vc	85	113	141	170	181	226	271	238	271	204	226
					fz	0.022	0.026	0.031	0.036	0.051	0.063	0.052	0.088	0.096	0.108	0.114
					RPM	9000	9000	9000	9000	7200	7200	7200	5400	5400	3600	3600
					FEED	585	700	840	970	1110	1350	1130	1420	1560	1170	1230
	22		0.15D	2.5D	Vc	85	113	141	170	181	226	271	238	271	204	226
					fz	0.022	0.026	0.031	0.036	0.051	0.063	0.052	0.088	0.096	0.108	0.114
					RPM	9000	9000	9000	9000	7200	7200	7200	5400	5400	3600	3600
					FEED	585	700	840	970	1110	1350	1130	1420	1560	1170	1230
	23	Aluminum-cast, alloyed	0.15D	2.5D	Vc	55	74	92	110	118	147	176	154	176	132	147
					fz	0.022	0.026	0.031	0.036	0.051	0.063	0.052	0.088	0.096	0.108	0.114
					RPM	5850	5850	5850	5850	4680	4680	4680	3510	3510	2340	2340
					FEED	380	455	545	630	720	880	735	925	1015	760	800
	24		0.15D	2.5D	Vc	55	74	92	110	118	147	176	154	176	132	147
					fz	0.022	0.026	0.031	0.036	0.051	0.063	0.052	0.088	0.096	0.108	0.114
					RPM	5850	5850	5850	5850	4680	4680	4680	3510	3510	2340	2340
					FEED	380	455	545	630	720	880	735	925	1015	760	800





K-2 Plus END MILLS

RECOMMENDED CUTTING CONDITIONS

E5C74 SERIES 3 FLUTE

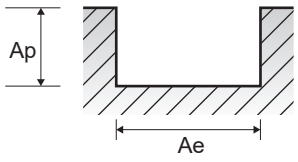
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fz = mm/tooth
RPM = rev./min.
FEED = mm/min.

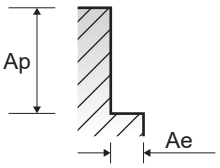
SLOTTING

ISO	VDI 3323	Material Description	Ae(mm)	Ap(mm)	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	Aluminum-wrought alloy	1.0D	0.2D	Vc	59	79	99	119	127	158	190	166	190	143	158
					fz	0.017	0.021	0.024	0.029	0.042	0.045	0.063	0.071	0.075	0.083	0.096
					RPM	6300	6300	6300	6300	5040	5040	5040	3780	3780	2520	2520
					FEED	315	400	450	545	630	680	945	810	850	630	725
	22		1.0D	0.2D	Vc	59	79	99	119	127	158	190	166	190	143	158
					fz	0.017	0.021	0.024	0.029	0.042	0.045	0.063	0.071	0.075	0.083	0.096
					RPM	6300	6300	6300	6300	5040	5040	5040	3780	3780	2520	2520
					FEED	315	400	450	545	630	680	945	810	850	630	725
	23	Aluminum-cast, alloyed	1.0D	0.2D	Vc	39	52	64	77	82	103	124	108	124	93	103
					fz	0.017	0.021	0.024	0.029	0.042	0.045	0.063	0.071	0.075	0.083	0.096
					RPM	4100	4100	4100	4100	3280	3280	3280	2460	2460	1640	1640
					FEED	205	260	295	355	410	440	615	525	555	410	470
	24		1.0D	0.2D	Vc	39	52	64	77	82	103	124	108	124	93	103
					fz	0.017	0.021	0.024	0.029	0.042	0.045	0.063	0.071	0.075	0.083	0.096
					RPM	4100	4100	4100	4100	3280	3280	3280	2460	2460	1640	1640
					FEED	205	260	295	355	410	440	615	525	555	410	470

SIDE CUTTING

ISO	VDI 3323	Material Description	Ae(mm)	Ap(mm)	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	Aluminum-wrought alloy	0.15D	2.5D	Vc	59	79	99	119	127	158	190	166	190	143	158
					fz	0.022	0.026	0.031	0.036	0.051	0.063	0.052	0.088	0.096	0.108	0.114
					RPM	6300	6300	6300	6300	5040	5040	5040	3780	3780	2520	2520
					FEED	410	490	590	680	775	945	790	995	1090	820	860
	22		0.15D	2.5D	Vc	59	79	99	119	127	158	190	166	190	143	158
					fz	0.022	0.026	0.031	0.036	0.051	0.063	0.052	0.088	0.096	0.108	0.114
					RPM	6300	6300	6300	6300	5040	5040	5040	3780	3780	2520	2520
					FEED	410	490	590	680	775	945	790	995	1090	820	860
	23	Aluminum-cast, alloyed	0.15D	2.5D	Vc	39	52	64	77	82	103	124	108	124	93	103
					fz	0.022	0.026	0.031	0.036	0.051	0.063	0.052	0.087	0.096	0.109	0.114
					RPM	4100	4100	4100	4100	3280	3280	3280	2460	2460	1640	1640
					FEED	265	320	385	440	505	615	515	645	710	535	560
	24		0.15D	2.5D	Vc	39	52	64	77	82	103	124	108	124	93	103
					fz	0.022	0.026	0.031	0.036	0.051	0.063	0.052	0.087	0.096	0.109	0.114
					RPM	4100	4100	4100	4100	3280	3280	3280	2460	2460	1640	1640
					FEED	265	320	385	440	505	615	515	645	710	535	560





YG

Leading Through Innovation



HSSCo8

GENERAL HSS
END MILLS

- General Purpose / Coating Available

SELECTION GUIDE

MILLING TOOLS

SERIES	E2401	E2412	E2760
FLUTE	2	4	4-6
HELIX ANGLE	30°	30°	30°
CUTTING EDGE SHAPE	SQUARE	SQUARE	SQUARE
SIZE MIN	D1.0	D1.0	D6.0
SIZE MAX	D50.0	D50.0	D50.0
PAGE	C313	C316	C319
	REGULAR LENGTH	REGULAR LENGTH CENTER CUT	SHORT LENGTH ROUGHING-COARSE
	Uncoated	Uncoated	Uncoated
	HSSCo8	HSSCo8	HSSCo8

HSS
GENERAL HSS END MILLS

General Purpose, Non-coated, Any Coating Available





Please visit globalyg1.com/mat for material search

◎ : Excellent ○ : Good

Recommended cutting conditions : p.C321

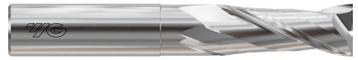
ISO	VDI 3323	Material Description	Composition / Structure / Heat Treatment		HB	HRc	E2401	E2412	E2760
P	1	Non-alloy steel	About 0.15% C	Annealed	125		◎	◎	◎
	2		About 0.45% C	Annealed	190	13	◎	◎	◎
	3		About 0.45% C	Quenched & Tempered	250	25	◎	◎	◎
	4		About 0.75% C	Annealed	270	28	◎	◎	◎
	5		About 0.75% 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		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		Ni or Co Based	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	Hardened steel		Hardened	550	55			
	39			Hardened	630	60			
	40	Chilled Cast Iron		Cast	400	42			
	41	Hardened Cast Iron		Hardened	550	55			

GENERAL HSS END MILLS

PLAIN SHANK **E2401** SERIES

HSSCo8, 2 FLUTE REGULAR LENGTH

▶ These end mills are furnished as regular with right-hand cutting and right-hand helical flutes. These are designed for slotting, drilling, pocketing and general-purpose operation.




HSS Co8 | 2 | 30° | PLAIN | UNCOATED

p.C321-C322

Unit : mm

EDP No.	Mill Diameter	Shank Diameter	Length of Cut	Overall Length
E2401010	1.0	6	2.5	55
E2401015	1.5	6	4	55
E2401016	1.6	6	4	55
E2401018	1.8	6	5	55
E2401020	2.0	6	6	55
E2401025	2.5	6	7	55
E2401030	3.0	6	10	55
E2401032	3.2	8	12	60
E2401902	3.5	6	12	55
E2401035	3.5	8	12	60
E2401903	4.0	6	12	55
E2401040	4.0	8	12	60
E2401904	4.5	6	15	60
E2401045	4.5	8	15	65
E2401048	4.8	8	15	65
E2401905	5.0	6	15	60
E2401050	5.0	8	15	65
E2401906	5.5	6	15	60
E2401055	5.5	8	15	65
E2401058	5.8	8	15	65
E2401059	5.9	8	15	65
E2401907	•6.0	6	15	60
E2401908	6.5	8	20	70
E2401060	•6.0	8	15	65
E2401065	6.5	10	20	75
E2401070	7.0	10	20	75

▶ NEXT PAGE

Mill Dia.Tolerance (mm)					Shank Dia.Tolerance
•6	•8	•10	•12	Other size	
0 - 0.035	0 - 0.040	0 - 0.040	0 - 0.045	0 - 0.030	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	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	◎	◎	◎	◎	◎	◎	◎	◎	○	◎	○									

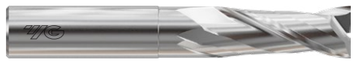
ISO	N										S							H		
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	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	○	○	○	○	○																

GENERAL HSS END MILLS

PLAIN SHANK **E2401** SERIES

HSSCo8, 2 FLUTE REGULAR LENGTH

▶ These end mills are furnished as regular with right-hand cutting and right-hand helical flutes.
These are designed for slotting, drilling, pocketing and general-purpose operation.





HSS Co8 | 2 | 30° | PLAIN | UNCOATED p.C321-C322

Unit : mm

EDP No.	Mill Diameter	Shank Diameter	Length of Cut	Overall Length
E2401909	7.0	8	20	70
E2401910	7.5	8	20	70
E2401075	7.5	10	20	75
E2401080	•8.0	10	21	75
E2401911	•8.0	8	20	70
E2401085	8.5	10	25	80
E2401090	9.0	10	25	80
E2401095	9.5	10	25	80
E2401100	10.0	10	26	80
E2401105	10.5	12	30	90
E2401110	11.0	12	30	90
E2401115	11.5	12	30	90
E2401120	•12.0	12	31	90
E2401130	13.0	12	35	95
E2401135	13.5	12	35	95
E2401916	14.0	12	35	95
E2401140	14.0	16	35	100
E2401150	15.0	16	40	105
E2401160	16.0	16	40	105
E2401165	16.5	16	40	105
E2401170	17.0	16	40	105
E2401175	17.5	16	40	105
E2401180	18.0	16	40	105
E2401190	19.0	20	45	115
E2401200	20.0	20	45	115
E2401210	21.0	20	45	115

▶ NEXT PAGE

Mill Dia.Tolerance (mm)					Shank Dia.Tolerance
•6	•8	•10	•12	Other size	
0 - 0.035	0 - 0.040	0 - 0.040	0 - 0.045	0 - 0.030	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	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	◎	◎	◎	◎	◎	◎	◎	◎	○	◎	○									

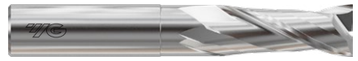
ISO	N										S							H		
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	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	○	○	○	○	○																

GENERAL HSS END MILLS

PLAIN SHANK E2401 SERIES

HSSCo8, 2 FLUTE REGULAR LENGTH

▶ These end mills are furnished as regular with right-hand cutting and right-hand helical flutes.
These are designed for slotting, drilling, pocketing and general-purpose operation.





HSS Co8 | 2 | 30° | PLAIN | UNCOATED p.C321-C322

Unit : mm

EDP No.	Mill Diameter	Shank Diameter	Length of Cut	Overall Length
E2401220	22.0	20	45	115
E2401230	23.0	25	50	125
E2401918	24.0	20	50	120
E2401240	24.0	25	50	125
E2401919	25.0	20	50	120
E2401250	25.0	25	50	125
E2401260	26.0	25	50	125
E2401270	27.0	25	55	125
E2401280	28.0	25	55	125
E2401290	29.0	25	55	125
E2401300	30.0	25	55	125
E2401310	31.0	32	60	145
E2401320	32.0	32	60	145
E2401330	33.0	32	60	145
E2401340	34.0	32	60	145
E2401350	35.0	32	60	145
E2401360	36.0	32	65	150
E2401370	37.0	32	65	150
E2401380	38.0	32	65	150
E2401390	39.0	32	65	150
E2401400	40.0	32	65	150
E2401420	42.0	42	70	160
E2401450	45.0	42	70	160
E2401460	46.0	42	75	160
E2401470	47	42	75	165
E2401480	48.0	42	75	165
E2401500	50.0	42	75	165

Mill Dia.Tolerance (mm)	Shank Dia.Tolerance
0 ~ - 0.03	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	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	○	○	○	○	○																

CARBIDE
HSS
i-Xmill END MILLS
X-1EH END MILLS
4G MILL END MILLS
X-POWER PRO END MILLS
TitaNox-POWER END MILLS
V7 PLUS END MILLS
ALU-CUT END MILLS
K-2 END MILLS
GENERAL CARBIDE END MILLS

GENERAL HSS END MILLS

PLAIN SHANK **E2412** SERIES

HSSCo8, 4FLUTE REGULAR LENGTH (Center Cut)

▶ These end mills are furnished as regular with right-hand cutting and right-hand helical flutes.
These are designed for slotting, drilling, pocketing and general-purpose operation.





HSS Co8 | 4 | 30° | PLAIN | UNCOATED p.C323-C324

Unit : mm

EDP No.	Mill Diameter	Shank Diameter	Length of Cut	Overall Length
E2412010	1.0	6	2.5	55
E2412015	1.5	6	4	55
E2412020	2.0	6	6	55
E2412025	2.5	6	7	55
E2412030	3.0	6	10	55
E2412035	3.5	8	12	60
E2412901	3.5	6	12	55
E2412040	4.0	8	12	60
E2412902	4.0	6	12	55
E2412045	4.5	8	15	65
E2412903	4.5	6	15	60
E2412050	5.0	8	15	65
E2412904	5.0	6	15	60
E2412055	5.5	8	15	65
E2412905	5.5	6	15	60
E2412060	6.0	8	15	65
E2412906	6.0	6	15	60
E2412065	6.5	10	20	75
E2412907	6.5	8	15	65
E2412070	7.0	10	20	75
E2412908	7.0	8	20	70
E2412075	7.5	10	20	75
E2412909	7.5	8	20	70
E2412080	8.0	10	20	75
E2412910	8.0	8	20	70
E2412085	8.5	10	25	80
E2412090	9.0	10	25	80
E2412095	9.5	10	25	80

▶ NEXT PAGE

Mill Dia.Tolerance (mm)	Shank Dia.Tolerance
0 ~ + 0.03	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	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	○	○	○	○	○																

GENERAL HSS END MILLS

PLAIN SHANK E2412 SERIES

HSSCo8, 4FLUTE REGULAR LENGTH (Center Cut)

▶ These end mills are furnished as regular with right-hand cutting and right-hand helical flutes.
These are designed for slotting, drilling, pocketing and general-purpose operation.





HSS Co8 | 4 | 30° | PLAIN | UNCOATED p.C323-C324

Unit : mm

EDP No.	Mill Diameter	Shank Diameter	Length of Cut	Overall Length
E2412100	10.0	10	25	80
E2412105	10.5	12	30	90
E2412110	11.0	12	30	90
E2412115	11.5	12	30	90
E2412120	12.0	12	30	90
E2412130	13.0	12	35	95
E2412912	14.0	12	35	95
E2412140	14.0	16	35	100
E2412150	15.0	16	40	105
E2412160	16.0	16	40	105
E2412170	17.0	16	40	105
E2412180	18.0	16	40	105
E2412190	19.0	20	45	115
E2412200	20.0	20	45	115
E2412210	21.0	20	45	115
E2412220	22.0	20	45	115
E2412230	23.0	25	50	125
E2412916	23.0	20	50	120
E2412240	24.0	25	50	125
E2412919	24.0	20	50	120
E2412250	25.0	25	50	125
E2412918	25.0	20	50	120
E2412260	26.0	25	50	125
E2412270	27.0	25	55	125
E2412280	28.0	25	55	125
E2412290	29.0	25	55	125
E2412300	30.0	25	55	125
E2412310	31.0	32	60	145

▶ NEXT PAGE

Mill Dia.Tolerance (mm)	Shank Dia.Tolerance
0 ~ + 0.03	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	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	○	○	○	○	○																

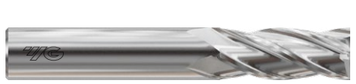
CARBIDE
HSS
i-Xmill END MILLS
X-1EH END MILLS
4G MILL END MILLS
X-POWER PRO END MILLS
TitaNox-POWER END MILLS
V7 PLUS END MILLS
ALU-CUT END MILLS
K-2 END MILLS
GENERAL CARBIDE END MILLS

GENERAL HSS END MILLS

PLAIN SHANK **E2412** SERIES

HSSCo8, 4FLUTE REGULAR LENGTH (Center Cut)

▶ These end mills are furnished as regular with right-hand cutting and right-hand helical flutes. These are designed for slotting, drilling, pocketing and general-purpose operation.





HSS Co8 | 4 | 30° | PLAIN | UNCOATED p.C323-C324

Unit : mm

EDP No.	Mill Diameter	Shank Diameter	Length of Cut	Overall Length
E2412320	32.0	32	60	145
E2412330	33.0	32	60	145
E2412340	34.0	32	60	145
E2412350	35.0	32	60	145
E2412360	36.0	32	65	150
E2412370	37.0	32	65	150
E2412380	38.0	32	65	150
E2412390	39.0	32	65	150
E2412400	40.0	32	65	150
E2412410	41.0	42	70	160
E2412420	42.0	42	70	160
E2412430	43.0	42	70	160
E2412440	44.0	42	70	160
E2412450	45.0	42	70	160
E2412460	46.0	42	70	160
E2412470	47.0	42	75	165
E2412480	48.0	42	75	165
E2412490	49.0	42	75	165
E2412500	50.0	42	75	165

Mill Dia.Tolerance (mm)	Shank Dia.Tolerance
0 ~ + 0.03	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	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	◎	◎	◎	◎	◎	◎	◎	◎	○	◎	○									

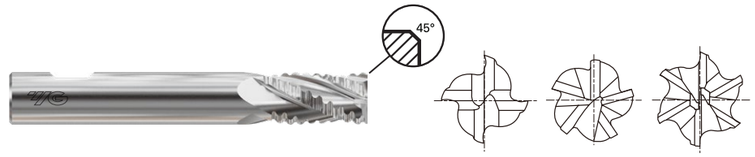
ISO	N										S							H		
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	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	○	○	○	○	○																

GENERAL HSS END MILLS

FLAT SHANK **E2760** SERIES

HSSCo8, MULTI FLUTE SHORT LENGTH ROUGHING-COARSE

▶ This general purpose rougher is designed for high production metal removal in a wide range of work piece material. It is recommanded for cutting steel grades and many non-ferrous materials.



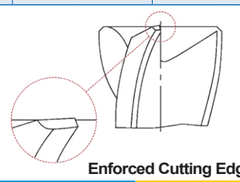
HSS Co8 | NR | 4-6 | 30° | DIN 1835B | UNCOATED p.C325-C326

Unit : mm

EDP No.	Mill Diameter	Shank Diameter	Length of Cut	Overall Length	No. of Flute
E2760060	6.0	8	15	60	4
E2760070	7.0	10	20	65	4
E2760080	8.0	10	20	65	4
E2760090	9.0	12	25	75	4
E2760100	10.0	12	25	75	4
E2760110	11.0	12	30	80	4
E2760120	12.0	12	30	80	4
E2760130	13.0	16	35	90	4
E2760140	14.0	16	35	90	4
E2760150	15.0	16	40	95	4
E2760160	16.0	16	40	95	4
E2760170	17.0	20	40	105	4
E2760180	18.0	20	40	105	4
E2760190	19.0	20	45	110	4
E2760200	20.0	20	45	110	4
E2760210	21.0	20	45	110	5
E2760220	22.0	20	45	110	5
E2760230	23.0	25	50	120	5
E2760240	24.0	25	50	120	5
E2760250	25.0	25	50	120	5
E2760260	26.0	25	50	120	6
E2760270	27.0	25	55	125	6
E2760280	28.0	25	55	125	6
E2760290	29.0	25	55	125	6
E2760300	30.0	25	55	125	6
E2760310	31.0	32	60	145	6

▶ NEXT PAGE

Mill Dia.Tolerance (mm) 直径公差	Shank Dia.Tolerance 柄径公差
± 0.12	h6



Enforced Cutting Edge

◎ : 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	◎	◎	◎	◎	◎	◎	◎	◎	○	◎	○									

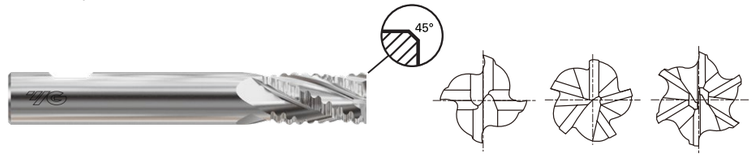
ISO	N										S							H		
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	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	○	○	○	○	○																

GENERAL HSS END MILLS

FLAT SHANK **E2760 SERIES**

HSSCo8, MULTI FLUTE SHORT LENGTH ROUGHING-COARSE

▶ This general purpose rougher is designed for high production metal removal in a wide range of work piece material. It is recommanded for cutting steel grades and many non-ferrous materials.



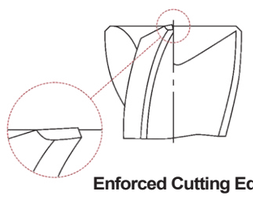
HSS Co8 | NR | 4·6 | 30° | DIN 1835B | UNCOATED

p.C325-C326

Unit : mm

EDP No.	Mill Diameter	Shank Diameter	Length of Cut	Overall Length	No. of Flute
E2760320	32.0	32	60	145	6
E2760330	33.0	32	60	145	6
E2760340	34.0	32	60	145	6
E2760350	35.0	32	60	145	6
E2760360	36.0	32	60	145	6
E2760370	37.0	32	65	150	6
E2760380	38.0	32	65	150	6
E2760390	39.0	32	65	150	6
E2760400	40.0	32	65	150	6
E2760420	42.0	32	65	155	6
E2760942	42.0	42	65	155	6
E2760450	45.0	32	70	160	6
E2760945	45.0	42	70	160	6
E2760480	48.0	32	70	160	6
E2760948	48.0	42	70	160	6
E2760500	50.0	32	70	160	6
E2760950	50.0	42	70	160	6

Mill Dia.Tolerance (mm)	Shank Dia.Tolerance
± 0.12	h6



Enforced Cutting Edge

◎ : 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	○	○	○	○	○																

GENERAL HSS END MILLS

RECOMMENDED CUTTING CONDITIONS

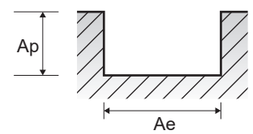
E2401 SERIES 2 FLUTE - SLOTTING

Vc = m/min.
fz = mm/tooth
RPM = rev./min.
FEED = mm/min.

ISO	VDI 3323	Material Description	Ae(mm)	Ap(mm)	Parameter	Diameter (Ø) 2.0	3.0	4.0	5.0	6.0	8.0	10.0	12.0	14.0
P	1	Non-alloy steel	1.0D	0.5D	Vc	35	33	35	35	34	35	35	34	35
					fz	0.004	0.008	0.013	0.020	0.025	0.036	0.045	0.061	0.069
					RPM	5600	3500	2800	2200	1800	1400	1100	900	800
					FEED	40	55	70	90	90	100	100	110	110
	2		1.0D	0.5D	Vc	28	30	28	28	30	28	28	30	31
					fz	0.003	0.007	0.013	0.019	0.025	0.041	0.050	0.063	0.064
					RPM	4500	3200	2200	1800	1600	1100	900	800	700
					FEED	30	45	55	70	80	90	90	100	90
	3-4		1.0D	0.5D	Vc	25	24	23	25	23	23	25	24	25
					fz	0.004	0.008	0.013	0.019	0.025	0.039	0.050	0.063	0.071
					RPM	4000	2500	1800	1600	1200	900	800	630	560
					FEED	30	40	45	60	60	70	80	80	80
	5		1.0D	0.5D	Vc	14	15	14	14	15	14	14	15	15
					fz	0.003	0.006	0.014	0.019	0.025	0.040	0.050	0.063	0.071
					RPM	2200	1600	1100	900	800	560	450	400	350
					FEED	15	20	30	35	40	45	45	50	50
	6	Low alloy steel	1.0D	0.5D	Vc	28	30	28	28	30	28	28	30	31
					fz	0.003	0.007	0.013	0.019	0.025	0.041	0.050	0.063	0.064
					RPM	4500	3200	2200	1800	1600	1100	900	800	700
					FEED	30	45	55	70	80	90	90	100	90
	7		1.0D	0.5D	Vc	25	24	23	25	23	23	25	24	25
					fz	0.004	0.008	0.013	0.019	0.025	0.039	0.050	0.063	0.071
					RPM	4000	2500	1800	1600	1200	900	800	630	560
					FEED	30	40	45	60	60	70	80	80	80
	8-9		1.0D	0.5D	Vc	14	15	14	14	15	14	14	15	15
					fz	0.003	0.006	0.014	0.019	0.025	0.040	0.050	0.063	0.071
					RPM	2200	1600	1100	900	800	560	450	400	350
					FEED	15	20	30	35	40	45	45	50	50
	10	High alloyed steel, and tool steel	1.0D	0.5D	Vc	28	30	28	28	30	28	28	30	31
					fz	0.003	0.007	0.013	0.019	0.025	0.041	0.050	0.063	0.064
					RPM	4500	3200	2200	1800	1600	1100	900	800	700
					FEED	30	45	55	70	80	90	90	100	90
	11.1		1.0D	0.5D	Vc	14	15	14	14	15	14	14	15	15
					fz	0.003	0.006	0.014	0.019	0.025	0.040	0.050	0.063	0.071
					RPM	2200	1600	1100	900	800	560	450	400	350
					FEED	15	20	30	35	40	45	45	50	50
N	21-22	Aluminum-wrought alloy	1.0D	0.5D	Vc	75	104	101	99	106	101	97	94	97
					fz	0.007	0.011	0.018	0.025	0.028	0.049	0.065	0.076	0.080
					RPM	12000	11000	8000	6300	5600	4000	3100	2500	2200
					FEED	160	250	290	310	310	390	400	380	350
	23-25	Aluminum-cast, alloyed	1.0D	0.5D	Vc	75	104	101	99	106	101	97	94	97
					fz	0.007	0.011	0.018	0.025	0.028	0.049	0.065	0.076	0.080
					RPM	12000	11000	8000	6300	5600	4000	3100	2500	2200
					FEED	160	250	290	310	310	390	400	380	350

※ The FEED, in long & extra long types, should be reduced by around 50%

▶ NEXT PAGE



GENERAL HSS END MILLS

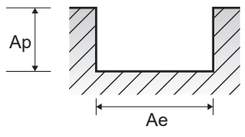
RECOMMENDED CUTTING CONDITIONS

E2401 SERIES — 2 FLUTE - SLOTTING

Vc = m/min.
fz = mm/tooth
RPM = rev./min.
FEED = mm/min.

ISO	VDI 3323	Ae(mm)	Ap(mm)	Parameter	Diameter (Ø) 16.0	18.0	20.0	22.0	25.0	28.0	30.0	32.0	36.0	40.0
P	1	1.0D	0.5D	Vc	35	36	35	35	35	33	35	35	35	35
				fz	0.079	0.079	0.089	0.100	0.100	0.100	0.100	0.100	0.097	0.107
				RPM	700	630	560	500	450	400	350	350	310	280
				FEED	110	100	100	100	90	80	70	70	60	60
	2	1.0D	0.5D	Vc	28	28	28	31	31	31	29	28	28	28
				fz	0.080	0.090	0.100	0.100	0.100	0.100	0.097	0.098	0.100	0.114
				RPM	560	500	450	450	400	350	310	280	250	220
				FEED	90	90	90	90	80	70	60	55	50	50
	3-4	1.0D	0.5D	Vc	23	23	25	24	24	25	24	22	23	23
				fz	0.078	0.088	0.088	0.100	0.097	0.098	0.100	0.102	0.100	0.111
				RPM	450	400	400	350	310	280	250	220	200	180
				FEED	70	70	70	70	60	55	50	45	40	40
	5	1.0D	0.5D	Vc	14	14	14	15	14	14	15	14	14	14
				fz	0.080	0.090	0.102	0.102	0.097	0.094	0.094	0.107	0.104	0.114
				RPM	280	250	220	220	180	160	160	140	120	110
				FEED	45	45	45	45	35	30	30	30	25	25
	6	1.0D	0.5D	Vc	28	28	28	31	31	31	29	28	28	28
				fz	0.080	0.090	0.100	0.100	0.100	0.100	0.097	0.098	0.100	0.114
				RPM	560	500	450	450	400	350	310	280	250	220
				FEED	90	90	90	90	80	70	60	55	50	50
	7	1.0D	0.5D	Vc	23	23	25	24	24	25	24	22	23	23
				fz	0.078	0.088	0.088	0.100	0.097	0.098	0.100	0.102	0.100	0.111
				RPM	450	400	400	350	310	280	250	220	200	180
				FEED	70	70	70	70	60	55	50	45	40	40
	8-9	1.0D	0.5D	Vc	14	14	14	15	14	14	15	14	14	14
				fz	0.080	0.090	0.102	0.102	0.097	0.094	0.094	0.107	0.104	0.114
				RPM	280	250	220	220	180	160	160	140	120	110
				FEED	45	45	45	45	35	30	30	30	25	25
	10	1.0D	0.5D	Vc	28	28	28	31	31	31	29	28	28	28
				fz	0.080	0.090	0.100	0.100	0.100	0.100	0.097	0.098	0.100	0.114
				RPM	560	500	450	450	400	350	310	280	250	220
				FEED	90	90	90	90	80	70	60	55	50	50
	11.1	1.0D	0.5D	Vc	14	14	14	15	14	14	15	14	14	14
				fz	0.080	0.090	0.102	0.102	0.097	0.094	0.094	0.107	0.104	0.114
				RPM	280	250	220	220	180	160	160	140	120	110
				FEED	45	45	45	45	35	30	30	30	25	25
N	21-22	1.0D	0.5D	Vc	101	102	101	97	94	97	104	101	102	101
				fz	0.088	0.097	0.100	0.107	0.117	0.123	0.123	0.120	0.122	0.125
				RPM	2000	1800	1600	1400	1200	1100	1100	1000	900	800
				FEED	350	350	320	300	280	270	270	240	220	200
	23-25	1.0D	0.5D	Vc	101	102	101	97	94	97	104	101	102	101
				fz	0.088	0.097	0.100	0.107	0.117	0.123	0.123	0.120	0.122	0.125
				RPM	2000	1800	1600	1400	1200	1100	1100	1000	900	800
				FEED	350	350	320	300	280	270	270	240	220	200

※ The FEED, in long & extra long types, should be reduced by around 50%



GENERAL HSS END MILLS

RECOMMENDED CUTTING CONDITIONS

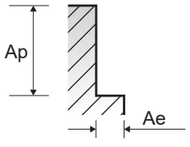
E2412 SERIES — 4 FLUTE - SIDE CUTTING

Vc = m/min.
fz = mm/tooth
RPM = rev./min.
FEED = mm/min.

ISO	VDI 3323	Material Description	Ae(mm)	Ap(mm)	Parameter	Diameter (Ø) 2.0	3.0	4.0	5.0	6.0	8.0	10.0	12.0	14.0
P	1	Non-alloy steel	0.1D	1.5D	Vc	35	33	35	35	34	35	35	34	35
					fz	0.004	0.008	0.013	0.02	0.025	0.036	0.045	0.061	0.069
					RPM	5600	3500	2800	2200	1800	1400	1100	900	800
					FEED	80	110	140	180	180	200	200	220	220
	2		0.1D	1.5D	Vc	28	30	28	28	30	28	28	30	31
					fz	0.003	0.006	0.011	0.017	0.023	0.036	0.044	0.056	0.057
					RPM	4500	3200	2200	1800	1600	1100	900	800	700
					FEED	55	80	100	125	145	160	160	180	160
	3-4		0.1D	1.5D	Vc	25	24	23	25	23	23	25	24	25
					fz	0.003	0.006	0.009	0.014	0.019	0.029	0.038	0.048	0.054
					RPM	4000	2500	1800	1600	1200	900	800	630	560
					FEED	45	60	65	90	90	105	120	120	120
	5		0.1D	1.5D	Vc	14	15	14	14	15	14	14	15	15
					fz	0.002	0.005	0.01	0.014	0.019	0.029	0.036	0.047	0.054
					RPM	2200	1600	1100	900	800	560	450	400	350
					FEED	20	30	45	50	60	65	65	75	75
	6	Low alloy steel	0.1D	1.5D	Vc	28	30	28	28	30	28	28	30	31
					fz	0.003	0.006	0.011	0.017	0.023	0.036	0.044	0.056	0.057
					RPM	4500	3200	2200	1800	1600	1100	900	800	700
					FEED	55	80	100	125	145	160	160	180	160
	7		0.1D	1.5D	Vc	25	24	23	25	23	23	25	24	25
					fz	0.003	0.006	0.009	0.014	0.019	0.029	0.038	0.048	0.054
					RPM	4000	2500	1800	1600	1200	900	800	630	560
					FEED	45	60	65	90	90	105	120	120	120
	8-9		0.1D	1.5D	Vc	14	15	14	14	15	14	14	15	15
					fz	0.002	0.005	0.01	0.014	0.019	0.029	0.036	0.047	0.054
					RPM	2200	1600	1100	900	800	560	450	400	350
					FEED	20	30	45	50	60	65	65	75	75
	10	High alloyed steel, and tool steel	0.1D	1.5D	Vc	28	30	28	28	30	28	28	30	31
					fz	0.003	0.006	0.011	0.017	0.023	0.036	0.044	0.056	0.057
					RPM	4500	3200	2200	1800	1600	1100	900	800	700
					FEED	55	80	100	125	145	160	160	180	160
	11.1		0.1D	1.5D	Vc	14	15	14	14	15	14	14	15	15
					fz	0.002	0.005	0.01	0.014	0.019	0.029	0.036	0.047	0.054
					RPM	2200	1600	1100	900	800	560	450	400	350
					FEED	20	30	45	50	60	65	65	75	75
N	21-22	Aluminum-wrought alloy	0.1D	1.5D	Vc	75	104	101	99	106	101	97	94	97
					fz	0.005	0.009	0.014	0.019	0.021	0.036	0.048	0.057	0.06
					RPM	12000	11000	8000	6300	5600	4000	3100	2500	2200
					FEED	240	380	440	470	470	580	600	570	530
	23-25	Aluminum-cast, alloyed	0.1D	1.5D	Vc	75	104	101	99	106	101	97	94	97
					fz	0.005	0.009	0.014	0.019	0.021	0.036	0.048	0.057	0.06
					RPM	12000	11000	8000	6300	5600	4000	3100	2500	2200
					FEED	240	380	440	470	470	580	600	570	530

※ The FEED, in long & extra long types, should be reduced by around 50%

▶ NEXT PAGE



CARBIDE
HSS
i-Xmill END MILLS
X-1EH END MILLS
4G MILL END MILLS
X-POWER PRO END MILLS
TitaNox-POWER END MILLS
V7 PLUS END MILLS
ALU-CUT END MILLS
K-2 END MILLS
GENERAL CARBIDE END MILLS

GENERAL HSS END MILLS

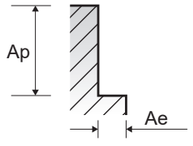
RECOMMENDED CUTTING CONDITIONS

E2412 SERIES — 4 FLUTE - SIDE CUTTING

Vc = m/min.
fz = mm/tooth
RPM = rev./min.
FEED = mm/min.

ISO	VDI 3323	Ae(mm)	Ap(mm)	Parameter	Diameter (Ø) 16.0	18.0	20.0	22.0	25.0	28.0	30.0	32.0	36.0	40.0
P	1	0.1D	1.5D	Vc	35	36	35	35	35	35	33	35	35	35
				fz	0.079	0.079	0.089	0.1	0.1	0.1	0.1	0.1	0.097	0.107
				RPM	700	630	560	500	450	400	350	350	310	280
				FEED	220	200	200	200	180	160	140	140	120	120
	2	0.1D	1.5D	Vc	28	28	28	31	31	31	29	28	28	28
				fz	0.071	0.08	0.089	0.089	0.091	0.089	0.089	0.089	0.09	0.102
				RPM	560	500	450	450	400	350	310	280	250	220
				FEED	160	160	160	160	145	125	110	100	90	90
	3-4	0.1D	1.5D	Vc	23	23	25	24	24	25	24	22	23	23
				fz	0.058	0.066	0.066	0.075	0.073	0.071	0.075	0.074	0.075	0.083
				RPM	450	400	400	350	310	280	250	220	200	180
				FEED	105	105	105	105	90	80	75	65	60	60
	5	0.1D	1.5D	Vc	14	14	14	15	14	14	15	14	14	14
				fz	0.058	0.065	0.074	0.074	0.069	0.07	0.07	0.08	0.073	0.08
				RPM	280	250	220	220	180	160	160	140	120	110
				FEED	65	65	65	65	50	45	45	45	35	35
	6	0.1D	1.5D	Vc	28	28	28	31	31	31	29	28	28	28
				fz	0.071	0.08	0.089	0.089	0.091	0.089	0.089	0.089	0.09	0.102
				RPM	560	500	450	450	400	350	310	280	250	220
				FEED	160	160	160	160	145	125	110	100	90	90
	7	0.1D	1.5D	Vc	23	23	25	24	24	25	24	22	23	23
				fz	0.058	0.066	0.066	0.075	0.073	0.071	0.075	0.074	0.075	0.083
				RPM	450	400	400	350	310	280	250	220	200	180
				FEED	105	105	105	105	90	80	75	65	60	60
	8-9	0.1D	1.5D	Vc	14	14	14	15	14	14	15	14	14	14
				fz	0.058	0.065	0.074	0.074	0.069	0.07	0.07	0.08	0.073	0.08
				RPM	280	250	220	220	180	160	160	140	120	110
				FEED	65	65	65	65	50	45	45	45	35	35
	10	0.1D	1.5D	Vc	28	28	28	31	31	31	29	28	28	28
				fz	0.071	0.08	0.089	0.089	0.091	0.089	0.089	0.089	0.09	0.102
				RPM	560	500	450	450	400	350	310	280	250	220
				FEED	160	160	160	160	145	125	110	100	90	90
	11.1	0.1D	1.5D	Vc	14	14	14	15	14	14	15	14	14	14
				fz	0.058	0.065	0.074	0.074	0.069	0.07	0.07	0.08	0.073	0.08
				RPM	280	250	220	220	180	160	160	140	120	110
				FEED	65	65	65	65	50	45	45	45	35	35
N	21-22	0.1D	1.5D	Vc	101	102	101	97	94	97	104	101	102	101
				fz	0.066	0.074	0.075	0.08	0.088	0.091	0.091	0.09	0.092	0.094
				RPM	2000	1800	1600	1400	1200	1100	1100	1000	900	800
				FEED	530	530	480	450	420	400	400	360	330	300
	23-25	0.1D	1.5D	Vc	101	102	101	97	94	97	104	101	102	101
				fz	0.066	0.074	0.075	0.08	0.088	0.091	0.091	0.09	0.092	0.094
				RPM	2000	1800	1600	1400	1200	1100	1100	1000	900	800
				FEED	530	530	480	450	420	400	400	360	330	300

※ The FEED, in long & extra long types, should be reduced by around 50%



GENERAL HSS END MILLS

RECOMMENDED CUTTING CONDITIONS

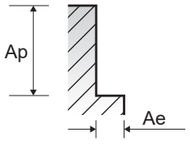
E2760 SERIES — MULTI FLUTE ROUGHING - SIDE CUTTING

Vc = m/min.
fz = mm/tooth
RPM = rev./min.
FEED = mm/min.

ISO	VDI 3323	Material Description 材料描述	Ae(mm) 切削宽度	Ap(mm) 切削深度	Parameter 参数	Diameter (Ø) 直径 6.0	8.0	10.0	12.0	14.0	16.0	18.0
P	1	Non-alloy steel	0.5D	1.5D	Vc	34	35	35	34	35	35	36
					fz	0.011	0.019	0.034	0.05	0.056	0.064	0.071
					RPM	1800	1400	1100	900	800	700	630
					FEED	80	105	150	180	180	180	180
	2		0.5D	1.5D	Vc	30	28	28	30	31	28	28
					fz	0.009	0.017	0.033	0.044	0.05	0.063	0.07
					RPM	1600	1100	900	800	700	560	500
					FEED	60	75	120	140	140	140	140
	3-4		0.5D	1.5D	Vc	23	23	25	24	25	23	23
					fz	0.011	0.018	0.034	0.044	0.049	0.061	0.069
					RPM	1200	900	800	630	560	450	400
					FEED	55	65	110	110	110	110	110
	5		0.5D	1.5D	Vc	15	14	14	15	15	14	14
					fz	0.009	0.016	0.033	0.044	0.05	0.063	0.07
					RPM	800	560	450	400	350	280	250
					FEED	30	35	60	70	70	70	70
	6	Low alloy steel	0.5D	1.5D	Vc	30	28	28	30	31	28	28
					fz	0.009	0.017	0.033	0.044	0.05	0.063	0.07
					RPM	1600	1100	900	800	700	560	500
					FEED	60	75	120	140	140	140	140
	7		0.5D	1.5D	Vc	23	23	25	24	25	23	23
					fz	0.011	0.018	0.034	0.044	0.049	0.061	0.069
					RPM	1200	900	800	630	560	450	400
					FEED	55	65	110	110	110	110	110
	8-9		0.5D	1.5D	Vc	15	14	14	15	15	14	14
					fz	0.009	0.016	0.033	0.044	0.05	0.063	0.07
					RPM	800	560	450	400	350	280	250
					FEED	30	35	60	70	70	70	70
	10	High alloyed steel, and tool steel	0.5D	1.5D	Vc	30	28	28	30	31	28	28
					fz	0.009	0.017	0.033	0.044	0.05	0.063	0.07
					RPM	1600	1100	900	800	700	560	500
					FEED	60	75	120	140	140	140	140
	11.1		0.5D	1.5D	Vc	15	14	14	15	15	14	14
					fz	0.009	0.016	0.033	0.044	0.05	0.063	0.07
					RPM	800	560	450	400	350	280	250
					FEED	30	35	60	70	70	70	70
N	21-22	Aluminum-wrought alloy	0.5D	1.5D	Vc	85	78	79	75	79	80	79
					fz	0.011	0.019	0.035	0.05	0.058	0.07	0.084
					RPM	4500	3100	2500	2000	1800	1600	1400
					FEED	200	230	350	400	420	450	470
	23-25	Aluminum-cast, alloyed	0.5D	1.5D	Vc	85	78	79	75	79	80	79
					fz	0.011	0.019	0.035	0.05	0.058	0.07	0.084
					RPM	4500	3100	2500	2000	1800	1600	1400
					FEED	200	230	350	400	420	450	470

※ The FEED, in long & extra long types, should be reduced by around 50%

▶ NEXT PAGE



GENERAL HSS END MILLS

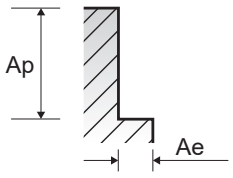
RECOMMENDED CUTTING CONDITIONS

E2760 SERIES — MULTI FLUTE ROUGHING - SIDE CUTTING

Vc = m/min.
fz = mm/tooth
RPM = rev./min.
FEED = mm/min.

ISO	VDI 3323	Ae(mm) 切削宽度	Ap(mm) 切削深度	Parameter 参数	Diameter (Ø) 直径 20.0	22.0	25.0	28.0	30.0	32.0	36.0	40.0	50.0
P	1	0.5D	1.5D	Vc	35	35	35	35	33	35	35	35	35
				fz	0.08	0.088	0.098	0.088	0.1	0.1	0.113	0.119	0.152
				RPM	560	500	450	400	350	350	310	280	220
				FEED	180	220	220	210	210	210	210	200	200
	2	0.5D	1.5D	Vc	28	31	31	31	29	28	28	28	28
				fz	0.078	0.076	0.085	0.076	0.086	0.095	0.107	0.114	0.157
				RPM	450	450	400	350	310	280	250	220	180
				FEED	140	170	170	160	160	160	160	150	170
	3-4	0.5D	1.5D	Vc	25	24	24	25	24	22	23	23	25
				fz	0.069	0.08	0.09	0.077	0.087	0.098	0.108	0.111	0.146
				RPM	400	350	310	280	250	220	200	180	160
				FEED	110	140	140	130	130	130	130	120	140
	5	0.5D	1.5D	Vc	14	15	14	14	15	14	14	14	14
				fz	0.08	0.077	0.094	0.089	0.089	0.101	0.118	0.121	0.148
				RPM	220	220	180	160	160	140	120	110	90
				FEED	70	85	85	85	85	85	85	80	80
	6	0.5D	1.5D	Vc	28	31	31	31	29	28	28	28	28
				fz	0.078	0.076	0.085	0.076	0.086	0.095	0.107	0.114	0.157
				RPM	450	450	400	350	310	280	250	220	180
				FEED	140	170	170	160	160	160	160	150	170
	7	0.5D	1.5D	Vc	25	24	24	25	24	22	23	23	25
				fz	0.069	0.08	0.09	0.077	0.087	0.098	0.108	0.111	0.146
				RPM	400	350	310	280	250	220	200	180	160
				FEED	110	140	140	130	130	130	130	120	140
	8-9	0.5D	1.5D	Vc	14	15	14	14	15	14	14	14	14
				fz	0.08	0.077	0.094	0.089	0.089	0.101	0.118	0.121	0.148
				RPM	220	220	180	160	160	140	120	110	90
				FEED	70	85	85	85	85	85	85	80	80
	10	0.5D	1.5D	Vc	28	31	31	31	29	28	28	28	28
				fz	0.078	0.076	0.085	0.076	0.086	0.095	0.107	0.114	0.157
				RPM	450	450	400	350	310	280	250	220	180
				FEED	140	170	170	160	160	160	160	150	170
	11.1	0.5D	1.5D	Vc	14	15	14	14	15	14	14	14	14
				fz	0.08	0.077	0.094	0.089	0.089	0.101	0.118	0.121	0.148
				RPM	220	220	180	160	160	140	120	110	90
				FEED	70	85	85	85	85	85	85	80	80
N	21-22	0.5D	1.5D	Vc	75	76	79	79	85	80	79	79	79
				fz	0.104	0.085	0.09	0.094	0.098	0.104	0.112	0.119	0.123
				RPM	1200	1100	1000	900	900	800	700	630	500
				FEED	500	470	450	510	530	500	470	450	370
	23-25	0.5D	1.5D	Vc	75	76	79	79	85	80	79	79	79
				fz	0.104	0.085	0.09	0.094	0.098	0.104	0.112	0.119	0.123
				RPM	1200	1100	1000	900	900	800	700	630	500
				FEED	500	470	450	510	530	500	470	450	370

※ The FEED, in long & extra long types, should be reduced by around 50%



YG CUTTING TOOLS

TOOLING SYSTEM

HYDRAULIC CHUCK

SHRINK FIT HOLDER

ER COLLET CHUCK

END MILL HOLDER & SIDE LOCK ARBOR

SHELL MILL ARBOR

POWER MILLING CHUCK

MORSE TAPER ARBOR

SK SLIM CHUCK

TAPPING ER CHUCK

TAPPING CHUCK

SYNCHRO TAPPING CHUCK

FACE MILL ARBOR

NC DRILL CHUCK

ACCESSORY & OTHERS

YG-1 CO., LTD.

HYDRAULIC CHUCK

Series	HCP		HCR
Type	POWER E HYDRO		RADIAL TOOL LENGTH PRE-SETTING TYPE
Shank	BT (JIS B6339/MAS 403)	HSK (DIN 69893/ISO 12164)	CBT (BT DUAL CONTACT)
Page	D9	D25	D20
Tool Holder			

Series	HC			HMC	HCS
Type	STANDARD			MOLD AND DIE	HYDRAULIC CHUCK SET
Shank	BT (JIS B6339/MAS 403)	CBT (BT DUAL CONTACT)	HSK (DIN 69893/ISO 12164)	HSK (DIN 69893/ISO 12164)	-
Page	D9	D20	D25	D26	D34
Tool Holder					

SHRINK FIT HOLDER

Series	SFH		SFHC	
Type	STANDARD		COOLANT CHANNEL	
Shank	BT (JIS B6339/MAS 403)	HSK (DIN 69893/ ISO 12164)	BT (JIS B6339/MAS 403)	HSK (DIN 69893/ISO 12164)
Page	D10	D27	D10	D27
Tool Holder				

ER COLLET CHUCK

Series	ER					
Type	STANDARD				EXTENSION (Slim)	NC-for CNC LATHE
Shank	BT (JIS B6339/ MAS 403)	CBT (BT DUAL CONTACT)	HSK (DIN 69893/ ISO 12164)	MTA	STRAIGHT TYPE	
Page	D11	D21	D28	D31	D32	D32
Tool Holder						

END MILL HOLDER & SIDE LOCK ARBOR

Series	EMH		SLA
Type	STANDARD		SIDE LOCK ARBOR
Shank	BT (JIS B6339/MAS 403)	SK (DIN 69871)	BT (JIS B6339/MAS 403)
Page	D12	D24	D13
Tool Holder	 6.3G	 6.3G	

SHELL MILL ARBOR

Series	SMA		CMA
Type	STANDARD		COMBI SHELL MILL ARBOR
Shank	BT (JIS B6339/ MAS 403)	SK (DIN 69871)	BT (JIS B6339/MAS 403)
Page	D14	D24	D14
Tool Holder	 SMALL FACE	 SMALL FACE	

POWER MILLING CHUCK

Series	C			PART
Type	STANDARD		POWER MILLING CHUCK SET	SPANNER FOR MILLING CHUCK
Shank	BT (JIS B6339/MAS 403)	HSK (DIN 69893/ISO 12164)		
Page	D15	D29	D34	D
Tool Holder				

MORSE TAPER ARBOR

Series	MTA/MTB	
Shank	BT (JIS B6339/ MAS 403)	NT (ANSI B5.18)
Page	D15	D31
Tool Holder		

SK SLIM CHUCK

Series	SKA	
Type	STANDARD	
Shank	BT (JIS B6339/MAS 403)	CBT (BT DUAL CONTACT)
Page	D16	D22
Tool Holder		

TAPPING ER CHUCK

Series	TER
Type	ER COLLET
Shank	BT (JIS B6339/MAS 403)
Page	D17
Tool Holder	

TAPPING CHUCK

Series	TC
Type	QUICK CHANGE TYPE
Standard	BT (JIS B6339/MAS 403)
Page	D17
Tool Holder	

SYNCHRO TAPPING CHUCK

Series	SYTER
Type	ER COLLET
Shank	STRAIGHT TYPE
Page	D33
Tool Holder	

FACE MILL ARBOR

Series	FMB	FMC		
Type	STANDARD	STANDARD		
Shank	BT (JIS B6339/MAS 403)	BT (JIS B6339/MAS 403)	CBT (BT DUAL CONTACT)	HSK (DIN 69893/ ISO 12164)
Page	D18	D18	D23	D30
Tool Holder				

NC DRILL CHUCK

Series	NPU
Type	KEYLESS TYPE
Shank	BT (JIS B6339/MAS 403)
Page	D19
Tool Holder	

ACCESSORY & OTHERS

Series	HK	HS	HF	UF	SKC
Type	COLLET (Reduction Sleeve : Open Type)	COLLET (Reduction Sleeve : Closed Type)	COLLET (Reduction Sleeve : Coolant Flush Type)	ER COLLET - UF	SK SLIM CHUCK - COLLET
Page	D35	D36	D37	D38	D40
Tool Holder					

Series	PART	SP	K / CK / MT / SP	PART	SP
Type	SK SLIM CHUCK - NUT	SK SLIM CHUCK - SPANNER	POWER MILLING CHUCK (END MILL COLLET K-TYPE)	ER COLLET CHUCK - NUT	ER COLLET CHUCK - SPANNER/WRENCH
Page	D41	D41	D42	D43	D43
Tool Holder					

Guide Line to Icons

Standard of Tools	Taper Accuracy	G Value	RPM	Run-Out	Coolant System
DIN 69871-SK, DIN 69893-HSK, JIS B6339-BT, CBT	AT3	2.5G, 6.3G	15,000 RPM, 20,000 RPM, 25,000 RPM, 30,000 RPM	(at 3D) ≤3㎛, (LD) ≤3㎛	AD⩾AD/B, AD/B, AD, AD+C or AD/B+C

Collet	ER Collet	Spanner	ER Nut	ER Spanner
				

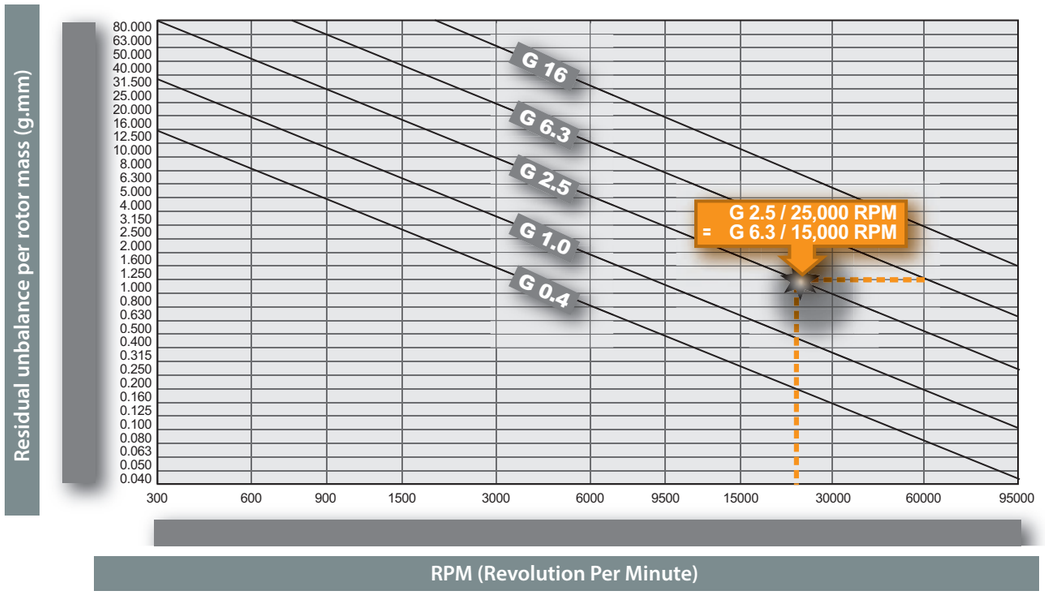
TECHNICAL INFORMATION

BALANCING

Definition of Balancing and Unbalancing

If the rotor(tool holder) is rotated around the axis, centrifugal forces generate in all parts. If these centrifugal forces are distributed symmetrically against the rotation axis, the centrifugal forces generating in the opposite direction are offset by one another, resulting in no forces to the rotation axis eventually. Therefore bearings are not vibrated. In this case tool holder is in the balanced state. On the contrary, if centrifugal forces are distributed asymmetrically against the rotation axis, or if the force of one part is greater than that of the opposite part, the forces equivalent to differences are added to the rotation axis, causing the rotor(tool holder) to vibrate. The imbalance of distribution of rotor mass is called "Unbalance". In other words, "Unbalance" is mass existing unevenly in the rotor(tool holder).

Balancing Grade Quality According to DIN ISO 1940



Calculation of G $\frac{G \times m}{RPM} \times 9549 = U$

G : Balancing grade or circumference speed
m : Rotor(Holder) weight ⇒ Unit : kg
9549 : Conversion constant
U : Degree of unbalance (Permissable unbalance) ⇒ Unit : g.mm
RPM : Revolutions Per Minute

Merits of Balanced Machining

Recently, rotating machines are more sophisticated and operated at High-Speed with the technical advance. Also, they require more efficiency and more stable functions which are stricter conditions than ever before. In High-Speed machining, one of the largest factors which degrade performance of machines is chattering. It causes workers to suffer displeasure, noise, and fatigue which are main problems affecting productivity. Balancing of the rotor(tool holder) is the essential and effective factor in order to prevent vibration of the machine. It is widely recognized as the indispensable process in manufacturing rotation machinery. YG-1 manufactures tool holders with various balancing grades meeting the needs of users.

Balancing Grade Standard



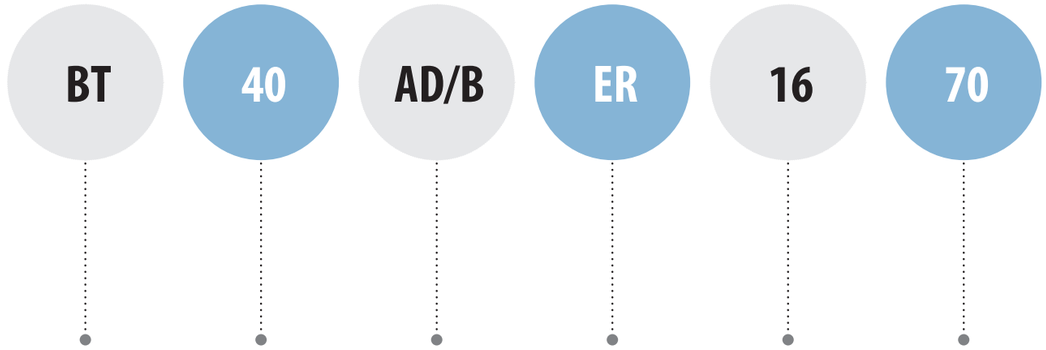
Balancing Specification for Balancing Design Products

PRODUCT	SHANK	GRADE	RPM
HYDRAULIC CHUCK	BT/CBT 30/40/50 SK 30/40/50 HSK 32/40/50/63/80/100	G 2.5	25,000
SHRINK FIT HOLDER	BT/CBT 30/40/50 SK 30/40/50 HSK 25/32/40/50/63/80/100 ISO 25	G 2.5	25,000
OTHER CHUCKS & TOOL HOLDERS	BT/CBT 30/40/50 SK 30/40/50 HSK 25/32/40/50/63/80/100 ISO 20/25	G 6.3 G 2.5	15,000 25,000

※ **Higher Balancing Grade Product Could Be Supplied Upon Customer's Request.**

MODEL NUMBERING SYSTEM & SURFACE FINISH

Model Numbering System



Surface Finish



YG TOOLING SYSTEM

HCP

HYDRAULIC CHUCK (Power E Hydro)

JIS B6339/ MAS 403-BT



FIG.1

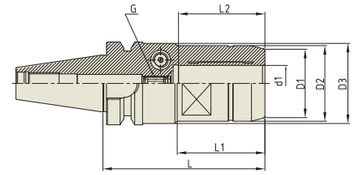
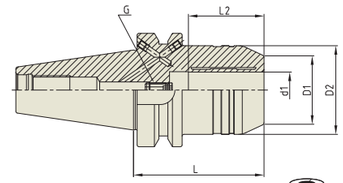


FIG.2



JIS B6339-BT | AT3 | 2.5G | 25,000 RPM | (at 3D) ≤3㎛ | AD∞AD/B

Collet, Refer to page D35-D37

Unit : mm

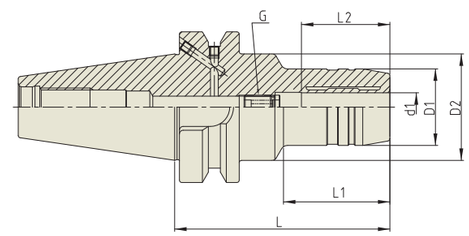
TAPER No.	MODEL No.	EDP No.	d1	D1	D2	L	L2	G	FIG.	WEIGHT (Kg)
30	BT30-HC20P-90	P2776602P	20	38	42	90	48	M8x1.0	1	0.9
40	BT40AD/B-HC20P-72.5	P2554001P	20	38	49.25	72.5	48	M8x1.0	2	1.40
50	BT50AD/B-HC20P-83.5	P2755010P	20	38	49.25	83.5	48	M8x1.0	2	3.90

HC

HYDRAULIC CHUCK (SLIM)

JIS B6339/ MAS 403-BT





JIS B6339-BT | AT3 | 2.5G | 25,000 RPM | (at 3D) ≤3㎛ | AD/B

Collet, Refer to page D35-D37

Unit : mm

TAPER No.	MODEL No.	EDP No.	d1	D1	D2	L	L1	L2	G	WEIGHT (Kg)
40	BT40AD/B-HC6-90	P2554003	6	26	44.5	90	43	27	M5x0.8	1.30
	BT40AD/B-HC8-90	P2554021	8	28	44.5	90	44.5	27	M6x1.0	1.30
	BT40AD/B-HC10-90	P2554005	10	30	44.5	90	44.5	32	M8x1.0	1.35
	BT40AD/B-HC12-90	P2554002	12	32	44.5	90	44.5	37	M10x1.0	1.35
	BT40AD/B-HC16-90	P2554006	16	38	44.5	90	47.5	42	M12x1.0	1.40

SHRINK FIT HOLDER

JIS B6339/
MAS 403-BT



FIG.1

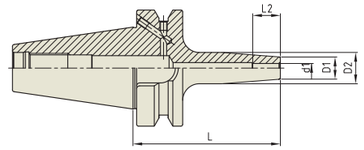
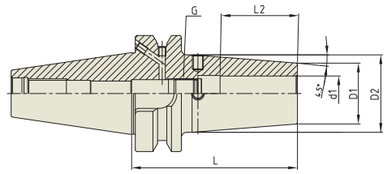


FIG.2



JIS B6339-BT | AT3 | 2.5G | 25,000 RPM | (LD) ≤3μm | AD/B

Unit : mm

TAPER No.	MODEL No.	EDP No.	d1	D1	D2	L	L2	G	FIG.	WEIGHT (Kg)
40	BT40AD/B-SFH4-90	P2776713	4	11	15	90	12	-	1	1.00
	BT40AD/B-SFH6-90	P2771601	6	21	27	90	36	M5×0.8	2	1.10
	BT40AD/B-SFH8-90	P2771603	8	21	27	90	36	M6×1.0	2	1.11
	BT40AD/B-SFH10-90	P2771605	10	24	32	90	42	M8×1.0	2	1.10
	BT40AD/B-SFH12-90	P2771607	12	24	32	90	47	M10×1.0	2	1.10
50	BT50AD/B-SFH10-100	P2771626	10	24	32	100	42	M8×1.0	2	1.50
	BT50AD/B-SFH16-100	P2771632	16	27	34	100	50	M12×1.0	2	1.60

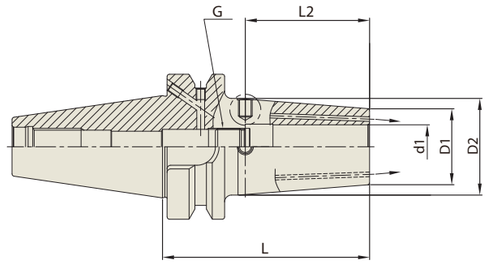
▶Without balancing screw.

SFH

SHRINK FIT HOLDER (COOLANT CHANNEL)

JIS B6339/
MAS 403-BT





JIS B6339-BT | AT3 | 2.5G | 25,000 RPM | (LD) ≤3μm | AD/B+C

Unit : mm

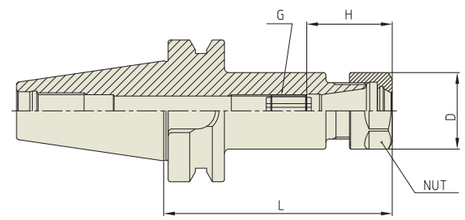
TAPER No.	MODEL No.	EDP No.	d1	D1	D2	L	L2	G	WEIGHT (Kg)
40	BT40AD/B-SFH20C-90	P2862099C	20	33	42	90	52	M16x1.0	1.40

▶Without balancing screw.
▶Resealable Coolant Channel type is available upon request.

ER COLLET CHUCK

JIS B6339/
MAS 403-BT





JIS B6339-BT | AT3 | 6.3G | 15,000 RPM | AD

ER Collet, Refer to page D38-D39

ER nut and Spanner refer to page D43

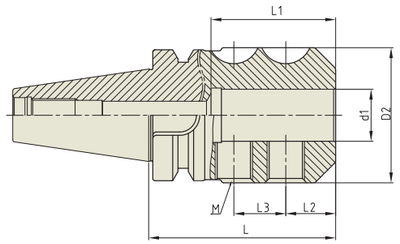
Unit : mm

TAPER No.	MODEL No.	EDP No.	CLAMPING RANGE	L	D	G	H	NUT / COLLET	WEIGHT (Kg)
30	BT30-ER16-70	P2772109	0.5 - 10.0	70	28	M12	45	ER16	1.00
	BT30-ER16-100	P2772110	0.5 - 10.0	100	28	M12	45	ER16	1.10
	BT30-ER20-80	P2772111	0.5 - 13.0	80	34	M12	50	ER20	1.20
	BT30-ER25-70	P2772106	1.0 - 16.0	70	42	M12	65	ER25	1.20
	BT30-ER25-100	P2772113	1.0 - 16.0	100	42	M12	65	ER25	1.30
	BT30-ER32-60	P2772144	1.0 - 20.0	60	50	M12	65	ER32	1.40
	BT30-ER32-90	P2772115	1.0 - 20.0	90	50	M12	65	ER32	1.90
40	BT40-ER16-75	P2772101	0.5 - 10.0	75	28	M12	45	ER16	1.10
	BT40-ER16-100	P2772118	0.5 - 10.0	100	28	M12	45	ER16	1.20
	BT40-ER16-120	P2772119	0.5 - 10.0	120	28	M12	45	ER16	1.40
	BT40-ER20-75	P2772102	0.5 - 13.0	75	34	M12	50	ER20	1.40
	BT40-ER20-100	P2772120	0.5 - 13.0	100	34	M12	50	ER20	1.80
	BT40-ER25-75	P2772103	1.0 - 16.0	75	42	M12	65	ER25	1.40
	BT40-ER25-100	P2772122	1.0 - 16.0	100	42	M12	65	ER25	1.80
	BT40-ER25-135	P2772123	1.0 - 16.0	135	42	M12	65	ER25	2.20
	BT40-ER32-60	P2772104	1.0 - 20.0	60	50	M12	65	ER32	1.80
	BT40-ER32-70	P2547010	1.0 - 20.0	70	50	M12	65	ER32	1.85
	BT40-ER32-100	P2772125	1.0 - 20.0	100	50	M12	65	ER32	2.20
	BT40-ER32-120	P2772105	1.0 - 20.0	120	50	M12	65	ER32	2.40
	BT40-ER32-150	P2772126	1.0 - 20.0	150	50	M12	65	ER32	2.60
	BT40-ER32-75	P2772155	1.0 - 20.0	75	50	M12	65	ER32	1.85
	BT40-ER40-80	P2772127	2.0 - 30.0	80	63	M12	75	ER40	1.50
50	BT50-ER32-100	P2772137	1.0 - 20.0	100	50	M12	65	ER32	5.20
	BT50-ER32-135	P2772138	1.0 - 20.0	135	50	M12	65	ER32	5.70
	BT50-ER32-165	P2772139	1.0 - 20.0	165	50	M12	65	ER32	5.80
	BT50-ER40-100	P2772140	2.0 - 30.0	100	63	M12	75	ER40	5.60

END MILL HOLDER

JIS B6339/
MAS 403-BT





JIS B6339-BT | AT3 | 6.3G | 15,000 RPM | AD

Unit : mm

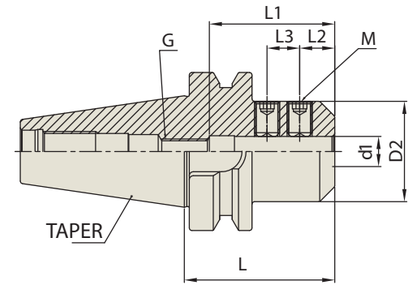
TAPER No.	MODEL No.	EDP No.	d1	D2	L	L1	L2	L3	M	WEIGHT (Kg)
50	BT50-EMH32-105	P2773080	32	72	105	64	24	28	M20	4.70

▶Standard End Mill Holder is for a cutting tool with Weldon shank and End Mill Holder for a cutting tool with Whistle notch is available upon request.
▶Combi-style holder with ball jointed clamping screw which can be used with cutting tools with Weldon and Whistle notch shank is available.

SIDE LOCK ARBOR

JIS B6339/
MAS 403-BT





JIS B6339-BT | AT3 | AD

TAPER No.	MODEL No.	EDP No.	d1	D2	L	L1	L2	L3	M	G	WEIGHT (Kg)
30	BT30-SLA10-60	P2780203	10	35	60	40	14	13	M8	M8	0.90
	BT30-SLA12-60	P2780204	12	40	60	50	14	13	M10	M10	1.10
	BT30-SLA16-75	P2780206	16	40	75	70	25	20	M12	M12	1.30
	BT30-SLA25-75	P2780208	25	50	75	70	25	20	M14	M12	1.50
	BT30-SLA32-105	P2780209	32	60	105	80	25	25	M16	M12	1.60
40	BT40-SLA12-60	P2780213	12	40	60	50	14	13	M10	M10	1.40
	BT40-SLA16-90	P2780214	16	40	90	70	25	20	M12	M12	1.50
	BT40-SLA20-90	P2780215	20	50	90	70	25	20	M12	M12	1.80
	BT40-SLA25-90	P2780216	25	50	90	70	25	20	M14	M12	1.70
	BT40-SLA32-90	P2780217	32	60	90	80	25	25	M16	M12	1.90
	BT40-SLA40-90	P2780218	40	63	90	80	25	25	M16	M12	1.80
50	BT50-SLA20-105	P2780226	20	50	105	70	25	20	M12	M12	4.80
	BT50-SLA25-105	P2780227	25	50	105	70	25	20	M14	M12	4.70
	BT50-SLA32-105	P2780228	32	60	105	80	25	25	M16	M12	4.00

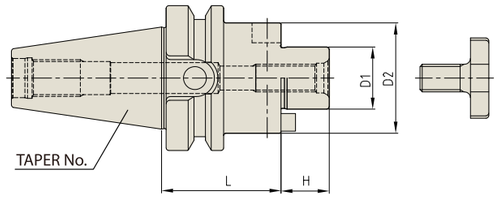
▶Standard End Mill Holder is for a cutting tool with Weldon shank and End Mill Holder for a cutting tool with Whistle notch is available upon request.
▶Side Lock Arbor is Non-Balancing.

SMA

SHELL MILL ARBOR

JIS B6339/ MAS 403-BT





JIS B6339-BT · AT3 · 6.3G · 15,000 RPM · AD

Unit : mm

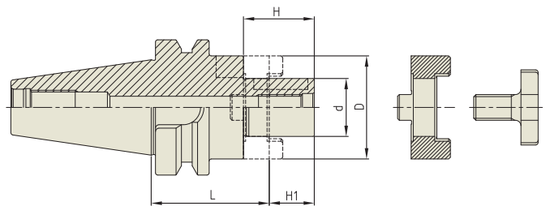
TAPER No.	MODEL No.	EDP No.	D1	D2	L	H	BOLT	WEIGHT (Kg)
40	**BT40-SMA22-120**	**P2778816**	22	40	120	19	M10x18L	1.85

CMA

COMBI-SHELL MILL ARBOR

JIS B6339/ MAS 403-BT





JIS B6339-BT · AT3 · 6.3G · 15,000 RPM · AD

Unit : mm

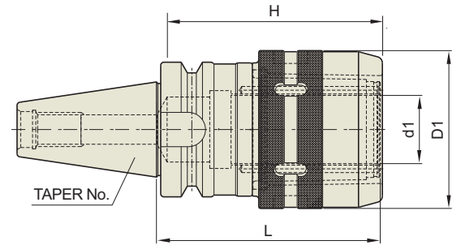
TAPER No.	MODEL No.	EDP No.	d	L	D	H1	H	WEIGHT (Kg)
40	**BT40-CMA22-100**	**P2544016**	22	100	40	19	31	1.68

C

POWER MILLING CHUCK

JIS B6339/MAS 403-BT





JIS B6339-BT · AT3 · AD


Collet, spanner, refer to page D42

Unit : mm

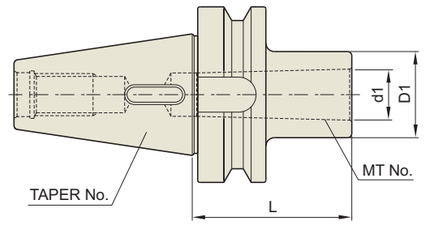
TAPER No.	MODEL No.	EDP No.	d1	D1	L	H	WEIGHT (Kg)
40	**BT40-C25-105**	**P2546005**	25	62.5	105	80	2.50
	BT40-C32-90	**P2546006**	32	72	90	100	3.00
	BT40-C32-105	**P2546007**	32	72	105	100	3.10
50	**BT50-C32-165**	**P2546018**	32	72	165	100	7.40

MTA

MORSE TAPER ARBOR

JIS B6339/ MAS 403-BT





JIS B6339-BT · AT3 · 6.3G · 15,000 RPM

Unit : mm

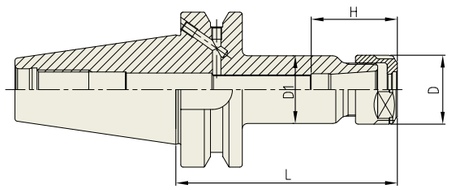
TAPER No.	MODEL No.	EDP No.	MT No.	L	d1	D1	WEIGHT (Kg)
50	**BT50-MTA2-135**	**P2542019**	2	135	17.780	32	4.40
	BT50-MTA2-180	**P2542020**	2	180	17.780	32	4.60

SKA

SK SLIM CHUCK

JIS B6339/
MAS 403-BT





JIS B6339-BT | AT3 | 2.5G | 25,000 RPM | AD



Collet, Nut and spanner, refer to page D40-D41

Unit : mm

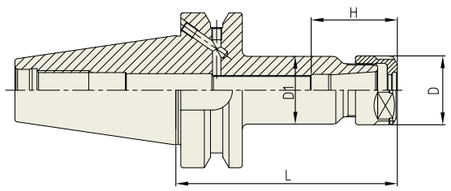
TAPER No.	MODEL No.	EDP No.	CLAMPING RANGE	L	D	D1	H	COLLET	WEIGHT (Kg)
30	BT30-SKA10-90	P2775757A	1.75 - 10.0	90	28	27.5	35	SKC10	1.00
	BT30-SKA16-90	P2775761A	2.75 - 16.0	90	40	40	52	SKC16	1.20

SKA

SK SLIM CHUCK

JIS B6339/
MAS 403-BT





JIS B6339-BT | AT3 | 6.3G | 15,000 RPM | AD



Collet, Nut and spanner, refer to page D40-D41

Unit : mm

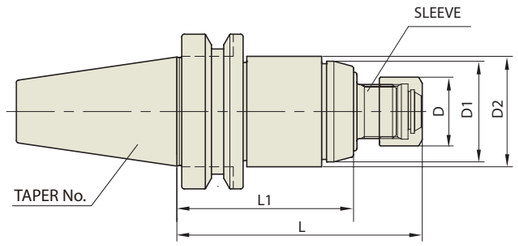
TAPER No.	MODEL No.	EDP No.	CLAMPING RANGE	L	D	D1	H	COLLET	WEIGHT (Kg)
30	BT30-SKA10-90	P2775810	1.75 - 10.0	90	28	27.5	35	SKC10	1.00
	BT30-SKA13-90	P2775812	2.75 - 13.0	90	33	33	43.6	SKC13	1.10
	BT30-SKA16-90	P2775814	2.75 - 16.0	90	40	40	52	SKC16	1.20
	BT30-SKA20-60	P2775815	3.5 - 20.0	60	48.5	40	59.6	SKC20	1.30
40	BT40-SKA06-120	P2775819	1.8 - 6.0	120	20	19.5	31	SKC6	1.40
	BT40-SKA20-90	P2775830	3.5 - 20.0	90	48.5	48.5	59.6	SKC20	1.60

TER

TAPPING ER CHUCK

JIS B6339/
MAS 403-BT





JIS B6339-BT | AT3



ER Collet, Refer to page D38-D39

Unit : mm

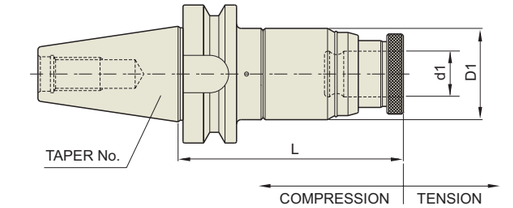
TAPER No.	MODEL No.	EDP No.	D	D1	D2	L	L1	NUT 螺母	WEIGHT (Kg)
40	BT40-TER32-110	P2774161	50	58	63	110	72	ER32	2.20

TC

TAPPING CHUCK

JIS B6339/
MAS 403-BT





JIS B6339-BT | AT3

Unit : mm

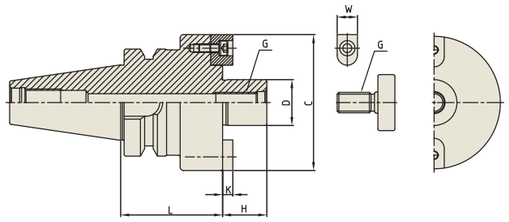
TAPER No.	MODEL No.	EDP No.	TAP SIZE	TAP ADAPTOR	LENGTH COMPENSATION		d1	D1	L	WEIGHT (Kg)
					Compression	Tension				
40	BT40-TC12-90	P2540011	M3-M12	TCS12	5	15	19	45	95	1.50

FMB

FACE MILL ARBOR

JIS B6339/
MAS 403-BT





JIS B6339-BT | AT3 | 6.3G | 15,000 RPM | AD

Unit : mm

TAPER No.	MODEL No.	EDP No.	D	L	C	H	W	K	G	FIG.	WEIGHT (Kg)
40	**BT40-FMB27-60**	**P2779292**	27	60	80	26	12	6	M12	1	2.50

FMC

FACE MILL ARBOR

JIS B6339/
MAS 403-BT



FIG.1

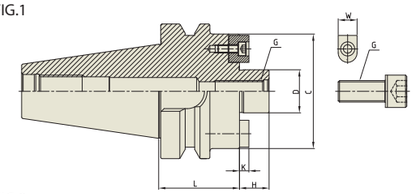
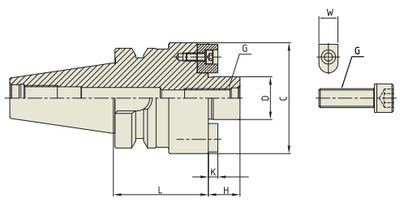


FIG.2



JIS B6339-BT | AT3 | 6.3G | 15,000 RPM | AD

Unit : mm

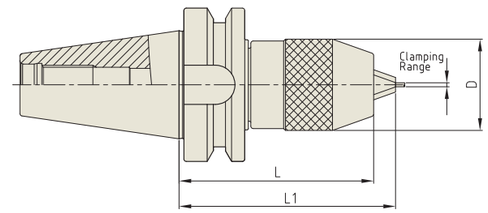
TAPER No.	MODEL No.	EDP No.	D	L	C	H	W	K	G	FIG.	WEIGHT (Kg)
30	**BT30-FMC22-45**	**P2776101**	22	45	45	18	10	5	M10	2	0.80
40	**BT40-FMC22-45**	**P2776102**	22	45	45	18	10	5	M10	1	1.30
	BT40-FMC32-60	**P2776104**	32	60	85	22	14	7	M16	2	2.30

NPU

NC DRILL CHUCK

JIS B6339/
MAS403-BT





JIS B6339-BT | AT3

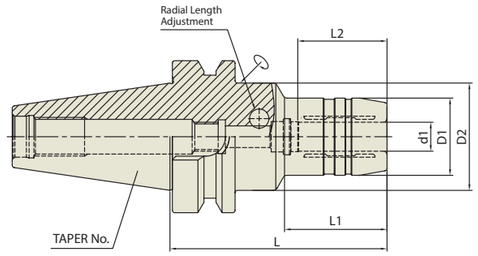
Unit : mm

TAPER No.	MODEL No.	EDP No.	CLAMPING RANGE	D	L (Min.)	L1 (Max.)	WEIGHT (Kg)
30	**BT30-NPU13-105**	**P2776017**	0.3 - 13	50.4	105	115	1.80
40	**BT40-NPU13-95**	**P2776019**	0.3 - 13	50.4	95	100.7	2.10
	BT40-NPU13-130	**P2776008**	0.3 - 13	50.4	130	140	2.70

HYDRAULIC CHUCK (Radial Tool Length Pre-Setting Type)

CBT (BT DUAL CONTACT)





CBT | AT3 | 2.5G | 25,000 RPM | (at 3D) ≤3㎛ | AD



Collet, Refer to page D35-D37

Unit : mm

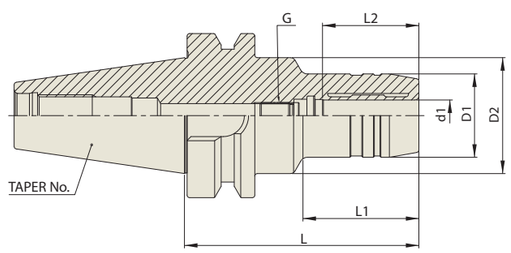
TAPER No.	MODEL No.	EDP No.	d1	D1	D2	L	L1	L2	WEIGHT (Kg)
30	CBT30-HCR12-85	P2770551	12	32	44.5	85	40	37	0.90

HC

HYDRAULIC CHUCK (SLIM)

CBT (BT DUAL CONTACT)





CBT | AT3 | 2.5G | 25,000 RPM | (at 3D) ≤3㎛ | AD



Collet, Refer to page D35-D37

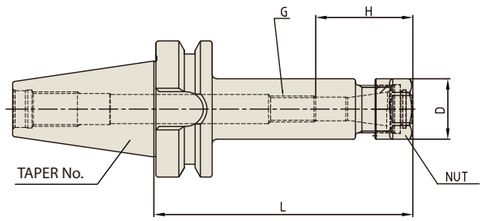
Unit : mm

TAPER No.	MODEL No.	EDP No.	d1	D1	D2	L	L1	L2	G	WEIGHT (Kg)
40	CBT40-HC20-90	P2770502	20	42	44.5	90	47.5	42	M16x1.0	1.50
	CBT40-HC32-105	P2770518	32	60	60	105	-	55	M16x1.0	2.10

ER COLLET CHUCK

CBT (BT DUAL CONTACT)





CBT | AT3 | 2.5G | 25,000 RPM | AD



Collet, Nut and spanner, refer to page D40-D41

Unit : mm

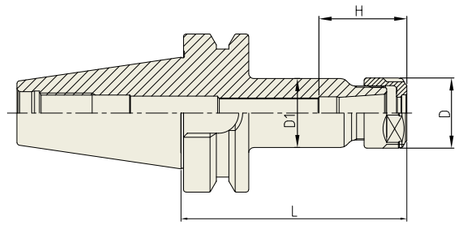
TAPER No.	MODEL No.	EDP No.	CLAMPING RANGE	L	D	G	H	NUT / COLLET	WEIGHT (Kg)
40	CBT40-ER16-75	P2772006	0.5 - 10.0	75	28	M12	45	ER16	1.10
	CBT40-ER16-100	P2772001	0.5 - 10.0	100	28	M12	45	ER16	1.20
	CBT40-ER16-120	P2772007	0.5 - 10.0	120	28	M12	45	ER16	1.40
	CBT40-ER25-100	P2772002	1.0 - 16.0	100	42	M12	65	ER25	1.80
	CBT40-ER32-100	P2772003	1.0 - 20.0	100	50	M12	65	ER32	2.20

SKA

SK SLIM CHUCK

CBT
(BT DUAL CONTACT)





CBT AT3 2.5G 25,000 RPM AD



Collet, Nut and spanner, refer to page D40-D41

Unit : mm

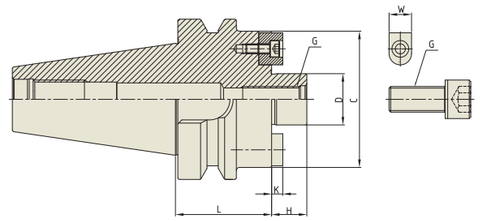
TAPER No.	MODEL No.	EDP No.	CLAMPING RANGE	L	D	D1	H	COLLET	WEIGHT (Kg)
50	CBT50-SKA06-105	P2775730	1.8 - 6.0	105	20	19.5	31	SKC6	3.80
	CBT50-SKA06-135	P2775731	1.8 - 6.0	135	20	19.5	31	SKC6	3.90
	CBT50-SKA06-165	P2775732	1.8 - 6.0	165	20	19.5	31	SKC6	4.00
	CBT50-SKA06-195	P2775733	1.8 - 6.0	195	20	19.5	31	SKC6	4.20
	CBT50-SKA10-105	P2775734	1.75 - 10.0	105	28	27.5	35	SKC10	4.20
	CBT50-SKA10-135	P2775735	1.75 - 10.0	135	28	27.5	35	SKC10	4.40
	CBT50-SKA10-165	P2775736	1.75 - 10.0	165	28	27.5	35	SKC10	4.60
	CBT50-SKA10-195	P2775737	1.75 - 10.0	195	28	27.5	35	SKC10	4.80
	CBT50-SKA13-105	P2775738	2.75 - 13.0	105	33	33	43.6	SKC13	4.50
	CBT50-SKA13-135	P2775739	2.75 - 13.0	135	33	33	43.6	SKC13	4.70
	CBT50-SKA13-165	P2775740	2.75 - 13.0	165	33	33	43.6	SKC13	4.90
	CBT50-SKA13-195	P2775741	2.75 - 13.0	195	33	33	43.6	SKC13	5.20
	CBT50-SKA16-105	P2775742	2.75 - 16.0	105	40	40	52	SKC16	4.70
	CBT50-SKA16-135	P2775743	2.75 - 16.0	135	40	40	52	SKC16	4.90
	CBT50-SKA16-165	P2775744	2.75 - 16.0	165	40	40	52	SKC16	5.10
	CBT50-SKA16-195	P2775745	2.75 - 16.0	195	40	40	52	SKC16	5.50
	CBT50-SKA20-105	P2775746	3.5 - 20.0	105	48.5	48.5	59.6	SKC20	4.30
	CBT50-SKA20-135	P2775747	3.5 - 20.0	135	48.5	48.5	59.6	SKC20	4.60
	CBT50-SKA20-165	P2775748	3.5 - 20.0	165	48.5	48.5	59.6	SKC20	5.00
	CBT50-SKA20-195	P2775749	3.5 - 20.0	195	48.5	48.5	59.6	SKC20	5.40
	CBT50-SKA25-105	P2775750	16.0 - 25.4	105	55	55	63.4	SKC25	5.20
	CBT50-SKA25-135	P2775751	16.0 - 25.4	135	55	55	63.4	SKC25	5.40
	CBT50-SKA25-165	P2775752	16.0 - 25.4	165	55	55	63.4	SKC25	5.60
	CBT50-SKA25-195	P2775753	16.0 - 25.4	195	55	55	63.4	SKC25	6.00

FMC

FACE MILL ARBOR

CBT
(BT DUAL CONTACT)





CBT AT3 2.5G 25,000 RPM AD

TAPER No.	MODEL No.	EDP No.	D	L	C	H	W	K	G	WEIGHT (Kg)
40	CBT40-FMC22-45	P2776132	22	45	45	18	10	5	M10	1.30

EMH

END MILL HOLDER

DIN 69871-SK



DIN 69871-SK | AT3 | 6.3G | 15,000 RPM | AD

FIG.1

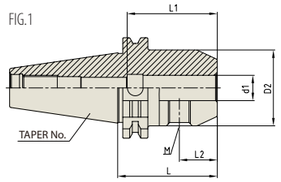
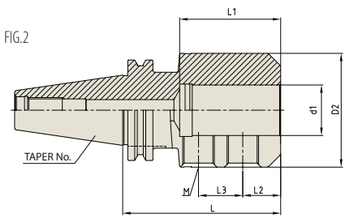


FIG.2



Unit : mm

TAPER No.	MODEL No.	EDP No.	d1	D2	L	L1	L2	L3	M	FIG.	WEIGHT (Kg)
50	SK50-EMH10-63	P2521019	10	35	50	39	20	-	M10	1	2.90
	SK50-EMH12-63	P2521020	12	42	63	46	22.5	-	M12	1	2.90
	SK50-EMH16-63	P2521021	16	48	63	49	24	-	M14	1	3.00
	SK50-EMH20-63	P2521022	20	52	63	52	25	-	M16	1	3.05
	SK50-EMH25-80	P2521023	25	65	80	60	24	25	M18	2	3.73
	SK50-EMH32-100	P2521024	32	72	100	64	24	28	M20	2	4.53
	SK50-EMH40-100	P2521025	40	80	100	74	30	32	M20	2	4.77
	SK50-EMH50-125	P2521026	50	100	125	84	35	35	M24	2	7.03

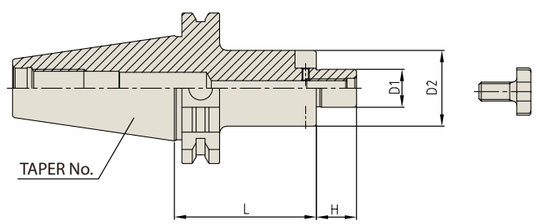
▶Standard End Mill Holder is for a cutting tool with Weldon shank and End Mill Holder for a cutting tool with Whistle notch is available upon request.
▶Combi-style holder with ball jointed clamping screw which can be used with cutting tools with Weldon and Whistle notch shank is available.

SMA

SHELL MILL ARBOR

DIN 69871-SK





DIN 69871-SK | AT3 | 6.3G | 15,000 RPM | AD

Unit : mm

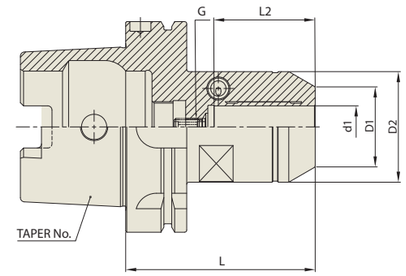
TAPER No.	MODEL No.	EDP No.	D1	D2	L	H	BOLT	WEIGHT (Kg)
50	SK50-SMA22-75	P2778910	22	40	75	19	M10x18L	3.10
	SK50-SMA27-75	P2778911	27	48	75	21	M12x22L	3.40
	SK50-SMA32-75	P2778912	32	58	75	24	M16x26L	3.80
	SK50-SMA40-75	P2778913	40	70	75	27	M20x30L	4.50

HCP

HYDRAULIC CHUCK (POWER E HYDRO)

DIN 69893/ ISO 12164-1-HSK FORM A





DIN 69893-HSK | AT3 | 2.5G | 25,000 RPM | (at 3D) ≤3μm | AD

Collet, Refer to page D35-D37

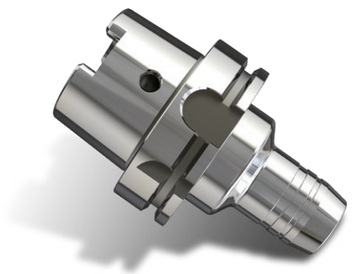
Unit : mm

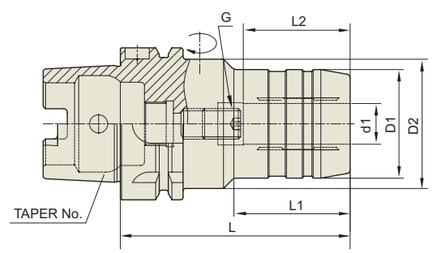
TAPER No.	MODEL No.	EDP No.	d1	D1	D2	L	L2	G	WEIGHT (Kg)
63A	HSK63A-HC20P-80	P2770301P	20	38	52.5	80	48	M8x1.0	1.30

HC

HYDRAULIC CHUCK (SLIM)

DIN 69893/ ISO 12164-1-HSK FORM A





DIN 69893-HSK | AT3 | 2.5G | 25,000 RPM | (at 3D) ≤3μm | AD

Collet, Refer to page D35-D37

Unit : mm

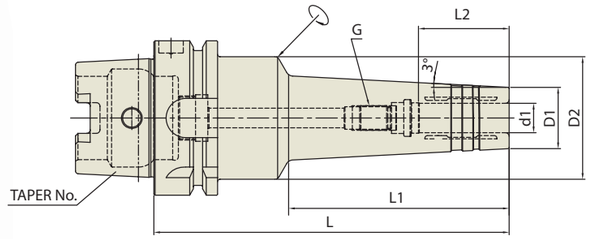
TAPER No.	MODEL No.	EDP No.	d1	D1	D2	L	L1	L2	G	WEIGHT (Kg)
50A	HSK50A-HC10-75	P2770406	10	30	40	75	34	32	M8×1.0	0.70
	HSK50A-HC12-85	P2770407	12	32	40	85	44	37	M10×1.0	0.75
	HSK50A-HC14-85	P2770408	14	34	40	85	43	37	M10×1.0	0.75

HMC

HYDRAULIC CHUCK (For MOLD and DIE)

DIN 69893/
ISO 12164-1-HSK FORM A





DIN 69893-HSK | AT3 | 2.5G | 25,000 RPM | (at 3D) ≤3㎛ | AD

Collet, refer to page D42

Unit : mm

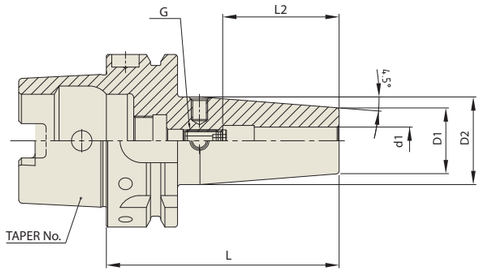
TAPER No.	MODEL No.	EDP No.	d1	D1	D2	L	L1	L2	G	WEIGHT (Kg)
63A	HSK63A-HMC12-145	P2770804	12	25	50	145	90	37	M10×1.0	1.40

SFH

SHRINK FIT HOLDER

DIN 69893/
ISO 12164-1-HSK FORM A





DIN 69893-HSK | 2.5G | 25,000 RPM | (I.D) ≤3㎛ | AD

Unit : mm

TAPER No.	MODEL No.	EDP No.	d1	D1	D2	L	L2	G	FIG.	WEIGHT (Kg)
63A	HSK63A-SFH12-90	P2600003	12	24	32	90	47	M10×1.0	2	0.83

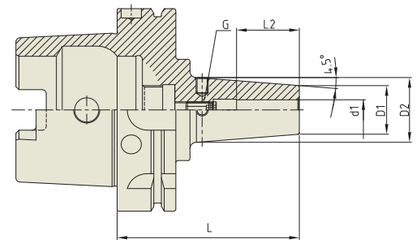
▶Without balancing screw.

SFH

SHRINK FIT HOLDER

DIN 69893/
ISO 12164-1-HSK FORM A





DIN 69893-HSK | 2.5G | 25,000 RPM | (I.D) ≤3㎛ | AD

Unit : mm

TAPER No.	MODEL No.	EDP No.	d1	D1	D2	L	L2	G	WEIGHT (Kg)
100A	HSK100A-SFH8-85	P2777302	8	21	27	85	36	M6×1.0	1.30

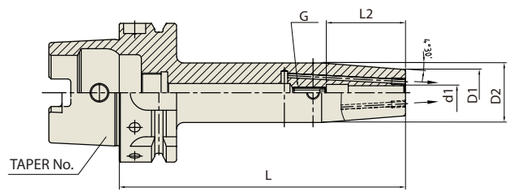
▶Without balancing screw.

SFH

SHRINK FIT HOLDER (COOLANT CHANNEL)

DIN 69893/
ISO 12164-1-HSK FORM A





DIN 69893-HSK | 2.5G | 25,000 RPM | (I.D) ≤3㎛ | AD+C

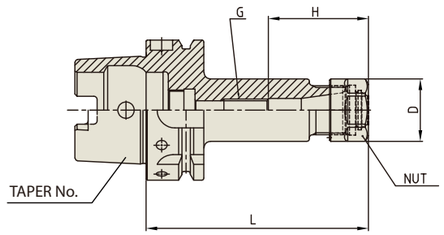
Unit : mm

TAPER No.	MODEL No.	EDP No.	d1	D1	D2	L	L2	G	WEIGHT (Kg)
63A	HSK63A-SFH6C-80	P2862013C	6	21	27	80	36	M5x0.8	0.83
	HSK63A-SFH8C-80	P2862015C	8	21	27	80	36	M6x1.0	0.83
	HSK63A-SFH10C-85	P2862017C	10	24	32	85	42	M8x1.0	0.83

ER COLLET CHUCK

DIN 69893/
ISO 12164-1-HSK FORM A





DIN 69893-HSK | 6.3G | 15,000 RPM | AD

Unit : mm

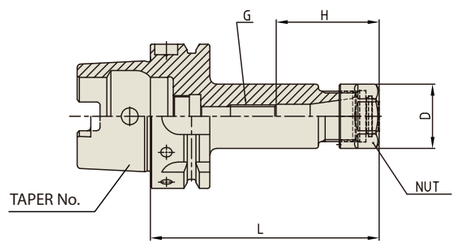
TAPER No.	MODEL No.	EDP No.	CLAMPING RANGE	L	D	G	H	NUT / COLLET	WEIGHT (Kg)
50A	**HSK50A-ER20-100**	**P2771928**	0.5 - 13.0	100	35	M12	50	ER20	0.90

ER

ER COLLET CHUCK

DIN 69893/
ISO 12164-1-HSK FORM A





DIN 69893-HSK | 2.5G | 25,000 RPM | AD

 ER Collet, Refer to page D38-D39

 ER nut and Spanner refer to page D43

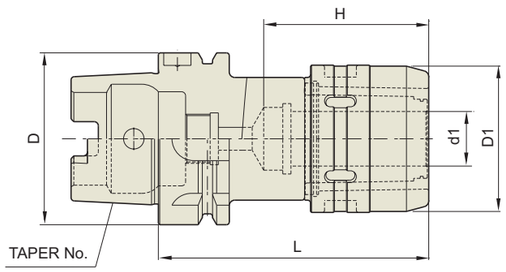
Unit : mm

TAPER No.	MODEL No.	EDP No.	CLAMPING RANGE	L	D	G	H	NUT / COLLET	WEIGHT (Kg)
50A	**HSK50A-ER20-100**	**P2774939**	0.5 - 13.0	100	35	M12	50	ER20	0.90
63A	**HSK63A-ER16-100**	**P2774901**	0.5 - 10.0	100	28	M12	45	ER16	1.20
	HSK63A-ER16-160	**P2774953**	0.5 - 10.0	160	28	M12	45	ER16	
	HSK63A-ER32-100	**P2774903**	1.0 - 20.0	100	50	M12	47	ER32	2.00
	HSK63A-ER32-160	**P2774954**	1.0 - 20.0	160	50	M12	47	ER32	
	HSK63A-ER32-120	**P2774955**	1.0 - 20.0	120	50	M12	47	ER32	

POWER MILLING CHUCK

DIN 69893/
ISO 12164-1-HSK FORM A





DIN 69893-HSK | AD

 Collet, spanner, refer to page D42

Unit : mm

TAPER No.	MODEL No.	EDP No.	d1	D	D1	L	H	WEIGHT (Kg)
63A	**HSK63A-C32-130**	**P2600032**	32	63	72	130	100	2.70

◆ ACCESSORY

END MILL COLLET	MODEL No.
	K20-6, 8, 10, 12, 16
	K25-6, 8, 10, 12, 16, 20
	K32-6, 8, 10, 12, 16, 20, 25
	K42-6, 8, 10, 12, 16, 20, 25, 32

▶Special size of Ø3, Ø4 or Ø5 can be produced and supplied upon request.

END MILL COLLET	MODEL No.
	CK20-6, 8, 10, 12, 16
	CK25-6, 8, 10, 12, 16, 20
	CK32-6, 8, 10, 12, 16, 20, 25
	CK42-6, 8, 10, 12, 16, 20, 25, 32

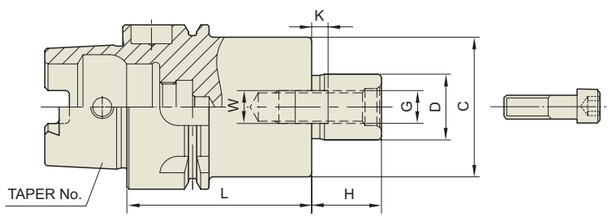
SPANNER	MODEL No.
	C20 SP
	C25 SP
	C32 SP
	C42 SP

FMC

FACE MILL ARBOR

DIN 69893/
ISO 12164-1-HSK FORM A





DIN 69893-HSK | 6.3G | 15,000 RPM | AD

Unit : mm

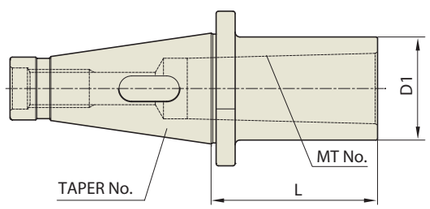
TAPER No.	MODEL No.	EDP No.	D	C	L	H	W	K	G	WEIGHT (Kg)
63A	**HSK63A-FMC22-45**	**P2774701**	**22**	45	45	18	10	5	M10	0.97

MTA / MTB

MORSE TAPER ARBOR

ANSI B5.18-NT





AT3

Unit : mm

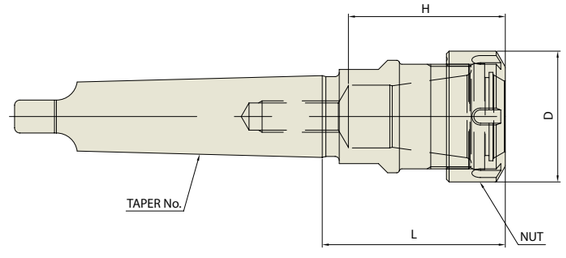
TAPER No.	MODEL No.	EDP No.	MT No.	RANGE OF DRILL Min. 最小	RANGE OF DRILL Max. 最大	D1	L	DRAW THREAD	WEIGHT (Kg)
NT40	**NT40-MTA2-30**	**P2542052**	2	14.1	23.0	32	30	U5/8-11(M16×2)	1.00
	NT40-MTA3-35	**P2542053**	3	23.1	32.0	40	45	U5/8-11(M16×2)	1.00

ER

ER COLLET CHUCK

DIN 228-MTA





ER Collet, Refer to page D38-D39

ER nut and Spanner refer to page D43

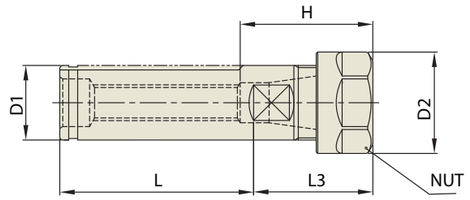
Unit : mm

TAPER No.	MODEL No.	EDP No.	CLAMPING RANGE	L	D	H	NUT / COLLET	WEIGHT (Kg)
2	**MTA2-ER25**	**P2772244**	1.0 - 16.0	50	42	41	ER25	0.60
3	**MTA3-ER25**	**P2772245**	1.0 - 16.0	60	42	52	ER25	0.60
	MTA3-ER32	**P2772246**	1.0 - 20.0	70	50	47	ER32	0.65
4	**MTA4-ER20**	**P2772247**	0.5 - 13.0	60	34	50	ER20	1.00
	MTA4-ER25	**P2772248**	1.0 - 16.0	60	42	52	ER25	1.10
	MTA4-ER32	**P2772249**	1.0 - 20.0	65	50	48	ER32	1.30
	MTA4-ER40	**P2772250**	2.0 - 30.0	80	63	69	ER40	1.50
5	**MTA5-ER32**	**P2772251**	1.0 - 20.0	70	50	60	ER32	2.20

ER COLLET CHUCK

NC- for CNC LATHE





ER Collet, Refer to page D38-D39

ER nut and Spanner refer to page D43

Unit : mm

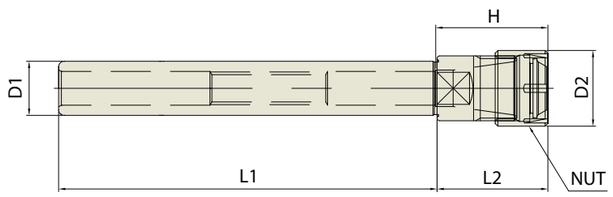
TAPER No.	MODEL No.	EDP No.	CLAMPING RANGE	D1	D2	L	L1	H	NUT / COLLET	WEIGHT (kg)
32	**NC32-ER25**	**P2772304**	1.0 - 16.0	32	42	70	40	41	ER25	0.70
40	**NC40-ER32**	**P2772306**	1.0 - 20.0	40	50	75	45	60	ER32	1.25
	NC40-ER40	**P2772307**	2.0 - 30.0	40	63	75	55	53	ER40	1.30

ER

EXTENSION ER COLLET CHUCK (Slim)

STRAIGHT-K





ER Collet, Refer to page D38-D39

ER nut and Spanner refer to page D43

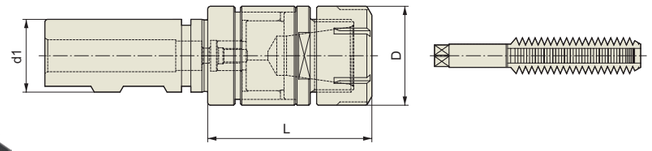
Unit : mm

TAPER No.	MODEL No.	EDP No.	CLAMPING RANGE	D1	D2	L1	L2	H	NUT / COLLET	WEIGHT (Kg)
16	**K16-ER11M-100**	**P2780006**	0.5 - 7.0	16	16	100	32	29.5	ER11M / ER11	0.18
20	**K20-ER16M-140**	**P2772207**	0.5 - 10.0	20	22	140	41	37.1	ER16M / ER16	0.28

SYNCHRO TAPPING CHUCK (ER TYPE)

STRAIGHT-KW





ER Collet, Refer to page D38-D39

Unit : mm

MODEL No.	EDP No.	TAP SIZE	NUT / COLLET	D	L	d1	WEIGHT (Kg)
KW20-SYTER16	**P2773901**	M3-M16	ER20	34	58	20	0.33

▶Feature :
- To compensate for synchronization errors to extend tap life and to improve thread quality
- To compensate for pitch tolerances of taps
- For machine with synchronized spindle

HYDRAULIC CHUCK SET



MODEL No.	HYDRAULIC CHUCK	EDP No.	REDUCTION SLEEVE	WRENCH
HCSS40-20	**SK40AD/B-HC20P-64.5**	**P2770971**	HK20-6.8.10.12.16 (5pcs)	ϕ5mm
HCSB40-20	**BT40AD/B-HC20P-72.5**	**P2770972**	HK20-6.8.10.12.16 (5pcs)	ϕ5mm
HCSH40-20	**HSK63A-HC20P-80**	**P2770973**	HK20-6.8.10.12.16 (5pcs)	ϕ5mm

C

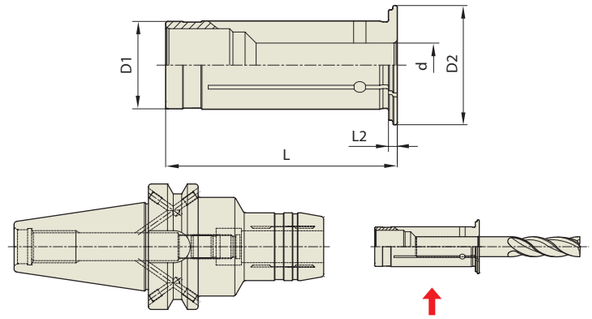
MILLING CHUCK STANDARD SET



TAPER	STANDARD SET MODEL No.	EDP No.	MILLING CHUCK	END MILL COLLET	SPANNER
SK	**SSK40-C20**	**P2526031**	SK40-C20-105	K20-6, 8, 10, 12, 16 (5pcs)	C20 SP
	SSK40-C32	**P2773301**	SK40-C32-105	K32-6, 8, 10, 12, 16, 20, 25 (7pcs)	C32 SP
	SSK50-C32	**P2773302**	SK50-C32-105	K32-6, 8, 10, 12, 16, 20, 25 (7pcs)	C32 SP
	SSK50-C42	**P2773303**	SK50-C42-115	K42-6, 8, 10, 12, 16, 20, 25, 32 (8pcs)	C42 SP

HYDRAULIC CHUCK COLLET (Reduction Sleeve : Open Type)





Hydraulic Chuck collet
液压刀柄筒夹

Unit : mm

MODEL No.		EDP No.	d	D1	D2	L	L2
HK12	**3**	**P2569022**	**3**	12	19	47	2
	4	**P2569023**	**4**	12	19	47	2
	5	**P2569024**	**5**	12	19	47	2
	6	**P2569025**	**6**	12	19	47	2
	7	**P2771001**	**7**	12	19	47	2
	8	**P2569026**	**8**	12	19	47	2
HK20	**3**	**P2569001**	**3**	20	27	52.5	2
	4	**P2569002**	**4**	20	27	52.5	2
	5	**P2569003**	**5**	20	27	52.5	2
	6	**P2569004**	**6**	20	27	52.5	2
	7	**P2771002**	**7**	20	27	52.5	2
	8	**P2569005**	**8**	20	27	52.5	2
	9	**P2771003**	**9**	20	27	52.5	2
	10	**P2569006**	**10**	20	27	52.5	2
	11	**P2771004**	**11**	20	27	52.5	2
	12	**P2569007**	**12**	20	27	52.5	2
	13	**P2771005**	**13**	20	27	52.5	2
	14	**P2569008**	**14**	20	27	52.5	2
	15	**P2771006**	**15**	20	27	52.5	2
	16	**P2569009**	**16**	20	27	52.5	2
HK32	**6**	**P2569010**	**6**	32	39	63.5	3
	8	**P2569011**	**8**	32	39	63.5	3
	10	**P2569012**	**10**	32	39	63.5	3
	12	**P2569013**	**12**	32	39	63.5	3
	14	**P2569014**	**14**	32	39	63.5	3
	16	**P2569015**	**16**	32	39	63.5	3
	18	**P2569016**	**18**	32	39	63.5	3
	20	**P2569017**	**20**	32	39	63.5	3
	25	**P2569018**	**25**	32	39	63.5	3

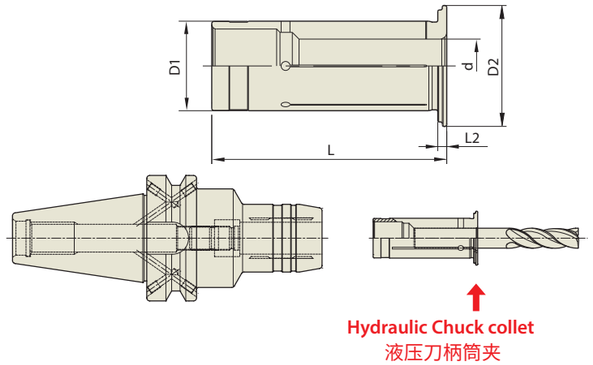
▶ Other special sizes of Hydraulic Chuck collets could be produced and supplied.

Feature HK Hydraulic Chuck collet (reduction sleeve) is cut into trisection by high precision cutting to guarantee precise I.D and strong clamping power.

Chucking Method Please assemble cutting tool with collet firstly, and then insert collet into Hydraulic Chuck.

HYDRAULIC CHUCK COLLET (Reduction Sleeve : Closed Type)





Hydraulic Chuck collet
液压刀柄筒夹

Unit : mm

MODEL No.		EDP No.	d	D1	D2	L	L2
HS12	3	P2771101	3	12	19	47	2
	4	P2771102	4	12	19	47	2
	5	P2771103	5	12	19	47	2
	6	P2771104	6	12	19	47	2
	7	P2771105	7	12	19	47	2
	8	P2771106	8	12	19	47	2
HS20	3	P2771107	3	20	27	52.5	2
	4	P2771108	4	20	27	52.5	2
	5	P2771109	5	20	27	52.5	2
	6	P2771110	6	20	27	52.5	2
	7	P2771111	7	20	27	52.5	2
	8	P2771112	8	20	27	52.5	2
	9	P2771113	9	20	27	52.5	2
	10	P2771114	10	20	27	52.5	2
	11	P2771115	11	20	27	52.5	2
	12	P2771116	12	20	27	52.5	2
	13	P2771117	13	20	27	52.5	2
	14	P2771118	14	20	27	52.5	2
	15	P2771119	15	20	27	52.5	2
	16	P2771120	16	20	27	52.5	2
	17	P2771130	17	20	27	52.5	2
HS32	6	P2771121	6	32	39	63.5	3
	8	P2771122	8	32	39	63.5	3
	10	P2771123	10	32	39	63.5	3
	12	P2771124	12	32	39	63.5	3
	14	P2771125	14	32	39	63.5	3
	16	P2771126	16	32	39	63.5	3
	18	P2771127	18	32	39	63.5	3
	20	P2771128	20	32	39	63.5	3
	25	P2771129	25	32	39	63.5	3

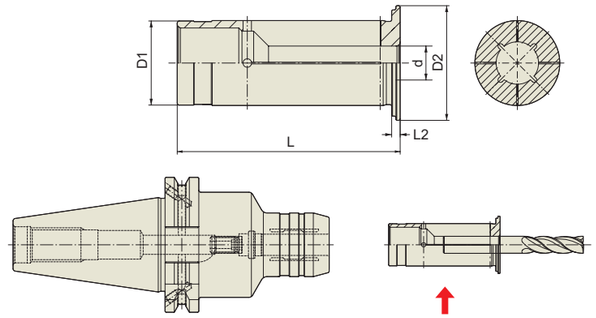
▶Other special sizes of Hydraulic Chuck collets could be produced and supplied.

Feature HS Hydraulic Chuck collet (reduction sleeve) is cut by high precision wire-cutting to guarantee precise I.D and strong clamping power.

Chucking Method Please assemble cutting tool with collet firstly, and then insert collet into Hydraulic Chuck.

HYDRAULIC CHUCK COLLET (Reduction Sleeve : Coolant Flush Type)





Hydraulic Chuck collet

Unit : mm

MODEL No.		EDP No.	d	D1	D2	L	L2
HF12	3	P2771201	3	12	19	47	2
	4	P2771202	4	12	19	47	2
	5	P2771203	5	12	19	47	2
	6	P2771204	6	12	19	47	2
	7	P2771205	7	12	19	47	2
	8	P2771206	8	12	19	47	2
HF20	3	P2771207	3	20	27	52.5	2
	4	P2771208	4	20	27	52.5	2
	5	P2771209	5	20	27	52.5	2
	6	P2771210	6	20	27	52.5	2
	7	P2771211	7	20	27	52.5	2
	8	P2771212	8	20	27	52.5	2
	9	P2771213	9	20	27	52.5	2
	10	P2771214	10	20	27	52.5	2
	11	P2771215	11	20	27	52.5	2
	12	P2771216	12	20	27	52.5	2
	13	P2771217	13	20	27	52.5	2
	14	P2771218	14	20	27	52.5	2
	15	P2771219	15	20	27	52.5	2
	16	P2771220	16	20	27	52.5	2
HF32	6	P2771221	6	32	39	63.5	3
	8	P2771222	8	32	39	63.5	3
	10	P2771223	10	32	39	63.5	3
	12	P2771224	12	32	39	63.5	3
	14	P2771225	14	32	39	63.5	3
	16	P2771226	16	32	39	63.5	3
	18	P2771227	18	32	39	63.5	3
	20	P2771228	20	32	39	63.5	3
	25	P2771229	25	32	39	63.5	3

▶Other special sizes of Hydraulic Chuck collets could be produced and supplied.

Feature HF Hydraulic Chuck collet (reduction sleeve) is for internal coolant flush.

Chucking Method Please assemble cutting tool with collet firstly, and then insert collet into Hydraulic Chuck.

ER COLLET - UF



Unit : mm

ER 8			ER 11			ER 16			ER 20		
CLAMPING RANGE	CODE No.	EDP No.	CLAMPING RANGE	CODE No.	EDP No.	CLAMPING RANGE	CODE No.	EDP No.	CLAMPING RANGE	CODE No.	EDP No.
1.0 - 0.5	208010	P2506292	1.0 - 0.5	211010	P2506311	1.0 - 0.5	216010	P2506201	2.0 - 1.0	220020	P2506332
1.5 - 1.0	208015	P2506293	1.5 - 1.0	211015	P2506312	2.0 - 1.0	216020	P2506202	3.0 - 2.0	220030	P2506333
2.0 - 1.5	208020	P2506294	2.0 - 1.5	211020	P2506313	3.0 - 2.0	216030	P2506203	4.0 - 3.0	220040	P2506334
2.5 - 2.0	208025	P2506295	2.5 - 2.0	211025	P2506314	4.0 - 3.0	216040	P2506204	5.0 - 4.0	220050	P2506335
3.0 - 2.5	208030	P2506296	3.0 - 2.5	211030	P2506315	5.0 - 4.0	216050	P2506205	6.0 - 5.0	220060	P2506336
3.5 - 3.0	208035	P2506297	3.5 - 3.0	211035	P2506316	6.0 - 5.0	216060	P2506206	7.0 - 6.0	220070	P2506337
4.0 - 3.5	208040	P2506298	4.0 - 3.5	211040	P2506317	7.0 - 6.0	216070	P2506207	8.0 - 7.0	220080	P2506338
4.5 - 4.0	208045	P2506299	4.5 - 4.0	211045	P2506318	8.0 - 7.0	216080	P2506208	9.0 - 8.0	220090	P2506339
5.0 - 4.5	208050	P2506300	5.0 - 4.5	211050	P2506319	9.0 - 8.0	216090	P2506209	10.0 - 9.0	220100	P2506340
			5.5 - 5.0	211055	P2506320	10.0 - 9.0	216100	P2506210	11.0 - 10.0	220120	P2506341
			6.0 - 5.5	211060	P2506321	1.5 - 1.0	216015	P2778506	12.0 - 11.0	220130	P2506342
			6.5 - 6.0	211065	P2506322	2.5 - 2.0	216025	P2778507	13.0 - 12.0	220140	P2506343
			7.0 - 6.5	211070	P2506323				1.0 - 0.5	220010	P2506344
									1.5 - 1.0	220015	P2506345
									2.5 - 2.0	220025	P2506346
STANDARD SET	208000	P2506301	STANDARD SET	211000	P2506302	STANDARD SET	216000	P2506303	STANDARD SET	220000	P2506304
Ø1.0 - 5.0mm			Ø1.0 - 7.0mm			Ø1.0 - 10.0mm			Ø2.0 - 13.0mm		
9pcs			13pcs			10pcs			12pcs		
WOODEN TRAY ZWT 8	108110		WOODEN TRAY ZWT 11	011110		WOODEN TRAY ZWT 16	016110		WOODEN TRAY ZWT 20	020110	

ER COLLET - UF



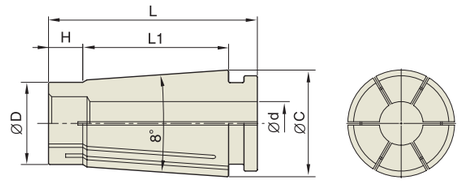
Unit : mm

ER 25			ER 32			ER 40			ER 50		
CLAMPING RANGE	CODE No.	EDP No.	CLAMPING RANGE	CODE No.	EDP No.	CLAMPING RANGE	CODE No.	EDP No.	CLAMPING RANGE	CODE No.	EDP No.
2.0 - 1.0	225020	P2506212	3.0 - 2.0	232030	P2506233	4.0 - 3.0	240040	P2506264	12.0 - 10.0	250120	P2506352
3.0 - 2.0	225030	P2506213	4.0 - 3.0	232040	P2506234	5.0 - 4.0	240050	P2506265	14.0 - 12.0	250140	P2506354
4.0 - 3.0	225040	P2506214	5.0 - 4.0	232050	P2506235	6.0 - 5.0	240060	P2506266	16.0 - 14.0	250160	P2506356
5.0 - 4.0	225050	P2506215	6.0 - 5.0	232060	P2506236	7.0 - 6.0	240070	P2506267	18.0 - 16.0	250180	P2506358
6.0 - 5.0	225060	P2506216	7.0 - 6.0	232070	P2506237	8.0 - 7.0	240080	P2506268	20.0 - 18.0	250200	P2506360
7.0 - 6.0	225070	P2506217	8.0 - 7.0	232080	P2506238	9.0 - 8.0	240090	P2506269	22.0 - 20.0	250220	P2506362
8.0 - 7.0	225080	P2506218	9.0 - 8.0	232090	P2506239	10.0 - 9.0	240100	P2506270	24.0 - 22.0	250240	P2506364
9.0 - 8.0	225090	P2506219	10.0 - 9.0	232100	P2506240	11.0 - 10.0	240110	P2506271	26.0 - 24.0	250260	P2506366
10.0 - 9.0	225100	P2506220	11.0 - 10.0	232110	P2506241	12.0 - 11.0	240120	P2506272	28.0 - 26.0	250280	P2506368
11.0 - 10.0	225110	P2506221	12.0 - 11.0	232120	P2506242	13.0 - 12.0	240130	P2506273	30.0 - 28.0	250300	P2506370
12.0 - 11.0	225120	P2506222	13.0 - 12.0	232130	P2506243	14.0 - 13.0	240140	P2506274	32.0 - 30.0	250320	P2506372
13.0 - 12.0	225130	P2506223	14.0 - 13.0	232140	P2506244	15.0 - 14.0	240150	P2506275	34.0 - 32.0	250340	P2506374
14.0 - 13.0	225140	P2506224	15.0 - 14.0	232150	P2506245	16.0 - 15.0	240160	P2506276	6.0 - 4.0	250060	P2778515
15.0 - 14.0	225150	P2506225	16.0 - 15.0	232160	P2506246	17.0 - 16.0	240170	P2506277	8.0 - 6.0	250080	P2778516
16.0 - 15.0	225160	P2506226	17.0 - 16.0	232170	P2506247	18.0 - 17.0	240180	P2506278	10.0 - 8.0	250100	P2778517
1.0 - 0.5	225010	P2506227	18.0 - 17.0	232180	P2506248	19.0 - 18.0	240190	P2506279	25.0 - 23.0	250250	P2778518
1.5 - 1.0	225015	P2506228	19.0 - 18.0	232190	P2506249	20.0 - 19.0	240200	P2506280			
2.5 - 2.0	225025	P2506229	20.0 - 19.0	232200	P2506250	21.0 - 20.0	240210	P2506281			
			2.0 - 1.0	232020	P2506251	22.0 - 21.0	240220	P2506282			
			2.5 - 2.0	232025	P2506252	23.0 - 22.0	240230	P2506283			
						24.0 - 23.0	240240	P2506284			
						25.0 - 24.0	240250	P2506285			
						26.0 - 25.0	240260	P2506286			
						3.0 - 2.0	240030	P2506287			
						27.0 - 26.0	240270	P2506288			
						28.0 - 27.0	240280	P2506289			
						29.0 - 28.0	240290	P2506290			
						30.0 - 29.0	240300	P2506291			
STANDARD SET	225000	P2506305	STANDARD SET	232000	P2506306	STANDARD SET	240000	P2506307	STANDARD SET	250000	P2506308
Ø2.0 - 16.0mm			Ø3.0 - 20.0mm			Ø4.0 - 26.0mm			Ø12.0 - 34.0mm		
15pcs			18pcs			23pcs			12pcs		
WOODEN TRAY ZWT 25	025110		WOODEN TRAY ZWT 32	032110		WOODEN TRAY ZWT 40	040110		WOODEN TRAY ZWT 50	050110	

▶Inch type collets available.

SK SLIM CHUCK - COLLET





◇ T.I.R : ≤0.005mm at 3D

Unit : mm

TYPE	MODEL No.	EDP No.	CLAMPING RANGE (d)
SKC6	SKC6-2	P2730780	1.8 - 2.0
	SKC6-2.5	P2773601	2.3 - 2.5
	SKC6-3	P2730782	2.8 - 3.0
	SKC6-3.5	P2773602	3.0 - 3.5
	SKC6-4	P2730784	3.5 - 4.0
	SKC6-4.5	P2773603	4.0 - 4.5
	SKC6-5	P2730786	4.5 - 5.0
	SKC6-5.5	P2773604	5.0 - 5.5
	SKC6-6	P2730788	5.5 - 6.0

TYPE	MODEL No.	EDP No.	CLAMPING RANGE (d)
SKC10	SKC10-2	P2730790	1.75 - 2.0
	SKC10-2.5	P2773605	2.25 - 2.5
	SKC10-3	P2730791	2.75 - 3.0
	SKC10-3.5	P2773606	3.0 - 3.5
	SKC10-4	P2730792	3.5 - 4.0
	SKC10-4.5	P2773607	4.0 - 4.5
	SKC10-5	P2730793	4.5 - 5.0
	SKC10-5.5	P2773608	5.0 - 5.5
	SKC10-6	P2730794	5.5 - 6.0
	SKC10-6.5	P2773609	6.0 - 6.5
	SKC10-7	P2730795	6.5 - 7.0
	SKC10-7.5	P2773610	7.0 - 7.5
	SKC10-8	P2730796	7.5 - 8.0
	SKC10-8.5	P2773611	8.0 - 8.5
	SKC10-9	P2730797	8.5 - 9.0
	SKC10-9.5	P2773612	9.0 - 9.5
	SKC10-10	P2730798	9.5 - 10.0

TYPE	MODEL No.	EDP No.	CLAMPING RANGE (d)
SKC13	SKC13-3	P2773656	2.75 - 3.0
	SKC13-3.5	P2773657	3.0 - 3.5
	SKC13-4	P2773658	3.5 - 4.0
	SKC13-4.5	P2773659	4.0 - 4.5
	SKC13-5	P2773660	4.5 - 5.0
	SKC13-5.5	P2773661	5.0 - 5.5
	SKC13-6	P2773662	5.5 - 6.0
	SKC13-6.5	P2773663	6.0 - 6.5
	SKC13-7	P2773664	6.5 - 7.0
	SKC13-7.5	P2773665	7.0 - 7.5
	SKC13-8	P2773666	7.5 - 8.0
	SKC13-8.5	P2773667	8.0 - 8.5
	SKC13-9	P2773668	8.5 - 9.0
	SKC13-9.5	P2773669	9.0 - 9.5
	SKC13-10	P2773670	9.5 - 10.0
	SKC13-10.5	P2773671	10.0 - 10.5
	SKC13-11	P2773672	10.5 - 11.0
	SKC13-11.5	P2773673	11.0 - 11.5
	SKC13-12	P2773674	11.5 - 12.0
	SKC13-12.5	P2773675	12.0 - 12.5
	SKC13-13	P2773676	12.5 - 13.0

TYPE	MODEL No.	EDP No.	CLAMPING RANGE (d)
SKC16	SKC16-3	P2730810	2.75 - 3.0
	SKC16-3.5	P2773613	3.0 - 3.5
	SKC16-4	P2730812	3.5 - 4.0
	SKC16-4.5	P2773614	4.0 - 4.5
	SKC16-5	P2773615	4.5 - 5.0
	SKC16-5.5	P2773616	5.0 - 5.5
	SKC16-6	P2730814	5.5 - 6.0
	SKC16-6.5	P2773617	6.0 - 6.5
	SKC16-7	P2773618	6.5 - 7.0
	SKC16-7.5	P2773619	7.0 - 7.5
	SKC16-8	P2730816	7.5 - 8.0
	SKC16-8.5	P2773620	8.0 - 8.5
	SKC16-9	P2773621	8.5 - 9.0
	SKC16-9.5	P2773622	9.0 - 9.5
	SKC16-10	P2730818	9.5 - 10.0
	SKC16-10.5	P2773623	10.0 - 10.5
	SKC16-11	P2773624	10.5 - 11.0
	SKC16-11.5	P2773625	10.0 - 11.5
	SKC16-12	P2730820	11.5 - 12.0
	SKC16-12.5	P2773626	12.0 - 12.5
	SKC16-13	P2773627	12.5 - 13.0
	SKC16-13.5	P2773628	13.0 - 13.5
	SKC16-14	P2773822	13.5 - 14.0
	SKC16-14.5	P2773629	14.0 - 14.5
	SKC16-15	P2773630	14.5 - 15.0
	SKC16-15.5	P2773631	15.0 - 15.5
	SKC16-16	P2730824	15.5 - 16.0

■ SKC COLLET DIMENSION

Unit : mm

TYPE	D	L	L1	H	C	WEIGHT (Kg)
SKC6	7.5	25.7	17.6	3.8	10	0.03
SKC10	12	32	21.3	5	15	0.04
SKC13	15.4	39	28.3	5.5	20	
SKC16	18.8	46	32	8	24	0.06
SKC20	22.5	54.2	41	8	29	
SKC25	28.9	58.2	43	8.5	35	0.10

SK SLIM CHUCK - NUT



FIG.1

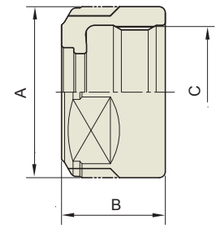
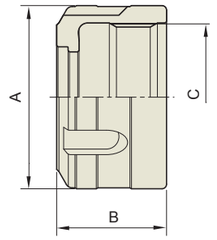


FIG.2



Unit : mm

TYPE	MODEL No.	A	B	C	FIG.	WEIGHT (Kg)
SKN06	P2773581	20	15	M15.5 x 1.0	1	0.02
SKN10	P2773582	28	17	M21.5 x 1.0	1	0.04
SKN13	P2773583	33	21	M27 x 1.0	2	0.05
SKN16	P2773584	40	24	M32 x 1.5	2	0.06
SKN20	P2773585	48.5	24	M40 x 1.0	2	0.08
SKN25	P2773586	55	30	M45 x 1.5	2	0.10

SP

SK SLIM CHUCK - SPANNER



MODEL No.	EDP No.
TSK6	P2773588
TSK10	P2773589
TSK13	P2773590
TSK16	P2773591
TSK20	P2773587
TSK25	P2773592

▶ Design and shape could be changed without prior notice.

POWER MILLING CHUCK - COLLET & SPANNER







■ END MILL COLLET (K TYPE)

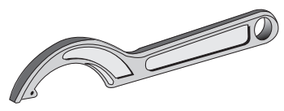
MODEL No.	EDP No.
K20-6	P2506401
K20-8	P2506402
K20-10	P2506403
K20-12	P2506404
K20-16	P2506405
K25-6	P2506601
K25-8	P2506602
K25-10	P2506603
K25-12	P2506604
K25-16	P2506605
K25-20	P2506606
K32-6	P2506411
K32-8	P2506412
K32-10	P2506413
K32-12	P2506414
K32-16	P2506415
K32-20	P2506416
K32-25	P2506417
K42-6	P2506511
K42-8	P2506512
K42-10	P2506513
K42-12	P2506514
K42-16	P2506515
K42-20	P2506516
K42-25	P2506517
K42-32	P2506518

■ END MILL COLLET (CK TYPE)

MODEL No.	EDP No.
CK20-6	P2506731
CK20-8	P2506732
CK20-10	P2506733
CK20-12	P2506734
CK20-16	P2506735
CK25-6	P2506736
CK25-8	P2506737
CK25-10	P2506738
CK25-12	P2506739
CK25-16	P2506740
CK25-20	P2506741
CK32-6	P2506742
CK32-8	P2506743
CK32-10	P2506744
CK32-12	P2506745
CK32-16	P2506746
CK32-20	P2506747
CK32-25	P2506748
CK42-6	P2506749
CK42-8	P2506750
CK42-10	P2506751
CK42-12	P2506752
CK42-16	P2506753
CK42-20	P2506754
CK42-25	P2506755
CK42-32	P2506756

■ MT COLLET

MODEL No.	EDP No.
K20-MT1	P2506519
K20-MT2	P2506520
K25-MT1	P2506521
K25-MT2	P2506522
K25-MT3	P2506534
K32-MT1	P2506523
K32-MT2	P2506524
K32-MT3	P2506525
K42-MT1	P2506526
K42-MT2	P2506527
K42-MT3	P2506528
K42-MT4	P2506529



■ SPANNER

MODEL No.	EDP No.
C20 SP	P2773401
C25 SP	P2773402
C32 SP	P2600033
C42 SP	P2773403

ER COLLET CHUCK - NUT



DIN 6499/ISO 15488

■ SQ-ER (Standard : Hex.)

Unit : mm

MODEL No.	EDP No.	THREAD	Dia.	LENGTH
SQ-ER11	P2700006	M14×0.75	19.0	12.0
SQ-ER16	P2700001	M22×1.50	28.0	18.0
SQ-ER20	P2700002	M25×1.50	34.0	19.5



■ SQ-ER (Standard : Round)

Unit : mm

MODEL No.	EDP No.	THREAD	Dia.	LENGTH
SQ-ER25	P2700003	M32×1.50	42.0	20.5
SQ-ER32	P2700004	M40×1.50	50.0	23.0
SQ-ER40	P2700005	M50×1.50	63.0	26.0
SQ-ER50	P2700007	M64×2.00	78.0	35.0

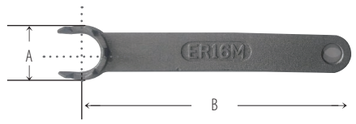
ER COLLET CHUCK - SPANNER/WRENCH



FIG.1



FIG.2



■ FOR ER / SKN NUT

Unit : mm

MODEL No.	EDP No.	A	B	APPLICABLE NUT
ER11SP	P2772601	-	-	ER11, SKN6 (FIG.1)
ER16SP	P2772602	50	160	ER16, SKN10 (FIG.1)
ER20SP	P2772603	55	180	ER20 (FIG.1)
ER25SP	P2772604	65	210	ER25, SKN16 (FIG.2)
ER32SP	P2772605	75	250	ER32 (FIG.2)
ER40SP	P2772606	90	290	ER40 (FIG.2)
ER50SP	P2772612	110	350	ER50 (FIG.2)

▶Design and shape could be changed without prior notice.

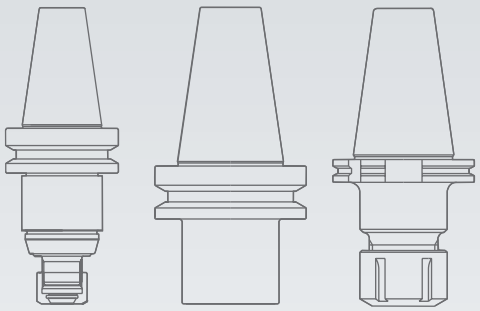
■ FOR ER Mini NUT

Unit : mm

MODEL No.	EDP No.	A	B	APPLICABLE NUT
GE8M	P2772608	12.4	70	ER8M
GE11M	P2772609	16.8	90	ER11M
GE16M	P2772610	22.5	110	ER16M
GE20M	P2772611	29.0	120	ER20M
GE25M	P2772607	36.0	130	ER25M

▶Design and shape could be changed without prior notice.

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