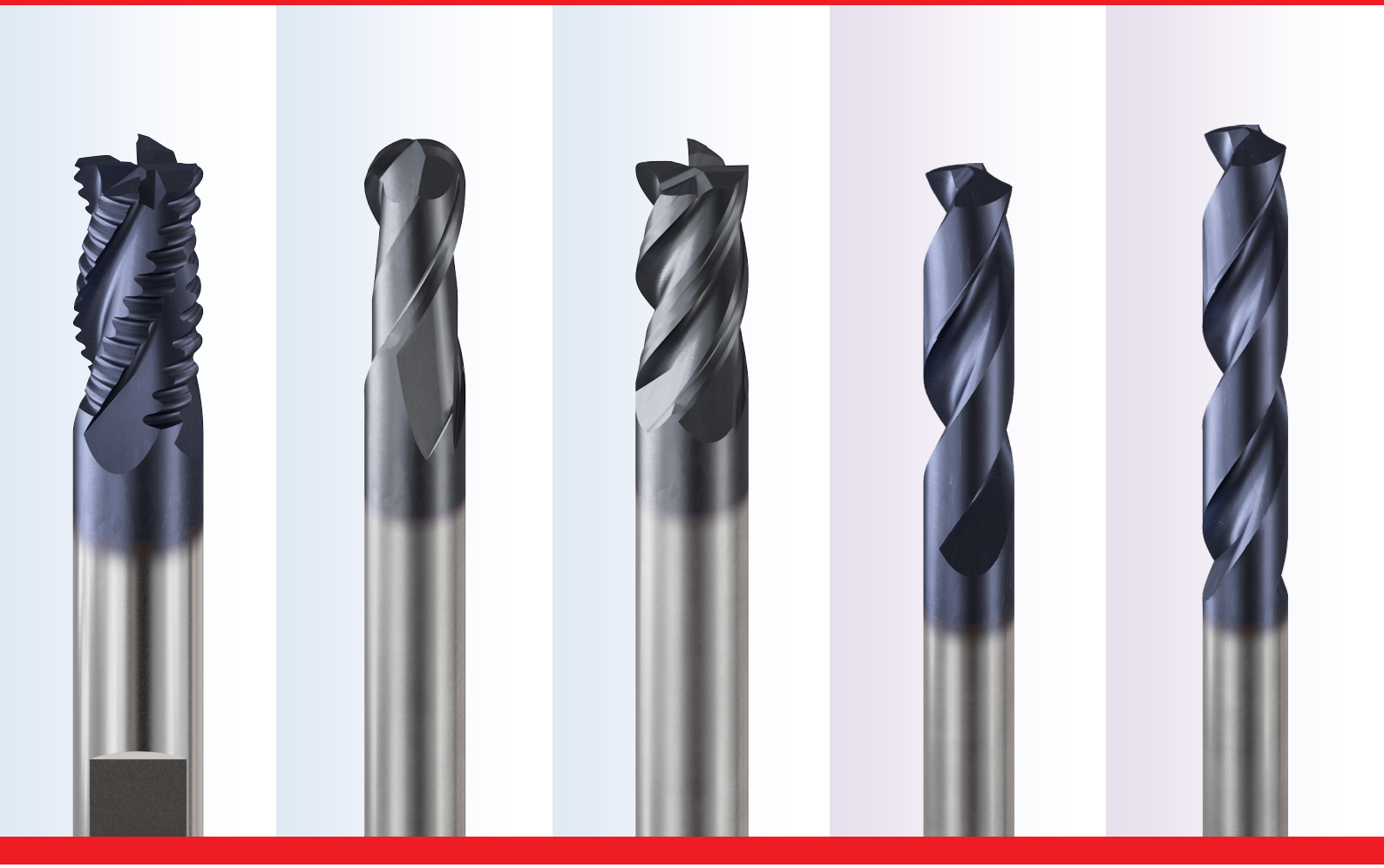
YE-NC24

NEW CENTURY

CUTTING TOOLS

END MILLS / DRILLS



END MILLS & DRILLS

PRODUCTS	DESCRIPTION
	***SUPER HARDENED HSS END MILL***
	***COATED CARBIDE, END MILL for GENERAL***
	***COATED CARBIDE, END MILL for HEAVY CUTTING***
	***COATED CARBIDE, END MILL for HARDENED MATERIAL***
	***COATED CARBIDE, DRILL for GENERAL***

· Phone: +82-32-526-0909, www.yg1.solutions, E-mail: yg1@yg1.solutions

END MILLS & DRILLS

HSS
SUPER HARDENED END MILLS

Designed to provide excellent toughness and wear resistance, outperforming standard HSS end mills in terms of performance

◎ : Excellent ○ : Good

SERIES	ESH570 EHC570	ESH571 EHC571	ESH573 EHC573
FLUTE	2	2	3
HELIX ANGLE	≒ 30°	≒ 30°	≒ 30°
CUTTING EDGE SHAPE	SQUARE	SQUARE	SQUARE
SIZE MIN	D2.0	D2.0	D2.0
SIZE MAX	D32.0	D32.0	D32.0
PAGE	6	7	8
	SHORT LENGTH	LONG LENGTH	SHORT LENGTH
	Bright / TiAlN	Bright / TiAlN	Bright / 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			

Recommended cutting conditions : p.19~31

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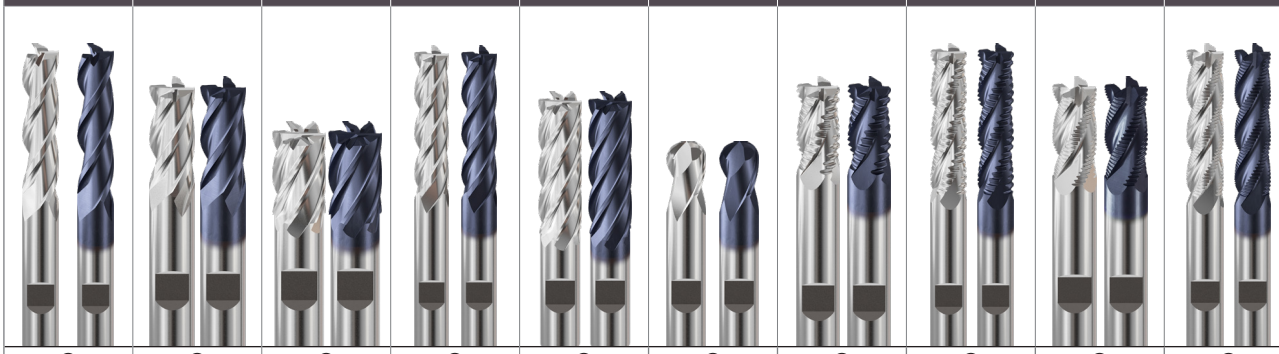
ESH516 EHC516	ESH595 EHC595	ESH596 EHC596	ESH597 EHC597	ESH598 EHC598	ESH535 EHC535	ESH751 EHC751	ESH752 EHC752	ESH753 EHC753	ESH762 EHC762	
3	4	6	4	6	2	3-6	3-6	3-6	3-6	
30°	≈ 30°	≈ 30°	≈ 30°	≈ 30°	≈ 30°	30°	30°	30°	30°	
SQUARE	SQUARE	SQUARE	SQUARE	SQUARE	BALL NOSE	ROUGHING	ROUGHING	ROUGHING	ROUGHING	
D2.0	D2.0	D21.0	D2.0	D22.0	D2.0	D6.0	D6.0	D6.0	D6.0	
D32.0	D30.0	D32.0	D30.0	D32.0	D25.0	D32.0	D32.0	D32.0	D32.0	
9	10	11	12	13	14	15	16	17	18	
LONG LENGTH	SHORT LENGTH	SHORT LENGTH	LONG LENGTH	LONG LENGTH	SHORT LENGTH	SHORT LENGTH	LONG LENGTH	SHORT LENGTH	LONG LENGTH	
Bright / TiAlN	Bright / TiAlN	Bright / TiAlN	Bright / TiAlN	Bright / TiAlN	Bright / TiAlN	Bright / TiAlN	Bright / TiAlN	Bright / TiAlN	Bright / TiAlN	
										
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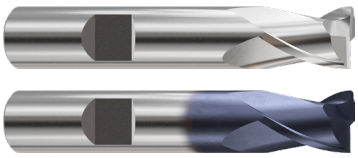
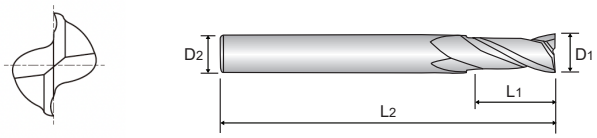
HSS, 2 FLUTE HELIX SHORT LENGTH

▶ Designed to machine carbon steels, alloyed steels.





PREMIUM HSS | DIN 327 | 2 | ≈30° | FLAT

p. 19~20

Tolerances according to DIN 7160 & 7161

Tolerance range in ㎛						
Nominal-Diameter in ㎛						
	from 1 to 3	over 3 to 6	over 6 to 10	over 10 to 18	over 18 to 30	over 30 to 50
e8	- 14 - 28	- 20 - 38	- 25 - 47	- 32 - 59	- 40 - 73	- 50 - 89
h6	0 - 6	0 - 8	0 - 9	0 - 11	0 - 13	0 - 16

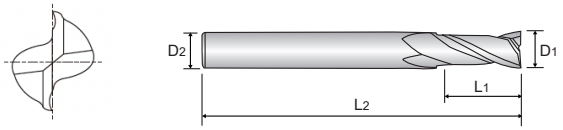
ESH570 EHC570 SERIES

Unit : mm

EDP No.		Mill Diameter	Shank Diameter	Length of Cut	Overall Length
Bright	TiAlN	D1	D2	L1	L2
ESH570020	EHC570020	2.0	6	4	48
ESH570030	EHC570030	3.0	6	5	49
ESH570040	EHC570040	4.0	6	7	51
ESH570050	EHC570050	5.0	6	8	52
ESH570060	EHC570060	6.0	6	8	52
ESH570070	EHC570070	7.0	10	10	60
ESH570080	EHC570080	8.0	10	11	61
ESH570090	EHC570090	9.0	10	11	61
ESH570100	EHC570100	10.0	10	13	63
ESH570110	EHC570110	11.0	12	13	70
ESH570120	EHC570120	12.0	12	16	73
ESH570130	EHC570130	13.0	12	16	73
ESH570140	EHC570140	14.0	12	16	73
ESH570150	EHC570150	15.0	12	16	73
ESH570160	EHC570160	16.0	16	19	79
ESH570170	EHC570170	17.0	16	19	79
ESH570180	EHC570180	18.0	16	19	79
ESH570190	EHC570190	19.0	16	19	79
ESH570200	EHC570200	20.0	20	22	88
ESH570210	EHC570210	21.0	20	22	88
ESH570220	EHC570220	22.0	20	22	88
ESH570230	EHC570230	23.0	25	22	88
ESH570240	EHC570240	24.0	25	26	102
ESH570250	EHC570250	25.0	25	26	102
ESH570280	EHC570280	28.0	25	26	102
ESH570300	EHC570300	30.0	25	26	102
ESH570320	EHC570320	32.0	32	32	112

HSS, 2 FLUTE HELIX LONG LENGTH

▶ Designed to machine carbon steels, alloyed steels.



PREMIUM HSS | DIN 844 | 2 | ≈30° | FLAT

p. 19~20

Tolerances according to DIN 7160 & 7161

Tolerance range in ㎛						
Nominal-Diameter in ㎛						
	from 1 to 3	over 3 to 6	over 6 to 10	over 10 to 18	over 18 to 30	over 30 to 50
e8	- 14 - 28	- 20 - 38	- 25 - 47	- 32 - 59	- 40 - 73	- 50 - 89
h6	0 - 6	0 - 8	0 - 9	0 - 11	0 - 13	0 - 16

ESH571 EHC571 SERIES

Unit : mm

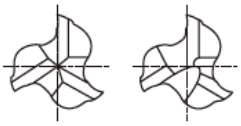
EDP No.		Mill Diameter	Shank Diameter	Length of Cut	Overall Length
Bright	TiAlN	D_1	D_2	L_1	L_2
ESH571020	EHC571020	2.0	6	7	51
ESH571030	EHC571030	3.0	6	8	52
ESH571040	EHC571040	4.0	6	11	55
ESH571050	EHC571050	5.0	6	13	57
ESH571060	EHC571060	6.0	6	13	57
ESH571070	EHC571070	7.0	10	16	66
ESH571080	EHC571080	8.0	10	19	69
ESH571090	EHC571090	9.0	10	19	69
ESH571100	EHC571100	10.0	10	22	72
ESH571110	EHC571110	11.0	12	22	79
ESH571120	EHC571120	12.0	12	26	83
ESH571130	EHC571130	13.0	12	26	83
ESH571140	EHC571140	14.0	12	26	83
ESH571150	EHC571150	15.0	12	26	83
ESH571160	EHC571160	16.0	16	32	92
ESH571170	EHC571170	17.0	16	32	92
ESH571180	EHC571180	18.0	16	32	92
ESH571190	EHC571190	19.0	16	32	92
ESH571200	EHC571200	20.0	20	38	104
ESH571210	EHC571210	21.0	20	38	104
ESH571220	EHC571220	22.0	20	38	104
ESH571230	EHC571230	23.0	20	38	104
ESH571240	EHC571240	24.0	25	45	121
ESH571250	EHC571250	25.0	25	45	121
ESH571280	EHC571280	28.0	25	45	121
ESH571300	EHC571300	30.0	25	45	121
ESH571320	EHC571320	32.0	32	53	133

SUPER HARDENED END MILLS

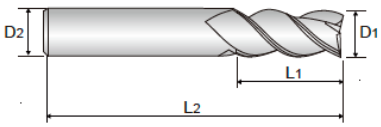
NEW CENTURY

HSS, 3 FLUTE HELIX SHORT LENGTH

▶ Designed to machine carbon steels, alloyed steels.



Up to Ø3mm Over Ø3mm



Tolerances according to DIN 7160 & 7161

Tolerance range in ㎛						
Nominal-Diameter in ㎛						
	from 1 to 3	over 3 to 6	over 6 to 10	over 10 to 18	over 18 to 30	over 30 to 50
e8	- 14 - 28	- 20 - 38	- 25 - 47	- 32 - 59	- 40 - 73	- 50 - 89
h6	0 - 6	0 - 8	0 - 9	0 - 11	0 - 13	0 - 16

PREMIUM HSS | DIN 844 | 3 | ≈30° | FLAT

p. 21~23

ESH573 EHC573 SERIES

Unit : mm

EDP No.		Mill Diameter	Shank Diameter	Length of Cut	Overall Length
Bright	TiAlN	D_1	D_2	L_1	L_2
ESH573020	EHC573020	2.0	6	7	51
ESH573030	EHC573030	3.0	6	8	52
ESH573040	EHC573040	4.0	6	11	55
ESH573050	EHC573050	5.0	6	13	57
ESH573060	EHC573060	6.0	6	13	57
ESH573070	EHC573070	7.0	10	16	66
ESH573080	EHC573080	8.0	10	19	69
ESH573090	EHC573090	9.0	10	19	69
ESH573100	EHC573100	10.0	10	22	72
ESH573110	EHC573110	11.0	12	22	79
ESH573120	EHC573120	12.0	12	26	83
ESH573130	EHC573130	13.0	12	26	83
ESH573140	EHC573140	14.0	12	26	83
ESH573150	EHC573150	15.0	12	26	83
ESH573160	EHC573160	16.0	16	32	92
ESH573170	EHC573170	17.0	16	32	92
ESH573180	EHC573180	18.0	16	32	92
ESH573190	EHC573190	19.0	16	32	92
ESH573200	EHC573200	20.0	20	38	104
ESH573210	EHC573210	21.0	20	38	104
ESH573220	EHC573220	22.0	20	38	104
ESH573230	EHC573230	23.0	20	38	104
ESH573240	EHC573240	24.0	25	45	121
ESH573250	EHC573250	25.0	25	45	121
ESH573280	EHC573280	28.0	25	45	121
ESH573300	EHC573300	30.0	25	45	121
ESH573320	EHC573320	32.0	32	53	133

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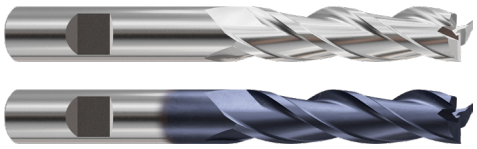
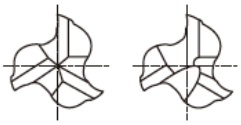
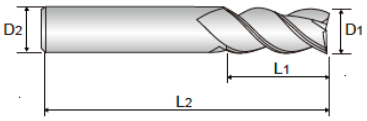
HSS, 3 FLUTE HELIX LONG LENGTH

▶ Designed to machine carbon steels, alloyed steels.





Up to Ø3mm Over Ø3mm



Tolerances according to DIN 7160 & 7161

Tolerance range in ㎛						
Nominal-Diameter in ㎛						
	from 1 to 3	over 3 to 6	over 6 to 10	over 10 to 18	over 18 to 30	over 30 to 50
e8	- 14 - 28	- 20 - 38	- 25 - 47	- 32 - 59	- 40 - 73	- 50 - 89
h6	0 - 6	0 - 8	0 - 9	0 - 11	0 - 13	0 - 16

p. 21~23

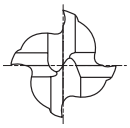
ESH516 EHC516 SERIES

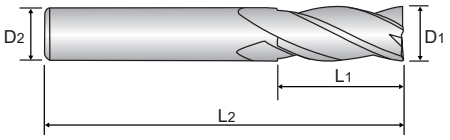
Unit : mm

EDP No.		Mill Diameter	Shank Diameter	Length of Cut	Overall Length
Bright	TiAlN	D1	D2	L1	L2
ESH516020	EHC516020	2.0	6	10	54
ESH516030	EHC516030	3.0	6	12	56
ESH516040	EHC516040	4.0	6	19	63
ESH516050	EHC516050	5.0	6	24	68
ESH516060	EHC516060	6.0	6	24	68
ESH516070	EHC516070	7.0	10	30	80
ESH516080	EHC516080	8.0	10	38	88
ESH516090	EHC516090	9.0	10	38	88
ESH516100	EHC516100	10.0	10	45	95
ESH516110	EHC516110	11.0	12	45	102
ESH516120	EHC516120	12.0	12	53	110
ESH516130	EHC516130	13.0	12	53	110
ESH516140	EHC516140	14.0	12	53	110
ESH516150	EHC516150	15.0	12	53	110
ESH516160	EHC516160	16.0	16	63	123
ESH516170	EHC516170	17.0	16	63	123
ESH516180	EHC516180	18.0	16	63	123
ESH516190	EHC516190	19.0	16	63	123
ESH516200	EHC516200	20.0	20	75	141
ESH516220	EHC516220	22.0	20	75	141
ESH516240	EHC516240	24.0	25	90	166
ESH516250	EHC516250	25.0	25	90	166
ESH516260	EHC516260	26.0	25	90	166
ESH516280	EHC516280	28.0	25	90	166
ESH516300	EHC516300	30.0	25	90	166
ESH516320	EHC516320	32.0	32	106	186

HSS, 4 FLUTE HELIX SHORT LENGTH

▶ Designed to machine carbon steels, alloyed steels.





p. 25~26

Mill Dia.Tolerance (mm)	Shank Dia.Tolerance
0 ~ + 0.04	h6

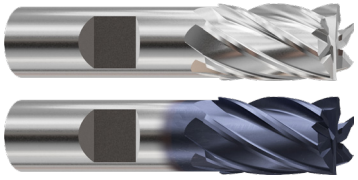
ESH595 EHC595 SERIES

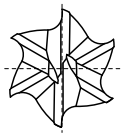
Unit : mm

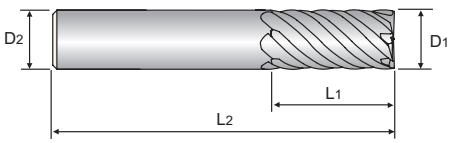
EDP No.		Mill Diameter	Shank Diameter	Length of Cut	Overall Length
Bright	TiAlN	D_1	D_2	L_1	L_2
ESH595020	EHC595020	2.0	6	7	51
ESH595030	EHC595030	3.0	6	8	52
ESH595040	EHC595040	4.0	6	11	55
ESH595050	EHC595050	5.0	6	13	57
ESH595060	EHC595060	6.0	6	13	57
ESH595070	EHC595070	7.0	10	16	66
ESH595080	EHC595080	8.0	10	19	69
ESH595090	EHC595090	9.0	10	19	69
ESH595100	EHC595100	10.0	10	22	72
ESH595110	EHC595110	11.0	12	22	79
ESH595120	EHC595120	12.0	12	26	83
ESH595130	EHC595130	13.0	12	26	83
ESH595140	EHC595140	14.0	12	26	83
ESH595150	EHC595150	15.0	12	26	83
ESH595160	EHC595160	16.0	16	32	92
ESH595170	EHC595170	17.0	16	32	92
ESH595180	EHC595180	18.0	16	32	92
ESH595190	EHC595190	19.0	16	32	92
ESH595920	EHC595920	20.0	16	38	98
ESH595200	EHC595200	20.0	20	38	104
ESH595210	EHC595210	21.0	20	38	104
ESH595220	EHC595220	22.0	20	38	104
ESH595230	EHC595230	23.0	20	38	104
ESH595240	EHC595240	24.0	25	45	121
ESH595250	EHC595250	25.0	25	45	121
ESH595280	EHC595280	28.0	25	45	121
ESH595300	EHC595300	30.0	25	45	121

HSS, 6 FLUTE HELIX SHORT LENGTH

▶ Designed to machine carbon steels, alloyed steels.







PREMIUM HSS | DIN 844 | 6 | ≈30° | FLAT

p. 27

Mill Dia.Tolerance (mm)	Shank Dia.Tolerance
0 ~ + 0.04	h6

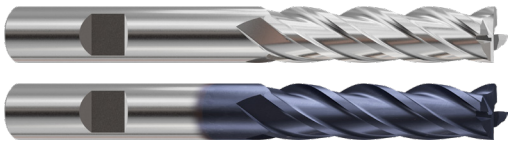
ESH596 | EHC596 SERIES

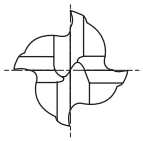
Unit : mm

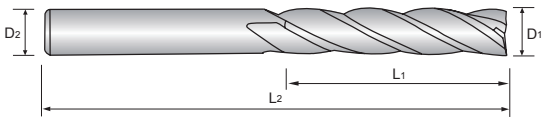
EDP No.		Mill Diameter	Shank Diameter	Length of Cut	Overall Length
Bright	TiAlN	D_1	D_2	L_1	L_2
ESH596210	**EHC596210**	**21.0**	20	38	104
ESH596220	**EHC596220**	**22.0**	20	38	104
ESH596230	**EHC596230**	**23.0**	20	38	104
ESH596240	**EHC596240**	**24.0**	25	45	121
ESH596250	**EHC596250**	**25.0**	25	45	121
ESH596260	**EHC596260**	**26.0**	25	45	121
ESH596280	**EHC596280**	**28.0**	25	45	121
ESH596300	**EHC596300**	**30.0**	25	45	121
ESH596320	**EHC596320**	**32.0**	32	53	133

HSS, 4 FLUTE HELIX LONG LENGTH

▶ Designed to machine carbon steels, alloyed steels.







PREMIUM HSS | DIN 844 | 4 | ≈30° | FLAT

p. 25~26

Size	Mill Dia.Tolerance (mm)	Shank Dia.Tolerance
up to Ø6	0 ~ + 0.04	h6
over Ø6	0 ~ + 0.05	

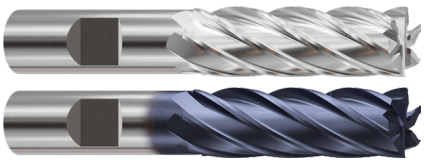
ESH597 EHC597 SERIES

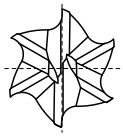
Unit : mm

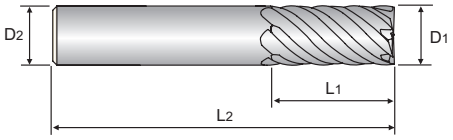
EDP No.		Mill Diameter	Shank Diameter	Length of Cut	Overall Length
Bright	TiAlN	D1	D2	L1	L2
ESH597020	EHC597020	2.0	6	10	54
ESH597030	EHC597030	3.0	6	12	56
ESH597040	EHC597040	4.0	6	19	63
ESH597050	EHC597050	5.0	6	24	68
ESH597060	EHC597060	6.0	6	24	68
ESH597070	EHC597070	7.0	10	30	80
ESH597080	EHC597080	8.0	10	38	88
ESH597090	EHC597090	9.0	10	38	88
ESH597100	EHC597100	10.0	10	45	95
ESH597110	EHC597110	11.0	12	45	102
ESH597120	EHC597120	12.0	12	53	110
ESH597130	EHC597130	13.0	12	53	110
ESH597140	EHC597140	14.0	12	53	110
ESH597150	EHC597150	15.0	12	53	110
ESH597160	EHC597160	16.0	16	63	123
ESH597170	EHC597170	17.0	16	63	123
ESH597180	EHC597180	18.0	16	63	123
ESH597190	EHC597190	19.0	16	63	123
ESH597200	EHC597200	20.0	20	75	141
ESH597220	EHC597220	22.0	20	75	141
ESH597240	EHC597240	24.0	25	90	166
ESH597250	EHC597250	25.0	25	90	166
ESH597260	EHC597260	26.0	25	90	166
ESH597280	EHC597280	28.0	25	90	166
ESH597300	EHC597300	30.0	25	90	166

HSS, 6 FLUTE HELIX LONG LENGTH

▶ Designed to machine carbon steels, alloyed steels.







p. 27

Size	Mill Dia.Tolerance (mm)	Shank Dia.Tolerance
up to Ø6	0 ~ + 0.04	h6
over Ø6	0 ~ + 0.05	

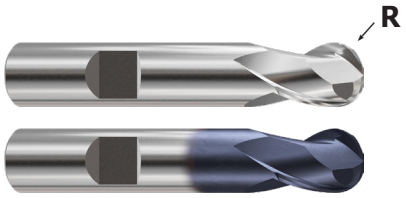
ESH598 EHC598 SERIES

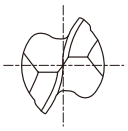
Unit : mm

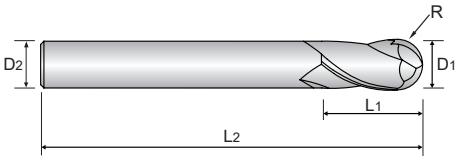
EDP No.		Mill Diameter	Shank Diameter	Length of Cut	Overall Length
Bright	TiAlN	D_1	D_2	L_1	L_2
ESH598220	**EHC598220**	**22.0**	20	75	141
ESH598240	**EHC598240**	**24.0**	25	90	166
ESH598250	**EHC598250**	**25.0**	25	90	166
ESH598260	**EHC598260**	**26.0**	25	90	166
ESH598280	**EHC598280**	**28.0**	25	90	166
ESH598300	**EHC598300**	**30.0**	25	90	166
ESH598320	**EHC598320**	**32.0**	32	106	186

HSS, 2 FLUTE BALL NOSE HELIX SHORT LENGTH

▶ Designed to machine carbon steels, alloyed steels.







PREMIUM HSS | DIN 327 | 2 | ≈30° | R ±0.020 | FLAT

p. 28~29

Mill Dia.Tolerance (mm)	Shank Dia.Tolerance
0 ~ - 0.03	h6

ESH535 EHC535 SERIES

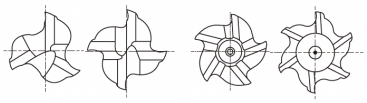
Unit : mm

EDP No.		Radius of Ball Nose	Mill Diameter	Shank Diameter	Length of Cut	Overall Length
Bright	TiAlN	R	D1	D2	L1	L2
ESH535020	EHC535020	R1.0	**2.0**	6	4	48
ESH535030	EHC535030	R1.5	**3.0**	6	5	49
ESH535040	EHC535040	R2.0	**4.0**	6	7	51
ESH535050	EHC535050	R2.5	**5.0**	6	8	52
ESH535060	EHC535060	R3.0	**6.0**	6	8	52
ESH535070	EHC535070	R3.5	**7.0**	10	10	60
ESH535080	EHC535080	R4.0	**8.0**	10	11	61
ESH535090	EHC535090	R4.5	**9.0**	10	11	61
ESH535100	EHC535100	R5.0	**10.0**	10	13	63
ESH535110	EHC535110	R5.5	**11.0**	12	13	70
ESH535120	EHC535120	R6.0	**12.0**	12	16	73
ESH535130	EHC535130	R6.5	**13.0**	12	16	73
ESH535140	EHC535140	R7.0	**14.0**	12	16	73
ESH535150	EHC535150	R7.5	**15.0**	12	16	73
ESH535160	EHC535160	R8.0	**16.0**	16	19	79
ESH535170	EHC535170	R8.5	**17.0**	16	19	79
ESH535180	EHC535180	R9.0	**18.0**	16	19	79
ESH535190	EHC535190	R9.5	**19.0**	16	19	79
ESH535200	EHC535200	R10.0	**20.0**	20	22	88
ESH535220	EHC535220	R11.0	**22.0**	20	22	88
ESH535240	EHC535240	R12.0	**24.0**	25	26	102
ESH535250	EHC535250	R12.5	**25.0**	25	26	102

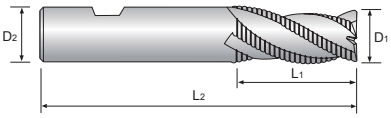
· Phone: +82-32-526-0909, www.yg1.solutions, E-mail: yg1@yg1.solutions

HSS, MULTI FLUTE SHORT LENGTH ROUGHING - COARSE

▶ Designed to machine carbon steels, alloyed steels.
▶ up to Ø20 : center cut, over Ø20 : non center cut.



Up to Ø20mm Over Ø20mm



PREMIUM HSS | DIN 844 | NR | 3-6 | 30° | FLAT

p. 30~31

Tolerances according to DIN 7160 & 7161

Tolerance range in ㎛						
Nominal-Diameter in ㎛						
	from 1 to 3	over 3 to 6	over 6 to 10	over 10 to 18	over 18 to 30	over 30 to 50
js12	±50	±60	±75	±90	±105	±125
h6	0 / -6	0 / -8	0 / -9	0 / -11	0 / -13	0 / -16

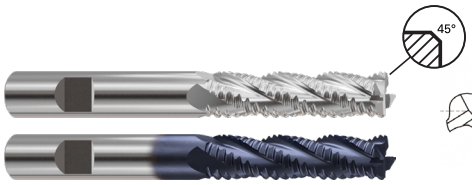
ESH751 EHC751 SERIES

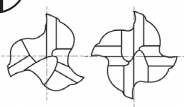
Unit : mm

EDP No.		Mill Diameter	Shank Diameter	Length of Cut	Overall Length	No. of Flute	Chamfer
Bright	TiAlN	D1	D2	L1	L2		
ESH751060	**EHC751060**	**6.0**	6	13	57	3	0.25
ESH751070	**EHC751070**	**7.0**	10	16	66	3	0.25
ESH751080	**EHC751080**	**8.0**	10	19	69	3	0.25
ESH751090	**EHC751090**	**9.0**	10	19	69	3	0.34
ESH751100	**EHC751100**	**10.0**	10	22	72	4	0.34
ESH751110	**EHC751110**	**11.0**	12	22	79	4	0.50
ESH751120	**EHC751120**	**12.0**	12	26	83	4	0.50
ESH751130	**EHC751130**	**13.0**	12	26	83	4	0.50
ESH751140	**EHC751140**	**14.0**	12	26	83	4	0.55
ESH751150	**EHC751150**	**15.0**	12	26	83	4	0.55
ESH751160	**EHC751160**	**16.0**	16	32	92	4	0.55
ESH751170	**EHC751170**	**17.0**	16	32	92	4	0.55
ESH751180	**EHC751180**	**18.0**	16	32	92	4	0.55
ESH751190	**EHC751190**	**19.0**	16	32	92	4	0.55
ESH751200	**EHC751200**	**20.0**	20	38	104	4	0.55
ESH751220	**EHC751220**	**22.0**	20	38	104	5	0.55
ESH751240	**EHC751240**	**24.0**	25	45	121	5	0.55
ESH751250	**EHC751250**	**25.0**	25	45	121	5	0.55
ESH751260	**EHC751260**	**26.0**	25	45	121	6	0.55
ESH751280	**EHC751280**	**28.0**	25	45	121	6	0.70
ESH751300	**EHC751300**	**30.0**	25	45	121	6	0.70
ESH751320	**EHC751320**	**32.0**	32	53	133	6	0.70

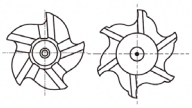
HSS, MULTI FLUTE LONG LENGTH ROUGHING - COARSE

▶ Designed to machine carbon steels, alloyed steels.
▶ up to Ø20 : center cut, over Ø20 : non center cut.

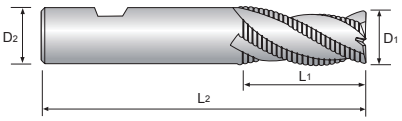




Up to Ø20mm



Over Ø20mm



PREMIUM HSS | DIN 844 | NR | 3-6 | 30° | FLAT

p. 30~31

Tolerances according to DIN 7160 & 7161

Tolerance range in ㎛						
Nominal-Diameter in ㎛						
	from 1 to 3	over 3 to 6	over 6 to 10	over 10 to 18	over 18 to 30	over 30 to 50
js12	±50	±60	±75	±90	±105	±125
h6	0 / -6	0 / -8	0 / -9	0 / -11	0 / -13	0 / -16

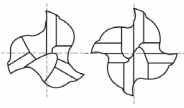
ESH752 EHC752 SERIES

Unit : mm

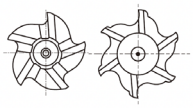
EDP No.		Mill Diameter	Shank Diameter	Length of Cut	Overall Length	No. of Flute	Chamfer
Bright	TiAlN	D1	D2	L1	L2		
ESH752060	**EHC752060**	**6.0**	6	24	68	3	0.25
ESH752070	**EHC752070**	**7.0**	10	30	80	3	0.25
ESH752080	**EHC752080**	**8.0**	10	38	88	3	0.25
ESH752090	**EHC752090**	**9.0**	10	38	88	3	0.34
ESH752100	**EHC752100**	**10.0**	10	45	95	4	0.34
ESH752110	**EHC752110**	**11.0**	12	45	102	4	0.50
ESH752120	**EHC752120**	**12.0**	12	53	110	4	0.50
ESH752130	**EHC752130**	**13.0**	12	53	110	4	0.50
ESH752140	**EHC752140**	**14.0**	12	53	110	4	0.55
ESH752150	**EHC752150**	**15.0**	12	53	110	4	0.55
ESH752160	**EHC752160**	**16.0**	16	63	123	4	0.55
ESH752170	**EHC752170**	**17.0**	16	63	123	4	0.55
ESH752180	**EHC752180**	**18.0**	16	63	123	4	0.55
ESH752190	**EHC752190**	**19.0**	16	63	123	4	0.55
ESH752200	**EHC752200**	**20.0**	20	75	141	4	0.55
ESH752220	**EHC752220**	**22.0**	20	75	141	5	0.55
ESH752240	**EHC752240**	**24.0**	25	90	166	5	0.55
ESH752250	**EHC752250**	**25.0**	25	90	166	5	0.55
ESH752260	**EHC752260**	**26.0**	25	90	166	6	0.55
ESH752280	**EHC752280**	**28.0**	25	90	166	6	0.70
ESH752300	**EHC752300**	**30.0**	25	90	166	6	0.70
ESH752320	**EHC752320**	**32.0**	32	106	186	6	0.70

HSS, MULTI FLUTE SHORT LENGTH ROUGHING - FINE

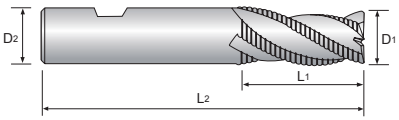
▶ Designed to machine carbon steels, alloyed steels.
▶ up to Ø20 : center cut, over Ø20 : non center cut.



Up to Ø20mm



Over Ø20mm



PREMIUM HSS | DIN 844 | HR | 3-6 | 30° | FLAT

p. 30~31

Tolerances according to DIN 7160 & 7161

Tolerance range in ㎛						
Nominal-Diameter in ㎛						
	from 1 to 3	over 3 to 6	over 6 to 10	over 10 to 18	over 18 to 30	over 30 to 50
js12	±50	±60	±75	±90	±105	±125
h6	0 -6	0 -8	0 -9	0 -11	0 -13	0 -16

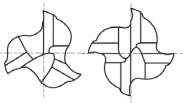
ESH753 EHC753 SERIES

Unit : mm

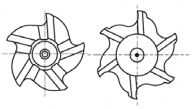
EDP No.		Mill Diameter	Shank Diameter	Length of Cut	Overall Length	No. of Flute	Chamfer
Bright	TiAlN	D1	D2	L1	L2		
ESH753060	**EHC753060**	**6.0**	6	13	57	3	0.25
ESH753070	**EHC753070**	**7.0**	10	16	66	3	0.25
ESH753080	**EHC753080**	**8.0**	10	19	69	3	0.25
ESH753090	**EHC753090**	**9.0**	10	19	69	3	0.34
ESH753100	**EHC753100**	**10.0**	10	22	72	4	0.34
ESH753110	**EHC753110**	**11.0**	12	22	79	4	0.50
ESH753120	**EHC753120**	**12.0**	12	26	83	4	0.50
ESH753130	**EHC753130**	**13.0**	12	26	83	4	0.50
ESH753140	**EHC753140**	**14.0**	12	26	83	4	0.55
ESH753150	**EHC753150**	**15.0**	12	26	83	4	0.55
ESH753160	**EHC753160**	**16.0**	16	32	92	4	0.55
ESH753170	**EHC753170**	**17.0**	16	32	92	4	0.55
ESH753180	**EHC753180**	**18.0**	16	32	92	4	0.55
ESH753190	**EHC753190**	**19.0**	16	32	92	4	0.55
ESH753200	**EHC753200**	**20.0**	20	38	104	4	0.55
ESH753220	**EHC753220**	**22.0**	20	38	104	5	0.55
ESH753240	**EHC753240**	**24.0**	25	45	121	5	0.55
ESH753250	**EHC753250**	**25.0**	25	45	121	5	0.55
ESH753260	**EHC753260**	**26.0**	25	45	121	6	0.55
ESH753280	**EHC753280**	**28.0**	25	45	121	6	0.70
ESH753300	**EHC753300**	**30.0**	25	45	121	6	0.70
ESH753320	**EHC753320**	**32.0**	32	53	133	6	0.70

HSS, MULTI FLUTE LONG LENGTH ROUGHING - FINE

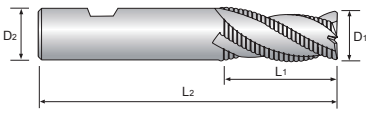
▶ Designed to machine carbon steels, alloyed steels.
▶ up to Ø20 : center cut, over Ø20 : non center cut.



Up to Ø20mm



Over Ø20mm



PREMIUM HSS | DIN 844 | HR | 3-6 | 30° | FLAT

p. 30~31

Tolerances according to DIN 7160 & 7161

Tolerance range in ㎛						
Nominal-Diameter in ㎛						
	from 1 to 3	over 3 to 6	over 6 to 10	over 10 to 18	over 18 to 30	over 30 to 50
js12	±50	±60	±75	±90	±105	±125
h6	0 / -6	0 / -8	0 / -9	0 / -11	0 / -13	0 / -16

ESH762 EHC762 SERIES

Unit : mm

EDP No.		Mill Diameter	Shank Diameter	Length of Cut	Overall Length	No. of Flute	Chamfer
Bright	TiAlN	D1	D2	L1	L2		
ESH762060	**EHC762060**	**6.0**	6	24	68	3	0.25
ESH762070	**EHC762070**	**7.0**	10	30	80	3	0.25
ESH762080	**EHC762080**	**8.0**	10	38	88	3	0.25
ESH762090	**EHC762090**	**9.0**	10	38	88	3	0.34
ESH762100	**EHC762100**	**10.0**	10	45	95	4	0.34
ESH762110	**EHC762110**	**11.0**	12	45	102	4	0.50
ESH762120	**EHC762120**	**12.0**	12	53	110	4	0.50
ESH762130	**EHC762130**	**13.0**	12	53	110	4	0.50
ESH762140	**EHC762140**	**14.0**	12	53	110	4	0.55
ESH762150	**EHC762150**	**15.0**	12	53	110	4	0.55
ESH762160	**EHC762160**	**16.0**	16	63	123	4	0.55
ESH762170	**EHC762170**	**17.0**	16	63	123	4	0.55
ESH762180	**EHC762180**	**18.0**	16	63	123	4	0.55
ESH762190	**EHC762190**	**19.0**	16	63	123	4	0.55
ESH762200	**EHC762200**	**20.0**	20	75	141	4	0.55
ESH762220	**EHC762220**	**22.0**	20	75	141	5	0.55
ESH762240	**EHC762240**	**24.0**	25	90	166	5	0.55
ESH762250	**EHC762250**	**25.0**	25	90	166	5	0.55
ESH762260	**EHC762260**	**26.0**	25	90	166	6	0.55
ESH762280	**EHC762280**	**28.0**	25	90	166	6	0.70
ESH762300	**EHC762300**	**30.0**	25	90	166	6	0.70
ESH762320	**EHC762320**	**32.0**	32	106	186	6	0.70

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RECOMMENDED CUTTING CONDITIONS

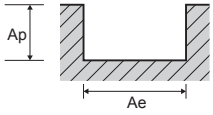
ESH570 / ESH571 SERIES

2 FLUTES - 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	16.0	18.0	20.0	22.0	25.0	28.0	30.0	32.0
P	1	Non-alloy steel	1D	0.5D	Vc	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35
					fz	0.004	0.008	0.013	0.020	0.025	0.036	0.045	0.061	0.069	0.079	0.079	0.089	0.100	0.100	0.100	0.100	0.100
					RPM	5600	3500	2800	2200	1800	1400	1100	900	800	700	630	560	500	450	400	350	350
					FEED	40	55	70	90	90	100	100	110	110	110	100	100	100	90	80	70	70
	2		1D	0.5D	Vc	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30
					fz	0.003	0.007	0.013	0.019	0.025	0.041	0.050	0.063	0.064	0.080	0.090	0.100	0.100	0.100	0.100	0.097	0.098
					RPM	4500	3200	2200	1800	1600	1100	900	800	700	560	500	450	450	400	350	310	280
					FEED	30	45	55	70	80	90	90	100	90	90	90	90	90	80	70	60	55
	3		1D	0.5D	Vc	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	20
					fz	0.004	0.008	0.013	0.019	0.025	0.039	0.050	0.063	0.071	0.078	0.088	0.088	0.100	0.097	0.098	0.100	0.102
					RPM	4000	2500	1800	1600	1200	900	800	630	560	450	400	400	350	310	280	250	220
					FEED	30	40	45	60	60	70	80	80	80	70	70	70	70	60	55	50	45
	4		1D	0.5D	Vc	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	20
					fz	0.004	0.008	0.013	0.019	0.025	0.039	0.050	0.063	0.071	0.078	0.088	0.088	0.100	0.097	0.098	0.100	0.102
					RPM	4000	2500	1800	1600	1200	900	800	630	560	450	400	400	350	310	280	250	220
					FEED	30	40	45	60	60	70	80	80	80	70	70	70	70	60	55	50	45
	5		1D	0.5D	Vc	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15
					fz	0.003	0.006	0.014	0.019	0.025	0.040	0.050	0.063	0.071	0.080	0.090	0.102	0.102	0.097	0.094	0.094	0.107
					RPM	2200	1600	1100	900	800	560	450	400	350	280	250	220	220	180	160	160	140
					FEED	15	20	30	35	40	45	45	50	50	45	45	45	45	35	30	30	30
	6	Low alloy steel	1D	0.5D	Vc	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30
					fz	0.003	0.007	0.013	0.019	0.025	0.041	0.050	0.063	0.064	0.080	0.090	0.100	0.100	0.100	0.100	0.097	0.098
					RPM	4500	3200	2200	1800	1600	1100	900	800	700	560	500	450	450	400	350	310	280
					FEED	30	45	55	70	80	90	90	100	90	90	90	90	90	80	70	60	55
	7		1D	0.5D	Vc	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	20
					fz	0.004	0.008	0.013	0.019	0.025	0.039	0.050	0.063	0.071	0.078	0.088	0.088	0.100	0.097	0.098	0.100	0.102
					RPM	4000	2500	1800	1600	1200	900	800	630	560	450	400	400	350	310	280	250	220
					FEED	30	40	45	60	60	70	80	80	80	70	70	70	70	60	55	50	45
	8		1D	0.5D	Vc	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15
					fz	0.003	0.006	0.014	0.019	0.025	0.040	0.050	0.063	0.071	0.080	0.090	0.102	0.102	0.097	0.094	0.094	0.107
					RPM	2200	1600	1100	900	800	560	450	400	350	280	250	220	220	180	160	160	140
					FEED	15	20	30	35	40	45	45	50	50	45	45	45	45	35	30	30	30
	9		1D	0.5D	Vc	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15
					fz	0.003	0.006	0.014	0.019	0.025	0.040	0.050	0.063	0.071	0.080	0.090	0.102	0.102	0.097	0.094	0.094	0.107
					RPM	2200	1600	1100	900	800	560	450	400	350	280	250	220	220	180	160	160	140
					FEED	15	20	30	35	40	45	45	50	50	45	45	45	45	35	30	30	30
	10	High alloyed steel, and tool steel	1D	0.5D	Vc	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30
					fz	0.003	0.007	0.013	0.019	0.025	0.041	0.050	0.063	0.064	0.080	0.090	0.100	0.100	0.100	0.100	0.097	0.098
					RPM	4500	3200	2200	1800	1600	1100	900	800	700	560	500	450	450	400	350	310	280
					FEED	30	45	55	70	80	90	90	100	90	90	90	90	90	80	70	60	55
	11.1		1D	0.5D	Vc	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15
					fz	0.003	0.006	0.014	0.019	0.025	0.040	0.050	0.063	0.071	0.080	0.090	0.102	0.102	0.097	0.094	0.094	0.107
					RPM	2200	1600	1100	900	800	560	450	400	350	280	250	220	220	180	160	160	140
					FEED	15	20	30	35	40	45	45	50	50	45	45	45	45	35	30	30	30
N	21	Aluminum-wrought alloy	1D	0.5D	Vc	75	105	100	100	105	100	95	95	95	100	100	100	95	95	95	105	100
					fz	0.007	0.011	0.018	0.025	0.028	0.049	0.065	0.076	0.08	0.088	0.097	0.1	0.107	0.117	0.123	0.123	0.12
					RPM	12000	11000	8000	6300	5600	4000	3100	2500	2200	2000	1800	1600	1400	1200	1100	1100	1000
					FEED	160	250	290	310	310	390	400	380	350	350	350	320	300	280	270	270	240
	22		1D	0.5D	Vc	75	105	100	100	105	100	95	95	95	100	100	100	95	95	95	105	100
					fz	0.007	0.011	0.018	0.025	0.028	0.049	0.065	0.076	0.08	0.088	0.097	0.1	0.107	0.117	0.123	0.123	0.12
					RPM	12000	11000	8000	6300	5600	4000	3100	2500	2200	2000	1800	1600	1400	1200	1100	1100	1000
					FEED	160	250	290	310	310	390	400	380	350	350	350	320	300	280	270	270	240
	23	Aluminum-cast, alloyed	1D	0.5D	Vc	75	105	100	100	105	100	95	95	95	100	100	100	95	95	95	105	100
					fz	0.007	0.011	0.018	0.025	0.028	0.049	0.065	0.076	0.08	0.088	0.097	0.1	0.107	0.117	0.123	0.123	0.12
					RPM	12000	11000	8000	6300	5600	4000	3100	2500	2200	2000	1800	1600	1400	1200	1100	1100	1000
					FEED	160	250	290	310	310	390	400	380	350	350	350	320	300	280	270	270	240
	24		1D	0.5D	Vc	75	105	100	100	105	100	95	95	95	100	100	100	95	95	95	105	100
					fz	0.007	0.011	0.018	0.025	0.028	0.049	0.065	0.076	0.08	0.088	0.097	0.1	0.107	0.117	0.123	0.123	0.12
					RPM	12000	11000	8000	6300	5600	4000	3100	2500	2200	2000	1800	1600	1400	1200	1100	1100	1000
					FEED	160	250	290	310	310	390	400	380	350	350	350	320	300	280	270	270	240
	25		1D	0.5D	Vc	75	105	100	100	105	100	95	95	95	100	100	100	95	95	95	105	100
					fz	0.007	0.011	0.018	0.025	0.028	0.049	0.065	0.076	0.08	0.088	0.097	0.1	0.107	0.117	0.123	0.123	0.12
					RPM	12000	11000	8000	6300	5600	4000	3100	2500	2200	2000	1800	1600	1400	1200	1100	1100	1000
					FEED	160	250	290	310	310	390	400	380	350	350	350	320	300	280	270	270	240

* The FEED, in long & extra long types, should be reduced by around 50%



RECOMMENDED CUTTING CONDITIONS

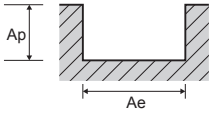
EHC570 / EHC571 SERIES

2 FLUTES - 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	16.0	18.0	20.0	22.0	25.0	28.0	30.0	32.0
P	1	Non-alloy steel	1D	0.5D	Vc	50	45	50	50	45	50	50	45	50	50	50	50	50	50	50	45	50
					fz	0.004	0.008	0.013	0.020	0.025	0.036	0.045	0.062	0.070	0.078	0.078	0.088	0.100	0.096	0.100	0.100	0.100
					RPM	7850	4900	3900	3100	2500	1950	1550	1250	1100	1000	900	800	700	650	550	500	500
					FEED	55	75	100	125	125	140	140	155	155	155	140	140	140	125	110	100	100
	2		1D	0.5D	Vc	40	40	40	40	40	40	40	40	45	40	40	40	45	45	45	40	40
					fz	0.003	0.007	0.012	0.020	0.024	0.040	0.050	0.064	0.063	0.078	0.089	0.096	0.096	0.100	0.100	0.094	0.094
					RPM	6300	4500	3100	2500	2250	1550	1250	1100	1000	800	700	650	650	550	500	450	400
					FEED	40	65	75	100	110	125	125	140	125	125	125	125	125	110	100	85	75
	3		1D	0.5D	Vc	35	35	30	35	30	30	35	35	35	35	30	35	35	35	35	35	30
					fz	0.004	0.008	0.013	0.019	0.025	0.040	0.050	0.061	0.069	0.077	0.091	0.091	0.100	0.094	0.094	0.100	0.108
					RPM	5600	3500	2500	2250	1700	1250	1100	900	800	650	550	550	500	450	400	350	300
					FEED	40	55	65	85	85	100	110	110	110	100	100	100	100	85	75	70	65
	4		1D	0.5D	Vc	35	35	30	35	30	30	35	35	35	35	30	35	35	35	35	35	30
					fz	0.004	0.008	0.013	0.019	0.025	0.040	0.050	0.061	0.069	0.077	0.091	0.091	0.100	0.094	0.094	0.100	0.108
					RPM	5600	3500	2500	2250	1700	1250	1100	900	800	650	550	550	500	450	400	350	300
					FEED	40	55	65	85	85	100	110	110	110	100	100	100	100	85	75	70	65
	5		1D	0.5D	Vc	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20
					fz	0.003	0.007	0.013	0.020	0.025	0.041	0.050	0.064	0.070	0.081	0.093	0.108	0.108	0.100	0.100	0.100	0.100
					RPM	3100	2250	1550	1250	1100	800	650	550	500	400	350	300	300	250	200	200	200
					FEED	20	30	40	50	55	65	65	70	70	65	65	65	65	50	40	40	40
	6	Low alloy steel	1D	0.5D	Vc	40	40	40	40	40	40	40	40	45	40	40	40	45	45	45	40	40
					fz	0.003	0.007	0.012	0.020	0.024	0.040	0.050	0.064	0.063	0.078	0.089	0.096	0.096	0.100	0.100	0.094	0.094
					RPM	6300	4500	3100	2500	2250	1550	1250	1100	1000	800	700	650	650	550	500	450	400
					FEED	40	65	75	100	110	125	125	140	125	125	125	125	125	110	100	85	75
	7		1D	0.5D	Vc	35	35	30	35	30	30	35	35	35	35	30	35	35	35	35	35	30
					fz	0.004	0.008	0.013	0.019	0.025	0.040	0.050	0.061	0.069	0.077	0.091	0.091	0.100	0.094	0.094	0.100	0.108
					RPM	5600	3500	2500	2250	1700	1250	1100	900	800	650	550	550	500	450	400	350	300
					FEED	40	55	65	85	85	100	110	110	110	100	100	100	100	85	75	70	65
	8		1D	0.5D	Vc	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20
					fz	0.003	0.007	0.013	0.020	0.025	0.041	0.050	0.064	0.070	0.081	0.093	0.108	0.108	0.100	0.100	0.100	0.100
					RPM	3100	2250	1550	1250	1100	800	650	550	500	400	350	300	300	250	200	200	200
					FEED	20	30	40	50	55	65	65	70	70	65	65	65	65	50	40	40	40
	9		1D	0.5D	Vc	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20
					fz	0.003	0.007	0.013	0.020	0.025	0.041	0.050	0.064	0.070	0.081	0.093	0.108	0.108	0.100	0.100	0.100	0.100
					RPM	3100	2250	1550	1250	1100	800	650	550	500	400	350	300	300	250	200	200	200
					FEED	20	30	40	50	55	65	65	70	70	65	65	65	65	50	40	40	40
	10	High alloyed steel, and tool steel	1D	0.5D	Vc	40	40	40	40	40	40	40	40	45	40	40	40	45	45	45	40	40
					fz	0.003	0.007	0.012	0.020	0.024	0.040	0.050	0.064	0.063	0.078	0.089	0.096	0.096	0.100	0.100	0.094	0.094
					RPM	6300	4500	3100	2500	2250	1550	1250	1100	1000	800	700	650	650	550	500	450	400
					FEED	40	65	75	100	110	125	125	140	125	125	125	125	125	110	100	85	75
	11.1		1D	0.5D	Vc	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20
					fz	0.003	0.007	0.013	0.020	0.025	0.041	0.050	0.064	0.070	0.081	0.093	0.108	0.108	0.100	0.100	0.100	0.100
					RPM	3100	2250	1550	1250	1100	800	650	550	500	400	350	300	300	250	200	200	200
					FEED	20	30	40	50	55	65	65	70	70	65	65	65	65	50	40	40	40
N	21	Aluminum-wrought alloy	1D	0.5D	Vc	105	145	140	140	150	140	135	130	135	140	140	140	135	135	135	145	140
					fz	0.007	0.011	0.018	0.025	0.028	0.049	0.064	0.076	0.079	0.088	0.098	0.1	0.108	0.115	0.123	0.123	0.12
					RPM	16800	15400	11200	8800	7850	5600	4350	3500	3100	2800	2500	2250	1950	1700	1550	1550	1400
					FEED	225	350	405	435	435	545	560	530	490	490	490	450	420	390	380	380	335
	22		1D	0.5D	Vc	105	145	140	140	150	140	135	130	135	140	140	140	135	135	135	145	140
					fz	0.007	0.011	0.018	0.025	0.028	0.049	0.064	0.076	0.079	0.088	0.098	0.1	0.108	0.115	0.123	0.123	0.12
					RPM	16800	15400	11200	8800	7850	5600	4350	3500	3100	2800	2500	2250	1950	1700	1550	1550	1400
					FEED	225	350	405	435	435	545	560	530	490	490	490	450	420	390	380	380	335
	23	Aluminum-cast, alloyed	1D	0.5D	Vc	105	145	140	140	150	140	135	130	135	140	140	140	135	135	135	145	140
					fz	0.007	0.011	0.018	0.025	0.028	0.049	0.064	0.076	0.079	0.088	0.098	0.1	0.108	0.115	0.123	0.123	0.12
					RPM	16800	15400	11200	8800	7850	5600	4350	3500	3100	2800	2500	2250	1950	1700	1550	1550	1400
					FEED	225	350	405	435	435	545	560	530	490	490	490	450	420	390	380	380	335
	24		1D	0.5D	Vc	105	145	140	140	150	140	135	130	135	140	140	140	135	135	135	145	140
					fz	0.007	0.011	0.018	0.025	0.028	0.049	0.064	0.076	0.079	0.088	0.098	0.1	0.108	0.115	0.123	0.123	0.12
					RPM	16800	15400	11200	8800	7850	5600	4350	3500	3100	2800	2500	2250	1950	1700	1550	1550	1400
					FEED	225	350	405	435	435	545	560	530	490	490	490	450	420	390	380	380	335
	25		1D	0.5D	Vc	105	145	140	140	150	140	135	130	135	140	140	140	135	135	135	145	140
					fz	0.007	0.011	0.018	0.025	0.028	0.049	0.064	0.076	0.079	0.088	0.098	0.1	0.108	0.115	0.123	0.123	0.12
					RPM	16800	15400	11200	8800	7850	5600	4350	3500	3100	2800	2500	2250	1950	1700	1550	1550	1400
					FEED	225	350	405	435	435	545	560	530	490	490	490	450	420	390	380	380	335

* The FEED, in long & extra long types, should be reduced by around 50%



· Phone: +82-32-526-0909, www.yg1.solutions, E-mail: yg1@yg1.solutions

RECOMMENDED CUTTING CONDITIONS

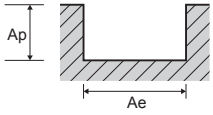
ESH573 / ESH516 SERIES

3 FLUTES - 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	16.0	18.0	20.0	22.0	25.0	28.0	30.0	32.0
P	1	Non-alloy steel	1D	0.5D	Vc	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35
					fz	0.002	0.005	0.007	0.012	0.015	0.021	0.027	0.037	0.042	0.048	0.048	0.054	0.060	0.059	0.058	0.057	0.057
					RPM	5600	3500	2800	2200	1800	1400	1100	900	800	700	630	560	500	450	400	350	350
					FEED	35	50	60	80	80	90	90	100	100	100	90	90	90	80	70	60	60
	2		1D	0.5D	Vc	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30
					fz	0.002	0.004	0.007	0.010	0.014	0.021	0.026	0.033	0.033	0.042	0.047	0.052	0.052	0.054	0.052	0.054	0.054
					RPM	4500	3200	2200	1800	1600	1100	900	800	700	560	500	450	450	400	350	310	280
					FEED	25	35	45	55	65	70	70	80	70	70	70	70	70	65	55	50	45
	3		1D	0.5D	Vc	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	20
					fz	0.002	0.003	0.006	0.008	0.011	0.019	0.023	0.029	0.033	0.037	0.042	0.042	0.048	0.043	0.042	0.040	0.045
					RPM	4000	2500	1800	1600	1200	900	800	630	560	450	400	400	350	310	280	250	220
					FEED	20	25	30	40	40	50	55	55	55	50	50	50	50	40	35	30	30
	4		1D	0.5D	Vc	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	20
					fz	0.002	0.003	0.006	0.008	0.011	0.019	0.023	0.029	0.033	0.037	0.042	0.042	0.048	0.043	0.042	0.040	0.045
					RPM	4000	2500	1800	1600	1200	900	800	630	560	450	400	400	350	310	280	250	220
					FEED	20	25	30	40	40	50	55	55	55	50	50	50	50	40	35	30	30
	5		1D	0.5D	Vc	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15
					fz	0.002	0.003	0.006	0.007	0.010	0.018	0.022	0.029	0.033	0.036	0.040	0.045	0.045	0.037	0.042	0.042	0.048
					RPM	2200	1600	1100	900	800	560	450	400	350	280	250	220	220	180	160	160	140
					FEED	10	15	20	20	25	30	30	35	35	30	30	30	30	20	20	20	20
	6	Low alloy steel	1D	0.5D	Vc	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30
					fz	0.002	0.004	0.007	0.010	0.014	0.021	0.026	0.033	0.033	0.042	0.047	0.052	0.052	0.054	0.052	0.054	0.054
					RPM	4500	3200	2200	1800	1600	1100	900	800	700	560	500	450	450	400	350	310	280
					FEED	25	35	45	55	65	70	70	80	70	70	70	70	70	65	55	50	45
	7		1D	0.5D	Vc	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	20
					fz	0.002	0.003	0.006	0.008	0.011	0.019	0.023	0.029	0.033	0.037	0.042	0.042	0.048	0.043	0.042	0.040	0.045
					RPM	4000	2500	1800	1600	1200	900	800	630	560	450	400	400	350	310	280	250	220
					FEED	20	25	30	40	40	50	55	55	55	50	50	50	50	40	35	30	30
	8		1D	0.5D	Vc	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15
					fz	0.002	0.003	0.006	0.007	0.010	0.018	0.022	0.029	0.033	0.036	0.040	0.045	0.045	0.037	0.042	0.042	0.048
					RPM	2200	1600	1100	900	800	560	450	400	350	280	250	220	220	180	160	160	140
					FEED	10	15	20	20	25	30	30	35	35	30	30	30	30	20	20	20	20
	9		1D	0.5D	Vc	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15
					fz	0.002	0.003	0.006	0.007	0.010	0.018	0.022	0.029	0.033	0.036	0.040	0.045	0.045	0.037	0.042	0.042	0.048
					RPM	2200	1600	1100	900	800	560	450	400	350	280	250	220	220	180	160	160	140
					FEED	10	15	20	20	25	30	30	35	35	30	30	30	30	20	20	20	20
	10	High alloyed steel, and tool steel	1D	0.5D	Vc	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30
					fz	0.002	0.004	0.007	0.010	0.014	0.021	0.026	0.033	0.033	0.042	0.047	0.052	0.052	0.054	0.052	0.054	0.054
					RPM	4500	3200	2200	1800	1600	1100	900	800	700	560	500	450	450	400	350	310	280
					FEED	25	35	45	55	65	70	70	80	70	70	70	70	70	65	55	50	45
	11.1		1D	0.5D	Vc	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15
					fz	0.002	0.003	0.006	0.007	0.010	0.018	0.022	0.029	0.033	0.036	0.040	0.045	0.045	0.037	0.042	0.042	0.048
					RPM	2200	1600	1100	900	800	560	450	400	350	280	250	220	220	180	160	160	140
					FEED	10	15	20	20	25	30	30	35	35	30	30	30	30	20	20	20	20
N	21	Aluminum-wrought alloy	1D	0.5D	Vc	75	105	100	100	105	100	95	95	95	100	100	100	95	95	95	105	100
					fz	0.003	0.005	0.008	0.011	0.013	0.022	0.029	0.035	0.036	0.04	0.044	0.046	0.048	0.053	0.055	0.055	0.053
					RPM	12000	11000	8000	6300	5600	4000	3100	2500	2200	2000	1800	1600	1400	1200	1100	1100	1000
					FEED	110	170	200	210	210	260	270	260	240	240	240	220	200	190	180	180	160
	22		1D	0.5D	Vc	75	105	100	100	105	100	95	95	95	100	100	100	95	95	95	105	100
					fz	0.003	0.005	0.008	0.011	0.013	0.022	0.029	0.035	0.036	0.04	0.044	0.046	0.048	0.053	0.055	0.055	0.053
					RPM	12000	11000	8000	6300	5600	4000	3100	2500	2200	2000	1800	1600	1400	1200	1100	1100	1000
					FEED	110	170	200	210	210	260	270	260	240	240	240	220	200	190	180	180	160
	23	Aluminum-cast, alloyed	1D	0.5D	Vc	75	105	100	100	105	100	95	95	95	100	100	100	95	95	95	105	100
					fz	0.003	0.005	0.008	0.011	0.013	0.022	0.029	0.035	0.036	0.04	0.044	0.046	0.048	0.053	0.055	0.055	0.053
					RPM	12000	11000	8000	6300	5600	4000	3100	2500	2200	2000	1800	1600	1400	1200	1100	1100	1000
					FEED	110	170	200	210	210	260	270	260	240	240	240	220	200	190	180	180	160
	24		1D	0.5D	Vc	75	105	100	100	105	100	95	95	95	100	100	100	95	95	95	105	100
					fz	0.003	0.005	0.008	0.011	0.013	0.022	0.029	0.035	0.036	0.04	0.044	0.046	0.048	0.053	0.055	0.055	0.053
					RPM	12000	11000	8000	6300	5600	4000	3100	2500	2200	2000	1800	1600	1400	1200	1100	1100	1000
					FEED	110	170	200	210	210	260	270	260	240	240	240	220	200	190	180	180	160
	25		1D	0.5D	Vc	75	105	100	100	105	100	95	95	95	100	100	100	95	95	95	105	100
					fz	0.003	0.005	0.008	0.011	0.013	0.022	0.029	0.035	0.036	0.04	0.044	0.046	0.048	0.053	0.055	0.055	0.053
					RPM	12000	11000	8000	6300	5600	4000	3100	2500	2200	2000	1800	1600	1400	1200	1100	1100	1000
					FEED	110	170	200	210	210	260	270	260	240	240	240	220	200	190	180	180	160

* The FEED, in long & extra long types, should be reduced by around 50%



RECOMMENDED CUTTING CONDITIONS

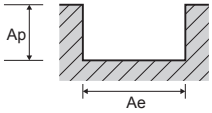
EHC573 / EHC516 SERIES

3 FLUTES - 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	16.0	18.0	20.0	22.0	25.0	28.0	30.0	32.0
P	1	Non-alloy steel	1D	0.5D	Vc	50	45	50	50	45	50	45	50	50	50	50	50	50	50	50	45	50
					fz	0.002	0.005	0.007	0.012	0.015	0.021	0.028	0.036	0.042	0.048	0.047	0.053	0.060	0.058	0.060	0.058	0.058
					RPM	7900	4900	3900	3100	2500	2000	1500	1300	1100	980	880	780	700	630	560	490	490
					FEED	50	70	85	110	110	125	125	140	140	140	125	125	125	110	100	85	85
	2		1D	0.5D	Vc	40	40	40	40	40	40	40	40	45	40	40	40	45	45	45	40	40
					fz	0.002	0.004	0.006	0.010	0.014	0.022	0.028	0.033	0.034	0.043	0.048	0.053	0.053	0.054	0.051	0.054	0.056
					RPM	6300	4500	3100	2500	2200	1500	1300	1100	980	780	700	630	630	560	490	430	390
					FEED	35	50	60	75	90	100	110	110	100	100	100	100	100	90	75	70	65
	3		1D	0.5D	Vc	35	35	30	35	30	35	35	35	35	30	30	35	35	35	35	35	30
					fz	0.002	0.003	0.005	0.008	0.011	0.018	0.023	0.028	0.032	0.037	0.042	0.042	0.048	0.043	0.043	0.038	0.043
					RPM	5600	3500	2500	2200	1700	1300	1100	880	780	630	560	560	490	430	390	350	310
					FEED	30	35	40	55	55	70	75	75	75	70	70	70	70	55	50	40	40
	4		1D	0.5D	Vc	35	35	30	35	30	35	35	35	35	30	30	35	35	35	35	35	30
					fz	0.002	0.003	0.005	0.008	0.011	0.018	0.023	0.028	0.032	0.037	0.042	0.042	0.048	0.043	0.043	0.038	0.043
					RPM	5600	3500	2500	2200	1700	1300	1100	880	780	630	560	560	490	430	390	350	310
					FEED	30	35	40	55	55	70	75	75	75	70	70	70	70	55	50	40	40
	5		1D	0.5D	Vc	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20
					fz	0.002	0.003	0.007	0.008	0.011	0.017	0.021	0.030	0.034	0.034	0.038	0.043	0.043	0.040	0.045	0.045	0.050
					RPM	3100	2200	1500	1300	1100	780	630	560	490	390	350	310	310	250	220	220	200
					FEED	15	20	30	30	35	40	40	50	50	40	40	40	40	30	30	30	30
	6	Low alloy steel	1D	0.5D	Vc	40	40	40	40	40	40	40	40	45	40	40	40	45	45	45	40	40
					fz	0.002	0.004	0.006	0.010	0.014	0.022	0.028	0.033	0.034	0.043	0.048	0.053	0.053	0.054	0.051	0.054	0.056
					RPM	6300	4500	3100	2500	2200	1500	1300	1100	980	780	700	630	630	560	490	430	390
					FEED	35	50	60	75	90	100	110	110	100	100	100	100	100	90	75	70	65
	7		1D	0.5D	Vc	35	35	30	35	30	35	35	35	35	30	30	35	35	35	35	35	30
					fz	0.002	0.003	0.005	0.008	0.011	0.018	0.023	0.028	0.032	0.037	0.042	0.042	0.048	0.043	0.043	0.038	0.043
					RPM	5600	3500	2500	2200	1700	1300	1100	880	780	630	560	560	490	430	390	350	310
					FEED	30	35	40	55	55	70	75	75	75	70	70	70	70	55	50	40	40
	8		1D	0.5D	Vc	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20
					fz	0.002	0.003	0.007	0.008	0.011	0.017	0.021	0.030	0.034	0.034	0.038	0.043	0.043	0.040	0.045	0.045	0.050
					RPM	3100	2200	1500	1300	1100	780	630	560	490	390	350	310	310	250	220	220	200
					FEED	15	20	30	30	35	40	40	50	50	40	40	40	40	30	30	30	30
	9		1D	0.5D	Vc	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20
					fz	0.002	0.003	0.007	0.008	0.011	0.017	0.021	0.030	0.034	0.034	0.038	0.043	0.043	0.040	0.045	0.045	0.050
					RPM	3100	2200	1500	1300	1100	780	630	560	490	390	350	310	310	250	220	220	200
					FEED	15	20	30	30	35	40	40	50	50	40	40	40	40	30	30	30	30
	10	High alloyed steel, and tool steel	1D	0.5D	Vc	40	40	40	40	40	40	40	40	45	40	40	40	45	45	45	40	40
					fz	0.002	0.004	0.006	0.010	0.014	0.022	0.028	0.033	0.034	0.043	0.048	0.053	0.053	0.054	0.051	0.054	0.056
					RPM	6300	4500	3100	2500	2200	1500	1300	1100	980	780	700	630	630	560	490	430	390
					FEED	35	50	60	75	90	100	110	110	100	100	100	100	100	90	75	70	65
	11.1		1D	0.5D	Vc	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20
					fz	0.002	0.003	0.007	0.008	0.011	0.017	0.021	0.030	0.034	0.034	0.038	0.043	0.043	0.040	0.045	0.045	0.050
					RPM	3100	2200	1500	1300	1100	780	630	560	490	390	350	310	310	250	220	220	200
					FEED	15	20	30	30	35	40	40	50	50	40	40	40	40	30	30	30	30
N	21	Aluminum-wrought alloy	1D	0.5D	Vc	105	145	140	140	145	140	135	130	135	140	140	140	135	135	130	140	140
					fz	0.003	0.005	0.008	0.011	0.012	0.021	0.029	0.034	0.037	0.04	0.045	0.047	0.048	0.053	0.056	0.056	0.054
					RPM	16800	15400	11200	8800	7800	5600	4300	3500	3100	2800	2500	2200	1950	1700	1500	1500	1400
					FEED	150	240	280	290	290	360	380	360	340	340	340	310	280	270	250	250	225
	22		1D	0.5D	Vc	105	145	140	140	145	140	135	130	135	140	140	140	135	135	130	140	140
					fz	0.003	0.005	0.008	0.011	0.012	0.021	0.029	0.034	0.037	0.04	0.045	0.047	0.048	0.053	0.056	0.056	0.054
					RPM	16800	15400	11200	8800	7800	5600	4300	3500	3100	2800	2500	2200	1950	1700	1500	1500	1400
					FEED	150	240	280	290	290	360	380	360	340	340	340	310	280	270	250	250	225
	23	Aluminum-cast, alloyed	1D	0.5D	Vc	105	145	140	140	145	140	135	130	135	140	140	140	135	135	130	140	140
					fz	0.003	0.005	0.008	0.011	0.012	0.021	0.029	0.034	0.037	0.04	0.045	0.047	0.048	0.053	0.056	0.056	0.054
					RPM	16800	15400	11200	8800	7800	5600	4300	3500	3100	2800	2500	2200	1950	1700	1500	1500	1400
					FEED	150	240	280	290	290	360	380	360	340	340	340	310	280	270	250	250	225
	24		1D	0.5D	Vc	105	145	140	140	145	140	135	130	135	140	140	140	135	135	130	140	140
					fz	0.003	0.005	0.008	0.011	0.012	0.021	0.029	0.034	0.037	0.04	0.045	0.047	0.048	0.053	0.056	0.056	0.054
					RPM	16800	15400	11200	8800	7800	5600	4300	3500	3100	2800	2500	2200	1950	1700	1500	1500	1400
					FEED	150	240	280	290	290	360	380	360	340	340	340	310	280	270	250	250	225
	25		1D	0.5D	Vc	105	145	140	140	145	140	135	130	135	140	140	140	135	135	130	140	140
					fz	0.003	0.005	0.008	0.011	0.012	0.021	0.029	0.034	0.037	0.04	0.045	0.047	0.048	0.053	0.056	0.056	0.054
					RPM	16800	15400	11200	8800	7800	5600	4300	3500	3100	2800	2500	2200	1950	1700	1500	1500	1400
					FEED	150	240	280	290	290	360	380	360	340	340	340	310	280	270	250	250	225

* The FEED, in long & extra long types, should be reduced by around 50%



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RECOMMENDED CUTTING CONDITIONS

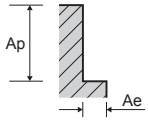
ESH573 / ESH516 SERIES

3 FLUTES - 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	16.0	18.0	20.0	22.0	25.0	28.0	30.0	32.0
P	1	Non-alloy steel	1D	1.5D	Vc	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35
					fz	0.004	0.008	0.013	0.020	0.025	0.036	0.045	0.061	0.069	0.079	0.079	0.089	0.100	0.100	0.100	0.100	0.100
					RPM	5600	3500	2800	2200	1800	1400	1100	900	800	700	630	560	500	450	400	350	350
					FEED	60	80	105	135	135	150	150	165	165	165	150	150	150	135	120	105	105
	2		1D	1.5D	Vc	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30
					fz	0.003	0.006	0.011	0.018	0.023	0.036	0.044	0.056	0.057	0.071	0.080	0.089	0.089	0.092	0.090	0.086	0.089
					RPM	4500	3200	2200	1800	1600	1100	900	800	700	560	500	450	450	400	350	310	280
					FEED	40	60	75	95	110	120	120	135	120	120	120	120	120	110	95	80	75
	3		1D	1.5D	Vc	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	20
					fz	0.003	0.006	0.009	0.014	0.018	0.030	0.038	0.048	0.054	0.059	0.067	0.067	0.076	0.070	0.071	0.073	0.076
					RPM	4000	2500	1800	1600	1200	900	800	630	560	450	400	400	350	310	280	250	220
					FEED	35	45	50	65	65	80	90	90	90	80	80	80	80	65	60	55	50
	4		1D	1.5D	Vc	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	20
					fz	0.003	0.006	0.009	0.014	0.018	0.030	0.038	0.048	0.054	0.059	0.067	0.067	0.076	0.070	0.071	0.073	0.076
					RPM	4000	2500	1800	1600	1200	900	800	630	560	450	400	400	350	310	280	250	220
					FEED	35	45	50	65	65	80	90	90	90	80	80	80	80	65	60	55	50
	5		1D	1.5D	Vc	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15
					fz	0.002	0.004	0.009	0.013	0.019	0.030	0.037	0.046	0.052	0.060	0.067	0.076	0.076	0.065	0.063	0.063	0.071
					RPM	2200	1600	1100	900	800	560	450	400	350	280	250	220	220	180	160	160	140
					FEED	15	20	30	35	45	50	50	55	55	50	50	50	50	35	30	30	30
	6	Low alloy steel	1D	1.5D	Vc	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30
					fz	0.003	0.006	0.011	0.018	0.023	0.036	0.044	0.056	0.057	0.071	0.080	0.089	0.089	0.092	0.090	0.086	0.089
					RPM	4500	3200	2200	1800	1600	1100	900	800	700	560	500	450	450	400	350	310	280
					FEED	40	60	75	95	110	120	120	135	120	120	120	120	120	110	95	80	75
	7		1D	1.5D	Vc	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	20
					fz	0.003	0.006	0.009	0.014	0.018	0.030	0.038	0.048	0.054	0.059	0.067	0.067	0.076	0.070	0.071	0.073	0.076
					RPM	4000	2500	1800	1600	1200	900	800	630	560	450	400	400	350	310	280	250	220
					FEED	35	45	50	65	65	80	90	90	90	80	80	80	80	65	60	55	50
	8		1D	1.5D	Vc	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15
					fz	0.002	0.004	0.009	0.013	0.019	0.030	0.037	0.046	0.052	0.060	0.067	0.076	0.076	0.065	0.063	0.063	0.071
					RPM	2200	1600	1100	900	800	560	450	400	350	280	250	220	220	180	160	160	140
					FEED	15	20	30	35	45	50	50	55	55	50	50	50	50	35	30	30	30
	9		1D	1.5D	Vc	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15
					fz	0.002	0.004	0.009	0.013	0.019	0.030	0.037	0.046	0.052	0.060	0.067	0.076	0.076	0.065	0.063	0.063	0.071
					RPM	2200	1600	1100	900	800	560	450	400	350	280	250	220	220	180	160	160	140
					FEED	15	20	30	35	45	50	50	55	55	50	50	50	50	35	30	30	30
	10	High alloyed steel, and tool steel	1D	1.5D	Vc	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30
					fz	0.003	0.006	0.011	0.018	0.023	0.036	0.044	0.056	0.057	0.071	0.080	0.089	0.089	0.092	0.090	0.086	0.089
					RPM	4500	3200	2200	1800	1600	1100	900	800	700	560	500	450	450	400	350	310	280
					FEED	40	60	75	95	110	120	120	135	120	120	120	120	120	110	95	80	75
	11.1		1D	1.5D	Vc	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15
					fz	0.002	0.004	0.009	0.013	0.019	0.030	0.037	0.046	0.052	0.060	0.067	0.076	0.076	0.065	0.063	0.063	0.071
					RPM	2200	1600	1100	900	800	560	450	400	350	280	250	220	220	180	160	160	140
					FEED	15	20	30	35	45	50	50	55	55	50	50	50	50	35	30	30	30
N	21	Aluminum-wrought alloy	1D	1.5D	Vc	75	105	100	100	105	100	95	95	95	100	100	100	95	95	95	105	100
					fz	0.005	0.008	0.014	0.019	0.021	0.037	0.048	0.057	0.061	0.067	0.074	0.075	0.081	0.089	0.091	0.091	0.09
					RPM	12000	11000	8000	6300	5600	4000	3100	2500	2200	2000	1800	1600	1400	1200	1100	1100	1000
					FEED	180	280	330	350	350	440	450	430	400	400	400	360	340	320	300	300	270
	22		1D	1.5D	Vc	75	105	100	100	105	100	95	95	95	100	100	100	95	95	95	105	100
					fz	0.005	0.008	0.014	0.019	0.021	0.037	0.048	0.057	0.061	0.067	0.074	0.075	0.081	0.089	0.091	0.091	0.09
					RPM	12000	11000	8000	6300	5600	4000	3100	2500	2200	2000	1800	1600	1400	1200	1100	1100	1000
					FEED	180	280	330	350	350	440	450	430	400	400	400	360	340	320	300	300	270
	23	Aluminum-cast, alloyed	1D	1.5D	Vc	75	105	100	100	105	100	95	95	95	100	100	100	95	95	95	105	100
					fz	0.005	0.008	0.014	0.019	0.021	0.037	0.048	0.057	0.061	0.067	0.074	0.075	0.081	0.089	0.091	0.091	0.09
					RPM	12000	11000	8000	6300	5600	4000	3100	2500	2200	2000	1800	1600	1400	1200	1100	1100	1000
					FEED	180	280	330	350	350	440	450	430	400	400	400	360	340	320	300	300	270
	24		1D	1.5D	Vc	75	105	100	100	105	100	95	95	95	100	100	100	95	95	95	105	100
					fz	0.005	0.008	0.014	0.019	0.021	0.037	0.048	0.057	0.061	0.067	0.074	0.075	0.081	0.089	0.091	0.091	0.09
					RPM	12000	11000	8000	6300	5600	4000	3100	2500	2200	2000	1800	1600	1400	1200	1100	1100	1000
					FEED	180	280	330	350	350	440	450	430	400	400	400	360	340	320	300	300	270
	25		1D	1.5D	Vc	75	105	100	100	105	100	95	95	95	100	100	100	95	95	95	105	100
					fz	0.005	0.008	0.014	0.019	0.021	0.037	0.048	0.057	0.061	0.067	0.074	0.075	0.081	0.089	0.091	0.091	0.09
					RPM	12000	11000	8000	6300	5600	4000	3100	2500	2200	2000	1800	1600	1400	1200	1100	1100	1000
					FEED	180	280	330	350	350	440	450	430	400	400	400	360	340	320	300	300	270

* The FEED, in long & extra long types, should be reduced by around 50%



RECOMMENDED CUTTING CONDITIONS

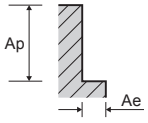
EHC573 / EHC516 SERIES

3 FLUTES - 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	16.0	18.0	20.0	22.0	25.0	28.0	30.0	32.0
P	1	Non-alloy steel	1D	1.5D	Vc	50	45	50	50	45	50	45	50	50	50	50	50	50	50	50	45	50
					fz	0.004	0.007	0.012	0.020	0.025	0.035	0.047	0.059	0.070	0.078	0.080	0.090	0.100	0.101	0.101	0.099	0.099
					RPM	7900	4900	3900	3100	2500	2000	1500	1300	1100	980	880	780	700	630	560	490	490
					FEED	85	110	145	190	190	210	210	230	230	230	210	210	210	190	170	145	145
	2		1D	1.5D	Vc	40	40	40	40	40	40	40	40	45	40	40	40	45	45	45	40	40
					fz	0.003	0.006	0.011	0.017	0.023	0.038	0.044	0.058	0.058	0.073	0.081	0.090	0.090	0.092	0.088	0.085	0.090
					RPM	6300	4500	3100	2500	2200	1500	1300	1100	980	780	700	630	630	560	490	430	390
					FEED	55	85	105	130	155	170	170	190	170	170	170	170	170	155	130	110	105
	3		1D	1.5D	Vc	35	35	30	35	30	35	35	35	35	30	30	35	35	35	35	35	30
					fz	0.003	0.006	0.009	0.014	0.018	0.028	0.038	0.047	0.053	0.058	0.065	0.065	0.075	0.070	0.073	0.071	0.075
					RPM	5600	3500	2500	2200	1700	1300	1100	880	780	630	560	560	490	430	390	350	310
					FEED	50	60	70	90	90	110	125	125	125	110	110	110	110	90	85	75	70
	4		1D	1.5D	Vc	35	35	30	35	30	35	35	35	35	30	30	35	35	35	35	35	30
					fz	0.003	0.006	0.009	0.014	0.018	0.028	0.038	0.047	0.053	0.058	0.065	0.065	0.075	0.070	0.073	0.071	0.075
					RPM	5600	3500	2500	2200	1700	1300	1100	880	780	630	560	560	490	430	390	350	310
					FEED	50	60	70	90	90	110	125	125	125	110	110	110	110	90	85	75	70
	5		1D	1.5D	Vc	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20
					fz	0.002	0.005	0.009	0.013	0.018	0.030	0.037	0.045	0.051	0.060	0.067	0.075	0.075	0.067	0.061	0.061	0.067
					RPM	3100	2200	1500	1300	1100	780	630	560	490	390	350	310	310	250	220	220	200
					FEED	20	30	40	50	60	70	70	75	75	70	70	70	70	50	40	40	40
	6	Low alloy steel	1D	1.5D	Vc	40	40	40	40	40	40	40	40	45	40	40	40	45	45	45	40	40
					fz	0.003	0.006	0.011	0.017	0.023	0.038	0.044	0.058	0.058	0.073	0.081	0.090	0.090	0.092	0.088	0.085	0.090
					RPM	6300	4500	3100	2500	2200	1500	1300	1100	980	780	700	630	630	560	490	430	390
					FEED	55	85	105	130	155	170	170	190	170	170	170	170	170	155	130	110	105
	7		1D	1.5D	Vc	35	35	30	35	30	35	35	35	35	30	30	35	35	35	35	35	30
					fz	0.003	0.006	0.009	0.014	0.018	0.028	0.038	0.047	0.053	0.058	0.065	0.065	0.075	0.070	0.073	0.071	0.075
					RPM	5600	3500	2500	2200	1700	1300	1100	880	780	630	560	560	490	430	390	350	310
					FEED	50	60	70	90	90	110	125	125	125	110	110	110	110	90	85	75	70
	8		1D	1.5D	Vc	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20
					fz	0.002	0.005	0.009	0.013	0.018	0.030	0.037	0.045	0.051	0.060	0.067	0.075	0.075	0.067	0.061	0.061	0.067
					RPM	3100	2200	1500	1300	1100	780	630	560	490	390	350	310	310	250	220	220	200
					FEED	20	30	40	50	60	70	70	75	75	70	70	70	70	50	40	40	40
	9		1D	1.5D	Vc	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20
					fz	0.002	0.005	0.009	0.013	0.018	0.030	0.037	0.045	0.051	0.060	0.067	0.075	0.075	0.067	0.061	0.061	0.067
					RPM	3100	2200	1500	1300	1100	780	630	560	490	390	350	310	310	250	220	220	200
					FEED	20	30	40	50	60	70	70	75	75	70	70	70	70	50	40	40	40
	10	High alloyed steel, and tool steel	1D	1.5D	Vc	40	40	40	40	40	40	40	40	45	40	40	40	45	45	45	40	40
					fz	0.003	0.006	0.011	0.017	0.023	0.038	0.044	0.058	0.058	0.073	0.081	0.090	0.090	0.092	0.088	0.085	0.090
					RPM	6300	4500	3100	2500	2200	1500	1300	1100	980	780	700	630	630	560	490	430	390
					FEED	55	85	105	130	155	170	170	190	170	170	170	170	170	155	130	110	105
	11.1		1D	1.5D	Vc	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20
					fz	0.002	0.005	0.009	0.013	0.018	0.030	0.037	0.045	0.051	0.060	0.067	0.075	0.075	0.067	0.061	0.061	0.067
					RPM	3100	2200	1500	1300	1100	780	630	560	490	390	350	310	310	250	220	220	200
					FEED	20	30	40	50	60	70	70	75	75	70	70	70	70	50	40	40	40
N	21	Aluminum-wrought alloy	1D	1.5D	Vc	105	145	140	140	145	140	135	130	135	140	140	140	135	135	130	140	140
					fz	0.005	0.008	0.014	0.019	0.021	0.037	0.049	0.057	0.06	0.067	0.075	0.076	0.082	0.088	0.093	0.093	0.09
					RPM	16800	15400	11200	8800	7800	5600	4300	3500	3100	2800	2500	2200	1950	1700	1500	1500	1400
					FEED	250	390	460	490	490	620	630	600	560	560	560	500	480	450	420	420	380
	22		1D	1.5D	Vc	105	145	140	140	145	140	135	130	135	140	140	140	135	135	130	140	140
					fz	0.005	0.008	0.014	0.019	0.021	0.037	0.049	0.057	0.06	0.067	0.075	0.076	0.082	0.088	0.093	0.093	0.09
					RPM	16800	15400	11200	8800	7800	5600	4300	3500	3100	2800	2500	2200	1950	1700	1500	1500	1400
					FEED	250	390	460	490	490	620	630	600	560	560	560	500	480	450	420	420	380
	23	Aluminum-cast, alloyed	1D	1.5D	Vc	105	145	140	140	145	140	135	130	135	140	140	140	135	135	130	140	140
					fz	0.005	0.008	0.014	0.019	0.021	0.037	0.049	0.057	0.06	0.067	0.075	0.076	0.082	0.088	0.093	0.093	0.09
					RPM	16800	15400	11200	8800	7800	5600	4300	3500	3100	2800	2500	2200	1950	1700	1500	1500	1400
					FEED	250	390	460	490	490	620	630	600	560	560	560	500	480	450	420	420	380
	24		1D	1.5D	Vc	105	145	140	140	145	140	135	130	135	140	140	140	135	135	130	140	140
					fz	0.005	0.008	0.014	0.019	0.021	0.037	0.049	0.057	0.06	0.067	0.075	0.076	0.082	0.088	0.093	0.093	0.09
					RPM	16800	15400	11200	8800	7800	5600	4300	3500	3100	2800	2500	2200	1950	1700	1500	1500	1400
					FEED	250	390	460	490	490	620	630	600	560	560	560	500	480	450	420	420	380
	25		1D	1.5D	Vc	105	145	140	140	145	140	135	130	135	140	140	140	135	135	130	140	140
					fz	0.005	0.008	0.014	0.019	0.021	0.037	0.049	0.057	0.06	0.067	0.075	0.076	0.082	0.088	0.093	0.093	0.09
					RPM	16800	15400	11200	8800	7800	5600	4300	3500	3100	2800	2500	2200	1950	1700	1500	1500	1400
					FEED	250	390	460	490	490	620	630	600	560	560	560	500	480	450	420	420	380

* The FEED, in long & extra long types, should be reduced by around 50%



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RECOMMENDED CUTTING CONDITIONS

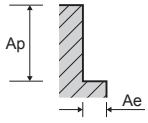
ESH595 / ESH597 SERIES

4 FLUTES - 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	16.0	18.0	20.0	22.0	25.0	28.0	30.0
P	1	Non-alloy steel	0.1D	1.5D	Vc	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35
					fz	0.004	0.008	0.013	0.020	0.025	0.036	0.045	0.061	0.069	0.079	0.079	0.089	0.100	0.100	0.100	0.100
					RPM	5600	3500	2800	2200	1800	1400	1100	900	800	700	630	560	500	450	400	350
					FEED	80	110	140	180	180	200	200	220	220	220	200	200	200	180	160	140
	2		0.1D	1.5D	Vc	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30
					fz	0.003	0.006	0.011	0.017	0.023	0.036	0.044	0.056	0.057	0.071	0.080	0.089	0.089	0.091	0.089	0.089
					RPM	4500	3200	2200	1800	1600	1100	900	800	700	560	500	450	450	400	350	310
					FEED	55	80	100	125	145	160	160	180	160	160	160	160	160	145	125	110
	3		0.1D	1.5D	Vc	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25
					fz	0.003	0.006	0.009	0.014	0.019	0.029	0.038	0.048	0.054	0.058	0.066	0.066	0.075	0.073	0.071	0.075
					RPM	4000	2500	1800	1600	1200	900	800	630	560	450	400	400	350	310	280	250
					FEED	45	60	65	90	90	105	120	120	120	105	105	105	105	90	80	75
	4		0.1D	1.5D	Vc	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25
					fz	0.003	0.006	0.009	0.014	0.019	0.029	0.038	0.048	0.054	0.058	0.066	0.066	0.075	0.073	0.071	0.075
					RPM	4000	2500	1800	1600	1200	900	800	630	560	450	400	400	350	310	280	250
					FEED	45	60	65	90	90	105	120	120	120	105	105	105	105	90	80	75
	5		0.1D	1.5D	Vc	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15
					fz	0.002	0.005	0.010	0.014	0.019	0.029	0.036	0.047	0.054	0.058	0.065	0.074	0.074	0.069	0.070	0.070
					RPM	2200	1600	1100	900	800	560	450	400	350	280	250	220	220	180	160	160
					FEED	20	30	45	50	60	65	65	75	75	65	65	65	65	50	45	45
	6	Low alloy steel	0.1D	1.5D	Vc	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30
					fz	0.003	0.006	0.011	0.017	0.023	0.036	0.044	0.056	0.057	0.071	0.080	0.089	0.089	0.091	0.089	0.089
					RPM	4500	3200	2200	1800	1600	1100	900	800	700	560	500	450	450	400	350	310
					FEED	55	80	100	125	145	160	160	180	160	160	160	160	160	145	125	110
	7		0.1D	1.5D	Vc	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25
					fz	0.003	0.006	0.009	0.014	0.019	0.029	0.038	0.048	0.054	0.058	0.066	0.066	0.075	0.073	0.071	0.075
					RPM	4000	2500	1800	1600	1200	900	800	630	560	450	400	400	350	310	280	250
					FEED	45	60	65	90	90	105	120	120	120	105	105	105	105	90	80	75
	8		0.1D	1.5D	Vc	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15
					fz	0.002	0.005	0.010	0.014	0.019	0.029	0.036	0.047	0.054	0.058	0.065	0.074	0.074	0.069	0.070	0.070
					RPM	2200	1600	1100	900	800	560	450	400	350	280	250	220	220	180	160	160
					FEED	20	30	45	50	60	65	65	75	75	65	65	65	65	50	45	45
	9		0.1D	1.5D	Vc	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15
					fz	0.002	0.005	0.010	0.014	0.019	0.029	0.036	0.047	0.054	0.058	0.065	0.074	0.074	0.069	0.070	0.070
					RPM	2200	1600	1100	900	800	560	450	400	350	280	250	220	220	180	160	160
					FEED	20	30	45	50	60	65	65	75	75	65	65	65	65	50	45	45
	10	High alloyed steel, and tool steel	0.1D	1.5D	Vc	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30
					fz	0.003	0.006	0.011	0.017	0.023	0.036	0.044	0.056	0.057	0.071	0.080	0.089	0.089	0.091	0.089	0.089
					RPM	4500	3200	2200	1800	1600	1100	900	800	700	560	500	450	450	400	350	310
					FEED	55	80	100	125	145	160	160	180	160	160	160	160	160	145	125	110
	11.1		0.1D	1.5D	Vc	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15
					fz	0.002	0.005	0.010	0.014	0.019	0.029	0.036	0.047	0.054	0.058	0.065	0.074	0.074	0.069	0.070	0.070
					RPM	2200	1600	1100	900	800	560	450	400	350	280	250	220	220	180	160	160
					FEED	20	30	45	50	60	65	65	75	75	65	65	65	65	50	45	45
N	21	Aluminum-wrought alloy	0.1D	1.5D	Vc	75	105	100	100	105	100	95	95	95	100	100	100	95	95	95	105
					fz	0.005	0.009	0.014	0.019	0.021	0.036	0.048	0.057	0.06	0.066	0.074	0.075	0.08	0.088	0.091	0.091
					RPM	12000	11000	8000	6300	5600	4000	3100	2500	2200	2000	1800	1600	1400	1200	1100	1100
					FEED	240	380	440	470	470	580	600	570	530	530	530	480	450	420	400	400
	22		0.1D	1.5D	Vc	75	105	100	100	105	100	95	95	95	100	100	100	95	95	95	105
					fz	0.005	0.009	0.014	0.019	0.021	0.036	0.048	0.057	0.06	0.066	0.074	0.075	0.08	0.088	0.091	0.091
					RPM	12000	11000	8000	6300	5600	4000	3100	2500	2200	2000	1800	1600	1400	1200	1100	1100
					FEED	240	380	440	470	470	580	600	570	530	530	530	480	450	420	400	400
	23	Aluminum-cast, alloyed	0.1D	1.5D	Vc	75	105	100	100	105	100	95	95	95	100	100	100	95	95	95	105
					fz	0.005	0.009	0.014	0.019	0.021	0.036	0.048	0.057	0.06	0.066	0.074	0.075	0.08	0.088	0.091	0.091
					RPM	12000	11000	8000	6300	5600	4000	3100	2500	2200	2000	1800	1600	1400	1200	1100	1100
					FEED	240	380	440	470	470	580	600	570	530	530	530	480	450	420	400	400
	24		0.1D	1.5D	Vc	75	105	100	100	105	100	95	95	95	100	100	100	95	95	95	105
					fz	0.005	0.009	0.014	0.019	0.021	0.036	0.048	0.057	0.06	0.066	0.074	0.075	0.08	0.088	0.091	0.091
					RPM	12000	11000	8000	6300	5600	4000	3100	2500	2200	2000	1800	1600	1400	1200	1100	1100
					FEED	240	380	440	470	470	580	600	570	530	530	530	480	450	420	400	400
	25		0.1D	1.5D	Vc	75	105	100	100	105	100	95	95	95	100	100	100	95	95	95	105
					fz	0.005	0.009	0.014	0.019	0.021	0.036	0.048	0.057	0.06	0.066	0.074	0.075	0.08	0.088	0.091	0.091
					RPM	12000	11000	8000	6300	5600	4000	3100	2500	2200	2000	1800	1600	1400	1200	1100	1100
					FEED	240	380	440	470	470	580	600	570	530	530	530	480	450	420	400	400

* The FEED, in long & extra long types, should be reduced by around 50%



RECOMMENDED CUTTING CONDITIONS

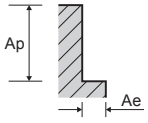
EHC595 / EHC597 SERIES

4 FLUTES - 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	16.0	18.0	20.0	22.0	25.0	28.0	30.0
P	1	Non-alloy steel	0.1D	1.5D	Vc	50	50	50	50	45	50	50	45	50	50	50	50	50	50	50	45
					fz	0.004	0.008	0.013	0.020	0.025	0.036	0.045	0.062	0.070	0.078	0.078	0.088	0.100	0.096	0.102	0.098
					RPM	7850	4900	3900	3100	2500	1950	1550	1250	1100	1000	900	800	700	650	550	500
					FEED	110	155	195	250	250	280	280	310	310	310	280	280	280	250	225	195
	2		0.1D	1.5D	Vc	40	40	40	40	40	40	40	40	45	40	40	40	45	45	45	40
					fz	0.003	0.006	0.011	0.018	0.023	0.036	0.045	0.057	0.056	0.070	0.080	0.087	0.087	0.093	0.088	0.086
					RPM	6300	4500	3100	2500	2250	1550	1250	1100	1000	800	700	650	650	550	500	450
					FEED	75	110	140	175	205	225	225	250	225	225	225	225	225	205	175	155
	3		0.1D	1.5D	Vc	35	35	30	35	30	30	35	35	35	35	30	35	35	35	35	35
					fz	0.003	0.006	0.009	0.014	0.018	0.029	0.039	0.047	0.053	0.056	0.066	0.066	0.073	0.069	0.069	0.075
					RPM	5600	3500	2500	2250	1700	1250	1100	900	800	650	550	550	500	450	400	350
					FEED	65	85	90	125	125	145	170	170	170	145	145	145	145	125	110	105
	4		0.1D	1.5D	Vc	35	35	30	35	30	30	35	35	35	35	30	35	35	35	35	35
					fz	0.003	0.006	0.009	0.014	0.018	0.029	0.039	0.047	0.053	0.056	0.066	0.066	0.073	0.069	0.069	0.075
					RPM	5600	3500	2500	2250	1700	1250	1100	900	800	650	550	550	500	450	400	350
					FEED	65	85	90	125	125	145	170	170	170	145	145	145	145	125	110	105
	5		0.1D	1.5D	Vc	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20
					fz	0.002	0.004	0.010	0.014	0.019	0.028	0.035	0.048	0.053	0.056	0.064	0.075	0.075	0.070	0.081	0.081
					RPM	3100	2250	1550	1250	1100	800	650	550	500	400	350	300	300	250	200	200
					FEED	30	40	65	70	85	90	90	105	105	90	90	90	90	70	65	65
	6	Low alloy steel	0.1D	1.5D	Vc	40	40	40	40	40	40	40	40	45	40	40	40	45	45	45	40
					fz	0.003	0.006	0.011	0.018	0.023	0.036	0.045	0.057	0.056	0.070	0.080	0.087	0.087	0.093	0.088	0.086
					RPM	6300	4500	3100	2500	2250	1550	1250	1100	1000	800	700	650	650	550	500	450
					FEED	75	110	140	175	205	225	225	250	225	225	225	225	225	205	175	155
	7		0.1D	1.5D	Vc	35	35	30	35	30	30	35	35	35	35	30	35	35	35	35	35
					fz	0.003	0.006	0.009	0.014	0.018	0.029	0.039	0.047	0.053	0.056	0.066	0.066	0.073	0.069	0.069	0.075
					RPM	5600	3500	2500	2250	1700	1250	1100	900	800	650	550	550	500	450	400	350
					FEED	65	85	90	125	125	145	170	170	170	145	145	145	145	125	110	105
	8		0.1D	1.5D	Vc	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20
					fz	0.002	0.004	0.010	0.014	0.019	0.028	0.035	0.048	0.053	0.056	0.064	0.075	0.075	0.070	0.081	0.081
					RPM	3100	2250	1550	1250	1100	800	650	550	500	400	350	300	300	250	200	200
					FEED	30	40	65	70	85	90	90	105	105	90	90	90	90	70	65	65
	9		0.1D	1.5D	Vc	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20
					fz	0.002	0.004	0.010	0.014	0.019	0.028	0.035	0.048	0.053	0.056	0.064	0.075	0.075	0.070	0.081	0.081
					RPM	3100	2250	1550	1250	1100	800	650	550	500	400	350	300	300	250	200	200
					FEED	30	40	65	70	85	90	90	105	105	90	90	90	90	70	65	65
	10	High alloyed steel, and tool steel	0.1D	1.5D	Vc	40	40	40	40	40	40	40	40	45	40	40	40	45	45	45	40
					fz	0.003	0.006	0.011	0.018	0.023	0.036	0.045	0.057	0.056	0.070	0.080	0.087	0.087	0.093	0.088	0.086
					RPM	6300	4500	3100	2500	2250	1550	1250	1100	1000	800	700	650	650	550	500	450
					FEED	75	110	140	175	205	225	225	250	225	225	225	225	225	205	175	155
	11.1		0.1D	1.5D	Vc	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20
					fz	0.002	0.004	0.010	0.014	0.019	0.028	0.035	0.048	0.053	0.056	0.064	0.075	0.075	0.070	0.081	0.081
					RPM	3100	2250	1550	1250	1100	800	650	550	500	400	350	300	300	250	200	200
					FEED	30	40	65	70	85	90	90	105	105	90	90	90	90	70	65	65
N	21	Aluminum-wrought alloy	0.1D	1.5D	Vc	105	145	140	140	150	140	135	130	135	140	140	140	135	135	135	145
					fz	0.005	0.009	0.014	0.019	0.021	0.036	0.048	0.057	0.06	0.066	0.074	0.074	0.081	0.087	0.09	0.09
					RPM	16800	15400	11200	8800	7850	5600	4350	3500	3100	2800	2500	2250	1950	1700	1550	1550
					FEED	335	530	615	660	660	810	840	800	740	740	740	670	630	590	560	560
	22		0.1D	1.5D	Vc	105	145	140	140	150	140	135	130	135	140	140	140	135	135	135	145
					fz	0.005	0.009	0.014	0.019	0.021	0.036	0.048	0.057	0.06	0.066	0.074	0.074	0.081	0.087	0.09	0.09
					RPM	16800	15400	11200	8800	7850	5600	4350	3500	3100	2800	2500	2250	1950	1700	1550	1550
					FEED	335	530	615	660	660	810	840	800	740	740	740	670	630	590	560	560
	23	Aluminum-cast, alloyed	0.1D	1.5D	Vc	105	145	140	140	150	140	135	130	135	140	140	140	135	135	135	145
					fz	0.005	0.009	0.014	0.019	0.021	0.036	0.048	0.057	0.06	0.066	0.074	0.074	0.081	0.087	0.09	0.09
					RPM	16800	15400	11200	8800	7850	5600	4350	3500	3100	2800	2500	2250	1950	1700	1550	1550
					FEED	335	530	615	660	660	810	840	800	740	740	740	670	630	590	560	560
	24		0.1D	1.5D	Vc	105	145	140	140	150	140	135	130	135	140	140	140	135	135	135	145
					fz	0.005	0.009	0.014	0.019	0.021	0.036	0.048	0.057	0.06	0.066	0.074	0.074	0.081	0.087	0.09	0.09
					RPM	16800	15400	11200	8800	7850	5600	4350	3500	3100	2800	2500	2250	1950	1700	1550	1550
					FEED	335	530	615	660	660	810	840	800	740	740	740	670	630	590	560	560
	25		0.1D	1.5D	Vc	105	145	140	140	150	140	135	130	135	140	140	140	135	135	135	145
					fz	0.005	0.009	0.014	0.019	0.021	0.036	0.048	0.057	0.06	0.066	0.074	0.074	0.081	0.087	0.09	0.09
					RPM	16800	15400	11200	8800	7850	5600	4350	3500	3100	2800	2500	2250	1950	1700	1550	1550
					FEED	335	530	615	660	660	810	840	800	740	740	740	670	630	590	560	560

* The FEED, in long & extra long types, should be reduced by around 50%



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RECOMMENDED CUTTING CONDITIONS

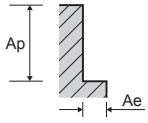
ESH596 / ESH598 SERIES

6 FLUTES
SIDE CUTTING

EHC596 / EHC598 SERIES

ISO	VDI 3323	Material Description	Ae(mm)	Ap(mm)	Parameter	Diameter (Ø)					Ae(mm)	Ap(mm)	Parameter	Diameter (Ø)				
						22.0	25.0	28.0	30.0	32.0				22.0	25.0	28.0	30.0	32.0
P	1	Non-alloy steel	0.1D	1.5D	Vc	35	35	35	35	35	0.1D	1.5D	Vc	50	50	50	45	50
					fz	0.067	0.067	0.067	0.067	0.067			fz	0.067	0.064	0.068	0.065	0.065
					RPM	500	450	400	350	350			RPM	700	650	550	500	500
					FEED	200	180	160	140	140			FEED	280	250	225	195	195
	2		0.1D	1.5D	Vc	30	30	30	30	30	0.1D	1.5D	Vc	45	45	45	40	40
					fz	0.089	0.091	0.089	0.089	0.089			fz	0.058	0.062	0.058	0.057	0.058
					RPM	450	400	350	310	280			RPM	650	550	500	450	400
					FEED	160	145	125	110	100			FEED	225	205	175	155	140
	3		0.1D	1.5D	Vc	25	25	25	25	25	0.1D	1.5D	Vc	35	35	35	35	30
					fz	0.075	0.073	0.071	0.075	0.074			fz	0.048	0.046	0.046	0.050	0.050
					RPM	350	310	280	250	220			RPM	500	450	400	350	300
					FEED	105	90	80	75	65			FEED	145	125	110	105	90
	4		0.1D	1.5D	Vc	25	25	25	25	25	0.1D	1.5D	Vc	35	35	35	35	30
					fz	0.075	0.073	0.071	0.075	0.074			fz	0.048	0.046	0.046	0.050	0.050
					RPM	350	310	280	250	220			RPM	500	450	400	350	300
					FEED	105	90	80	75	65			FEED	145	125	110	105	90
	5		0.1D	1.5D	Vc	15	15	15	15	15	0.1D	1.5D	Vc	20	20	20	20	20
					fz	0.074	0.069	0.070	0.070	0.080			fz	0.050	0.047	0.054	0.054	0.054
					RPM	220	180	160	160	140			RPM	300	250	200	200	200
					FEED	65	50	45	45	45			FEED	90	70	65	65	65
	6	Low alloy steel	0.1D	1.5D	Vc	30	30	30	30	30	0.1D	1.5D	Vc	45	45	45	40	40
					fz	0.089	0.091	0.089	0.089	0.089			fz	0.058	0.062	0.058	0.057	0.058
					RPM	450	400	350	310	280			RPM	650	550	500	450	400
					FEED	160	145	125	110	100			FEED	225	205	175	155	140
	7		0.1D	1.5D	Vc	25	25	25	25	25	0.1D	1.5D	Vc	35	35	35	35	30
					fz	0.075	0.073	0.071	0.075	0.074			fz	0.048	0.046	0.046	0.050	0.050
					RPM	350	310	280	250	220			RPM	500	450	400	350	300
					FEED	105	90	80	75	65			FEED	145	125	110	105	90
	8		0.1D	1.5D	Vc	15	15	15	15	15	0.1D	1.5D	Vc	20	20	20	20	20
					fz	0.074	0.069	0.070	0.070	0.080			fz	0.050	0.047	0.054	0.054	0.054
					RPM	220	180	160	160	140			RPM	300	250	200	200	200
					FEED	65	50	45	45	45			FEED	90	70	65	65	65
	9		0.1D	1.5D	Vc	15	15	15	15	15	0.1D	1.5D	Vc	20	20	20	20	20
					fz	0.074	0.069	0.070	0.070	0.080			fz	0.050	0.047	0.054	0.054	0.054
					RPM	220	180	160	160	140			RPM	300	250	200	200	200
					FEED	65	50	45	45	45			FEED	90	70	65	65	65
	10	High alloyed steel, and tool steel	0.1D	1.5D	Vc	30	30	30	30	30	0.1D	1.5D	Vc	45	45	45	40	40
					fz	0.089	0.091	0.089	0.089	0.089			fz	0.058	0.062	0.058	0.057	0.058
					RPM	450	400	350	310	280			RPM	650	550	500	450	400
					FEED	160	145	125	110	100			FEED	225	205	175	155	140
	11.1		0.1D	1.5D	Vc	15	15	15	15	15	0.1D	1.5D	Vc	20	20	20	20	20
					fz	0.074	0.069	0.070	0.070	0.080			fz	0.050	0.047	0.054	0.054	0.054
					RPM	220	180	160	160	140			RPM	300	250	200	200	200
					FEED	65	50	45	45	45			FEED	90	70	65	65	65
N	21	Aluminum-wrought alloy	0.1D	1.5D	Vc	95	95	95	105	100	0.1D	1.5D	Vc	135	135	135	145	140
					fz	0.08	0.088	0.091	0.091	0.09			fz	0.054	0.058	0.06	0.06	0.06
					RPM	1400	1200	1100	1100	1000			RPM	1950	1700	1550	1550	1400
					FEED	450	420	400	400	360			FEED	630	590	560	560	505
	22		0.1D	1.5D	Vc	95	95	95	105	100	0.1D	1.5D	Vc	135	135	135	145	140
					fz	0.08	0.088	0.091	0.091	0.09			fz	0.054	0.058	0.06	0.06	0.06
					RPM	1400	1200	1100	1100	1000			RPM	1950	1700	1550	1550	1400
					FEED	450	420	400	400	360			FEED	630	590	560	560	505
	23	Aluminum-cast, alloyed	0.1D	1.5D	Vc	95	95	95	105	100	0.1D	1.5D	Vc	135	135	135	145	140
					fz	0.08	0.088	0.091	0.091	0.09			fz	0.054	0.058	0.06	0.06	0.06
					RPM	1400	1200	1100	1100	1000			RPM	1950	1700	1550	1550	1400
					FEED	450	420	400	400	360			FEED	630	590	560	560	505
	24		0.1D	1.5D	Vc	95	95	95	105	100	0.1D	1.5D	Vc	135	135	135	145	140
					fz	0.08	0.088	0.091	0.091	0.09			fz	0.054	0.058	0.06	0.06	0.06
					RPM	1400	1200	1100	1100	1000			RPM	1950	1700	1550	1550	1400
					FEED	450	420	400	400	360			FEED	630	590	560	560	505
	25		0.1D	1.5D	Vc	95	95	95	105	100	0.1D	1.5D	Vc	135	135	135	145	140
					fz	0.08	0.088	0.091	0.091	0.09			fz	0.054	0.058	0.06	0.06	0.06
					RPM	1400	1200	1100	1100	1000			RPM	1950	1700	1550	1550	1400
					FEED	450	420	400	400	360			FEED	630	590	560	560	505

* The FEED, in long & extra long types, should be reduced by around 50%



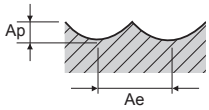
RECOMMENDED CUTTING CONDITIONS

ESH535 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) 3.0	4.0	6.0	8.0	10.0	12.0	16.0	20.0	25.0
P	1	Non-alloy steel	0.5D	0.3D	Vc	40	40	40	40	40	40	40	40	40
					fz	0.011	0.018	0.031	0.050	0.069	0.085	0.094	0.117	0.130
					RPM	4500	3200	2200	1600	1300	1000	800	600	500
					FEED	95	115	135	160	180	170	150	140	130
	2		0.5D	0.3D	Vc	30	30	30	30	30	30	30	30	30
					fz	0.010	0.017	0.026	0.044	0.060	0.066	0.083	0.085	0.088
					RPM	3400	2400	1700	1200	1000	800	600	500	400
					FEED	70	80	90	105	120	105	100	85	70
	3		0.5D	0.3D	Vc	20	20	20	20	20	15	20	20	15
					fz	0.008	0.013	0.023	0.036	0.054	0.061	0.079	0.083	0.091
					RPM	2000	1400	1000	700	560	450	350	300	220
					FEED	30	35	45	50	60	55	55	50	40
	4		0.5D	0.3D	Vc	20	20	20	20	20	15	20	20	15
					fz	0.008	0.013	0.023	0.036	0.054	0.061	0.079	0.083	0.091
					RPM	2000	1400	1000	700	560	450	350	300	220
					FEED	30	35	45	50	60	55	55	50	40
	5		0.5D	0.3D	Vc	15	15	15	15	15	10	15	15	15
					fz	0.007	0.013	0.018	0.030	0.044	0.055	0.070	0.088	0.094
					RPM	1400	1000	700	500	400	320	250	200	160
					FEED	20	25	25	30	35	35	35	35	30
	6	Low alloy steel	0.5D	0.3D	Vc	30	30	30	30	30	30	30	30	30
					fz	0.010	0.017	0.026	0.044	0.060	0.066	0.083	0.085	0.088
					RPM	3400	2400	1700	1200	1000	800	600	500	400
					FEED	70	80	90	105	120	105	100	85	70
	7		0.5D	0.3D	Vc	20	20	20	20	20	15	20	20	15
					fz	0.008	0.013	0.023	0.036	0.054	0.061	0.079	0.083	0.091
					RPM	2000	1400	1000	700	560	450	350	300	220
					FEED	30	35	45	50	60	55	55	50	40
	8		0.5D	0.3D	Vc	15	15	15	15	15	10	15	15	15
					fz	0.007	0.013	0.018	0.030	0.044	0.055	0.070	0.088	0.094
					RPM	1400	1000	700	500	400	320	250	200	160
					FEED	20	25	25	30	35	35	35	35	30
	9		0.5D	0.3D	Vc	15	15	15	15	15	10	15	15	15
					fz	0.007	0.013	0.018	0.030	0.044	0.055	0.070	0.088	0.094
					RPM	1400	1000	700	500	400	320	250	200	160
					FEED	20	25	25	30	35	35	35	35	30
	10	High alloyed steel, and tool steel	0.5D	0.3D	Vc	30	30	30	30	30	30	30	30	30
					fz	0.010	0.017	0.026	0.044	0.060	0.066	0.083	0.085	0.088
					RPM	3400	2400	1700	1200	1000	800	600	500	400
					FEED	70	80	90	105	120	105	100	85	70
	11.1		0.5D	0.3D	Vc	15	15	15	15	15	10	15	15	15
					fz	0.007	0.013	0.018	0.030	0.044	0.055	0.070	0.088	0.094
					RPM	1400	1000	700	500	400	320	250	200	160
					FEED	20	25	25	30	35	35	35	35	30
N	21	Aluminum-wrought alloy	0.5D	0.3D	Vc	105	100	105	100	100	95	100	100	100
					fz	0.01	0.016	0.025	0.044	0.056	0.068	0.075	0.088	0.096
					RPM	11000	8000	5600	4000	3200	2500	2000	1600	1300
					FEED	230	260	280	350	360	340	300	280	250
	22		0.5D	0.3D	Vc	105	100	105	100	100	95	100	100	100
					fz	0.01	0.016	0.025	0.044	0.056	0.068	0.075	0.088	0.096
					RPM	11000	8000	5600	4000	3200	2500	2000	1600	1300
					FEED	230	260	280	350	360	340	300	280	250
	23	Aluminum-cast, alloyed	0.5D	0.3D	Vc	105	100	105	100	100	95	100	100	100
					fz	0.01	0.016	0.025	0.044	0.056	0.068	0.075	0.088	0.096
					RPM	11000	8000	5600	4000	3200	2500	2000	1600	1300
					FEED	230	260	280	350	360	340	300	280	250
	24		0.5D	0.3D	Vc	105	100	105	100	100	95	100	100	100
					fz	0.01	0.016	0.025	0.044	0.056	0.068	0.075	0.088	0.096
					RPM	11000	8000	5600	4000	3200	2500	2000	1600	1300
					FEED	230	260	280	350	360	340	300	280	250
	25		0.5D	0.3D	Vc	105	100	105	100	100	95	100	100	100
					fz	0.01	0.016	0.025	0.044	0.056	0.068	0.075	0.088	0.096
					RPM	11000	8000	5600	4000	3200	2500	2000	1600	1300
					FEED	230	260	280	350	360	340	300	280	250

* The FEED, in long & extra long types, should be reduced by around 50%



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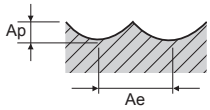
RECOMMENDED CUTTING CONDITIONS

EHC535 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) 3.0	4.0	6.0	8.0	10.0	12.0	16.0	20.0	25.0
P	1	Non-alloy steel	0.7D	0.3D	Vc	60	55	60	55	55	55	55	55	55
					fz	0.011	0.018	0.031	0.050	0.069	0.086	0.095	0.115	0.129
					RPM	6300	4500	3100	2250	1800	1400	1100	850	700
					FEED	135	160	190	225	250	240	210	195	180
	2		0.7D	0.3D	Vc	45	40	45	45	45	40	45	45	45
					fz	0.011	0.016	0.026	0.043	0.061	0.066	0.082	0.086	0.091
					RPM	4750	3350	2400	1700	1400	1100	850	700	550
					FEED	100	110	125	145	170	145	140	120	100
	3		0.7D	0.3D	Vc	25	25	25	25	25	25	25	25	25
					fz	0.007	0.013	0.023	0.035	0.053	0.058	0.075	0.088	0.092
					RPM	2800	1950	1400	1000	800	650	500	400	300
					FEED	40	50	65	70	85	75	75	70	55
	4		0.7D	0.3D	Vc	25	25	25	25	25	25	25	25	25
					fz	0.007	0.013	0.023	0.035	0.053	0.058	0.075	0.088	0.092
					RPM	2800	1950	1400	1000	800	650	500	400	300
					FEED	40	50	65	70	85	75	75	70	55
	5		0.7D	0.3D	Vc	20	20	20	20	15	15	20	20	15
					fz	0.008	0.013	0.018	0.029	0.045	0.056	0.071	0.083	0.100
					RPM	1950	1400	1000	700	550	450	350	300	200
					FEED	30	35	35	40	50	50	50	50	40
	6	Low alloy steel	0.7D	0.3D	Vc	45	40	45	45	45	40	45	45	45
					fz	0.011	0.016	0.026	0.043	0.061	0.066	0.082	0.086	0.091
					RPM	4750	3350	2400	1700	1400	1100	850	700	550
					FEED	100	110	125	145	170	145	140	120	100
	7		0.7D	0.3D	Vc	25	25	25	25	25	25	25	25	25
					fz	0.007	0.013	0.023	0.035	0.053	0.058	0.075	0.088	0.092
					RPM	2800	1950	1400	1000	800	650	500	400	300
					FEED	40	50	65	70	85	75	75	70	55
	8		0.7D	0.3D	Vc	20	20	20	20	15	15	20	20	15
					fz	0.008	0.013	0.018	0.029	0.045	0.056	0.071	0.083	0.100
					RPM	1950	1400	1000	700	550	450	350	300	200
					FEED	30	35	35	40	50	50	50	50	40
	9		0.7D	0.3D	Vc	20	20	20	20	15	15	20	20	15
					fz	0.008	0.013	0.018	0.029	0.045	0.056	0.071	0.083	0.100
					RPM	1950	1400	1000	700	550	450	350	300	200
					FEED	30	35	35	40	50	50	50	50	40
	10	High alloyed steel, and tool steel	0.7D	0.3D	Vc	45	40	45	45	45	40	45	45	45
					fz	0.011	0.016	0.026	0.043	0.061	0.066	0.082	0.086	0.091
					RPM	4750	3350	2400	1700	1400	1100	850	700	550
					FEED	100	110	125	145	170	145	140	120	100
	11.1		0.7D	0.3D	Vc	20	20	20	20	15	15	20	20	15
					fz	0.008	0.013	0.018	0.029	0.045	0.056	0.071	0.083	0.100
					RPM	1950	1400	1000	700	550	450	350	300	200
					FEED	30	35	35	40	50	50	50	50	40
N	21	Aluminum-wrought alloy	0.7D	0.3D	Vc	145	140	150	140	140	130	140	140	140
					fz	0.01	0.016	0.025	0.044	0.056	0.068	0.075	0.087	0.097
					RPM	15400	11200	7850	5600	4500	3500	2800	2250	1800
					FEED	320	365	390	490	505	475	420	390	350
	22		0.7D	0.3D	Vc	145	140	150	140	140	130	140	140	140
					fz	0.01	0.016	0.025	0.044	0.056	0.068	0.075	0.087	0.097
					RPM	15400	11200	7850	5600	4500	3500	2800	2250	1800
					FEED	320	365	390	490	505	475	420	390	350
	23	Aluminum-cast, alloyed	0.7D	0.3D	Vc	145	140	150	140	140	130	140	140	140
					fz	0.01	0.016	0.025	0.044	0.056	0.068	0.075	0.087	0.097
					RPM	15400	11200	7850	5600	4500	3500	2800	2250	1800
					FEED	320	365	390	490	505	475	420	390	350
	24		0.7D	0.3D	Vc	145	140	150	140	140	130	140	140	140
					fz	0.01	0.016	0.025	0.044	0.056	0.068	0.075	0.087	0.097
					RPM	15400	11200	7850	5600	4500	3500	2800	2250	1800
					FEED	320	365	390	490	505	475	420	390	350
	25		0.7D	0.3D	Vc	145	140	150	140	140	130	140	140	140
					fz	0.01	0.016	0.025	0.044	0.056	0.068	0.075	0.087	0.097
					RPM	15400	11200	7850	5600	4500	3500	2800	2250	1800
					FEED	320	365	390	490	505	475	420	390	350

* The FEED, in long & extra long types, should be reduced by around 50%



RECOMMENDED CUTTING CONDITIONS

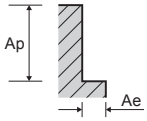
ESH751/ESH752/ESH753/ESH762 SERIES

MULTI FLUTE ROUGHING - 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	22.0	25.0	28.0	30.0	32.0
P	1	Non-alloy steel	0.5D	1.5D	Vc	35	35	35	35	35	35	35	35	35	35	35	35	35
					fz	0.015	0.025	0.034	0.050	0.056	0.064	0.071	0.080	0.088	0.098	0.088	0.100	0.100
					RPM	1800	1400	1100	900	800	700	630	560	500	450	400	350	350
					FEED	80	105	150	180	180	180	180	180	220	220	210	210	210
	2		0.5D	1.5D	Vc	30	30	30	30	30	30	30	30	30	30	30	30	30
					fz	0.013	0.023	0.033	0.044	0.050	0.063	0.070	0.078	0.076	0.085	0.076	0.086	0.095
					RPM	1600	1100	900	800	700	560	500	450	450	400	350	310	280
					FEED	60	75	120	140	140	140	140	140	170	170	160	160	160
	3		0.5D	1.5D	Vc	25	25	25	25	25	25	25	25	25	25	25	25	20
					fz	0.015	0.024	0.034	0.044	0.049	0.061	0.069	0.069	0.080	0.090	0.077	0.087	0.098
					RPM	1200	900	800	630	560	450	400	400	350	310	280	250	220
					FEED	55	65	110	110	110	110	110	110	140	140	130	130	130
	4		0.5D	1.5D	Vc	25	25	25	25	25	25	25	25	25	25	25	25	20
					fz	0.015	0.024	0.034	0.044	0.049	0.061	0.069	0.069	0.080	0.090	0.077	0.087	0.098
					RPM	1200	900	800	630	560	450	400	400	350	310	280	250	220
					FEED	55	65	110	110	110	110	110	110	140	140	130	130	130
	5		0.5D	1.5D	Vc	15	15	15	15	15	15	15	15	15	15	15	15	15
					fz	0.013	0.021	0.033	0.044	0.050	0.063	0.070	0.080	0.077	0.094	0.089	0.089	0.101
					RPM	800	560	450	400	350	280	250	220	220	180	160	160	140
					FEED	30	35	60	70	70	70	70	70	85	85	85	85	85
	6	Low alloy steel	0.5D	1.5D	Vc	30	30	30	30	30	30	30	30	30	30	30	30	30
					fz	0.013	0.023	0.033	0.044	0.050	0.063	0.070	0.078	0.076	0.085	0.076	0.086	0.095
					RPM	1600	1100	900	800	700	560	500	450	450	400	350	310	280
					FEED	60	75	120	140	140	140	140	140	170	170	160	160	160
	7		0.5D	1.5D	Vc	25	25	25	25	25	25	25	25	25	25	25	25	20
					fz	0.015	0.024	0.034	0.044	0.049	0.061	0.069	0.069	0.080	0.090	0.077	0.087	0.098
					RPM	1200	900	800	630	560	450	400	400	350	310	280	250	220
					FEED	55	65	110	110	110	110	110	110	140	140	130	130	130
	8		0.5D	1.5D	Vc	15	15	15	15	15	15	15	15	15	15	15	15	15
					fz	0.013	0.021	0.033	0.044	0.050	0.063	0.070	0.080	0.077	0.094	0.089	0.089	0.101
					RPM	800	560	450	400	350	280	250	220	220	180	160	160	140
					FEED	30	35	60	70	70	70	70	70	85	85	85	85	85
	9		0.5D	1.5D	Vc	15	15	15	15	15	15	15	15	15	15	15	15	15
					fz	0.013	0.021	0.033	0.044	0.050	0.063	0.070	0.080	0.077	0.094	0.089	0.089	0.101
					RPM	800	560	450	400	350	280	250	220	220	180	160	160	140
					FEED	30	35	60	70	70	70	70	70	85	85	85	85	85
	10	High alloyed steel, and tool steel	0.5D	1.5D	Vc	30	30	30	30	30	30	30	30	30	30	30	30	30
					fz	0.013	0.023	0.033	0.044	0.050	0.063	0.070	0.078	0.076	0.085	0.076	0.086	0.095
					RPM	1600	1100	900	800	700	560	500	450	450	400	350	310	280
					FEED	60	75	120	140	140	140	140	140	170	170	160	160	160
	11.1		0.5D	1.5D	Vc	15	15	15	15	15	15	15	15	15	15	15	15	15
					fz	0.013	0.021	0.033	0.044	0.050	0.063	0.070	0.080	0.077	0.094	0.089	0.089	0.101
					RPM	800	560	450	400	350	280	250	220	220	180	160	160	140
					FEED	30	35	60	70	70	70	70	70	85	85	85	85	85
N	21	Aluminum-wrought alloy	0.5D	1.5D	Vc	85	80	80	75	80	80	80	75	75	80	80	85	80
					fz	0.015	0.025	0.035	0.05	0.058	0.07	0.084	0.104	0.085	0.09	0.094	0.098	0.104
					RPM	4500	3100	2500	2000	1800	1600	1400	1200	1100	1000	900	900	800
					FEED	200	230	350	400	420	450	470	500	470	450	510	530	500
	22		0.5D	1.5D	Vc	85	80	80	75	80	80	80	75	75	80	80	85	80
					fz	0.015	0.025	0.035	0.05	0.058	0.07	0.084	0.104	0.085	0.09	0.094	0.098	0.104
					RPM	4500	3100	2500	2000	1800	1600	1400	1200	1100	1000	900	900	800
					FEED	200	230	350	400	420	450	470	500	470	450	510	530	500
	23	Aluminum-cast, alloyed	0.5D	1.5D	Vc	85	80	80	75	80	80	80	75	75	80	80	85	80
					fz	0.015	0.025	0.035	0.05	0.058	0.07	0.084	0.104	0.085	0.09	0.094	0.098	0.104
					RPM	4500	3100	2500	2000	1800	1600	1400	1200	1100	1000	900	900	800
					FEED	200	230	350	400	420	450	470	500	470	450	510	530	500
	24		0.5D	1.5D	Vc	85	80	80	75	80	80	80	75	75	80	80	85	80
					fz	0.015	0.025	0.035	0.05	0.058	0.07	0.084	0.104	0.085	0.09	0.094	0.098	0.104
					RPM	4500	3100	2500	2000	1800	1600	1400	1200	1100	1000	900	900	800
					FEED	200	230	350	400	420	450	470	500	470	450	510	530	500
	25		0.5D	1.5D	Vc	85	80	80	75	80	80	80	75	75	80	80	85	80
					fz	0.015	0.025	0.035	0.05	0.058	0.07	0.084	0.104	0.085	0.09	0.094	0.098	0.104
					RPM	4500	3100	2500	2000	1800	1600	1400	1200	1100	1000	900	900	800
					FEED	200	230	350	400	420	450	470	500	470	450	510	530	500

* The FEED, in long & extra long types, should be reduced by around 50%



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RECOMMENDED CUTTING CONDITIONS

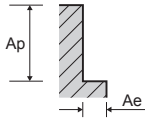
EHC751/EHC752/EHC753/EHC762 SERIES

MULTI FLUTE ROUGHING - 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	22.0	25.0	28.0	30.0	32.0
P	1	Non-alloy steel	0.5D	1.5D	Vc	45	50	50	45	50	50	50	50	50	50	50	45	50
					fz	0.015	0.025	0.034	0.050	0.057	0.063	0.069	0.078	0.089	0.095	0.089	0.098	0.098
					RPM	2500	1950	1550	1250	1100	1000	900	800	700	650	550	500	500
					FEED	110	145	210	250	250	250	250	250	310	310	295	295	295
	2		0.5D	1.5D	Vc	40	40	40	40	45	40	40	40	45	45	45	40	40
					fz	0.013	0.023	0.034	0.044	0.049	0.061	0.070	0.075	0.074	0.087	0.075	0.083	0.094
					RPM	2250	1550	1250	1100	1000	800	700	650	650	550	500	450	400
					FEED	85	105	170	195	195	195	195	195	240	240	225	225	225
	3		0.5D	1.5D	Vc	30	30	35	35	35	35	30	35	35	35	35	35	30
					fz	0.015	0.024	0.035	0.043	0.048	0.060	0.070	0.070	0.078	0.087	0.075	0.086	0.100
					RPM	1700	1250	1100	900	800	650	550	550	500	450	400	350	300
					FEED	75	90	155	155	155	155	155	155	195	195	180	180	180
	4		0.5D	1.5D	Vc	30	30	35	35	35	35	30	35	35	35	35	35	30
					fz	0.015	0.024	0.035	0.043	0.048	0.060	0.070	0.070	0.078	0.087	0.075	0.086	0.100
					RPM	1700	1250	1100	900	800	650	550	550	500	450	400	350	300
					FEED	75	90	155	155	155	155	155	155	195	195	180	180	180
	5		0.5D	1.5D	Vc	20	20	20	20	20	20	20	20	20	20	20	20	20
					fz	0.012	0.021	0.033	0.045	0.050	0.063	0.071	0.083	0.080	0.096	0.091	0.091	0.100
					RPM	1100	800	650	550	500	400	350	300	300	250	220	220	200
					FEED	40	50	85	100	100	100	100	100	120	120	120	120	120
	6	Low alloy steel	0.5D	1.5D	Vc	40	40	40	40	45	40	40	40	45	45	45	40	40
					fz	0.013	0.023	0.034	0.044	0.049	0.061	0.070	0.075	0.074	0.087	0.075	0.083	0.094
					RPM	2250	1550	1250	1100	1000	800	700	650	650	550	500	450	400
					FEED	85	105	170	195	195	195	195	195	240	240	225	225	225
	7		0.5D	1.5D	Vc	30	30	35	35	35	35	30	35	35	35	35	35	30
					fz	0.015	0.024	0.035	0.043	0.048	0.060	0.070	0.070	0.078	0.087	0.075	0.086	0.100
					RPM	1700	1250	1100	900	800	650	550	550	500	450	400	350	300
					FEED	75	90	155	155	155	155	155	155	195	195	180	180	180
	8		0.5D	1.5D	Vc	20	20	20	20	20	20	20	20	20	20	20	20	20
					fz	0.012	0.021	0.033	0.045	0.050	0.063	0.071	0.083	0.080	0.096	0.091	0.091	0.100
					RPM	1100	800	650	550	500	400	350	300	300	250	220	220	200
					FEED	40	50	85	100	100	100	100	100	120	120	120	120	120
	9		0.5D	1.5D	Vc	20	20	20	20	20	20	20	20	20	20	20	20	20
					fz	0.012	0.021	0.033	0.045	0.050	0.063	0.071	0.083	0.080	0.096	0.091	0.091	0.100
					RPM	1100	800	650	550	500	400	350	300	300	250	220	220	200
					FEED	40	50	85	100	100	100	100	100	120	120	120	120	120
	10	High alloyed steel, and tool steel	0.5D	1.5D	Vc	40	40	40	40	45	40	40	40	45	45	45	40	40
					fz	0.013	0.023	0.034	0.044	0.049	0.061	0.070	0.075	0.074	0.087	0.075	0.083	0.094
					RPM	2250	1550	1250	1100	1000	800	700	650	650	550	500	450	400
					FEED	85	105	170	195	195	195	195	195	240	240	225	225	225
	11.1		0.5D	1.5D	Vc	20	20	20	20	20	20	20	20	20	20	20	20	20
					fz	0.012	0.021	0.033	0.045	0.050	0.063	0.071	0.083	0.080	0.096	0.091	0.091	0.100
					RPM	1100	800	650	550	500	400	350	300	300	250	220	220	200
					FEED	40	50	85	100	100	100	100	100	120	120	120	120	120
N	21	Aluminum-wrought alloy	0.5D	1.5D	Vc	120	110	110	105	110	115	110	105	105	110	110	120	110
					fz	0.015	0.025	0.035	0.05	0.059	0.07	0.085	0.103	0.085	0.09	0.095	0.099	0.106
					RPM	6300	4350	3500	2800	2500	2250	1950	1700	1550	1400	1250	1250	1100
					FEED	280	320	490	560	590	630	660	700	660	630	715	740	700
	22		0.5D	1.5D	Vc	120	110	110	105	110	115	110	105	105	110	110	120	110
					fz	0.015	0.025	0.035	0.05	0.059	0.07	0.085	0.103	0.085	0.09	0.095	0.099	0.106
					RPM	6300	4350	3500	2800	2500	2250	1950	1700	1550	1400	1250	1250	1100
					FEED	280	320	490	560	590	630	660	700	660	630	715	740	700
	23	Aluminum-cast, alloyed	0.5D	1.5D	Vc	120	110	110	105	110	115	110	105	105	110	110	120	110
					fz	0.015	0.025	0.035	0.05	0.059	0.07	0.085	0.103	0.085	0.09	0.095	0.099	0.106
					RPM	6300	4350	3500	2800	2500	2250	1950	1700	1550	1400	1250	1250	1100
					FEED	280	320	490	560	590	630	660	700	660	630	715	740	700
	24		0.5D	1.5D	Vc	120	110	110	105	110	115	110	105	105	110	110	120	110
					fz	0.015	0.025	0.035	0.05	0.059	0.07	0.085	0.103	0.085	0.09	0.095	0.099	0.106
					RPM	6300	4350	3500	2800	2500	2250	1950	1700	1550	1400	1250	1250	1100
					FEED	280	320	490	560	590	630	660	700	660	630	715	740	700
	25		0.5D	1.5D	Vc	120	110	110	105	110	115	110	105	105	110	110	120	110
					fz	0.015	0.025	0.035	0.05	0.059	0.07	0.085	0.103	0.085	0.09	0.095	0.099	0.106
					RPM	6300	4350	3500	2800	2500	2250	1950	1700	1550	1400	1250	1250	1100
					FEED	280	320	490	560	590	630	660	700	660	630	715	740	700

* The FEED, in long & extra long types, should be reduced by around 50%



SOLID CARBIDE, END MILLS for General

A highly effective solution
for enhancing productivity and efficiency when cutting various materials

◎ : Excellent ○ : Good

							SERIES	G9F44	G9J56	G9J62
							FLUTE	2	2	2
							HELIX ANGLE	30°	30°	30°
							CUTTING EDGE SHAPE	BALL NOSE	BALL NOSE	BALL NOSE
							SIZE MIN	R1.0	R1.5	R0.25
							SIZE MAX	R6.0	R6.0	R2.0
							PAGE	34	35	36
								SHORT LENGTH	-	-
								X-Coating	X-Coating	X-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	38.1	Hardened steel		Hardened	550	55	◎	◎	◎
	38.2			Hardened	630	60	○	○	○
	40	Chilled Cast Iron		Cast	400	42	◎	◎	◎
	41	Hardened Cast Iron		Hardened	550	55	○	○	○

Recommended cutting conditions : p.47~58

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G9J57	G9F41	G9J54	G9J61	G9J59	G9F43	G9F42	G9J55	G9J58	G9J60	
4	2	2	2	3	3	4	4	6	4	
30°	30°	30°	30°	30°	30°	30°	30°	45°	20°	
CORNER RADIUS	SQUARE	SQUARE	SQUARE	SQUARE	SQUARE	SQUARE	SQUARE	SQUARE	Roughing	
D2.0	D1.0	D3.0	D0.4	D2.0	D1.0	D1.0	D3.0	D6.0	D6.0	
D12.0	D20.0	D12.0	D4.0	D12.0	D20.0	D20.0	D12.0	D16.0	D20.0	
37	**38**	**39**	**40**	**41**	**42**	**43**	**44**	**45**	**46**	
-	SHORT LENGTH	-	-	SHORT LENGTH	-	SHORT LENGTH	-	-	FINE	
X-Coating	X-Coating	X-Coating	X-Coating	X-Coating	X-Coating	X-Coating	X-Coating	X-Coating	X-Coating	
										
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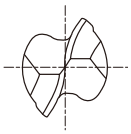
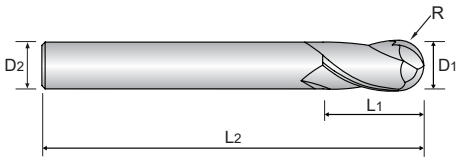
◎	○	○	◎	○	○	○	○	◎		40 H
○			○					○		41

CARBIDE, 2 FLUTE 30° HELIX 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.





R1.0~R3.0 R4.0~R10.0

p. 47

Mill Dia.Tolerance (mm)	Shank Dia.Tolerance
0 ~ - 0.030	h6

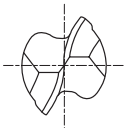
G9F44 SERIES

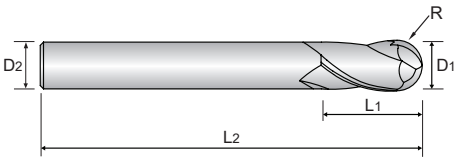
Unit : mm

EDP No.	Radius of Ball Nose	Mill Diameter	Shank Diameter	Length of Cut	Overall Length
	R	D1	D2	L1	L2
G9F44020N	R1.0	**2.0**	4	5	50
G9F44030N	R1.5	**3.0**	4	6	50
G9F44040N	R2.0	**4.0**	6	8	50
G9F44050N	R2.5	**5.0**	6	10	50
G9F44060N	R3.0	**6.0**	6	12	50
G9F44080N	R4.0	**8.0**	8	14	60
G9F44100N	R5.0	**10.0**	10	20	75
G9F44120N	R6.0	**12.0**	12	24	75

CARBIDE, 2 FLUTE 30° HELIX 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.





CARBIDE | 2 | 30° | R ±0.01 R1.0~R3.0 | R ±0.02 R4.0~R10.0 | PLAIN | X Coating

p. 47

Mill Dia.Tolerance (mm)	Shank Dia.Tolerance
0 ~ - 0.030	h6

G9J56 SERIES

Unit : mm

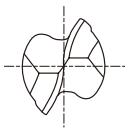
EDP No.	Radius of Ball Nose	Mill Diameter	Shank Diameter	Length of Cut	Overall Length
	R	D1	D2	L1	L2
G9J56999N	R1.5	**3.0**	3	5	75
G9J56998N	R2.0	**4.0**	4	8	75
G9J56997N	R2.5	**5.0**	5	10	75
G9J56996N	R3.0	**6.0**	6	12	100
G9J56995N	R4.0	**8.0**	8	16	100
G9J56994N	R5.0	**10.0**	10	20	100
G9J56993N	R6.0	**12.0**	12	24	100

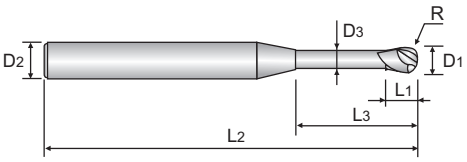
END MILLS for GENERAL

NEW CENTURY

CARBIDE, 2 FIUTE 30° HELIX 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.
▶ Deep slotting is possible by reduced neck.





p. 48~49

Mill Dia.Tolerance (mm)	Shank Dia.Tolerance
0 ~ - 0.030	h6

G9J62 SERIES

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
G9J62999N	R0.25	0.5	4	0.75	2	50	0.45
G9J62998N	R0.3	0.6	4	0.9	6	50	0.55
G9J62997N	R0.4	0.8	4	1.2	6	50	0.75
G9J62996N	R0.4	0.8	4	1.2	8	50	0.75
G9J62995N	R0.5	1.0	4	1.5	6	50	0.95
G9J62994N	R0.5	1.0	4	1.5	8	50	0.95
G9J62993N	R0.5	1.0	4	1.5	10	50	0.95
G9J62992N	R0.5	1.0	4	1.5	12	50	0.95
G9J62991N	R0.75	1.5	4	2.3	6	50	1.45
G9J62990N	R0.75	1.5	4	2.3	8	50	1.45
G9J62989N	R0.75	1.5	4	2.3	10	50	1.45
G9J62988N	R0.75	1.5	4	2.3	12	50	1.45
G9J62987N	R0.8	1.6	4	2.4	8	50	1.55
G9J62986N	R1.0	2.0	4	3	8	50	1.95
G9J62985N	R1.0	2.0	4	3	10	50	1.95
G9J62984N	R1.0	2.0	4	3	12	50	1.95
G9J62983N	R1.0	2.0	4	3	14	50	1.95
G9J62982N	R1.0	2.0	4	3	16	50	1.95
G9J62981N	R1.0	2.0	4	3	20	50	1.95
G9J62980N	R1.5	3.0	6	4.5	10	50	2.85
G9J62979N	R1.5	3.0	6	4.5	12	50	2.85
G9J62978N	R1.5	3.0	6	4.5	16	60	2.85
G9J62977N	R1.5	3.0	6	4.5	20	60	2.85
G9J62976N	R1.5	3.0	6	4.5	25	75	2.85
G9J62975N	R2.0	4.0	6	6	12	50	3.85
G9J62974N	R2.0	4.0	6	6	25	75	3.85
G9J62973N	R2.0	4.0	6	6	30	75	3.85

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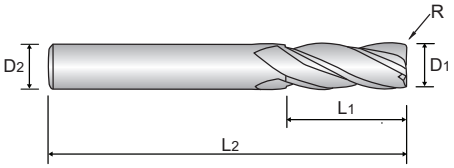
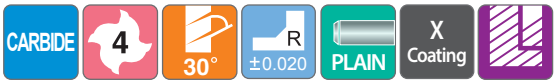
CARBIDE, 4 FLUTE 30° HELIX CORNER RADIUS

▶ 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 design enables improved finishes on workpieces.
▶ Prevent chipping in high speed machining with corner radius.





p.50

Mill Dia.Tolerance (mm)	Shank Dia.Tolerance
0 ~ - 0.030	h6

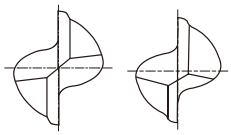
G9J57 SERIES

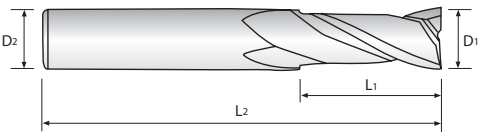
Unit : mm

EDP No.	Corner Radius	Mill Diameter	Shank Diameter	Length of Cut	Overall Length
	R	D1	D2	L1	L2
G9J57999N	R0.2	2.0	4	6	50
G9J57998N	R0.3	2.0	4	6	50
G9J57997N	R0.5	2.0	4	6	50
G9J57996N	R0.2	3.0	4	8	50
G9J57995N	R0.3	3.0	4	8	50
G9J57994N	R0.5	3.0	4	8	50
G9J57993N	R1.0	3.0	4	8	50
G9J57992N	R0.2	4.0	4	10	50
G9J57991N	R0.3	4.0	4	10	50
G9J57990N	R0.5	4.0	4	10	50
G9J57989N	R1.0	4.0	4	10	50
G9J57898N	R0.2	5.0	6	13	50
G9J57897N	R0.3	5.0	6	13	50
G9J57896N	R0.5	5.0	6	13	50
G9J57895N	R1.0	5.0	6	13	50
G9J57894N	R0.2	6.0	6	15	50
G9J57893N	R0.3	6.0	6	15	50
G9J57892N	R0.5	6.0	6	15	50
G9J57891N	R1.0	6.0	6	15	50
G9J57890N	R0.5	8.0	8	20	60
G9J57889N	R1.0	8.0	8	20	60
G9J57888N	R1.5	8.0	8	20	60
G9J57887N	R2.0	8.0	8	20	60
G9J57886N	R2.5	8.0	8	20	60
G9J57885N	R0.5	10.0	10	25	75
G9J57884N	R1.0	10.0	10	25	75
G9J57883N	R1.5	10.0	10	25	75
G9J57882N	R2.0	10.0	10	25	75
G9J57881N	R2.5	10.0	10	25	75
G9J57880N	R0.5	12.0	12	30	75
G9J57879N	R1.0	12.0	12	30	75
G9J57878N	R1.5	12.0	12	30	75
G9J57877N	R2.0	12.0	12	30	75
G9J57876N	R2.5	12.0	12	30	75

CARBIDE, 2 FLUTE 30° 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.





p.51

Mill Dia.Tolerance (mm)	Shank Dia.Tolerance
0 ~ - 0.030	h6

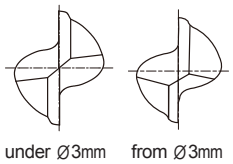
G9F41 SERIES

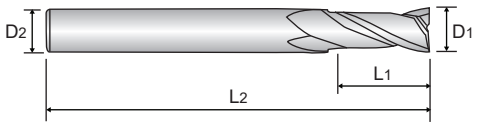
Unit : mm

EDP No.	Mill Diameter	Shank Diameter	Length of Cut	Overall Length
	D_1	D_2	L_1	L_2
G9F41010N	1.0	4	3	50
G9F41999N	1.5	4	4	50
G9F41020N	2.0	4	6	50
G9F41998N	2.5	4	8	50
G9F41030N	3.0	4	8	50
G9F41997N	3.5	4	10	50
G9F41040N	4.0	4	11	50
G9F41996N	4.5	4.5	12	50
G9F41050N	5.0	6	13	50
G9F41995N	5.5	5.5	15	50
G9F41060N	6.0	6	16	50
G9F41994N	7.0	7	20	60
G9F41080N	8.0	8	20	60
G9F41993N	9.0	9	20	60
G9F41100N	10.0	10	25	75
G9F41120N	12.0	12	32	75
G9F41140N	14.0	14	32	75
G9F41160N	16.0	16	32	75
G9F41200N	20.0	20	32	100

CARBIDE, 2 FLUTE 30° HELIX

▶ Designed for general purposes to carbon steels, tool steels, alloy steels, and stainless steels.
▶ Suitable for high speed machining in wet or dry condition.





CARBIDE | 2 | 30° | PLAIN | X Coating

p.51

Mill Dia.Tolerance (mm)	Shank Dia.Tolerance
0 ~ - 0.030	h6

G9J54 SERIES

Unit : mm

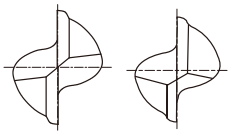
EDP No.	Mill Diameter	Shank Diameter	Length of Cut	Overall Length
	D1	D2	L1	L2
G9J54999N	3.0	3	10	75
G9J54998N	4.0	4	12	75
G9J54997N	5.0	5	20	75
G9J54996N	6.0	6	20	75
G9J54995N	8.0	8	25	75
G9J54994N	10.0	10	40	100
G9J54993N	12.0	12	45	100

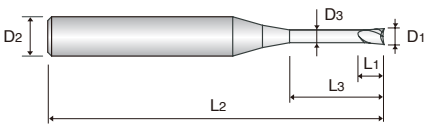
END MILLS for GENERAL

NEW CENTURY

CARBIDE, 2 FIUTE 30° HELIX LONG LENGTH

▶ Designed for general purposes to carbon steels, tool steels, alloy steels.
▶ Suitable for high speed machining in wet or dry condition.
▶2 flute design enables improved finishes on workpieces.





CARBIDE | 2 | 30° | PLAIN | X Coating

p.52~53

Mill Dia.Tolerance (mm)	Shank Dia.Tolerance
0 ~ - 0.030	h6

G9J61 SERIES

Unit : mm

EDP No.	Mill Diameter	Shank Diameter	Length of Cut	Length Below Shank	Overall Length	Neck Diameter
	D1	D2	L1	L3	L2	D3
G9J61999N	0.4	4	0.7	2	50	0.37
G9J61998N	0.4	4	0.7	4	50	0.37
G9J61997N	0.5	4	0.75	2	50	0.45
G9J61996N	0.5	4	0.75	6	50	0.45
G9J61995N	0.7	4	1.1	4	50	0.65
G9J61994N	0.7	4	1.1	6	50	0.65
G9J61993N	0.8	4	1.2	6	50	0.75
G9J61992N	1.0	4	1.5	6	50	0.95
G9J61991N	1.0	4	1.5	8	50	0.95
G9J61990N	1.0	4	1.5	10	50	0.95
G9J61989N	1.0	4	1.5	12	50	0.95
G9J61988N	1.2	4	1.8	6	50	1.15
G9J61987N	1.2	4	1.8	8	50	1.15
G9J61986N	1.2	4	1.8	12	50	1.15
G9J61985N	1.5	4	2.3	6	50	1.45
G9J61984N	1.5	4	2.3	8	50	1.45
G9J61983N	1.5	4	2.3	10	50	1.45
G9J61982N	1.5	4	2.3	12	50	1.45
G9J61981N	1.5	4	2.3	16	50	1.45
G9J61980N	1.5	4	2.3	20	50	1.45
G9J61979N	2.0	4	3	6	50	1.95
G9J61978N	2.0	4	3	10	50	1.95
G9J61977N	2.0	4	3	12	50	1.95
G9J61976N	2.0	4	3	14	50	1.95
G9J61975N	2.0	4	3	16	50	1.95
G9J61974N	2.0	4	3	18	50	1.95
G9J61973N	2.0	4	3	20	50	1.95
G9J61972N	2.5	4	3.7	12	50	2.4
G9J61971N	2.5	4	3.7	16	50	2.4
G9J61970N	2.5	4	3.7	20	50	2.4
G9J61969N	3.0	6	4.5	12	50	2.85
G9J61968N	3.0	6	4.5	16	60	2.85
G9J61967N	3.0	6	4.5	20	60	2.85
G9J61966N	3.0	6	4.5	25	75	2.85
G9J61965N	4.0	6	6	12	50	3.85
G9J61964N	4.0	6	6	16	60	3.85
G9J61963N	4.0	6	6	20	75	3.85
G9J61962N	4.0	6	6	25	75	3.85

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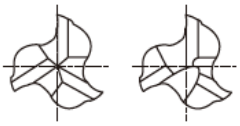
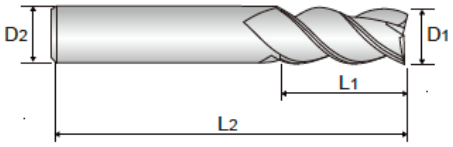
CARBIDE, 3 FLUTE 30° HELIX SHORT LENGTH

▶ Designed for general purposes to carbon steels, tool steels, alloy steels, and stainless steels.
▶ Suitable for high speed machining in wet or dry condition.





p.54~55

Mill Dia.Tolerance (mm)	Shank Dia.Tolerance
0 ~ - 0.030	h6

G9J59 SERIES

Unit : mm

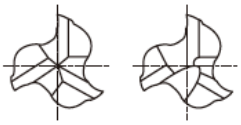
EDP No.	Mill Diameter	Shank Diameter	Length of Cut	Overall Length
	D1	D2	L1	L2
G9J59999N	2.0	6	4	35
G9J59998N	2.5	6	5	36
G9J59997N	3.0	6	5	36
G9J59996N	3.5	6	6	37
G9J59995N	4.0	6	7	38
G9J59994N	5.0	6	8	39
G9J59993N	6.0	6	8	39
G9J59992N	8.0	8	11	43
G9J59991N	10.0	10	13	50
G9J59990N	12.0	12	15	55

END MILLS for GENERAL

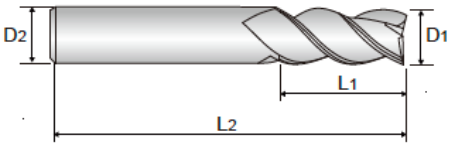
NEW CENTURY

CARBIDE, 3 FLUTE 30° 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.



under Ø3mm from Ø3mm



CARBIDE | 3 | 30° | PLAIN | X Coating

p.54~55

Mill Dia.Tolerance (mm)	Shank Dia.Tolerance
0 ~ - 0.030	h6

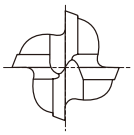
G9F43 SERIES

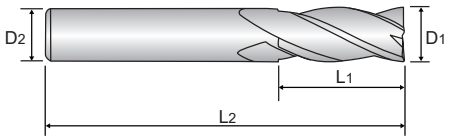
Unit : mm

EDP No.	Mill Diameter	Shank Diameter	Length of Cut	Overall Length
	D_1	D_2	L_1	L_2
G9F43010N	1.0	4	3	50
G9F43020N	2.0	4	6	50
G9F43030N	3.0	4	8	50
G9F43040N	4.0	4	11	50
G9F43050N	5.0	6	13	50
G9F43060N	6.0	6	16	50
G9F43080N	8.0	8	20	60
G9F43100N	10.0	10	25	75
G9F43120N	12.0	12	32	75
G9F43140N	14.0	14	32	75
G9F43160N	16.0	16	32	75
G9F43200N	20.0	20	32	100

CARBIDE, 4 FLUTE 30° 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 design enables improved finishes on workpieces.





p.56

Mill Dia.Tolerance (mm)	Shank Dia.Tolerance
0 ~ - 0.030	h6

G9F42 SERIES

Unit : mm

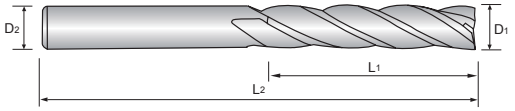
EDP No.	Mill Diameter	Shank Diameter	Length of Cut	Overall Length
	D1	D2	L1	L2
G9F42010N	1.0	4	3	50
G9F42999N	1.5	4	4	50
G9F42020N	2.0	4	6	50
G9F42998N	2.5	4	8	50
G9F42030N	3.0	4	8	50
G9F42997N	3.5	4	10	50
G9F42040N	4.0	4	11	50
G9F42996N	4.5	4.5	12	50
G9F42050N	5.0	6	13	50
G9F42060N	6.0	6	16	50
G9F42995N	7.0	7	20	60
G9F42080N	8.0	8	20	60
G9F42994N	9.0	9	20	60
G9F42100N	10.0	10	25	75
G9F42120N	12.0	12	32	75
G9F42140N	14.0	14	32	75
G9F42160N	16.0	16	32	75
G9F42200N	20.0	20	32	100

END MILLS for GENERAL

NEW CENTURY

CARBIDE, 4 FLUTE 30° HELIX

▶ 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 design enables improved finishes on workpieces.



p.56

Mill Dia.Tolerance (mm)	Shank Dia.Tolerance
0 ~ - 0.030	h6

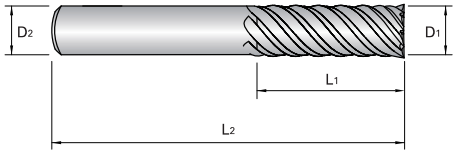
G9J55 SERIES

Unit : mm

EDP No.	Mill Diameter	Shank Diameter	Length of Cut	Overall Length
	D1	D2	L1	L2
G9J55999N	3.0	3	10	75
G9J55998N	4.0	4	12	75
G9J55997N	5.0	5	20	75
G9J55996N	6.0	6	20	75
G9J55995N	8.0	8	25	75
G9J55994N	10.0	10	40	100
G9J55993N	12.0	12	45	100

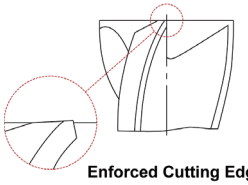
CARBIDE, 6 FLUTE 45° HELIX

▶ High speed cutting and finish milling with high feed rate.
▶ Excellent surface finishes.
▶ Application in high speed machining, wet and dry cutting condition.



CARBIDE | 6 | 45° | PLAIN | X Coating

p.57



Enforced Cutting Edge

Mill Dia.Tolerance (mm)	Shank Dia.Tolerance
0 ~ - 0.030	h5

G9J58 SERIES

Unit : mm

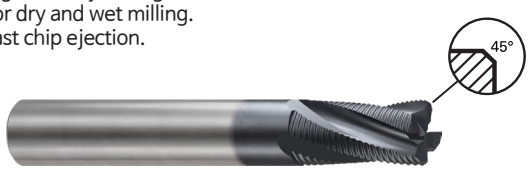
EDP No.	Mill Diameter	Shank Diameter	Length of Cut	Overall Length
	D1	D2	L1	L2
G9J58999N	6.0	6	15	50
G9J58998N	8.0	8	20	60
G9J58997N	10.0	10	25	75
G9J58996N	12.0	12	30	75
G9J58995N	16.0	16	40	100

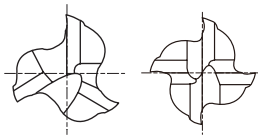
END MILLS for GENERAL

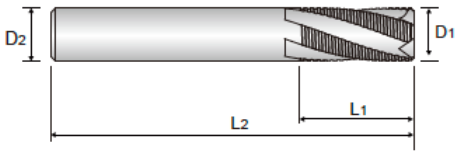
NEW CENTURY

CARBIDE, MULTI FLUTE 20° HELIX ROUGHING - FINE

- ▶ Designed to machine tool steels, alloy steels, mold steels and other hardened materials.
- ▶ High velocity milling of hardened steels.
- ▶ For dry and wet milling.
- ▶ Fast chip ejection.







CARBIDE | HR | 3-4 | 20° | PLAIN | X Coating | C x 45°

p.58

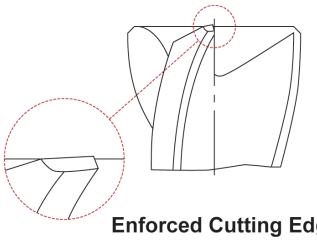
G9J60 SERIES

Unit : mm

EDP No.	Mill Diameter	Shank Diameter	Length of Cut	Overall Length	Chamfer	No. of Flute
	D1	D2	L1	L2		
G9J60999	**6.0**	6	16	57	0.38	3
G9J60998	**8.0**	8	16	63	0.38	3
G9J60997	**10.0**	10	22	72	0.60	4
G9J60996	**12.0**	12	26	83	0.60	4
G9J60995	**16.0**	16	32	92	0.60	4
G9J60994	**20.0**	20	38	104	0.60	4

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



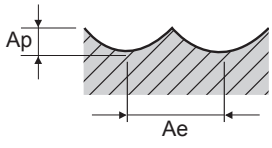
Enforced Cutting Edge

RECOMMENDED CUTTING CONDITIONS

G9F44 / G9J56 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	16.0	20.0
P	1-4	Non-alloy steel	0.2D	D1~D6 =0.2mm D8~D20 =0.3mm	Vc	84	116	121	132	148	166	185	204	221	242
					fz	0.026	0.025	0.035	0.045	0.060	0.089	0.122	0.150	0.181	0.200
					RPM	13350	12300	9650	8400	7850	6600	5900	5400	4400	3850
					FEED	690	620	680	755	940	1180	1435	1620	1590	1540
	5		0.2D	D1~D6 =0.2mm D8~D20 =0.3mm	Vc	62	87	97	105	120	133	148	160	173	188
					fz	0.023	0.023	0.031	0.040	0.060	0.080	0.100	0.121	0.141	0.159
					RPM	9900	9250	7700	6700	6350	5300	4700	4250	3450	3000
					FEED	450	420	485	530	760	850	940	1026	975	955
	6-7	Low alloy steel	0.2D	D1~D6 =0.2mm D8~D20 =0.3mm	Vc	84	116	121	132	148	166	185	204	221	242
					fz	0.026	0.025	0.035	0.045	0.060	0.089	0.122	0.150	0.181	0.200
					RPM	13350	12300	9650	8400	7850	6600	5900	5400	4400	3850
					FEED	690	620	680	755	940	1180	1435	1620	1590	1540
	8-9		0.2D	D1~D6 =0.2mm D8~D20 =0.3mm	Vc	62	87	97	105	120	133	148	160	173	188
					fz	0.023	0.023	0.031	0.040	0.060	0.080	0.100	0.121	0.141	0.159
					RPM	9900	9250	7700	6700	6350	5300	4700	4250	3450	3000
					FEED	450	420	485	530	760	850	940	1026	975	955
	10	High alloyed steel, and tool steel	0.2D	D1~D6 =0.2mm D8~D20 =0.3mm	Vc	84	116	121	132	148	166	185	204	221	242
					fz	0.026	0.025	0.035	0.045	0.060	0.089	0.122	0.150	0.181	0.200
					RPM	13350	12300	9650	8400	7850	6600	5900	5400	4400	3850
					FEED	690	620	680	755	940	1180	1435	1620	1590	1540
	11.1 ~ 11.2		0.2D	D1~D6 =0.2mm D8~D20 =0.3mm	Vc	62	87	97	105	120	133	148	160	173	188
					fz	0.023	0.023	0.031	0.040	0.060	0.080	0.100	0.121	0.141	0.159
					RPM	9900	9250	7700	6700	6350	5300	4700	4250	3450	3000
					FEED	450	420	485	530	760	850	940	1026	975	955
K	15-16	Grey cast iron	0.7D	0.3D	Vc	71	72	70	71	69	68	69	72	70	72
					fz	0.011	0.016	0.028	0.039	0.053	0.092	0.113	0.130	0.177	0.196
					RPM	11350	7600	5550	4500	3650	2700	2200	1900	1400	1150
					FEED	240	250	310	355	390	495	495	495	495	450
	17-18	Nodular cast iron	0.7D	0.3D	Vc	71	72	70	71	69	68	69	72	70	72
					fz	0.011	0.016	0.028	0.039	0.053	0.092	0.113	0.130	0.177	0.196
					RPM	11350	7600	5550	4500	3650	2700	2200	1900	1400	1150
					FEED	240	250	310	355	390	495	495	495	495	450
	19-20	Malleable cast iron	0.7D	0.3D	Vc	71	72	70	71	69	68	69	72	70	72
					fz	0.011	0.016	0.028	0.039	0.053	0.092	0.113	0.130	0.177	0.196
					RPM	11350	7600	5550	4500	3650	2700	2200	1900	1400	1150
					FEED	240	250	310	355	390	495	495	495	495	450
H	38.1	Hardened steel	0.2D	D1~D6 =0.2mm D8~D20 =0.3mm	Vc	62	87	97	105	120	133	148	160	173	188
					fz	0.023	0.023	0.031	0.040	0.060	0.080	0.100	0.121	0.141	0.159
					RPM	9900	9250	7700	6700	6350	5300	4700	4250	3450	3000
					FEED	450	420	485	530	760	850	940	1026	975	955
	38.2		0.2D	D1~D6 =0.2mm D8~D20 =0.3mm	Vc	27	39	49	53	55	55	60	60	63	66
					fz	0.016	0.016	0.021	0.024	0.029	0.047	0.054	0.070	0.090	0.107
					RPM	4300	4100	3900	3350	2900	2200	1900	1600	1250	1050
					FEED	135	135	160	160	170	205	205	225	225	225
	40	Chilled Cast Iron	0.2D	D1~D6 =0.2mm D8~D20 =0.3mm	Vc	62	87	97	105	120	133	148	160	173	188
					fz	0.023	0.023	0.031	0.040	0.060	0.080	0.100	0.121	0.141	0.159
					RPM	9900	9250	7700	6700	6350	5300	4700	4250	3450	3000
					FEED	450	420	485	530	760	850	940	1026	975	955
	41	Hardened Cast Iron	0.2D	D1~D6 =0.2mm D8~D20 =0.3mm	Vc	27	39	49	53	55	55	60	60	63	66
					fz	0.016	0.016	0.021	0.024	0.029	0.047	0.054	0.070	0.090	0.107
					RPM	4300	4100	3900	3350	2900	2200	1900	1600	1250	1050
					FEED	135	135	160	160	170	205	205	225	225	225



RECOMMENDED CUTTING CONDITIONS

G9J62 SERIES — 2 FLUTE BALL NOSE - RIB PROCESSING

ISO	VDI 3323	Material Description	Parameter	Diameter (Ø) 0.4	0.5	0.6	0.8	1.0	1.2	1.4	1.5
P	1-4	Non-alloy steel	Vc	38~49	48~61	58~73	77~98	87~111	87~112	90~110	87~109
			fz	0.003~0.006	0.003~0.006	0.004~0.008	0.004~0.008	0.004~0.010	0.005~0.013	0.006~0.015	0.007~0.017
			RPM	30600~38950	30600~38950	30600~38950	30600~38950	27800~35250	23200~29650	20400~25050	18550~23200
			FEED	180~490	180~490	225~630	225~630	250~690	250~770	250~770	250~770
			Ap	0.018~0.036	0.023~0.045	0.027~0.054	0.036~0.072	0.045~0.090	0.055~0.100	0.062~0.125	0.070~0.135
	5		Vc	28~35	35~44	42~52	56~70	64~79	63~80	65~77	63~81
			fz	0.002~0.005	0.002~0.005	0.002~0.006	0.002~0.006	0.003~0.008	0.004~0.009	0.004~0.011	0.005~0.011
			RPM	22250~27800	22250~27800	22250~27800	22250~27800	20400~25000	16700~21300	14850~17600	13450~17150
			FEED	90~270	90~270	110~350	110~350	130~390	130~390	130~390	130~390
			Ap	0.018~0.036	0.023~0.045	0.027~0.054	0.036~0.072	0.045~0.090	0.055~0.100	0.062~0.125	0.070~0.135
	6-7	Low alloy steel	Vc	38~49	48~61	58~73	77~98	87~111	87~112	90~110	87~109
			fz	0.003~0.006	0.003~0.006	0.004~0.008	0.004~0.008	0.004~0.010	0.005~0.013	0.006~0.015	0.007~0.017
			RPM	30600~38950	30600~38950	30600~38950	30600~38950	27800~35250	23200~29650	20400~25050	18550~23200
			FEED	180~490	180~490	225~630	225~630	250~690	250~770	250~770	250~770
			Ap	0.018~0.036	0.023~0.045	0.027~0.054	0.036~0.072	0.045~0.090	0.055~0.100	0.062~0.125	0.070~0.135
	8-9		Vc	28~35	35~44	42~52	56~70	64~79	63~80	65~77	63~81
			fz	0.002~0.005	0.002~0.005	0.002~0.006	0.002~0.006	0.003~0.008	0.004~0.009	0.004~0.011	0.005~0.011
			RPM	22250~27800	22250~27800	22250~27800	22250~27800	20400~25000	16700~21300	14850~17600	13450~17150
			FEED	90~270	90~270	110~350	110~350	130~390	130~390	130~390	130~390
			Ap	0.018~0.036	0.023~0.045	0.027~0.054	0.036~0.072	0.045~0.090	0.055~0.100	0.062~0.125	0.070~0.135
	10	High alloyed steel, and tool steel	Vc	38~49	48~61	58~73	77~98	87~111	87~112	90~110	87~109
			fz	0.003~0.006	0.003~0.006	0.004~0.008	0.004~0.008	0.004~0.010	0.005~0.013	0.006~0.015	0.007~0.017
			RPM	30600~38950	30600~38950	30600~38950	30600~38950	27800~35250	23200~29650	20400~25050	18550~23200
			FEED	180~490	180~490	225~630	225~630	250~690	250~770	250~770	250~770
			Ap	0.018~0.036	0.023~0.045	0.027~0.054	0.036~0.072	0.045~0.090	0.055~0.100	0.062~0.125	0.070~0.135
	11.1 - 11.2		Vc	28~35	35~44	42~52	56~70	64~79	63~80	65~77	63~81
			fz	0.002~0.005	0.002~0.005	0.002~0.006	0.002~0.006	0.003~0.008	0.004~0.009	0.004~0.011	0.005~0.011
			RPM	22250~27800	22250~27800	22250~27800	22250~27800	20400~25000	16700~21300	14850~17600	13450~17150
			FEED	90~270	90~270	110~350	110~350	130~390	130~390	130~390	130~390
			Ap	0.018~0.036	0.023~0.045	0.027~0.054	0.036~0.072	0.045~0.090	0.055~0.100	0.062~0.125	0.070~0.135
H	38.1 38.2	Hardened steel	Vc	17~22	22~28	26~33	35~44	39~51	40~51	41~51	41~50
			fz	0.003~0.005	0.003~0.005	0.004~0.006	0.004~0.006	0.005~0.008	0.006~0.009	0.007~0.011	0.007~0.012
			RPM	13900~17600	13900~17600	13900~17600	13900~17600	12500~16200	10650~13450	9250~11600	8800~10650
			FEED	90~180	90~180	110~225	110~225	130~250	130~250	130~250	130~250
			Ap	0.004~0.007	0.005~0.009	0.005~0.011	0.007~0.014	0.009~0.018	0.010~0.022	0.012~0.025	0.014~0.028
	40	Chilled Cast Iron	Vc	28~35	35~44	42~52	56~70	64~79	63~80	65~77	63~81
			fz	0.002~0.005	0.002~0.005	0.002~0.006	0.002~0.006	0.003~0.008	0.004~0.009	0.004~0.011	0.005~0.011
			RPM	22250~27800	22250~27800	22250~27800	22250~27800	20400~25000	16700~21300	14850~17600	13450~17150
			FEED	90~270	90~270	110~350	110~350	130~390	130~390	130~390	130~390
			Ap	0.018~0.036	0.023~0.045	0.027~0.054	0.036~0.072	0.045~0.090	0.055~0.100	0.062~0.125	0.070~0.135
	41	Hardened Cast Iron	Vc	17~22	22~28	26~33	35~44	39~51	40~51	41~51	41~50
			fz	0.003~0.005	0.003~0.005	0.004~0.006	0.004~0.006	0.005~0.008	0.006~0.009	0.007~0.011	0.007~0.012
			RPM	13900~17600	13900~17600	13900~17600	13900~17600	12500~16200	10650~13450	9250~11600	8800~10650
			FEED	90~180	90~180	110~225	110~225	130~250	130~250	130~250	130~250
			Ap	0.004~0.007	0.005~0.009	0.005~0.011	0.007~0.014	0.009~0.018	0.010~0.022	0.012~0.025	0.014~0.028

▶ NEXT PAGE

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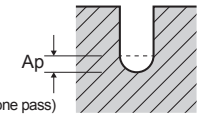
RECOMMENDED CUTTING CONDITIONS

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

Parameter	Diameter (Ø)						
	1.6	1.8	2.0	3.0	4.0	5.0	6.0
Vc	88~117	94~120	93~117	96~123	105~139	102~131	105~139
fz	0.007~0.017	0.007~0.018	0.008~0.021	0.012~0.030	0.015~0.035	0.019~0.046	0.023~0.052
RPM	17600~23200	16700~21300	14850~18550	10200~13000	8350~11100	6500~8350	5550~7400
FEED	250~770	250~770	250~770	250~770	250~770	250~770	250~770
Ap	0.075~0.145	0.080~0.160	0.090~0.180	0.135~0.270	0.180~0.360	0.225~0.450	0.270~0.540
Vc	65~81	66~84	67~85	66~83	71~96	73~95	70~96
fz	0.005~0.012	0.006~0.013	0.006~0.014	0.009~0.022	0.012~0.026	0.014~0.032	0.018~0.038
RPM	13000~16200	11600~14850	10650~13450	6950~8800	5650~7600	4650~6050	3700~5100
FEED	130~390	130~390	130~390	130~390	130~390	130~390	130~390
Ap	0.075~0.145	0.080~0.160	0.090~0.180	0.135~0.270	0.180~0.360	0.225~0.450	0.270~0.540
Vc	88~117	94~120	93~117	96~123	105~139	102~131	105~139
fz	0.007~0.017	0.007~0.018	0.008~0.021	0.012~0.030	0.015~0.035	0.019~0.046	0.023~0.052
RPM	17600~23200	16700~21300	14850~18550	10200~13000	8350~11100	6500~8350	5550~7400
FEED	250~770	250~770	250~770	250~770	250~770	250~770	250~770
Ap	0.075~0.145	0.080~0.160	0.090~0.180	0.135~0.270	0.180~0.360	0.225~0.450	0.270~0.540
Vc	65~81	66~84	67~85	66~83	71~96	73~95	70~96
fz	0.005~0.012	0.006~0.013	0.006~0.014	0.009~0.022	0.012~0.026	0.014~0.032	0.018~0.038
RPM	13000~16200	11600~14850	10650~13450	6950~8800	5650~7600	4650~6050	3700~5100
FEED	130~390	130~390	130~390	130~390	130~390	130~390	130~390
Ap	0.075~0.145	0.080~0.160	0.090~0.180	0.135~0.270	0.180~0.360	0.225~0.450	0.270~0.540
Vc	88~117	94~120	93~117	96~123	105~139	102~131	105~139
fz	0.007~0.017	0.007~0.018	0.008~0.021	0.012~0.030	0.015~0.035	0.019~0.046	0.023~0.052
RPM	17600~23200	16700~21300	14850~18550	10200~13000	8350~11100	6500~8350	5550~7400
FEED	250~770	250~770	250~770	250~770	250~770	250~770	250~770
Ap	0.075~0.145	0.080~0.160	0.090~0.180	0.135~0.270	0.180~0.360	0.225~0.450	0.270~0.540
Vc	65~81	66~84	67~85	66~83	71~96	73~95	70~96
fz	0.005~0.012	0.006~0.013	0.006~0.014	0.009~0.022	0.012~0.026	0.014~0.032	0.018~0.038
RPM	13000~16200	11600~14850	10650~13450	6950~8800	5650~7600	4650~6050	3700~5100
FEED	130~390	130~390	130~390	130~390	130~390	130~390	130~390
Ap	0.075~0.145	0.080~0.160	0.090~0.180	0.135~0.270	0.180~0.360	0.225~0.450	0.270~0.540
Vc	42~51	42~52	44~52	44~52	46~58	47~60	43~61
fz	0.008~0.012	0.009~0.014	0.009~0.015	0.014~0.023	0.018~0.027	0.022~0.033	0.028~0.038
RPM	8350~10200	7400~9250	6950~8350	4650~5550	3700~4650	3000~3800	2300~3250
FEED	130~250	130~250	130~250	130~250	130~250	130~250	130~250
Ap	0.015~0.030	0.016~0.032	0.018~0.035	0.028~0.055	0.035~0.070	0.044~0.088	0.053~0.105
Vc	65~81	66~84	67~85	66~83	71~96	73~95	70~96
fz	0.005~0.012	0.006~0.013	0.006~0.014	0.009~0.022	0.012~0.026	0.014~0.032	0.018~0.038
RPM	13000~16200	11600~14850	10650~13450	6950~8800	5650~7600	4650~6050	3700~5100
FEED	130~390	130~390	130~390	130~390	130~390	130~390	130~390
Ap	0.075~0.145	0.080~0.160	0.090~0.180	0.135~0.270	0.180~0.360	0.225~0.450	0.270~0.540
Vc	42~51	42~52	44~52	44~52	46~58	47~60	43~61
fz	0.008~0.012	0.009~0.014	0.009~0.015	0.014~0.023	0.018~0.027	0.022~0.033	0.028~0.038
RPM	8350~10200	7400~9250	6950~8350	4650~5550	3700~4650	3000~3800	2300~3250
FEED	130~250	130~250	130~250	130~250	130~250	130~250	130~250
Ap	0.015~0.030	0.016~0.032	0.018~0.035	0.028~0.055	0.035~0.070	0.044~0.088	0.053~0.105



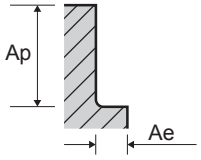
(Depth of cut per one pass)

RECOMMENDED CUTTING CONDITIONS

G9J57 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) 2.0	3.0	4.0	5.0	6.0	8.0	10.0	12.0
P	1-4	Non-alloy steel	0.05D	2D	Vc	55	61	65	70	73	73	63	62
					fz	0.011	0.014	0.022	0.026	0.030	0.042	0.061	0.059
					RPM	8754	6450	5200	4450	3850	2900	2000	1650
					FEED	385	185	225	230	230	245	245	195
	5		0.05D	2D	Vc	35	39	42	45	46	46	50	53
					fz	0.010	0.017	0.023	0.034	0.040	0.053	0.061	0.063
					RPM	5570	4150	3350	2850	2450	1850	1600	1400
					FEED	223	140	155	195	195	195	195	175
	6-7	Low alloy steel	0.05D	2D	Vc	55	61	65	70	73	73	63	62
					fz	0.011	0.014	0.022	0.026	0.030	0.042	0.061	0.059
					RPM	8754	6450	5200	4450	3850	2900	2000	1650
					FEED	385	185	225	230	230	245	245	195
	8-9		0.05D	2D	Vc	35	39	42	45	46	46	50	53
					fz	0.010	0.017	0.023	0.034	0.040	0.053	0.061	0.063
					RPM	5570	4150	3350	2850	2450	1850	1600	1400
					FEED	223	140	155	195	195	195	195	175
	10	High alloyed steel, and tool steel	0.05D	2D	Vc	55	61	65	70	73	73	63	62
					fz	0.011	0.014	0.022	0.026	0.030	0.042	0.061	0.059
					RPM	8754	6450	5200	4450	3850	2900	2000	1650
					FEED	385	185	225	230	230	245	245	195
	11.1 ~ 11.2		0.05D	2D	Vc	35	39	42	45	46	46	50	53
					fz	0.010	0.017	0.023	0.034	0.040	0.053	0.061	0.063
					RPM	5570	4150	3350	2850	2450	1850	1600	1400
					FEED	223	140	155	195	195	195	195	175
K	15-16	Grey cast iron	0.05D	2.0D	Vc	55	61	65	70	73	73	63	62
					fz	0.011	0.014	0.022	0.026	0.030	0.042	0.061	0.059
					RPM	8754	6450	5200	4450	3850	2900	2000	1650
					FEED	385	185	225	230	230	245	245	195
	17-18	Nodular cast iron	0.05D	2.0D	Vc	55	61	65	70	73	73	63	62
					fz	0.011	0.014	0.022	0.026	0.030	0.042	0.061	0.059
					RPM	8754	6450	5200	4450	3850	2900	2000	1650
					FEED	385	185	225	230	230	245	245	195
	19-20	Malleable cast iron	0.05D	2.0D	Vc	55	61	65	70	73	73	63	62
					fz	0.011	0.014	0.022	0.026	0.030	0.042	0.061	0.059
					RPM	8754	6450	5200	4450	3850	2900	2000	1650
					FEED	385	185	225	230	230	245	245	195
H	38.1 38.2	Hardened steel	0.02D	2D	Vc	25	29	31	35	36	38	36	36
					fz	0.009	0.016	0.020	0.026	0.030	0.038	0.050	0.042
					RPM	3979	3050	2500	2200	1900	1500	1150	950
					FEED	143	95	100	115	115	115	115	80
	40	Chilled Cast Iron	0.05D	2D	Vc	35	39	42	45	46	46	50	53
					fz	0.010	0.017	0.023	0.034	0.040	0.053	0.061	0.063
					RPM	5570	4150	3350	2850	2450	1850	1600	1400
					FEED	223	140	155	195	195	195	195	175
	41	Hardened Cast Iron	0.05D	2D	Vc	25	29	31	35	36	38	36	36
					fz	0.009	0.016	0.020	0.026	0.030	0.038	0.050	0.042
					RPM	3979	3050	2500	2200	1900	1500	1150	950
					FEED	143	95	100	115	115	115	115	80



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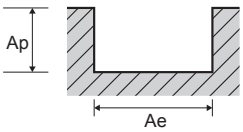
RECOMMENDED CUTTING CONDITIONS

G9F41 / G9J54 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	2.5	3.0	3.5	4.0	4.5	5.0	5.5	6.0	6.5	8.0	9.0	10.0	12.0	14.0	16.0	20.0
P	1-4	Non-alloy steel	1D	0.5D (Up to Ø3 : 0.2D)	Vc	49	48	53	58	62	66	70	72	73	75	77	77	78	76	74	75	81	80	79
					fz	0.004	0.008	0.010	0.012	0.014	0.020	0.025	0.028	0.031	0.035	0.040	0.048	0.056	0.060	0.064	0.065	0.062	0.063	0.062
					RPM	15450	10100	8500	7380	6600	6000	5550	5090	4650	4340	4100	3770	3100	2690	2350	2000	1850	1600	1250
					FEED	115	160	170	180	190	240	275	285	290	305	325	360	350	325	300	260	230	200	155
	5		1D	0.5D (Up to Ø3 : 0.2D)	Vc	29	28	35	37	39	41	43	43	43	45	47	46	46	46	46	47	51	50	47
					fz	0.004	0.008	0.010	0.013	0.016	0.020	0.024	0.027	0.031	0.036	0.041	0.045	0.050	0.050	0.050	0.048	0.048	0.050	0.050
					RPM	9200	6000	5550	4710	4100	3730	3400	3040	2750	2600	2500	2250	1850	1630	1450	1250	1150	1000	750
					FEED	70	90	110	120	130	150	165	165	170	190	205	205	185	165	145	120	110	100	75
	6-7	Low alloy steel	1D	0.5D (Up to Ø3 : 0.2D)	Vc	49	48	53	58	62	66	70	72	73	75	77	77	78	76	74	75	81	80	79
					fz	0.004	0.008	0.010	0.012	0.014	0.020	0.025	0.028	0.031	0.035	0.040	0.048	0.056	0.060	0.064	0.065	0.062	0.063	0.062
					RPM	15450	10100	8500	7380	6600	6000	5550	5090	4650	4340	4100	3770	3100	2690	2350	2000	1850	1600	1250
					FEED	115	160	170	180	190	240	275	285	290	305	325	360	350	325	300	260	230	200	155
	8-9		1D	0.5D (Up to Ø3 : 0.2D)	Vc	29	28	35	37	39	41	43	43	43	45	47	46	46	46	46	47	51	50	47
					fz	0.004	0.008	0.010	0.013	0.016	0.020	0.024	0.027	0.031	0.036	0.041	0.045	0.050	0.050	0.050	0.048	0.048	0.050	0.050
					RPM	9200	6000	5550	4710	4100	3730	3400	3040	2750	2600	2500	2250	1850	1630	1450	1250	1150	1000	750
					FEED	70	90	110	120	130	150	165	165	170	190	205	205	185	165	145	120	110	100	75
	10	High alloyed steel, and tool steel	1D	0.5D (Up to Ø3 : 0.2D)	Vc	49	48	53	58	62	66	70	72	73	75	77	77	78	76	74	75	81	80	79
					fz	0.004	0.008	0.010	0.012	0.014	0.020	0.025	0.028	0.031	0.035	0.040	0.048	0.056	0.060	0.064	0.065	0.062	0.063	0.062
					RPM	15450	10100	8500	7380	6600	6000	5550	5090	4650	4340	4100	3770	3100	2690	2350	2000	1850	1600	1250
					FEED	115	160	170	180	190	240	275	285	290	305	325	360	350	325	300	260	230	200	155
	11.1 - 11.2		1D	0.5D (Up to Ø3 : 0.2D)	Vc	29	28	35	37	39	41	43	43	43	45	47	46	46	46	46	47	51	50	47
					fz	0.004	0.008	0.010	0.013	0.016	0.020	0.024	0.027	0.031	0.036	0.041	0.045	0.050	0.050	0.050	0.048	0.048	0.050	0.050
					RPM	9200	6000	5550	4710	4100	3730	3400	3040	2750	2600	2500	2250	1850	1630	1450	1250	1150	1000	750
					FEED	70	90	110	120	130	150	165	165	170	190	205	205	185	165	145	120	110	100	75
M	14.1	Stainless steel	1D	0.5D (Up to Ø3 : 0.2D)	Vc	24	29	29	30	32	34	36	36	36	38	40	39	39	39	39	40	40	38	38
					fz	0.004	0.007	0.009	0.012	0.016	0.020	0.025	0.028	0.032	0.036	0.039	0.046	0.053	0.055	0.058	0.057	0.061	0.067	0.063
					RPM	7700	6050	4650	3820	3400	3090	2850	2550	2300	2200	2100	1910	1550	1380	1250	1050	900	750	600
					FEED	55	85	85	90	110	125	140	140	145	160	165	175	165	150	145	120	110	100	75
K	15-16	Grey cast iron	1D	1.0D	Vc	63	61	63	62	62	62	62	62	62	61	60	60	60	62	63	58	62	60	60
					fz	0.005	0.008	0.012	0.015	0.018	0.021	0.024	0.027	0.030	0.037	0.043	0.052	0.061	0.069	0.078	0.103	0.120	0.144	0.192
					RPM	20200	13050	10100	7890	6550	5640	4950	4390	3950	3530	3200	2940	2400	2190	2000	1550	1400	1200	950
					FEED	220	220	240	235	240	240	240	240	240	260	275	305	295	305	310	320	335	345	365
	17-18	Nodular cast iron	1D	1.0D	Vc	63	61	63	62	62	62	62	62	62	61	60	60	60	62	63	58	62	60	60
					fz	0.005	0.008	0.012	0.015	0.018	0.021	0.024	0.027	0.030	0.037	0.043	0.052	0.061	0.069	0.078	0.103	0.120	0.144	0.192
					RPM	20200	13050	10100	7890	6550	5640	4950	4390	3950	3530	3200	2940	2400	2190	2000	1550	1400	1200	950
					FEED	220	220	240	235	240	240	240	240	240	260	275	305	295	305	310	320	335	345	365
	19-20	Malleable cast iron	1D	1.0D	Vc	63	61	63	62	62	62	62	62	62	61	60	60	60	62	63	58	62	60	60
					fz	0.005	0.008	0.012	0.015	0.018	0.021	0.024	0.027	0.030	0.037	0.043	0.052	0.061	0.069	0.078	0.103	0.120	0.144	0.192
					RPM	20200	13050	10100	7890	6550	5640	4950	4390	3950	3530	3200	2940	2400	2190	2000	1550	1400	1200	950
					FEED	220	220	240	235	240	240	240	240	240	260	275	305	295	305	310	320	335	345	365
H	38.1 40	Hardened steel Chilled Cast Iron	1D	0.5D (Up to Ø3 : 0.2D)	Vc	29	28	35	37	39	41	43	43	43	45	47	46	46	46	46	47	51	50	47
					fz	0.004	0.008	0.010	0.013	0.016	0.020	0.024	0.027	0.031	0.036	0.041	0.045	0.050	0.050	0.050	0.048	0.048	0.050	0.050
					RPM	9200	6000	5550	4710	4100	3730	3400	3040	2750	2600	2500	2250	1850	1630	1450	1250	1150	1000	750
					FEED	70	90	110	120	130	150	165	165	170	190	205	205	185	165	145	120	110	100	75

* The FEED, in long & extra long types, should be reduced by around 50%



RECOMMENDED CUTTING CONDITIONS

G9J61 SERIES — 2 FLUTE - RIB PROCESSING

ISO	VDI 3323	Material Description	Parameter	Diameter (Ø)							
				0.4	0.5	0.6	0.7	0.8	0.9	1.0	1.2
P	1-4	Non-alloy steel	Vc	38~49	48~61	58~73	67~86	66~86	68~87	70~87	68~84
			fz	0.003~0.006	0.003~0.006	0.004~0.007	0.004~0.007	0.005~0.009	0.006~0.012	0.006~0.015	0.008~0.020
			RPM	30600~38930	30600~38930	30600~38930	30600~38930	26400~34300	24100~30600	22250~27800	18100~22250
			FEED	200~440	200~440	250~570	250~570	280~630	280~720	280~810	280~890
			Ap	0.007~0.018	0.009~0.022	0.011~0.026	0.012~0.031	0.014~0.035	0.030~0.060	0.045~0.090	0.055~0.100
	5		Vc	28~35	35~44	42~52	49~61	48~61	50~63	48~61	49~59
			fz	0.002~0.006	0.002~0.006	0.002~0.008	0.002~0.008	0.003~0.010	0.005~0.012	0.006~0.015	0.007~0.019
			RPM	22250~27800	22250~27800	22250~27800	22250~27800	19000~24100	17600~22250	15300~19450	13000~15750
			FEED	90~340	90~340	110~440	110~440	120~480	160~540	190~590	190~590
			Ap	0.007~0.018	0.009~0.022	0.011~0.026	0.012~0.031	0.014~0.035	0.030~0.060	0.045~0.090	0.055~0.100
	6-7	Low alloy steel	Vc	38~49	48~61	58~73	67~86	66~86	68~87	70~87	68~84
			fz	0.003~0.006	0.003~0.006	0.004~0.007	0.004~0.007	0.005~0.009	0.006~0.012	0.006~0.015	0.008~0.020
			RPM	30600~38930	30600~38930	30600~38930	30600~38930	26400~34300	24100~30600	22250~27800	18100~22250
			FEED	200~440	200~440	250~570	250~570	280~630	280~720	280~810	280~890
			Ap	0.007~0.018	0.009~0.022	0.011~0.026	0.012~0.031	0.014~0.035	0.030~0.060	0.045~0.090	0.055~0.100
	8-9		Vc	28~35	35~44	42~52	49~61	48~61	50~63	48~61	49~59
			fz	0.002~0.006	0.002~0.006	0.002~0.008	0.002~0.008	0.003~0.010	0.005~0.012	0.006~0.015	0.007~0.019
			RPM	22250~27800	22250~27800	22250~27800	22250~27800	19000~24100	17600~22250	15300~19450	13000~15750
			FEED	90~340	90~340	110~440	110~440	120~480	160~540	190~590	190~590
			Ap	0.007~0.018	0.009~0.022	0.011~0.026	0.012~0.031	0.014~0.035	0.030~0.060	0.045~0.090	0.055~0.100
	10	High alloyed steel, and tool steel	Vc	38~49	48~61	58~73	67~86	66~86	68~87	70~87	68~84
			fz	0.003~0.006	0.003~0.006	0.004~0.007	0.004~0.007	0.005~0.009	0.006~0.012	0.006~0.015	0.008~0.020
			RPM	30600~38930	30600~38930	30600~38930	30600~38930	26400~34300	24100~30600	22250~27800	18100~22250
			FEED	200~440	200~440	250~570	250~570	280~630	280~720	280~810	280~890
			Ap	0.007~0.018	0.009~0.022	0.011~0.026	0.012~0.031	0.014~0.035	0.030~0.060	0.045~0.090	0.055~0.100
	11.1 - 11.2		Vc	28~35	35~44	42~52	49~61	48~61	50~63	48~61	49~59
			fz	0.002~0.006	0.002~0.006	0.002~0.008	0.002~0.008	0.003~0.010	0.005~0.012	0.006~0.015	0.007~0.019
			RPM	22250~27800	22250~27800	22250~27800	22250~27800	19000~24100	17600~22250	15300~19450	13000~15750
			FEED	90~340	90~340	110~440	110~440	120~480	160~540	190~590	190~590
			Ap	0.007~0.018	0.009~0.022	0.011~0.026	0.012~0.031	0.014~0.035	0.030~0.060	0.045~0.090	0.055~0.100
H	38.1 38.2	Hardened steel	Vc	17~21	22~26	26~31	31~37	30~36	30~35	31~39	31~38
			fz	0.001~0.003	0.001~0.003	0.001~0.003	0.001~0.003	0.002~0.005	0.002~0.005	0.004~0.005	0.004~0.006
			RPM	13900~16700	13900~16700	13900~16700	13900~16700	12050~14350	10650~12500	9750~12500	8350~10200
			FEED	30~90	30~90	40~110	40~110	45~130	50~130	70~130	70~130
			Ap	0.004~0.008	0.004~0.009	0.005~0.011	0.006~0.013	0.007~0.015	0.008~0.016	0.009~0.018	0.010~0.022
	40	Chilled Cast Iron	Vc	28~35	35~44	42~52	49~61	48~61	50~63	48~61	49~59
			fz	0.002~0.006	0.002~0.006	0.002~0.008	0.002~0.008	0.003~0.010	0.005~0.012	0.006~0.015	0.007~0.019
			RPM	22250~27800	22250~27800	22250~27800	22250~27800	19000~24100	17600~22250	15300~19450	13000~15750
			FEED	90~340	90~340	110~440	110~440	120~480	160~540	190~590	190~590
			Ap	0.007~0.018	0.009~0.022	0.011~0.026	0.012~0.031	0.014~0.035	0.030~0.060	0.045~0.090	0.055~0.100
	41	Hardened Cast Iron	Vc	17~21	22~26	26~31	31~37	30~36	30~35	31~39	31~38
			fz	0.001~0.003	0.001~0.003	0.001~0.003	0.001~0.003	0.002~0.005	0.002~0.005	0.004~0.005	0.004~0.006
			RPM	13900~16700	13900~16700	13900~16700	13900~16700	12050~14350	10650~12500	9750~12500	8350~10200
			FEED	30~90	30~90	40~110	40~110	45~130	50~130	70~130	70~130
			Ap	0.004~0.008	0.004~0.009	0.005~0.011	0.006~0.013	0.007~0.015	0.008~0.016	0.009~0.018	0.010~0.022

▶ NEXT PAGE

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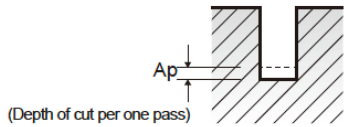
RECOMMENDED CUTTING CONDITIONS

G9J61 SERIES — 2 FLUTE - RIB PROCESSING

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

ISO	VDI 3323	Material Description	Parameter	Diameter (Ø)									
				1.4	1.5	1.6	1.8	2.0	2.5	3.0	4.0	5.0	6.0
P	1-4	Non-alloy steel	Vc	69~86	68~87	70~88	74~94	73~90	73~95	16~92	76~93	73~95	88~96
			fz	0.009~0.023	0.010~0.024	0.010~0.025	0.011~0.027	0.012~0.031	0.015~0.037	0.082~0.046	0.023~0.060	0.030~0.074	0.030~0.087
			RPM	15750~19450	14350~18550	13900~17600	13000~16700	11600~14350	9250~12050	1700~9750	6050~7400	4650~6050	4650~5100
			FEED	280~890	280~890	280~890	280~890	280~890	280~890	280~890	280~890	280~890	280~890
			Ap	0.062~0.125	0.070~0.135	0.075~0.145	0.080~0.160	0.090~0.180	0.112~0.235	0.135~0.270	0.180~0.360	0.225~0.450	0.270~0.540
	5		Vc	49~61	48~63	51~63	52~63	52~64	51~66	52~66	52~64	51~65	53~70
			fz	0.009~0.021	0.009~0.022	0.009~0.024	0.010~0.027	0.011~0.029	0.015~0.035	0.017~0.042	0.023~0.058	0.029~0.071	0.034~0.080
			RPM	11100~13900	10200~13450	10200~12500	9250~11100	8350~10200	6500~8350	5550~6950	4150~5100	3250~4150	2800~3700
			FEED	190~590	190~590	190~590	190~590	190~590	190~590	190~590	190~590	190~590	190~590
			Ap	0.062~0.125	0.070~0.135	0.075~0.140	0.080~0.160	0.090~0.180	0.112~0.235	0.135~0.270	0.180~0.360	0.225~0.450	0.270~0.540
	6-7	Low alloy steel	Vc	69~86	68~87	70~88	74~94	73~90	73~95	16~92	76~93	73~95	88~96
			fz	0.009~0.023	0.010~0.024	0.010~0.025	0.011~0.027	0.012~0.031	0.015~0.037	0.082~0.046	0.023~0.060	0.030~0.074	0.030~0.087
			RPM	15750~19450	14350~18550	13900~17600	13000~16700	11600~14350	9250~12050	1700~9750	6050~7400	4650~6050	4650~5100
			FEED	280~890	280~890	280~890	280~890	280~890	280~890	280~890	280~890	280~890	280~890
			Ap	0.062~0.125	0.070~0.135	0.075~0.145	0.080~0.160	0.090~0.180	0.112~0.235	0.135~0.270	0.180~0.360	0.225~0.450	0.270~0.540
	8-9		Vc	49~61	48~63	51~63	52~63	52~64	51~66	52~66	52~64	51~65	53~70
			fz	0.009~0.021	0.009~0.022	0.009~0.024	0.010~0.027	0.011~0.029	0.015~0.035	0.017~0.042	0.023~0.058	0.029~0.071	0.034~0.080
			RPM	11100~13900	10200~13450	10200~12500	9250~11100	8350~10200	6500~8350	5550~6950	4150~5100	3250~4150	2800~3700
			FEED	190~590	190~590	190~590	190~590	190~590	190~590	190~590	190~590	190~590	190~590
			Ap	0.062~0.125	0.070~0.135	0.075~0.140	0.080~0.160	0.090~0.180	0.112~0.235	0.135~0.270	0.180~0.360	0.225~0.450	0.270~0.540
	10	High alloyed steel, and tool steel	Vc	69~86	68~87	70~88	74~94	73~90	73~95	16~92	76~93	73~95	88~96
			fz	0.009~0.023	0.010~0.024	0.010~0.025	0.011~0.027	0.012~0.031	0.015~0.037	0.082~0.046	0.023~0.060	0.030~0.074	0.030~0.087
			RPM	15750~19450	14350~18550	13900~17600	13000~16700	11600~14350	9250~12050	1700~9750	6050~7400	4650~6050	4650~5100
			FEED	280~890	280~890	280~890	280~890	280~890	280~890	280~890	280~890	280~890	280~890
			Ap	0.062~0.125	0.070~0.135	0.075~0.145	0.080~0.160	0.090~0.180	0.112~0.235	0.135~0.270	0.180~0.360	0.225~0.450	0.270~0.540
	11.1 - 11.2		Vc	49~61	48~63	51~63	52~63	52~64	51~66	52~66	52~64	51~65	53~70
			fz	0.009~0.021	0.009~0.022	0.009~0.024	0.010~0.027	0.011~0.029	0.015~0.035	0.017~0.042	0.023~0.058	0.029~0.071	0.034~0.080
			RPM	11100~13900	10200~13450	10200~12500	9250~11100	8350~10200	6500~8350	5550~6950	4150~5100	3250~4150	2800~3700
			FEED	190~590	190~590	190~590	190~590	190~590	190~590	190~590	190~590	190~590	190~590
			Ap	0.062~0.125	0.070~0.135	0.075~0.140	0.080~0.160	0.090~0.180	0.112~0.235	0.135~0.270	0.180~0.360	0.225~0.450	0.270~0.540
H	38.1 38.2	Hardened steel	Vc	31~39	31~37	30~40	31~39	32~41	33~40	31~39	31~41	32~41	35~53
			fz	0.005~0.007	0.005~0.008	0.006~0.008	0.006~0.009	0.007~0.010	0.008~0.013	0.011~0.016	0.014~0.020	0.017~0.025	0.019~0.023
			RPM	6950~8800	6500~7900	6050~7900	5550~6950	5100~6500	4150~5100	3250~4150	2500~3250	2050~2600	1850~2800
			FEED	70~130	70~130	70~130	70~130	70~130	70~130	70~130	70~130	70~130	70~130
			Ap	0.012~0.025	0.014~0.028	0.015~0.030	0.016~0.032	0.018~0.035	0.022~0.045	0.028~0.055	0.036~0.072	0.045~0.090	0.054~0.108
	40	Chilled Cast Iron	Vc	49~61	48~63	51~63	52~63	52~64	51~66	52~66	52~64	51~65	53~70
			fz	0.009~0.021	0.009~0.022	0.009~0.024	0.010~0.027	0.011~0.029	0.015~0.035	0.017~0.042	0.023~0.058	0.029~0.071	0.034~0.080
			RPM	11100~13900	10200~13450	10200~12500	9250~11100	8350~10200	6500~8350	5550~6950	4150~5100	3250~4150	2800~3700
			FEED	190~590	190~590	190~590	190~590	190~590	190~590	190~590	190~590	190~590	190~590
			Ap	0.062~0.125	0.070~0.135	0.075~0.140	0.080~0.160	0.090~0.180	0.112~0.235	0.135~0.270	0.180~0.360	0.225~0.450	0.270~0.540
	41	Hardened Cast Iron	Vc	31~39	31~37	30~40	31~39	32~41	33~40	31~39	31~41	32~41	35~53
			fz	0.005~0.007	0.005~0.008	0.006~0.008	0.006~0.009	0.007~0.010	0.008~0.013	0.011~0.016	0.014~0.020	0.017~0.025	0.019~0.023
			RPM	6950~8800	6500~7900	6050~7900	5550~6950	5100~6500	4150~5100	3250~4150	2500~3250	2050~2600	1850~2800
			FEED	70~130	70~130	70~130	70~130	70~130	70~130	70~130	70~130	70~130	70~130
			Ap	0.012~0.025	0.014~0.028	0.015~0.030	0.016~0.032	0.018~0.035	0.022~0.045	0.028~0.055	0.036~0.072	0.045~0.090	0.054~0.108



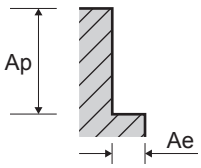
RECOMMENDED CUTTING CONDITIONS

G9F43 / G9J59 SERIES

3 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	2.0	2.5	3.0	3.5	4.0	5.0	6.0	8.0	10.0	12.0	14.0	16.0	20.0
P	1-4	Non-alloy steel	0.05D	1D	Vc	49	53	58	62	66	70	73	77	78	74	75	81	80	79
					fz	0.005	0.012	0.014	0.017	0.024	0.030	0.037	0.048	0.068	0.077	0.078	0.075	0.075	0.075
					RPM	15450	8500	7385	6600	600	5550	4650	4100	3100	2350	2000	1850	1600	1250
					FEED	210	305	310	340	430	500	520	590	630	540	470	415	360	280
	5		0.05D	1D	Vc	29	35	37	39	41	43	43	47	46	46	47	51	50	47
					fz	0.005	0.012	0.016	0.019	0.024	0.029	0.037	0.049	0.060	0.061	0.057	0.058	0.060	0.062
					RPM	9200	5550	4710	4100	3730	3400	2750	2500	1850	1450	1250	1150	1000	750
					FEED	125	200	225	235	270	300	305	370	335	265	215	200	180	140
	6-7	Low alloy steel	0.05D	1D	Vc	49	53	58	62	66	70	73	77	78	74	75	81	80	79
					fz	0.005	0.012	0.014	0.017	0.024	0.030	0.037	0.048	0.068	0.077	0.078	0.075	0.075	0.075
					RPM	15450	8500	7385	6600	600	5550	4650	4100	3100	2350	2000	1850	1600	1250
					FEED	210	305	310	340	430	500	520	590	630	540	470	415	360	280
	8-9		0.05D	1D	Vc	29	35	37	39	41	43	43	47	46	46	47	51	50	47
					fz	0.005	0.012	0.016	0.019	0.024	0.029	0.037	0.049	0.060	0.061	0.057	0.058	0.060	0.062
					RPM	9200	5550	4710	4100	3730	3400	2750	2500	1850	1450	1250	1150	1000	750
					FEED	125	200	225	235	270	300	305	370	335	265	215	200	180	140
	10	High alloyed steel, and tool steel	0.05D	1D	Vc	49	53	58	62	66	70	73	77	78	74	75	81	80	79
					fz	0.005	0.012	0.014	0.017	0.024	0.030	0.037	0.048	0.068	0.077	0.078	0.075	0.075	0.075
					RPM	15450	8500	7385	6600	600	5550	4650	4100	3100	2350	2000	1850	1600	1250
					FEED	210	305	310	340	430	500	520	590	630	540	470	415	360	280
	11.1 ~ 11.2		0.05D	1D	Vc	29	35	37	39	41	43	43	47	46	46	47	51	50	47
					fz	0.005	0.012	0.016	0.019	0.024	0.029	0.037	0.049	0.060	0.061	0.057	0.058	0.060	0.062
					RPM	9200	5550	4710	4100	3730	3400	2750	2500	1850	1450	1250	1150	1000	750
					FEED	125	200	225	235	270	300	305	370	335	265	215	200	180	140
M	14.1	Stainless steel	0.05D	1D	Vc	24	29	30	32	34	36	36	40	39	39	40	40	38	38
					fz	0.004	0.011	0.015	0.020	0.024	0.029	0.038	0.042	0.057	0.071	0.068	0.074	0.080	0.078
					RPM	7700	4650	3820	3400	3090	2850	2300	2100	1550	1250	1050	900	750	600
					FEED	100	155	170	200	225	250	265	265	265	265	215	200	180	140
K	15-16	Grey cast iron	0.05D	1D	Vc	63	63	62	62	62	62	62	60	60	63	58	62	60	60
					fz	0.006	0.013	0.017	0.020	0.023	0.027	0.033	0.047	0.068	0.085	0.114	0.132	0.158	0.212
					RPM	20200	10100	7895	6550	5640	4950	3950	3200	2400	2000	1550	1400	1200	950
					FEED	365	395	405	395	390	395	395	455	490	510	530	555	570	605
	17-18	Nodular cast iron	0.05D	1D	Vc	63	63	62	62	62	62	62	60	60	63	58	62	60	60
					fz	0.006	0.013	0.017	0.020	0.023	0.027	0.033	0.047	0.068	0.085	0.114	0.132	0.158	0.212
					RPM	20200	10100	7895	6550	5640	4950	3950	3200	2400	2000	1550	1400	1200	950
					FEED	365	395	405	395	390	395	395	455	490	510	530	555	570	605
	19-20	Malleable cast iron	0.05D	1D	Vc	63	63	62	62	62	62	62	60	60	63	58	62	60	60
					fz	0.006	0.013	0.017	0.020	0.023	0.027	0.033	0.047	0.068	0.085	0.114	0.132	0.158	0.212
					RPM	20200	10100	7895	6550	5640	4950	3950	3200	2400	2000	1550	1400	1200	950
					FEED	365	395	405	395	390	395	395	455	490	510	530	555	570	605
H	38.1	Hardened steel	0.05D	1D	Vc	29	35	37	39	41	43	43	47	46	46	47	51	50	47
					fz	0.005	0.012	0.016	0.019	0.024	0.029	0.037	0.049	0.060	0.061	0.057	0.058	0.060	0.062
					RPM	9200	5550	4710	4100	3730	3400	2750	2500	1850	1450	1250	1150	1000	750
					FEED	125	200	225	235	270	300	305	370	335	265	215	200	180	140
	40	Chilled Cast Iron	0.05D	1D	Vc	29	35	37	39	41	43	43	47	46	46	47	51	50	47
					fz	0.005	0.012	0.016	0.019	0.024	0.029	0.037	0.049	0.060	0.061	0.057	0.058	0.060	0.062
					RPM	9200	5550	4710	4100	3730	3400	2750	2500	1850	1450	1250	1150	1000	750
					FEED	125	200	225	235	270	300	305	370	335	265	215	200	180	140



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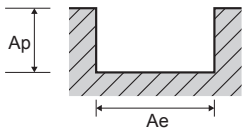
RECOMMENDED CUTTING CONDITIONS

G9F43 / G9J59 SERIES — 3 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	2	2.5	3	3.5	4	5	6	8	10	12	14	16	20
P	1-4	Non-alloy steel	1D	0.5D (Up to Ø3 : 0.2D)	Vc	49	53	58	62	66	70	73	77	78	74	75	81	80	79
					fz	0.004	0.010	0.012	0.014	0.019	0.025	0.031	0.040	0.056	0.064	0.065	0.062	0.063	0.062
					RPM	15450	8500	7385	6600	6000	5550	4650	4100	3100	2350	2000	1850	1600	1250
					FEED	175	255	265	285	340	415	435	490	525	450	390	345	300	235
	5		1D	0.5D (Up to Ø3 : 0.2D)	Vc	29	35	37	39	41	43	43	47	46	46	47	51	50	47
					fz	0.004	0.010	0.013	0.016	0.020	0.024	0.031	0.041	0.050	0.050	0.048	0.048	0.050	0.050
					RPM	9200	5550	4710	4100	3730	3400	2750	2500	1850	1450	1250	1150	1000	750
					FEED	105	165	185	195	225	250	255	310	280	220	180	165	150	115
	6-7	Low alloy steel	1D	0.5D (Up to Ø3 : 0.2D)	Vc	49	53	58	62	66	70	73	77	78	74	75	81	80	79
					fz	0.004	0.010	0.012	0.014	0.019	0.025	0.031	0.040	0.056	0.064	0.065	0.062	0.063	0.062
					RPM	15450	8500	7385	6600	6000	5550	4650	4100	3100	2350	2000	1850	1600	1250
					FEED	175	255	265	285	340	415	435	490	525	450	390	345	300	235
	8-9		1D	0.5D (Up to Ø3 : 0.2D)	Vc	29	35	37	39	41	43	43	47	46	46	47	51	50	47
					fz	0.004	0.010	0.013	0.016	0.020	0.024	0.031	0.041	0.050	0.050	0.048	0.048	0.050	0.050
					RPM	9200	5550	4710	4100	3730	3400	2750	2500	1850	1450	1250	1150	1000	750
					FEED	105	165	185	195	225	250	255	310	280	220	180	165	150	115
	10	High alloyed steel, and tool steel	1D	0.5D (Up to Ø3 : 0.2D)	Vc	49	53	58	62	66	70	73	77	78	74	75	81	80	79
					fz	0.004	0.010	0.012	0.014	0.019	0.025	0.031	0.040	0.056	0.064	0.065	0.062	0.063	0.062
					RPM	15450	8500	7385	6600	6000	5550	4650	4100	3100	2350	2000	1850	1600	1250
					FEED	175	255	265	285	340	415	435	490	525	450	390	345	300	235
	11.1 ~ 11.2		1D	0.5D (Up to Ø3 : 0.2D)	Vc	29	35	37	39	41	43	43	47	46	46	47	51	50	47
					fz	0.004	0.010	0.013	0.016	0.020	0.024	0.031	0.041	0.050	0.050	0.048	0.048	0.050	0.050
					RPM	9200	5550	4710	4100	3730	3400	2750	2500	1850	1450	1250	1150	1000	750
					FEED	105	165	185	195	225	250	255	310	280	220	180	165	150	115
M	14.1	Stainless steel	1D	0.5D (Up to Ø3 : 0.2D)	Vc	24	29	30	32	34	36	36	40	39	39	40	40	38	38
					fz	0.004	0.009	0.012	0.016	0.020	0.025	0.032	0.039	0.053	0.058	0.057	0.061	0.067	0.063
					RPM	7700	4650	3820	3400	3090	2850	2300	2100	1550	1250	1050	900	750	600
					FEED	85	130	140	165	185	210	220	220	220	220	180	165	150	115
K	15-16	Grey cast iron	1D	1D	Vc	63	63	62	62	62	62	62	60	60	63	58	62	60	60
					fz	0.005	0.012	0.015	0.018	0.021	0.024	0.030	0.043	0.061	0.078	0.103	0.120	0.144	0.192
					RPM	20200	10100	7895	6550	5640	4950	3950	3200	2400	2000	1550	1400	1200	950
					FEED	330	360	355	360	355	360	360	415	445	465	480	505	520	550
	17-18	Nodular cast iron	1D	1D	Vc	63	63	62	62	62	62	62	60	60	63	58	62	60	60
					fz	0.005	0.012	0.015	0.018	0.021	0.024	0.030	0.043	0.061	0.078	0.103	0.120	0.144	0.192
					RPM	20200	10100	7895	6550	5640	4950	3950	3200	2400	2000	1550	1400	1200	950
					FEED	330	360	355	360	355	360	360	415	445	465	480	505	520	550
	19-20	Malleable cast iron	1D	1D	Vc	63	63	62	62	62	62	62	60	60	63	58	62	60	60
					fz	0.005	0.012	0.015	0.018	0.021	0.024	0.030	0.043	0.061	0.078	0.103	0.120	0.144	0.192
					RPM	20200	10100	7895	6550	5640	4950	3950	3200	2400	2000	1550	1400	1200	950
					FEED	330	360	355	360	355	360	360	415	445	465	480	505	520	550
H	38.1	Hardened steel	1D	0.5D (Up to Ø3 : 0.2D)	Vc	29	35	37	39	41	43	43	47	46	46	47	51	50	47
					fz	0.004	0.010	0.013	0.016	0.020	0.024	0.031	0.041	0.050	0.050	0.048	0.048	0.050	0.050
					RPM	9200	5550	4710	4100	3730	3400	2750	2500	1850	1450	1250	1150	1000	750
					FEED	105	165	185	195	225	250	255	310	280	220	180	165	150	115
	40	Chilled Cast Iron	1D	0.5D (Up to Ø3 : 0.2D)	Vc	29	35	37	39	41	43	43	47	46	46	47	51	50	47
					fz	0.004	0.010	0.013	0.016	0.020	0.024	0.031	0.041	0.050	0.050	0.048	0.048	0.050	0.050
					RPM	9200	5550	4710	4100	3730	3400	2750	2500	1850	1450	1250	1150	1000	750
					FEED	105	165	185	195	225	250	255	310	280	220	180	165	150	115



RECOMMENDED CUTTING CONDITIONS

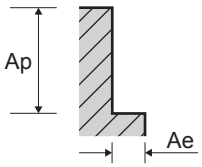
G9F42 / G9J55 SERIES

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	2.5	3.0	3.5	4.0	4.5	5.0	6.0	7.0	8.0	9.0	10.0	12.0	14.0	16.0	20.0
P	1-4	Non-alloy steel	0.1D	1D	Vc	60	60	67	72	77	82	87	89	91	96	96	97	96	93	96	99	101	97
					fz	0.002	0.005	0.006	0.007	0.009	0.014	0.019	0.021	0.024	0.030	0.037	0.043	0.045	0.047	0.047	0.047	0.048	0.047
					RPM	19000	12750	10650	9165	8200	7460	6950	6295	5800	5100	4365	3850	3395	2950	2550	2250	2000	1550
					FEED	160	230	260	255	290	420	525	530	550	605	645	655	611	560	475	425	380	290
	5		0.1D	1D	Vc	35	36	44	46	49	51	53	53	54	58	58	58	58	58	58	62	63	60
					fz	0.002	0.004	0.006	0.007	0.009	0.014	0.019	0.021	0.024	0.031	0.035	0.038	0.037	0.037	0.037	0.038	0.037	0.038
					RPM	11050	7600	6950	5855	5150	4640	4250	3750	3450	3100	2640	2300	2050	1850	1550	1400	1250	950
					FEED	90	125	155	165	185	260	325	315	330	380	370	350	305	275	230	210	185	145
	6-7	Low alloy steel	0.1D	1D	Vc	60	60	67	72	77	82	87	89	91	96	96	97	96	93	96	99	101	97
					fz	0.002	0.005	0.006	0.007	0.009	0.014	0.019	0.021	0.024	0.030	0.037	0.043	0.045	0.047	0.047	0.047	0.048	0.047
					RPM	19000	12750	10650	9165	8200	7460	6950	6295	5800	5100	4365	3850	3395	2950	2550	2250	2000	1550
					FEED	160	230	260	255	290	420	525	530	550	605	645	655	611	560	475	425	380	290
	8-9		0.1D	1D	Vc	35	36	44	46	49	51	53	53	54	58	58	58	58	58	58	62	63	60
					fz	0.002	0.004	0.006	0.007	0.009	0.014	0.019	0.021	0.024	0.031	0.035	0.038	0.037	0.037	0.037	0.038	0.037	0.038
					RPM	11050	7600	6950	5855	5150	4640	4250	3750	3450	3100	2640	2300	2050	1850	1550	1400	1250	950
					FEED	90	125	155	165	185	260	325	315	330	380	370	350	305	275	230	210	185	145
	10	High alloyed steel, and tool steel	0.1D	1D	Vc	60	60	67	72	77	82	87	89	91	96	96	97	96	93	96	99	101	97
					fz	0.002	0.005	0.006	0.007	0.009	0.014	0.019	0.021	0.024	0.030	0.037	0.043	0.045	0.047	0.047	0.047	0.048	0.047
					RPM	19000	12750	10650	9165	8200	7460	6950	6295	5800	5100	4365	3850	3395	2950	2550	2250	2000	1550
					FEED	160	230	260	255	290	420	525	530	550	605	645	655	611	560	475	425	380	290
	11.1 ~ 11.2		0.1D	1D	Vc	35	36	44	46	49	51	53	53	54	58	58	58	58	58	58	62	63	60
					fz	0.002	0.004	0.006	0.007	0.009	0.014	0.019	0.021	0.024	0.031	0.035	0.038	0.037	0.037	0.037	0.038	0.037	0.038
					RPM	11050	7600	6950	5855	5150	4640	4250	3750	3450	3100	2640	2300	2050	1850	1550	1400	1250	950
					FEED	90	125	155	165	185	260	325	315	330	380	370	350	305	275	230	210	185	145
M	14.1	Stainless steel	0.1D	1D	Vc	29	36	36	38	40	42	45	45	46	49	49	49	48	47	47	51	53	47
					fz	0.002	0.004	0.006	0.007	0.009	0.013	0.018	0.021	0.024	0.029	0.035	0.042	0.044	0.046	0.044	0.045	0.044	0.047
					RPM	9350	7600	5800	4840	4250	3820	3550	3185	2900	2600	2230	1950	1700	1500	1250	1150	1050	750
					FEED	80	130	130	135	155	200	260	270	275	300	315	325	300	275	220	205	185	140
K	15-16	Grey cast iron	0.1D	1.5D	Vc	63	61	63	62	62	62	62	62	62	60	60	60	62	63	58	62	60	60
					fz	0.008	0.013	0.017	0.022	0.026	0.031	0.035	0.040	0.044	0.065	0.079	0.092	0.104	0.116	0.156	0.182	0.219	0.295
					RPM	20200	13050	10100	4895	6550	5640	4950	4385	3950	3200	2730	2400	2195	2000	1550	1400	1200	950
					FEED	670	670	690	695	690	700	690	700	690	830	865	880	915	930	970	1020	1050	1120
	17-18	Nodular cast iron	0.1D	1.5D	Vc	63	61	63	62	62	62	62	62	62	60	60	60	62	63	58	62	60	60
					fz	0.008	0.013	0.017	0.022	0.026	0.031	0.035	0.040	0.044	0.065	0.079	0.092	0.104	0.116	0.156	0.182	0.219	0.295
					RPM	20200	13050	10100	4895	6550	5640	4950	4385	3950	3200	2730	2400	2195	2000	1550	1400	1200	950
					FEED	670	670	690	695	690	700	690	700	690	830	865	880	915	930	970	1020	1050	1120
	19-20	Malleable cast iron	0.1D	1.5D	Vc	63	61	63	62	62	62	62	62	62	60	60	60	62	63	58	62	60	60
					fz	0.008	0.013	0.017	0.022	0.026	0.031	0.035	0.040	0.044	0.065	0.079	0.092	0.104	0.116	0.156	0.182	0.219	0.295
					RPM	20200	13050	10100	4895	6550	5640	4950	4385	3950	3200	2730	2400	2195	2000	1550	1400	1200	950
					FEED	670	670	690	695	690	700	690	700	690	830	865	880	915	930	970	1020	1050	1120
H	38.1	Hardened steel	0.1D	1D	Vc	35	36	44	46	49	51	53	53	54	58	58	58	58	58	58	62	63	60
					fz	0.002	0.004	0.006	0.007	0.009	0.014	0.019	0.021	0.024	0.031	0.035	0.038	0.037	0.037	0.037	0.038	0.037	0.038
					RPM	11050	7600	6950	5855	5150	4640	4250	3750	3450	3100	2640	2300	2050	1850	1550	1400	1250	950
					FEED	90	125	155	165	185	260	325	315	330	380	370	350	305	275	230	210	185	145
	40	Chilled Cast Iron	0.1D	1D	Vc	35	36	44	46	49	51	53	53	54	58	58	58	58	58	58	62	63	60
					fz	0.002	0.004	0.006	0.007	0.009	0.014	0.019	0.021	0.024	0.031	0.035	0.038	0.037	0.037	0.037	0.038	0.037	0.038
					RPM	11050	7600	6950	5855	5150	4640	4250	3750	3450	3100	2640	2300	2050	1850	1550	1400	1250	950
					FEED	90	125	155	165	185	260	325	315	330	380	370	350	305	275	230	210	185	145

* The FEED, in long & extra long types, should be reduced by around 50%



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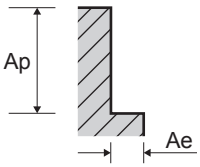
RECOMMENDED CUTTING CONDITIONS

G9J58 SERIES — 6 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) 6.0	8.0	10.0	12.0	16.0
P	3-4	Non-alloy steel	0.05D	1.5D	Vc	105	106	104	107	106
					fz	0.030	0.038	0.045	0.053	0.062
					RPM	5590	4210	3320	2835	2105
					FEED	995	960	900	895	785
	5		0.03D	1.5D	Vc	70	71	70	71	71
					fz	0.030	0.038	0.045	0.053	0.062
					RPM	3725	2810	2215	1890	1405
					FEED	675	640	600	600	520
	7	Low alloy steel	0.05D	1.5D	Vc	105	106	104	107	106
					fz	0.030	0.038	0.045	0.053	0.062
					RPM	5590	4210	3320	2835	2105
					FEED	995	960	900	895	785
	8-9		0.03D	1.5D	Vc	70	71	70	71	71
					fz	0.030	0.038	0.045	0.053	0.062
					RPM	3725	2810	2215	1890	1405
					FEED	675	640	600	600	520
	11.1 11.2	High alloyed steel, and tool steel	0.03D	1.5D	Vc	70	71	70	71	71
					fz	0.030	0.038	0.045	0.053	0.062
					RPM	3725	2810	2215	1890	1405
					FEED	675	640	600	600	520
K	15-16	Grey cast iron	0.05D	1.5D	Vc	105	106	104	107	106
					fz	0.030	0.038	0.045	0.053	0.062
					RPM	5590	4210	3320	2835	2105
					FEED	995	960	900	895	785
	17-18	Nodular cast iron	0.05D	1.5D	Vc	105	106	104	107	106
					fz	0.030	0.038	0.045	0.053	0.062
					RPM	5590	4210	3320	2835	2105
					FEED	995	960	900	895	785
	19-20	Malleable cast iron	0.05D	1.5D	Vc	105	106	104	107	106
					fz	0.030	0.038	0.045	0.053	0.062
					RPM	5590	4210	3320	2835	2105
					FEED	995	960	900	895	785
H	38.1	Hardened steel	0.03D	1.5D	Vc	54	54	54	54	54
					fz	0.023	0.029	0.033	0.039	0.046
					RPM	2860	2160	1730	1440	1080
					FEED	400	370	340	340	300
	38.2		0.02D	1D	Vc	43	44	43	43	44
					fz	0.018	0.023	0.027	0.032	0.038
					RPM	2270	1730	1380	1135	865
					FEED	250	235	220	215	195
	40	Chilled Cast Iron	0.03D	1.5D	Vc	70	71	70	71	71
					fz	0.030	0.038	0.045	0.053	0.062
					RPM	3725	2810	2215	1890	1405
					FEED	675	640	600	600	520
	41	Hardened Cast Iron	0.02D	1D	Vc	43	44	43	43	44
					fz	0.018	0.023	0.027	0.032	0.038
					RPM	2270	1730	1380	1135	865
					FEED	250	235	220	215	195

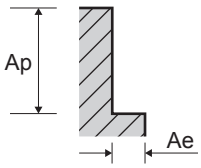


RECOMMENDED CUTTING CONDITIONS

G9J60 SERIES — 3&4 FLUTE ROUGHING - 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	16.0	20.0
P	1-4	Non-alloy steel	0.3D	1.5D	Vc	265	262	260	271	271	271
					fz	0.050	0.067	0.063	0.075	0.100	0.113
					RPM	14040	10440	8280	7200	5400	4320
					FEED	2090	2090	2090	2160	2160	1945
	5		0.3D	1.5D	Vc	210	208	215	204	217	204
					fz	0.023	0.030	0.028	0.033	0.040	0.039
					RPM	11160	8280	6840	5400	4320	3240
					FEED	755	755	755	720	685	505
	6-7	Low alloy steel	0.3D	1.5D	Vc	265	262	260	271	271	271
					fz	0.050	0.067	0.063	0.075	0.100	0.113
					RPM	14040	10440	8280	7200	5400	4320
					FEED	2090	2090	2090	2160	2160	1945
	8-9		0.3D	1.5D	Vc	210	208	215	204	217	204
					fz	0.023	0.030	0.028	0.033	0.040	0.039
					RPM	11160	8280	6840	5400	4320	3240
					FEED	755	755	755	720	685	505
	10	High alloyed steel, and tool steel	0.3D	1.5D	Vc	265	262	260	271	271	271
					fz	0.050	0.067	0.063	0.075	0.100	0.113
					RPM	14040	10440	8280	7200	5400	4320
					FEED	2090	2090	2090	2160	2160	1945
	11.1		0.3D	1.5D	Vc	210	208	215	204	217	204
					fz	0.023	0.030	0.028	0.033	0.040	0.039
					RPM	11160	8280	6840	5400	4320	3240
					FEED	755	755	755	720	685	505
M	14.1	Stainless steel	0.3D	1.5D	Vc	143	143	144	143	149	136
					fz	0.023	0.030	0.028	0.034	0.042	0.038
					RPM	7560	5670	4590	3780	2970	2160
					FEED	515	515	515	515	500	325
K	15-16	Grey cast iron	0.3D	1.5D	Vc	265	262	260	271	271	271
					fz	0.050	0.067	0.063	0.075	0.100	0.113
					RPM	14040	10440	8280	7200	5400	4320
					FEED	2090	2090	2090	2160	2160	1945
	17-18	Nodular cast iron	0.3D	1.5D	Vc	265	262	260	271	271	271
					fz	0.050	0.067	0.063	0.075	0.100	0.113
					RPM	14040	10440	8280	7200	5400	4320
					FEED	2090	2090	2090	2160	2160	1945
	19-20	Malleable cast iron	0.3D	1.5D	Vc	265	262	260	271	271	271
					fz	0.050	0.067	0.063	0.075	0.100	0.113
					RPM	14040	10440	8280	7200	5400	4320
					FEED	2090	2090	2090	2160	2160	1945



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SOLID CARBIDE, END MILLS for Heavy Cutting

Unique geometry design reduces vibration
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such as steels, alloy steels, stainless steels. etc

◎ : Excellent ○ : Good

SERIES	G9J64 G9J65	G9J66 G9J67
FLUTE	4	4
HELIX ANGLE	35°/37°	35°/37°
CUTTING EDGE SHAPE	SQUARE	SQUARE
SIZE MIN	D3.0	D3.0
SIZE MAX	D20.0	D20.0
PAGE	61	62
	SHORT LENGTH	LONG LENGTH
	X-Coating	X-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	38.1	Hardened steel		Hardened	550	55		
	38.2			Hardened	630	60		
	40	Chilled Cast Iron		Cast	400	42		
	41	Hardened Cast Iron		Hardened	550	55		

Recommended cutting conditions : p.63

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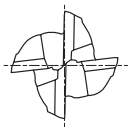
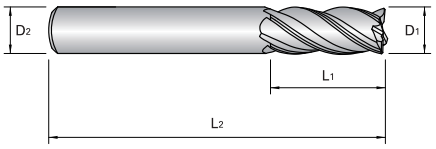
CARBIDE, 4 FLUTE MULTIPLE HELIX SHORT LENGTH

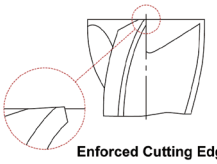
▶ New Coating enhances heat and oxidation resistance
▶ Multiple Helix Designed for Optimal Chip Formation and Chip Evacuation
▶ Unique Geometry applied to Reduce Vibration





CARBIDE | DIN 6527 | 4 | 35/37° | PLAIN | FLAT | X Coating

p.63



Mill Dia. Tolerance(mm)	Shank Dia. Tolerance
0 ~ - 0.030	h5

G9J64 G9J65 SERIES

Unit : mm

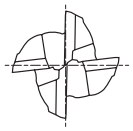
EDP No.		Mill Diameter	Shank Diameter	Length of Cut	Overall Length
PLAIN	FLAT	D1	D2	L1	L2
G9J64030	G9J65030	3.0	6	5	50
G9J64040	G9J65040	4.0	6	8	54
G9J64050	G9J65050	5.0	6	9	54
G9J64060	G9J65060	6.0	6	10	54
G9J64080	G9J65080	8.0	8	12	58
G9J64100	G9J65100	10.0	10	14	66
G9J64120	G9J65120	12.0	12	16	73
G9J64160	G9J65160	16.0	16	22	82
G9J64200	G9J65200	20.0	20	26	92

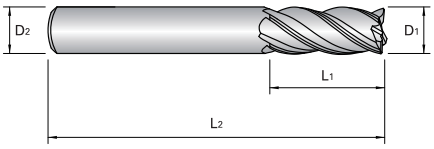
END MILLS for HEAVY CUTTING

NEW CENTURY

CARBIDE, 4 FLUTE MULTIPLE HELIX LONG LENGTH

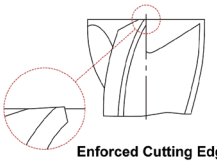
▶ New Coating enhances heat and oxidation resistance
▶ Multiple Helix Designed for Optimal Chip Formation and Chip Evacuation
▶ Unique Geometry applied to Reduce Vibration





CARBIDE | DIN 6527 | 4 | 35/37° | PLAIN | FLAT | X Coating

p.63


Enforced Cutting Edge

Mill Dia. Tolerance(mm)	Shank Dia. Tolerance
0 ~ - 0.030	h5

G9J66 G9J67 SERIES

Unit : mm

EDP No.		Mill Diameter	Shank Diameter	Length of Cut	Overall Length
PLAIN	FLAT	D1	D2	L1	L2
G9J66030	G9J67030	3.0	6	8	57
G9J66040	G9J67040	4.0	6	11	57
G9J66050	G9J67050	5.0	6	13	57
G9J66060	G9J67060	6.0	6	13	57
G9J66080	G9J67080	8.0	8	19	63
G9J66100	G9J67100	10.0	10	22	72
G9J66120	G9J67120	12.0	12	26	83
G9J66160	G9J67160	16.0	16	32	92
G9J66200	G9J67200	20.0	20	38	104

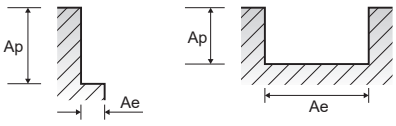
RECOMMENDED CUTTING CONDITIONS

G9J64, G9J65, G9J66, G9J67 SERIES — 4 FLUTE MULTIFUL HELIX

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

ISO	VDI 3323	Material Description	SIDE CUTTING Ae	SIDE CUTTING Ap	SLOTTING Ae	SLOTTING Ap	Parameter	Diameter (Ø) 3.0	4.0	5.0	6.0	8.0	10.0	12.0	16.0	20.0
P	1-4	Non-alloy steel	0.3D	1.5D (1.2D)	0.1D	0.8D	Vc	106	106	106	106	106	118	118	118	118
							fz	0.005	0.008	0.011	0.016	0.027	0.038	0.047	0.053	0.065
							RPM	11291	8470	6776	5642	4235	3745	3122	2338	1869
							FEED	228	270	298	361	459	571	588	497	487
	5		0.3D	1.5D (1.2D)	0.1D	0.8D	Vc	75	75	75	75	75	82	82	82	82
							fz	0.005	0.008	0.011	0.016	0.027	0.038	0.047	0.053	0.065
							RPM	7945	5957	4767	3976	2982	2604	2170	1631	1302
							FEED	158	189	210	256	322	396	410	347	340
	6-7	Low alloy steel	0.3D	1.5D (1.2D)	0.1D	0.8D	Vc	106	106	106	106	106	118	118	118	118
							fz	0.005	0.008	0.011	0.016	0.027	0.038	0.047	0.053	0.065
							RPM	11291	8470	6776	5642	4235	3745	3122	2338	1869
							FEED	228	270	298	361	459	571	588	497	487
	8-9		0.3D	1.5D (1.2D)	0.1D	0.8D	Vc	75	75	75	75	75	82	82	82	82
							fz	0.005	0.008	0.011	0.016	0.027	0.038	0.047	0.053	0.065
							RPM	7945	5957	4767	3976	2982	2604	2170	1631	1302
							FEED	158	189	210	256	322	396	410	347	340
	10 - 11.1	High alloyed steel, and tool steel	0.3D	1.5D (1.2D)	0.1D	0.8D	Vc	45	45	45	45	45	49	49	49	49
							fz	0.003	0.006	0.008	0.011	0.019	0.027	0.032	0.037	0.045
							RPM	4753	3563	2849	2380	1785	1561	1302	973	777
							FEED	56	84	91	105	137	168	168	144	140
M	12-13	Stainless steel	0.1D	1.5D (1.2D)	0.1D	0.8D	Vc	104	104	104	104	104	104	104	104	104
							fz	0.004	0.006	0.009	0.013	0.022	0.034	0.039	0.045	0.055
							RPM	10990	8246	6594	5495	4123	3297	2751	2058	1652
							FEED	175	200	238	287	364	448	427	371	364
	14.1		0.3D	1.5D (1.2D)	0.1D	0.8D	Vc	74	74	74	74	74	74	74	74	74
							fz	0.005	0.008	0.013	0.018	0.028	0.048	0.055	0.062	0.077
							RPM	7875	5908	4725	3934	2954	2359	1967	1477	1183
							FEED	158	189	245	284	329	455	434	368	364
	14.2		0.3D	1.5D (1.2D)	0.1D	0.8D	Vc	67	67	67	67	67	67	67	67	67
							fz	0.005	0.008	0.013	0.018	0.028	0.048	0.055	0.062	0.076
							RPM	7056	5292	4235	3528	2646	2114	1764	1323	1057
							FEED	140	168	221	256	298	406	389	329	322
K	15-16	Grey cast iron	0.3D	1.5D (1.2D)	0.1D	0.8D	Vc	78	78	78	78	78	86	86	86	86
							fz	0.006	0.01	0.014	0.02	0.034	0.048	0.058	0.065	0.081
							RPM	8316	6237	4991	4158	3122	2744	2282	1715	1372
							FEED	200	249	280	333	424	525	529	445	445
	17-18	Nodular cast iron	0.3D	1.5D (1.2D)	0.1D	0.8D	Vc	78	78	78	78	78	86	86	86	86
							fz	0.006	0.01	0.014	0.02	0.034	0.048	0.058	0.065	0.081
							RPM	8316	6237	4991	4158	3122	2744	2282	1715	1372
							FEED	200	249	280	333	424	525	529	445	445
	19-20	Malleable cast iron	0.3D	1.5D (1.2D)	0.1D	0.8D	Vc	78	78	78	78	78	86	86	86	86
							fz	0.006	0.01	0.014	0.02	0.034	0.048	0.058	0.065	0.081
							RPM	8316	6237	4991	4158	3122	2744	2282	1715	1372
							FEED	200	249	280	333	424	525	529	445	445

*( ) : Short length



SOLID CARBIDE, END MILLS for Hardened Material

Specially optimized geometry and coating
for machining Hardened steels up to 65 HRc

◎ : Excellent ○ : Good

SERIES	GFJ69	GFJ68
FLUTE	2	2
HELIX ANGLE	30°	30°
CUTTING EDGE SHAPE	BALL NOSE	BALL NOSE
SIZE MIN	R0.2	R0.1
SIZE MAX	R2.0	R6.0
PAGE	66	69
	LONG LENGTH	-
	Z-VG Coating	Z-VG 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	◎	◎

Recommended cutting conditions : p.75~82

· Phone: +82-32-526-0909, www.yg1.solutions, E-mail: yg1@yg1.solutions

GFJ70	GFJ71	GFJ74	GFJ72	GFJ73
4	4	6	2	4
30°	30°	45°	30°	30°
CORNER RADIUS	CORNER RADIUS	SQUARE	SQUARE	SQUARE
D6.0	D3.0	D6.0	D0.4	D1.0
D12.0	D12.0	D20.0	D20.0	D20.0
70	**71**	**72**	**73**	**74**
-	SHORT LENGTH	-	STUB LENGTH	STUB LENGTH
Z-VG Coating	Z-VG Coating	Z-VG Coating	Z-VG Coating	Z-VG Coating
				
				1
				2
				3
				4
○	○	○	○	○ 5
				6 P
				7
○	○	○	○	○ 8
○	○	○	○	○ 9
				10
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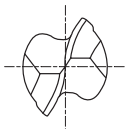
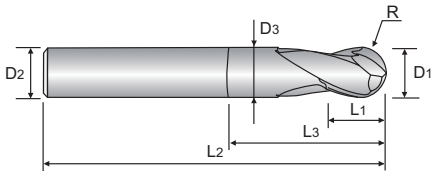
◎	◎	◎	◎	◎ 41

CARBIDE, 2 FLUTE BALL NOSE LONG LENGTH

▶ Designed for machining high-hardened materials, dry cutting, and high-speed cutting.
▶ Consistently delivers an exceptional workpiece finish and boasts high wear resistance.





CARBIDE | 2 | 30° | R ±0.005 (D≤Ø6) | R ±0.010 (D>Ø6) | PLAIN | Z-VG Coating

p. 75

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

GFJ69 SERIES

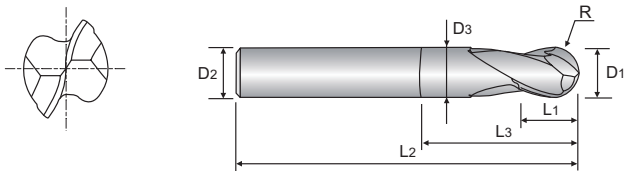
Unit : mm

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
GFJ69004010	R0.2	0.4	4	0.4	1	45	0.37
GFJ69004020	R0.2	0.4	4	0.4	2	45	0.37
GFJ69004030	R0.2	0.4	4	0.4	3	45	0.37
GFJ69004040	R0.2	0.4	4	0.4	4	45	0.37
GFJ69004050	R0.2	0.4	4	0.4	5	45	0.37
GFJ69005020	R0.25	0.5	4	0.5	2	45	0.45
GFJ69005040	R0.25	0.5	4	0.5	4	45	0.45
GFJ69005060	R0.25	0.5	4	0.5	6	45	0.45
GFJ69005080	R0.25	0.5	4	0.5	8	45	0.45
GFJ69006020	R0.3	0.6	4	0.6	2	45	0.55
GFJ69006030	R0.3	0.6	4	0.6	3	45	0.55
GFJ69006040	R0.3	0.6	4	0.6	4	45	0.55
GFJ69006050	R0.3	0.6	4	0.6	5	45	0.55
GFJ69006060	R0.3	0.6	4	0.6	6	45	0.55
GFJ69006080	R0.3	0.6	4	0.6	8	45	0.55
GFJ69006100	R0.3	0.6	4	0.6	10	45	0.55
GFJ69008020	R0.4	0.8	4	0.8	2	45	0.75
GFJ69008040	R0.4	0.8	4	0.8	4	45	0.75
GFJ69008060	R0.4	0.8	4	0.8	6	45	0.75
GFJ69008080	R0.4	0.8	4	0.8	8	45	0.75
GFJ69008100	R0.4	0.8	4	0.8	10	45	0.75
GFJ69010030	R0.5	1.0	4	1	3	45	0.95
GFJ69010040	R0.5	1.0	4	1	4	45	0.95
GFJ69010050	R0.5	1.0	4	1	5	45	0.95
GFJ69010060	R0.5	1.0	4	1	6	45	0.95
GFJ69010070	R0.5	1.0	4	1	7	45	0.95
GFJ69010080	R0.5	1.0	4	1	8	45	0.95
GFJ69010100	R0.5	1.0	4	1	10	45	0.95
GFJ69010120	R0.5	1.0	4	1	12	45	0.95
GFJ69010140	R0.5	1.0	4	1	14	50	0.95

▶ NEXT PAGE

CARBIDE, 2 FLUTE BALL NOSE LONG LENGTH

▶ Designed to machine Steels, Stainless steels, Titanium, and Heat-Resistant Super Alloys.
▶ Fine pitch wave geometry for high speed machining of hardened steels.



CARBIDE | 2 | 30° | R ±0.005 (D≤Ø6) | R ±0.010 (D>Ø6) | PLAIN | Z-VG Coating

p. 75

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

GFJ69 SERIES

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
GFJ69010160	R0.5	1.0	4	1	16	50	0.95
GFJ69010200	R0.5	1.0	4	1	20	55	0.95
GFJ69012060	R0.6	1.2	4	1.2	6	45	1.15
GFJ69012080	R0.6	1.2	4	1.2	8	45	1.15
GFJ69012100	R0.6	1.2	4	1.2	10	45	1.15
GFJ69012120	R0.6	1.2	4	1.2	12	45	1.15
GFJ69015060	R0.75	1.5	4	1.5	6	45	1.45
GFJ69015080	R0.75	1.5	4	1.5	8	45	1.45
GFJ69015100	R0.75	1.5	4	1.5	10	45	1.45
GFJ69015120	R0.75	1.5	4	1.5	12	45	1.45
GFJ69015140	R0.75	1.5	4	1.5	14	50	1.45
GFJ69015160	R0.75	1.5	4	1.5	16	50	1.45
GFJ69015200	R0.75	1.5	4	1.5	20	55	1.45
GFJ69020040	R1.0	2.0	4	2	4	45	1.95
GFJ69020060	R1.0	2.0	4	2	6	45	1.95
GFJ69020080	R1.0	2.0	4	2	8	45	1.95
GFJ69020100	R1.0	2.0	4	2	10	45	1.95
GFJ69020120	R1.0	2.0	4	2	12	50	1.95
GFJ69020140	R1.0	2.0	4	2	14	50	1.95
GFJ69020160	R1.0	2.0	4	2	16	50	1.95
GFJ69020180	R1.0	2.0	4	2	18	55	1.95
GFJ69020200	R1.0	2.0	4	2	20	55	1.95
GFJ69020220	R1.0	2.0	4	2	22	60	1.95
GFJ69020260	R1.0	2.0	4	2	26	70	1.95
GFJ69020300	R1.0	2.0	4	2	30	70	1.95
GFJ69030120	R1.5	3.0	6	3	12	50	2.85
GFJ69030140	R1.5	3.0	6	3	14	55	2.85
GFJ69030160	R1.5	3.0	6	3	16	55	2.85
GFJ69030180	R1.5	3.0	6	3	18	60	2.85
GFJ69030200	R1.5	3.0	6	3	20	60	2.85

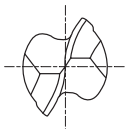
▶ NEXT PAGE

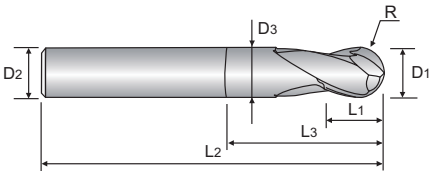
END MILLS for HARDENED MATERIAL

NEW CENTURY

CARBIDE, 2 FLUTE BALL NOSE LONG LENGTH

▶ Designed for machining high-hardened materials, dry cutting, and high-speed cutting.
▶ Consistently delivers an exceptional workpiece finish and boasts high wear resistance.





CARBIDE | 2 | 30° | R ±0.005 (D≤Ø6) | R ±0.010 (D>Ø6) | PLAIN | Z-VG Coating

p. 75

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

GFJ69 SERIES

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
GFJ69030260	R1.5	3.0	6	3	26	70	2.85
GFJ69030300	R1.5	3.0	6	3	30	70	2.85
GFJ69030360	R1.5	3.0	6	3	36	80	2.85
GFJ69040120	R2.0	4.0	6	4	12	60	3.85
GFJ69040160	R2.0	4.0	6	4	16	60	3.85
GFJ69040200	R2.0	4.0	6	4	20	65	3.85
GFJ69040260	R2.0	4.0	6	4	26	70	3.85
GFJ69040300	R2.0	4.0	6	4	30	70	3.85
GFJ69040360	R2.0	4.0	6	4	36	80	3.85
GFJ69040400	R2.0	4.0	6	4	40	90	3.85
GFJ69040460	R2.0	4.0	6	4	46	90	3.85
GFJ69040500	R2.0	4.0	6	4	50	100	3.85

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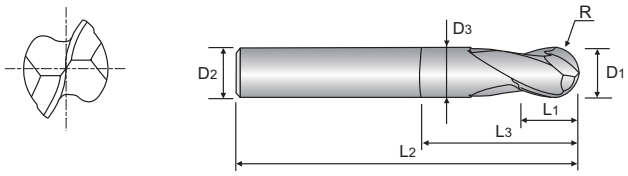
CARBIDE, 2 FLUTE BALL NOSE

▶ Designed for machining high-hardened materials, dry cutting, and high-speed cutting.
▶ Consistently delivers an exceptional workpiece finish and boasts high wear resistance.



CARBIDE | 2 | 30° | R ±0.005 (D≤Ø6) | R ±0.010 (D>Ø6) | PLAIN | Z-VG Coating

p. 76

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

GFJ68 SERIES

Unit : mm

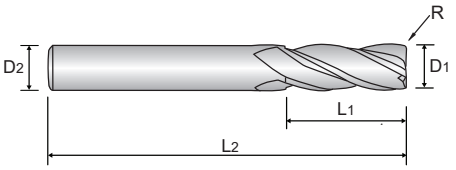
EDP No.	Radius of Ball Nose	Mill Diameter	Shank Diameter	Length of Cut	Length Below Shank	Overall Length	Neck Diameter
	R	D1	D2	L1	L3	L2	D3
GFJ68002	R0.1	**0.2**	4	0.3	-	40	-
GFJ68003	R0.15	**0.3**	4	0.5	-	40	-
GFJ68004	R0.2	**0.4**	4	0.6	-	40	-
GFJ68005	R0.25	**0.5**	4	0.7	-	40	-
GFJ68006	R0.3	**0.6**	4	0.9	-	40	-
GFJ68007	R0.35	**0.7**	4	1.1	-	40	-
GFJ68008	R0.4	**0.8**	4	1.2	-	40	-
GFJ68009	R0.45	**0.9**	4	1.4	-	40	-
GFJ68010	R0.5	**1.0**	6	1.5	3	50	0.95
GFJ68015	R0.75	**1.5**	6	2	4	50	1.45
GFJ68020	R1.0	**2.0**	6	2.5	5	50	1.95
GFJ68025	R1.25	**2.5**	6	3	7	50	2.4
GFJ68030	R1.5	**3.0**	6	4	10	60	2.85
GFJ68040	R2.0	**4.0**	6	5	10	60	3.85
GFJ68050	R2.5	**5.0**	6	6	12	60	4.85
GFJ68060	R3.0	**6.0**	6	7	15	60	5.85
GFJ68080	R4.0	**8.0**	8	9	15	60	7.7
GFJ68080080	R4.0	**8.0**	8	9	15	80	7.7
GFJ68100	R5.0	**10.0**	10	11	25	60	9.7
GFJ68100080	R5.0	**10.0**	10	11	25	80	9.7
GFJ68120	R6.0	**12.0**	12	14	25	80	11.7

END MILLS for HARDENED MATERIAL

NEW CENTURY

CARBIDE, 4 FLUTE CORNER RADIUS

▶ Designed for machining high-hardened materials, dry cutting, and high-speed cutting.
▶ Consistently delivers an exceptional workpiece finish and boasts high wear resistance.



CARBIDE | 4 | 30° | R ±0.010 | PLAIN | Z-VG Coating

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

GFJ70 SERIES

Unit : mm

EDP No.	Corner Radius	Mill Diameter	Shank Diameter	Length of Cut	Overall Length
	R	D1	D2	L1	L2
GFJ7006005	R0.5	**6.0**	6	15	90
GFJ7006010	R1.0	**6.0**	6	15	90
GFJ7008005	R0.5	**8.0**	8	20	100
GFJ7008010	R1.0	**8.0**	8	20	100
GFJ7010005	R0.5	**10.0**	10	25	100
GFJ7010010	R1.0	**10.0**	10	25	100
GFJ7010020	R2.0	**10.0**	10	25	100
GFJ7012005	R0.5	**12.0**	12	30	110
GFJ7012010	R1.0	**12.0**	12	30	110
GFJ7012020	R2.0	**12.0**	12	30	110

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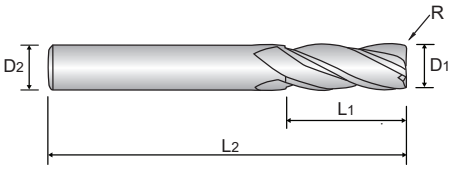
CARBIDE, 4 FLUTE CORNER RADIUS SHORT LENGTH

▶ Designed for machining high-hardened materials, dry cutting, and high-speed cutting.
▶ Consistently delivers an exceptional workpiece finish and boasts high wear resistance.



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

GFJ71 SERIES

Unit : mm

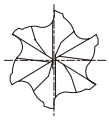
EDP No.	Corner Radius	Mill Diameter	Shank Diameter	Length of Cut	Overall Length
	R	D_1	D_2	L_1	L_2
GFJ7103002	R0.2	3.0	6	8	50
GFJ7103003	R0.3	3.0	6	8	50
GFJ7103005	R0.5	3.0	6	8	50
GFJ7104002	R0.2	4.0	6	11	50
GFJ7104003	R0.3	4.0	6	11	50
GFJ7104005	R0.5	4.0	6	11	50
GFJ7105002	R0.2	5.0	6	13	50
GFJ7106002	R0.2	6.0	6	16	50
GFJ7106005	R0.5	6.0	6	16	50
GFJ7106010	R1.0	6.0	6	16	50
GFJ7108003	R0.3	8.0	8	20	60
GFJ7108005	R0.5	8.0	8	20	60
GFJ7108010	R1.0	8.0	8	20	60
GFJ7108015	R1.5	8.0	8	20	60
GFJ7108020	R2.0	8.0	8	20	60
GFJ7110003	R0.3	10.0	10	25	75
GFJ7110005	R0.5	10.0	10	25	75
GFJ7110010	R1.0	10.0	10	25	75
GFJ7110015	R1.5	10.0	10	25	75
GFJ7110020	R2.0	10.0	10	25	75
GFJ7112005	R0.5	12.0	12	32	75
GFJ7112010	R1.0	12.0	12	32	75
GFJ7112015	R1.5	12.0	12	32	75
GFJ7112020	R2.0	12.0	12	32	75

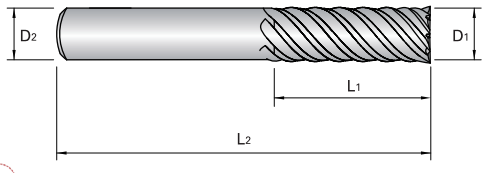
END MILLS for HARDENED MATERIAL

NEW CENTURY

CARBIDE, 6 FLUTE 45° HELIX SHORT LENGTH

▶ Designed for machining high-hardened materials, dry cutting, and high-speed cutting.
▶ Consistently delivers an exceptional workpiece finish and boasts high wear resistance.





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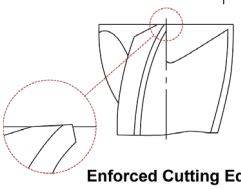


Mill Dia.Tolerance (mm)	Shank Dia.Tolerance
0 ~ - 0.020	h5

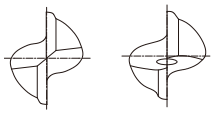
GFJ74 SERIES

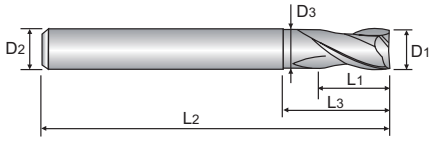
Unit : mm

EDP No.	Mill Diameter	Shank Diameter	Length of Cut	Overall Length
	D1	D2	L1	L2
GFJ74060	6.0	6	16	50
GFJ74080	8.0	8	19	60
GFJ74100	10.0	10	22	75
GFJ74120	12.0	12	26	75
GFJ74140	14.0	14	30	90
GFJ74160	16.0	16	32	100
GFJ74180	18.0	18	38	100
GFJ74200	20.0	20	38	100

CARBIDE, 2 FLUTE STUB LENGTH

▶ Designed for machining high-hardened materials, dry cutting, and high-speed cutting.
▶ Consistently delivers an exceptional workpiece finish and boasts high wear resistance.





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

GFJ72 SERIES

Unit : mm

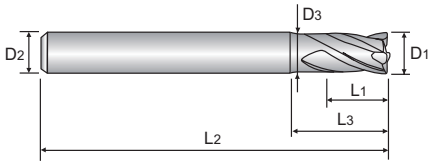
EDP No.	Mill Diameter	Shank Diameter	Length of Cut	Length Below Shank	Overall Length	Neck Diameter
	D1	D2	L1	L3	L2	D3
GFJ72004	0.4	4	0.8	-	40	-
GFJ72005	0.5	4	1	-	40	-
GFJ72006	0.6	4	1.2	-	40	-
GFJ72007	0.7	4	1.4	-	40	-
GFJ72008	0.8	4	1.6	-	40	-
GFJ72009	0.9	4	2	-	40	-
GFJ72010	1.0	6	1.5	3	50	0.95
GFJ72015	1.5	6	1.7	4	50	1.45
GFJ72020	2.0	6	2	5	50	1.95
GFJ72025	2.5	6	2.5	6	55	2.4
GFJ72030	3.0	6	3	8	55	2.85
GFJ72035	3.5	6	3.5	9	55	3.35
GFJ72040	4.0	6	4	10	55	3.85
GFJ72050	5.0	6	5	13	55	4.85
GFJ72060	6.0	6	6	15	55	5.85
GFJ72080	8.0	8	8	20	65	7.7
GFJ72100	10.0	10	10	25	75	9.7
GFJ72120	12.0	12	12	28	85	11.7
GFJ72160	16.0	16	16	32	90	15.7
GFJ72200	20.0	20	20	40	105	19.7

END MILLS for HARDENED MATERIAL

NEW CENTURY

CARBIDE, 4 FLUTE STUB LENGTH

- Designed for machining high-hardened materials, dry cutting, and high-speed cutting.
- Consistently delivers an exceptional workpiece finish and boasts high wear resistance.



CARBIDE | 4 | 30° | PLAIN | Z-VG Coating

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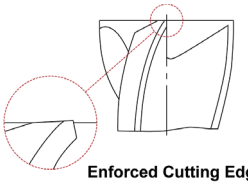

Enforced Cutting Edge

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

GFJ73 SERIES

Unit : mm

EDP No.	Mill Diameter	Shank Diameter	Length of Cut	Length Below Shank	Overall Length	Neck Diameter
	D1	D2	L1	L3	L2	D3
GFJ73010	1.0	6	1.5	3	50	0.95
GFJ73020	2.0	6	2	5	50	1.95
GFJ73030	3.0	6	3	8	55	2.85
GFJ73040	4.0	6	4	10	55	3.85
GFJ73050	5.0	6	5	13	55	4.85
GFJ73060	6.0	6	6	15	55	5.85
GFJ73080	8.0	8	8	20	65	7.7
GFJ73100	10.0	10	10	25	75	9.7
GFJ73120	12.0	12	12	28	85	11.7
GFJ73160	16.0	16	16	32	90	15.7
GFJ73200	20.0	20	20	40	105	19.7

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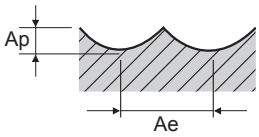
RECOMMENDED CUTTING CONDITIONS

GFJ69 SERIES — 2 FLUTE BALL NOSE

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

ISO	VDI 3323	Material Description	Parameter	Diameter (Ø)									
				0.4	0.5	0.6	0.8	1	1.2	1.5	2.0	3.0	4.0
P	1-4	Non-alloy steel	Vc	51~57	64~72	76~86	102~115	116~130	116~131	111~128	123~137	127~143	139~164
			fz	0.003~0.006	0.003~0.006	0.004~0.008	0.031~0.008	0.005~0.01	0.006~0.013	0.007~0.017	0.009~0.021	0.013~0.031	0.015~0.036
			RPM	40550~45650	40450~45650	40550~45650	40750~45650	36850~41300	30700~34800	23450~27150	19650~21750	13500~15200	11050~13050
			FEED	245~590	245~590	310~760	2515~760	340~835	340~935	340~935	340~935	340~935	340~935
			Ap	0.018~0.036	0.023~0.045	0.027~0.054	0.036~0.072	0.045~0.090	0.055~0.100	0.070~0.135	0.090~0.180	0.135~0.270	0.180~0.360
	5		Vc	37~41	46~51	56~61	74~82	85~92	83~94	84~95	89~99	87~87	94~112
			fz	0.002~0.005	0.002~0.005	0.002~0.006	0.002~0.006	0.003~0.008	0.004~0.009	0.005~0.012	0.006~0.015	0.009~0.025	0.011~0.026
			RPM	29500~32600	29500~32600	29500~32600	29500~32600	27050~29350	22100~25000	17800~20100	14150~15750	9200~9250	7500~8900
			FEED	125~325	125~325	145~420	145~405	170~465	170~465	170~465	170~465	170~465	170~465
			Ap	0.018~0.036	0.023~0.045	0.027~0.054	0.036~0.072	0.045~0.090	0.055~0.100	0.070~0.135	0.090~0.180	0.135~0.270	0.180~0.360
	6-7	Low alloy steel	Vc	51~57	64~72	76~86	102~115	116~130	116~131	111~128	123~137	127~143	139~164
			fz	0.003~0.006	0.003~0.006	0.004~0.008	0.031~0.008	0.005~0.01	0.006~0.013	0.007~0.017	0.009~0.021	0.013~0.031	0.015~0.036
			RPM	40550~45650	40450~45650	40550~45650	40750~45650	36850~41300	30700~34800	23450~27150	19650~21750	13500~15200	11050~13050
			FEED	245~590	245~590	310~760	2515~760	340~835	340~935	340~935	340~935	340~935	340~935
			Ap	0.018~0.036	0.023~0.045	0.027~0.054	0.036~0.072	0.045~0.090	0.055~0.100	0.070~0.135	0.090~0.180	0.135~0.270	0.180~0.360
	8-9		Vc	37~41	46~51	56~61	74~82	85~92	83~94	84~95	89~99	87~87	94~112
			fz	0.002~0.005	0.002~0.005	0.002~0.006	0.002~0.006	0.003~0.008	0.004~0.009	0.005~0.012	0.006~0.015	0.009~0.025	0.011~0.026
			RPM	29500~32600	29500~32600	29500~32600	29500~32600	27050~29350	22100~25000	17800~20100	14150~15750	9200~9250	7500~8900
			FEED	125~325	125~325	145~420	145~405	170~465	170~465	170~465	170~465	170~465	170~465
			Ap	0.018~0.036	0.023~0.045	0.027~0.054	0.036~0.072	0.045~0.090	0.055~0.100	0.070~0.135	0.090~0.180	0.135~0.270	0.180~0.360
	10	High alloyed steel, and tool steel	Vc	51~57	64~72	76~86	102~115	116~130	116~131	111~128	123~137	127~143	139~164
			fz	0.003~0.006	0.003~0.006	0.004~0.008	0.031~0.008	0.005~0.01	0.006~0.013	0.007~0.017	0.009~0.021	0.013~0.031	0.015~0.036
			RPM	40550~45650	40450~45650	40550~45650	40750~45650	36850~41300	30700~34800	23450~27150	19650~21750	13500~15200	11050~13050
			FEED	245~590	245~590	310~760	2515~760	340~835	340~935	340~935	340~935	340~935	340~935
			Ap	0.018~0.036	0.023~0.045	0.027~0.054	0.036~0.072	0.045~0.090	0.055~0.100	0.070~0.135	0.090~0.180	0.135~0.270	0.180~0.360
	11.1 - 11.2		Vc	37~41	46~51	56~61	74~82	85~92	83~94	84~95	89~99	87~87	94~112
			fz	0.002~0.005	0.002~0.005	0.002~0.006	0.002~0.006	0.003~0.008	0.004~0.009	0.005~0.012	0.006~0.015	0.009~0.025	0.011~0.026
			RPM	29500~32600	29500~32600	29500~32600	29500~32600	27050~29350	22100~25000	17800~20100	14150~15750	9200~9250	7500~8900
			FEED	125~325	125~325	145~420	145~405	170~465	170~465	170~465	170~465	170~465	170~465
			Ap	0.018~0.036	0.023~0.045	0.027~0.054	0.036~0.072	0.045~0.090	0.055~0.100	0.070~0.135	0.090~0.180	0.135~0.270	0.180~0.360
H	38.1 - 38.2	Hardened steel	Vc	23~26	29~32	35~39	46~52	52~60	53~59	55~58	58~55	58~61	62~68
			fz	0.003~0.005	0.003~0.005	0.004~0.007	0.004~0.007	0.005~0.008	0.006~0.009	0.007~0.012	0.009~0.017	0.014~0.023	0.017~0.028
			RPM	18450~20650	18450~20650	18450~20650	18450~20650	16600~19000	14150~15750	11650~12400	9200~8750	6150~6500	4900~5450
			FEED	125~215	125~215	145~270	145~270	170~305	170~295	170~295	170~305	170~305	170~305
			Ap	0.004~0.007	0.005~0.009	0.005~0.011	0.007~0.014	0.009~0.018	0.010~0.022	0.014~0.028	0.018~0.035	0.028~0.055	0.035~0.070
	40	Chilled Cast Iron	Vc	37~41	46~51	56~61	74~82	85~92	83~94	84~95	89~99	87~87	94~112
			fz	0.002~0.005	0.002~0.005	0.002~0.006	0.002~0.006	0.003~0.008	0.004~0.009	0.005~0.012	0.006~0.015	0.009~0.025	0.011~0.026
			RPM	29500~32600	29500~32600	29500~32600	29500~32600	27050~29350	22100~25000	17800~20100	14150~15750	9200~9250	7500~8900
			FEED	125~325	125~325	145~420	145~405	170~465	170~465	170~465	170~465	170~465	170~465
			Ap	0.018~0.036	0.023~0.045	0.027~0.054	0.036~0.072	0.045~0.090	0.055~0.100	0.070~0.135	0.090~0.180	0.135~0.270	0.180~0.360
	41	Hardened Cast Iron	Vc	23~26	29~32	35~39	46~52	52~60	53~59	55~58	58~55	58~61	62~68
			fz	0.003~0.005	0.003~0.005	0.004~0.007	0.004~0.007	0.005~0.008	0.006~0.009	0.007~0.012	0.009~0.017	0.014~0.023	0.017~0.028
			RPM	18450~20650	18450~20650	18450~20650	18450~20650	16600~19000	14150~15750	11650~12400	9200~8750	6150~6500	4900~5450
			FEED	125~215	125~215	145~270	145~270	170~305	170~295	170~295	170~305	170~305	170~305
			Ap	0.004~0.007	0.005~0.009	0.005~0.011	0.007~0.014	0.009~0.018	0.010~0.022	0.014~0.028	0.018~0.035	0.028~0.055	0.035~0.070

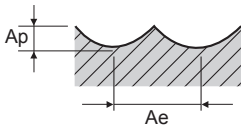


RECOMMENDED CUTTING CONDITIONS

GFJ68 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) 0.2	0.3	0.4	0.5	0.6	0.8	1.0	1.5	2.0	3.0	4.0	5.0	6.0	8.0	10.0	12.0
P	5	Non-alloy steel	0.05D	0.02D	Vc	16	25	33	41	49	66	82	124	164	164	164	153	138	147	154	138
					fz	0.013	0.016	0.021	0.026	0.032	0.043	0.053	0.059	0.063	0.100	0.133	0.171	0.192	0.207	0.218	0.234
					RPM	26,250	26,250	26,250	26,250	26,250	26,250	26,250	26,250	26,100	17,400	13,050	9,750	7,300	5,850	4,900	3,650
					FEED	695	865	1095	1385	1675	2250	2770	3120	3290	3465	3465	3340	2800	2425	2135	1705
	8-9	Low alloy steel	0.05D	0.02D	Vc	16	25	33	41	49	66	82	124	164	164	164	153	138	147	154	138
					fz	0.013	0.016	0.021	0.026	0.032	0.043	0.053	0.059	0.063	0.100	0.133	0.171	0.192	0.207	0.218	0.234
					RPM	26,250	26,250	26,250	26,250	26,250	26,250	26,250	26,250	26,100	17,400	13,050	9,750	7,300	5,850	4,900	3,650
					FEED	695	865	1095	1385	1675	2250	2770	3120	3290	3465	3465	3340	2800	2425	2135	1705
	11.1	High alloyed steel, and tool steel	0.05D	0.02D	Vc	16	25	33	41	49	66	82	124	164	164	164	153	138	147	154	138
					fz	0.013	0.016	0.021	0.026	0.032	0.043	0.053	0.059	0.063	0.100	0.133	0.171	0.192	0.207	0.218	0.234
					RPM	26,250	26,250	26,250	26,250	26,250	26,250	26,250	26,250	26,100	17,400	13,050	9,750	7,300	5,850	4,900	3,650
					FEED	695	865	1095	1385	1675	2250	2770	3120	3290	3465	3465	3340	2800	2425	2135	1705
	11.2		0.05D	0.02D	Vc	16	25	33	41	49	66	82	119	158	157	158	147	133	141	146	132
					fz	0.012	0.015	0.019	0.023	0.028	0.036	0.046	0.052	0.055	0.092	0.122	0.151	0.168	0.180	0.192	0.206
					RPM	26,250	26,250	26,250	26,250	26,250	26,250	26,250	25,200	25,100	16,700	12,550	9,350	7,050	5,600	4,650	3,500
					FEED	605	780	980	1215	1445	1905	2425	2600	2770	3060	3060	2820	2370	2020	1790	1445
H	38.1	Hardened steel	0.05D	0.02D	Vc	16	25	33	41	49	66	82	119	158	157	158	147	133	141	146	132
					fz	0.012	0.015	0.019	0.023	0.028	0.036	0.046	0.052	0.055	0.092	0.122	0.151	0.168	0.180	0.192	0.206
					RPM	26,250	26,250	26,250	26,250	26,250	26,250	26,250	25,200	25,100	16,700	12,550	9,350	7,050	5,600	4,650	3,500
					FEED	605	780	980	1215	1445	1905	2425	2600	2770	3060	3060	2820	2370	2020	1790	1445
	38.2		0.05D	0.02D	Vc	15	22	30	37	45	59	74	106	132	131	132	124	109	119	124	111
					fz	0.012	0.015	0.018	0.023	0.027	0.037	0.046	0.051	0.055	0.083	0.110	0.137	0.154	0.164	0.175	0.186
					RPM	23,650	23,650	23,650	23,650	23,650	23,650	23,650	22,600	21,000	13,900	10,500	7,900	5,800	4,750	3,950	2,950
					FEED	555	695	865	1095	1270	1735	2185	2310	2310	2310	2310	2165	1790	1560	1385	1095
	39.1		0.05D	0.02D	Vc	13	20	26	33	40	53	66	92	116	116	116	112	99	106	108	100
					fz	0.011	0.013	0.017	0.021	0.025	0.033	0.041	0.046	0.049	0.074	0.099	0.124	0.138	0.148	0.159	0.169
					RPM	21,000	21,000	21,000	21,000	21,000	21,000	21,000	19,450	18,400	12,350	9,200	7,100	5,250	4,200	3,450	2,650
					FEED	445	560	695	865	1040	1385	1735	1790	1820	1820	1820	1760	1445	1240	1095	895
	39.2		0.05D	0.02D	Vc	12	17	23	29	35	46	58	82	106	104	106	95	87	93	96	87
					fz	0.011	0.013	0.016	0.020	0.025	0.033	0.041	0.045	0.048	0.073	0.096	0.122	0.135	0.145	0.157	0.157
					RPM	18,400	18,400	18,400	18,400	18,400	18,400	18,400	17,350	16,800	11,050	8,400	6,050	4,600	3,700	3,050	2,300
					FEED	390	485	605	750	925	1215	1500	1560	1615	1615	1615	1475	1240	1070	955	720
	40	Chilled Cast Iron	0.05D	0.02D	Vc	16	25	33	41	49	66	82	119	158	157	158	147	133	141	146	132
					fz	0.012	0.015	0.019	0.023	0.028	0.036	0.046	0.052	0.055	0.092	0.122	0.151	0.168	0.180	0.192	0.206
					RPM	26,250	26,250	26,250	26,250	26,250	26,250	26,250	25,200	25,100	16,700	12,550	9,350	7,050	5,600	4,650	3,500
					FEED	605	780	980	1215	1445	1905	2425	2600	2770	3060	3060	2820	2370	2020	1790	1445
	41	Hardened Cast Iron	0.05D	0.02D	Vc	15	22	30	37	45	59	74	106	132	131	132	124	109	119	124	111
					fz	0.012	0.015	0.018	0.023	0.027	0.037	0.046	0.051	0.055	0.083	0.110	0.137	0.154	0.164	0.175	0.186
					RPM	23,650	23,650	23,650	23,650	23,650	23,650	23,650	22,600	21,000	13,900	10,500	7,900	5,800	4,750	3,950	2,950
					FEED	555	695	865	1095	1270	1735	2185	2310	2310	2310	2310	2165	1790	1560	1385	1095



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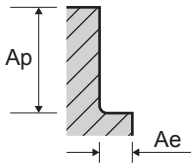
RECOMMENDED CUTTING CONDITIONS

GFJ70 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) 6.0	8.0	10.0	12.0
P	1-4	Non-alloy steel	0.1D	1.0D	Vc	110	111	107	109
					fz	0.030	0.042	0.047	0.047
					RPM	5,850	4,400	3,400	2,900
					FEED	695	745	640	545
	5		0.02D	1.0D	Vc	67	67	66	66
					fz	0.030	0.038	0.038	0.038
					RPM	3,550	2,650	2,100	1,750
					FEED	430	400	315	265
	6-7	Low alloy steel	0.1D	1.0D	Vc	110	111	107	109
					fz	0.030	0.042	0.047	0.047
					RPM	5,850	4,400	3,400	2,900
					FEED	695	745	640	545
	8-9		0.02D	1.0D	Vc	67	67	66	66
					fz	0.030	0.038	0.038	0.038
					RPM	3,550	2,650	2,100	1,750
					FEED	430	400	315	265
	10	High alloyed steel, and tool steel	0.1D	1.0D	Vc	110	111	107	109
					fz	0.030	0.042	0.047	0.047
					RPM	5,850	4,400	3,400	2,900
					FEED	695	745	640	545
	11.1 - 11.2		0.02D	1.0D	Vc	67	67	66	66
					fz	0.030	0.038	0.038	0.038
					RPM	3,550	2,650	2,100	1,750
					FEED	430	400	315	265
M	14.1	Stainless steel	0.1D	1.0D	Vc	57	55	55	55
					fz	0.029	0.042	0.045	0.043
					RPM	3,000	2,200	1,750	1,450
					FEED	345	370	315	250
H	38.1 - 38.2	Hardened steel	0.02D	1.0D	Vc	40	44	46	45
					fz	0.010	0.016	0.016	0.018
					RPM	2,100	1,750	1,450	1,200
					FEED	85	115	95	85
	39.1 - 39.2		0.02D	1.0D	Vc	22	23	22	23
					fz	0.012	0.015	0.014	0.017
					RPM	1,150	900	700	600
					FEED	55	55	40	40
	40	Chilled Cast Iron	0.02D	1.0D	Vc	67	67	66	66
					fz	0.030	0.038	0.038	0.038
					RPM	3,550	2,650	2,100	1,750
					FEED	430	400	315	265
	41	Hardened steel Chilled Cast Iron	0.02D	1.0D	Vc	40	44	46	45
					fz	0.010	0.016	0.016	0.018
					RPM	2,100	1,750	1,450	1,200
					FEED	85	115	95	85

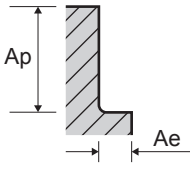


RECOMMENDED CUTTING CONDITIONS

GFJ71 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) 3.0	4.0	5.0	6.0	8.0	10.0	12.0
P	1-4	Non-alloy steel	0.1D	1.0D	Vc	88	100	104	110	111	107	109
					fz	0.009	0.019	0.024	0.030	0.042	0.047	0.047
					RPM	9,350	7,950	6,600	5,850	4,400	3,400	2,900
					FEED	335	600	630	695	745	640	545
	5		0.02D	1.0D	Vc	55	61	62	67	67	66	66
					fz	0.009	0.019	0.024	0.030	0.038	0.038	0.038
					RPM	5,850	4,850	3,950	3,550	2,650	2,100	1,750
					FEED	210	370	380	430	400	315	265
	6-7	Low alloy steel	0.1D	1.0D	Vc	88	100	104	110	111	107	109
					fz	0.009	0.019	0.024	0.030	0.042	0.047	0.047
					RPM	9,350	7,950	6,600	5,850	4,400	3,400	2,900
					FEED	335	600	630	695	745	640	545
	8-9		0.02D	1.0D	Vc	55	61	62	67	67	66	66
					fz	0.009	0.019	0.024	0.030	0.038	0.038	0.038
					RPM	5,850	4,850	3,950	3,550	2,650	2,100	1,750
					FEED	210	370	380	430	400	315	265
	10	High alloyed steel, and tool steel	0.1D	1.0D	Vc	88	100	104	110	111	107	109
					fz	0.009	0.019	0.024	0.030	0.042	0.047	0.047
					RPM	9,350	7,950	6,600	5,850	4,400	3,400	2,900
					FEED	335	600	630	695	745	640	545
	11.1 - 11.2		0.02D	1.0D	Vc	55	61	62	67	67	66	66
					fz	0.009	0.019	0.024	0.030	0.038	0.038	0.038
					RPM	5,850	4,850	3,950	3,550	2,650	2,100	1,750
					FEED	210	370	380	430	400	315	265
M	14.1	Stainless steel	0.1D	1.0D	Vc	46	51	52	57	55	55	55
					fz	0.009	0.018	0.024	0.029	0.042	0.045	0.043
					RPM	4,850	4,050	3,300	3,000	2,200	1,750	1,450
					FEED	180	295	315	345	370	315	250
H	38.1 - 38.2	Hardened steel	0.02D	1.0D	Vc	33	39	38	40	44	46	45
					fz	0.005	0.005	0.008	0.010	0.016	0.016	0.018
					RPM	3,550	3,100	2,450	2,100	1,750	1,450	1,200
					FEED	65	65	75	85	115	95	85
	39.1 - 39.2		0.02D	1.0D	Vc	19	19	20	22	23	22	23
					fz	0.007	0.009	0.011	0.012	0.015	0.014	0.017
					RPM	2,000	1,550	1,300	1,150	900	700	600
					FEED	55	55	55	55	55	40	40
	40	Chilled Cast Iron	0.02D	1.0D	Vc	55	61	62	67	67	66	66
					fz	0.009	0.019	0.024	0.030	0.038	0.038	0.038
					RPM	5,850	4,850	3,950	3,550	2,650	2,100	1,750
					FEED	210	370	380	430	400	315	265
	41	Hardened steel Chilled Cast Iron	0.02D	1.0D	Vc	33	39	38	40	44	46	45
					fz	0.005	0.005	0.008	0.010	0.016	0.016	0.018
					RPM	3,550	3,100	2,450	2,100	1,750	1,450	1,200
					FEED	65	65	75	85	115	95	85



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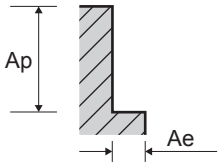
RECOMMENDED CUTTING CONDITIONS

GFJ74 SERIES — 6 FLUTES - 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	16.0	20.0
P	1-4	Non-alloy steel	0.05D	1.5D	Vc	123	123	121	124	123	123
					fz	0.030	0.038	0.045	0.053	0.062	0.069
					RPM	6,500	4,900	3,850	3,300	2,450	1,950
					FEED	1,165	1,125	1,050	1,050	915	810
	5		0.05D	1.5D	Vc	82	83	82	83	83	82
					fz	0.030	0.038	0.045	0.053	0.062	0.069
					RPM	4,350	3,300	2,600	2,200	1,650	1,300
					FEED	790	745	705	705	610	540
	6-7	Low alloy steel	0.05D	1.5D	Vc	123	123	121	124	123	123
					fz	0.030	0.038	0.045	0.053	0.062	0.069
					RPM	6,500	4,900	3,850	3,300	2,450	1,950
					FEED	1,165	1,125	1,050	1,050	915	810
	8-9		0.03D	1.5D	Vc	82	83	82	83	83	82
					fz	0.030	0.038	0.045	0.053	0.062	0.069
					RPM	4,350	3,300	2,600	2,200	1,650	1,300
					FEED	790	745	705	705	610	540
	10	High alloyed steel, and tool steel	0.05D	1.5D	Vc	123	123	121	124	123	123
					fz	0.030	0.038	0.045	0.053	0.062	0.069
					RPM	6,500	4,900	3,850	3,300	2,450	1,950
					FEED	1,165	1,125	1,050	1,050	915	810
	11.1 - 11.2		0.05D	1.5D	Vc	82	83	82	83	83	82
					fz	0.030	0.038	0.045	0.053	0.062	0.069
					RPM	4,350	3,300	2,600	2,200	1,650	1,300
					FEED	790	745	705	705	610	540
H	38.1	Hardened steel	0.03D	1.5D	Vc	82	83	82	83	83	82
					fz	0.030	0.038	0.045	0.053	0.062	0.069
					RPM	4,350	3,300	2,600	2,200	1,650	1,300
					FEED	790	745	705	705	610	540
	38.2 - 39.1		0.03D	1.5D	Vc	63	63	63	62	63	63
					fz	0.023	0.029	0.033	0.040	0.047	0.053
					RPM	3,350	2,500	2,000	1,650	1,250	1,000
					FEED	460	430	400	400	350	315
	39.2		0.02D	1.5D	Vc	50	50	50	49	50	50
					fz	0.019	0.023	0.027	0.032	0.038	0.044
					RPM	2,650	2,000	1,600	1,300	1,000	800
					FEED	295	275	255	250	225	210
	40	Chilled Cast Iron	0.03D	1.5D	Vc	82	83	82	83	83	82
					fz	0.030	0.038	0.045	0.053	0.062	0.069
					RPM	4,350	3,300	2,600	2,200	1,650	1,300
					FEED	790	745	705	705	610	540

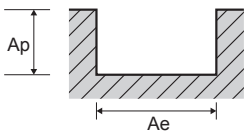


RECOMMENDED CUTTING CONDITIONS

GFJ72 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 參数	Diameter (Ø) 0.5	0.6	0.8	1.0	2.0	3.0	4.0	5.0	6.0	8.0	10.0	12.0
P	5	Non-alloy steel	1.0D	0.05D	Vc	31	37	50	59	82	81	82	97	97	98	96	98
					fz	0.003	0.004	0.006	0.007	0.012	0.018	0.025	0.030	0.033	0.044	0.052	0.061
					RPM	19,700	19,700	19,700	18,900	13,100	8,600	6,550	6,200	5,150	3,900	3,050	2,600
					FEED	135	175	220	275	315	315	325	370	345	345	315	315
	8-9	Low alloy steel	1.0D	0.05D	Vc	31	37	50	59	82	81	82	97	97	98	96	98
					fz	0.003	0.004	0.006	0.007	0.012	0.018	0.025	0.030	0.033	0.044	0.052	0.061
					RPM	19700	19700	19700	18900	13100	8600	6550	6200	5150	3900	3050	2600
					FEED	135	175	220	275	315	315	325	370	345	345	315	315
	11.1	High alloyed steel, and tool steel	1.0D	0.05D	Vc	31	37	50	59	82	81	82	97	97	98	96	98
					fz	0.003	0.004	0.006	0.007	0.012	0.018	0.025	0.030	0.033	0.044	0.052	0.061
					RPM	19,700	19,700	19,700	18,900	13,100	8,600	6,550	6,200	5,150	3,900	3,050	2,600
					FEED	135	175	220	275	315	315	325	370	345	345	315	315
	11.2		1.0D	0.05D	Vc	28	33	44	47	64	64	65	77	76	77	77	77
					fz	0.003	0.004	0.005	0.007	0.012	0.018	0.025	0.030	0.035	0.043	0.051	0.061
					RPM	17,700	17,700	17,700	14,950	10,250	6,800	5,200	4,900	4,050	3,050	2,450	2,050
					FEED	105	135	160	210	250	250	265	295	285	265	250	250
H	38.1	Hardened steel	1.0D	0.05D	Vc	28	33	44	47	64	64	65	77	76	77	77	77
					fz	0.003	0.004	0.005	0.007	0.012	0.018	0.025	0.030	0.035	0.043	0.051	0.061
					RPM	17,700	17,700	17,700	14,950	10,250	6,800	5,200	4,900	4,050	3,050	2,450	2,050
					FEED	105	135	160	210	250	250	265	295	285	265	250	250
	38.2		1.0D	0.05D	Vc	25	30	30	32	43	43	43	51	51	52	50	53
					fz	0.003	0.003	0.004	0.007	0.012	0.018	0.025	0.029	0.033	0.041	0.050	0.057
					RPM	15,750	15,750	11,800	10,050	6,900	4,550	3,450	3,250	2,700	2,050	1,600	1,400
					FEED	85	105	105	135	160	160	170	190	180	170	160	160
	39.1		1.0D	0.05D	Vc	20	22	25	25	36	35	36	39	40	40	39	40
					fz	0.002	0.003	0.003	0.005	0.008	0.013	0.018	0.021	0.025	0.030	0.036	0.043
					RPM	13,000	11,800	9,850	8,050	5,700	3,750	2,850	2,500	2,100	1,600	1,250	1,050
					FEED	55	60	65	85	95	95	100	105	105	95	90	90
	39.2		1.0D	0.05D	Vc	15	19	19	20	27	28	28	31	31	31	31	32
					fz	0.002	0.002	0.003	0.004	0.007	0.010	0.015	0.016	0.020	0.026	0.028	0.032
					RPM	9,850	9,850	7,500	6,300	4,350	2,950	2,200	2,000	1,650	1,250	1,000	850
					FEED	30	40	40	55	60	60	65	65	65	65	55	55
	40	Chilled Cast Iron	1.0D	0.05D	Vc	28	33	44	47	64	64	65	77	76	77	77	77
					fz	0.003	0.004	0.005	0.007	0.012	0.018	0.025	0.030	0.035	0.043	0.051	0.061
					RPM	17,700	17,700	17,700	14,950	10,250	6,800	5,200	4,900	4,050	3,050	2,450	2,050
					FEED	105	135	160	210	250	250	265	295	285	265	250	250
	41	Hardened Cast Iron	1.0D	0.05D	Vc	25	30	30	32	43	43	43	51	51	52	50	53
					fz	0.003	0.003	0.004	0.007	0.012	0.018	0.025	0.029	0.033	0.041	0.050	0.057
					RPM	15,750	15,750	11,800	10,050	6,900	4,550	3,450	3,250	2,700	2,050	1,600	1,400
					FEED	85	105	105	135	160	160	170	190	180	170	160	160



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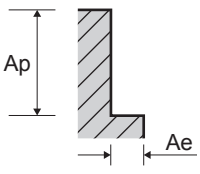
RECOMMENDED CUTTING CONDITIONS

GFJ72 SERIES — 2 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) 0.5	0.6	0.8	1.0	2.0	3.0	4.0	5.0	6.0	8.0	10.0	12.0
P	5	Non-alloy steel	0.03D	1.0D	Vc	31	37	50	59	82	81	82	97	97	98	96	98
					fz	0.002	0.003	0.004	0.010	0.017	0.026	0.035	0.043	0.049	0.063	0.072	0.085
					RPM	19,700	19,700	19,700	18,900	13,100	8,600	6,550	6,200	5,150	3,900	3,050	2,600
					FEED	95	125	160	390	440	440	460	535	500	490	440	440
	8-9	Low alloy steel	0.03D	1.0D	Vc	31	37	50	59	82	81	82	97	97	98	96	98
					fz	0.002	0.003	0.004	0.010	0.017	0.026	0.035	0.043	0.049	0.063	0.072	0.085
					RPM	19,700	19,700	19,700	18,900	13,100	8,600	6,550	6,200	5,150	3,900	3,050	2,600
					FEED	95	125	160	390	440	440	460	535	500	490	440	440
	11.1	High alloyed steel, and tool steel	0.03D	1.0D	Vc	31	37	50	59	82	81	82	97	97	98	96	98
					fz	0.002	0.003	0.004	0.010	0.017	0.026	0.035	0.043	0.049	0.063	0.072	0.085
					RPM	19,700	19,700	19,700	18,900	13,100	8,600	6,550	6,200	5,150	3,900	3,050	2,600
					FEED	95	125	160	390	440	440	460	535	500	490	440	440
	11.2		0.02D	1.0D	Vc	28	33	44	47	64	64	65	77	76	77	77	77
					fz	0.002	0.003	0.003	0.010	0.017	0.026	0.036	0.043	0.051	0.062	0.072	0.087
					RPM	17,700	17,700	17,700	14,950	10,250	6,800	5,200	4,900	4,050	3,050	2,450	2,050
					FEED	75	95	115	305	355	355	370	425	410	380	355	355
H	38.1	Hardened steel	0.02D	1.0D	Vc	28	33	44	47	64	64	65	77	76	77	77	77
					fz	0.002	0.003	0.003	0.010	0.017	0.026	0.036	0.043	0.051	0.062	0.072	0.087
					RPM	17,700	17,700	17,700	14,950	10,250	6,800	5,200	4,900	4,050	3,050	2,450	2,050
					FEED	75	95	115	305	355	355	370	425	410	380	355	355
	38.2		0.02D	1.0D	Vc	25	30	30	32	43	43	43	51	51	52	50	53
					fz	0.002	0.002	0.003	0.009	0.016	0.024	0.033	0.041	0.046	0.056	0.069	0.079
					RPM	15,750	15,750	11,800	10,050	6,900	4,550	3,450	3,250	2,700	2,050	1,600	1,400
					FEED	60	75	75	190	220	220	230	265	250	230	220	220
	39.1		0.02D	1.0D	Vc	20	22	25	25	36	35	36	39	40	40	39	40
					fz	0.001	0.002	0.002	0.007	0.012	0.018	0.025	0.029	0.035	0.042	0.050	0.060
					RPM	13,000	11,800	9,850	8,050	5,700	3,750	2,850	2,500	2,100	1,600	1,250	1,050
					FEED	35	40	40	115	135	135	140	145	145	135	125	125
	39.2		0.02D	1.0D	Vc	15	19	19	20	27	28	28	31	31	31	31	32
					fz	0.001	0.002	0.002	0.006	0.010	0.014	0.020	0.024	0.029	0.034	0.043	0.050
					RPM	9,850	9,850	7,500	6,300	4,350	2,950	2,200	2,000	1,650	1,250	1,000	850
					FEED	20	30	30	75	85	85	90	95	95	85	85	85
	40	Chilled Cast Iron	0.02D	1.0D	Vc	28	33	44	47	64	64	65	77	76	77	77	77
					fz	0.002	0.003	0.003	0.010	0.017	0.026	0.036	0.043	0.051	0.062	0.072	0.087
					RPM	17,700	17,700	17,700	14,950	10,250	6,800	5,200	4,900	4,050	3,050	2,450	2,050
					FEED	75	95	115	305	355	355	370	425	410	380	355	355
	41	Hardened Cast Iron	0.02D	1.0D	Vc	25	30	30	32	43	43	43	51	51	52	50	53
					fz	0.002	0.002	0.003	0.009	0.016	0.024	0.033	0.041	0.046	0.056	0.069	0.079
					RPM	15,750	15,750	11,800	10,050	6,900	4,550	3,450	3,250	2,700	2,050	1,600	1,400
					FEED	60	75	75	190	220	220	230	265	250	230	220	220

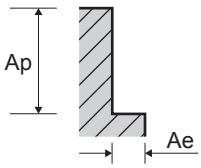


RECOMMENDED CUTTING CONDITIONS

GFJ73 SERIES — 4 FLUTES - 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 1.0	2.0	3.0	4.0	5.0	6.0	8.0	10.0	12.0	16.0	20.0
P	5	Non-alloy steel	0.03D	1.0D	Vc	79	110	108	110	130	130	131	129	132	128	129
					fz	0.008	0.014	0.022	0.030	0.035	0.041	0.052	0.062	0.072	0.085	0.091
					RPM	25,200	17,500	11,450	8,750	8,250	6,900	5,200	4,100	3,500	2,550	2,050
					FEED	855	1010	1010	1040	1155	1125	1085	1010	1010	865	750
	8-9	Low alloy steel	0.03D	1.0D	Vc	79	110	108	110	130	130	131	129	132	128	129
					fz	0.008	0.014	0.022	0.030	0.035	0.041	0.052	0.062	0.072	0.085	0.091
					RPM	25,200	17,500	11,450	8,750	8,250	6,900	5,200	4,100	3,500	2,550	2,050
					FEED	855	1010	1010	1040	1155	1125	1085	1010	1010	865	750
	11.1	High alloyed steel, and tool steel	0.03D	1.0D	Vc	79	110	108	110	130	130	131	129	132	128	129
					fz	0.008	0.014	0.022	0.030	0.035	0.041	0.052	0.062	0.072	0.085	0.091
					RPM	25,200	17,500	11,450	8,750	8,250	6,900	5,200	4,100	3,500	2,550	2,050
					FEED	855	1010	1010	1040	1155	1125	1085	1010	1010	865	750
	11.2		0.02D	1.0D	Vc	63	86	86	87	103	103	103	102	104	103	104
					fz	0.008	0.013	0.020	0.027	0.033	0.037	0.048	0.056	0.066	0.077	0.085
					RPM	19,950	13,650	9,100	6,950	6,550	5,450	4,100	3,250	2,750	2,050	1,650
					FEED	605	720	720	750	865	810	780	730	730	635	560
H	38.1	Hardened steel	0.02D	1.0D	Vc	63	86	86	87	103	103	103	102	104	103	104
					fz	0.008	0.013	0.020	0.027	0.033	0.037	0.048	0.056	0.066	0.077	0.085
					RPM	19,950	13,650	9,100	6,950	6,550	5,450	4,100	3,250	2,750	2,050	1,650
					FEED	605	720	720	750	865	810	780	730	730	635	560
	38.2		0.02D	1.0D	Vc	42	58	57	58	68	68	69	68	70	68	69
					fz	0.008	0.013	0.020	0.028	0.033	0.038	0.047	0.056	0.066	0.078	0.085
					RPM	13,400	9,200	6,050	4,600	4,350	3,600	2,750	2,150	1,850	1,350	1,100
					FEED	410	485	485	510	580	550	520	485	485	420	375
	39.1		0.02D	1.0D	Vc	34	48	47	48	53	53	53	53	53	53	53
					fz	0.006	0.010	0.015	0.020	0.025	0.029	0.036	0.040	0.049	0.058	0.065
					RPM	10,750	7,600	5,000	3,800	3,350	2,800	2,100	1,700	1,400	1,050	850
					FEED	250	300	300	310	335	325	300	275	275	245	220
	39.2		0.02D	1.0D	Vc	26	36	37	37	42	41	43	42	41	43	44
					fz	0.005	0.008	0.012	0.017	0.020	0.023	0.028	0.033	0.040	0.046	0.052
					RPM	8,400	5,800	3,950	2,950	2,700	2,200	1,700	1,350	1,100	850	700
					FEED	155	185	185	195	215	205	190	180	175	155	145
	40	Chilled Cast Iron	0.02D	1.0D	Vc	63	86	86	87	103	103	103	102	104	103	104
					fz	0.008	0.013	0.020	0.027	0.033	0.037	0.048	0.056	0.066	0.077	0.085
					RPM	19,950	13,650	9,100	6,950	6,550	5,450	4,100	3,250	2,750	2,050	1,650
					FEED	605	720	720	750	865	810	780	730	730	635	560
	41	Hardened Cast Iron	0.02D	1.0D	Vc	42	58	57	58	68	68	69	68	70	68	69
					fz	0.008	0.013	0.020	0.028	0.033	0.038	0.047	0.056	0.066	0.078	0.085
					RPM	13,400	9,200	6,050	4,600	4,350	3,600	2,750	2,150	1,850	1,350	1,100
					FEED	410	485	485	510	580	550	520	485	485	420	375



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NEW CENTURY

SOLID CARBIDE, DRILLS for GENERAL

Economical drill for general applications

◎ : Excellent ○ : Good

SERIES	DH223	DH224
DRILLING DEPTH	3XD	5XD
LENGTH	SHORT	LONG
SIZE MIN	D3.0	D1.0
SIZE MAX	D20.0	D20.0
PAGE	85	87
SURFACE TREATMENT	TiAlN	

ISO	VDI 3323	Material Description	Composition / Structure / Heat Treatment		HB	HRc	DH223	DH224
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		

Recommended cutting conditions : p.89

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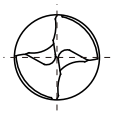
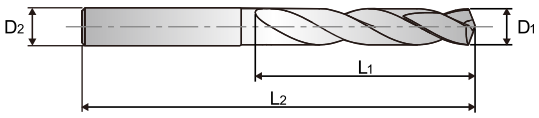
- Self centering and chip breaking by special thinning.
- Wave shape and negative land on the cutting edge for low thrust, stable torque and long tool life.
- Optimized flute shape for strength of drilling and smooth chip evacuation.

3 × D





DIN 6537 | CARBIDE | 30° | h6 | m7 | 140°

p. 89

DH223 SERIES

Unit : mm

EDP No.	Drill Diameter	Shank Diameter	Flute Length	Overall Length
TiAlN	D_1	D_2	L_1	L_2
DH2230300	3.0	6	20	62
DH2230310	3.1	6	20	62
DH2230320	3.2	6	20	62
DH2230330	3.3	6	20	62
DH2230340	3.4	6	20	62
DH2230350	3.5	6	20	62
DH2230360	3.6	6	20	62
DH2230370	3.7	6	20	62
DH2230380	3.8	6	24	66
DH2230390	3.9	6	24	66
DH2230400	4.0	6	24	66
DH2230410	4.1	6	24	66
DH2230420	4.2	6	24	66
DH2230430	4.3	6	24	66
DH2230440	4.4	6	24	66
DH2230450	4.5	6	24	66
DH2230460	4.6	6	24	66
DH2230470	4.7	6	24	66
DH2230480	4.8	6	28	66
DH2230490	4.9	6	28	66
DH2230500	5.0	6	28	66
DH2230510	5.1	6	28	66
DH2230520	5.2	6	28	66
DH2230530	5.3	6	28	66
DH2230540	5.4	6	28	66
DH2230550	5.5	6	28	66
DH2230560	5.6	6	28	66
DH2230570	5.7	6	28	66
DH2230580	5.8	6	28	66
DH2230590	5.9	6	28	66
DH2230600	6.0	6	28	66
DH2230610	6.1	8	34	79

EDP No.	Drill Diameter	Shank Diameter	Flute Length	Overall Length
TiAlN	D_1	D_2	L_1	L_2
DH2230620	6.2	8	34	79
DH2230630	6.3	8	34	79
DH2230640	6.4	8	34	79
DH2230650	6.5	8	34	79
DH2230660	6.6	8	34	79
DH2230670	6.7	8	34	79
DH2230680	6.8	8	34	79
DH2230690	6.9	8	34	79
DH2230700	7.0	8	34	79
DH2230710	7.1	8	41	79
DH2230720	7.2	8	41	79
DH2230730	7.3	8	41	79
DH2230740	7.4	8	41	79
DH2230750	7.5	8	41	79
DH2230760	7.6	8	41	79
DH2230770	7.7	8	41	79
DH2230780	7.8	8	41	79
DH2230790	7.9	8	41	79
DH2230800	8.0	8	41	79
DH2230810	8.1	10	47	89
DH2230820	8.2	10	47	89
DH2230830	8.3	10	47	89
DH2230840	8.4	10	47	89
DH2230850	8.5	10	47	89
DH2230860	8.6	10	47	89
DH2230870	8.7	10	47	89
DH2230880	8.8	10	47	89
DH2230890	8.9	10	47	89
DH2230900	9.0	10	47	89
DH2230910	9.1	10	47	89
DH2230920	9.2	10	47	89
DH2230930	9.3	10	47	89

▶ NEXT PAGE

CARBIDE, DRILLS for GENERAL without COOLANT HOLES

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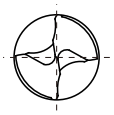

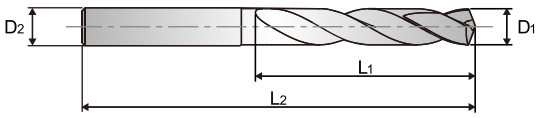

DIN 6537 | CARBIDE | 30° | h6 | m7 | 140°

p. 89

DH223 SERIES

Unit : mm

EDP No.	Drill Diameter	Shank Diameter	Flute Length	Overall Length
TiAlN	D_1	D_2	L_1	L_2
DH2230940	9.4	10	47	89
DH2230950	9.5	10	47	89
DH2230960	9.6	10	47	89
DH2230970	9.7	10	47	89
DH2230980	9.8	10	47	89
DH2230990	9.9	10	47	89
DH2231000	10.0	10	47	89
DH2231010	10.1	12	55	102
DH2231020	10.2	12	55	102
DH2231030	10.3	12	55	102
DH2231040	10.4	12	55	102
DH2231050	10.5	12	55	102
DH2231060	10.6	12	55	102
DH2231070	10.7	12	55	102
DH2231080	10.8	12	55	102
DH2231090	10.9	12	55	102
DH2231100	11.0	12	55	102
DH2231110	11.1	12	55	102
DH2231120	11.2	12	55	102
DH2231130	11.3	12	55	102
DH2231140	11.4	12	55	102
DH2231150	11.5	12	55	102
DH2231160	11.6	12	55	102
DH2231170	11.7	12	55	102
DH2231180	11.8	12	55	102
DH2231190	11.9	12	55	102
DH2231200	12.0	12	55	102
DH2231250	12.5	14	60	107
DH2231300	13.0	14	60	107
DH2231350	13.5	14	60	107
DH2231400	14.0	14	60	107
DH2231450	14.5	16	65	115

EDP No.	Drill Diameter	Shank Diameter	Flute Length	Overall Length
TiAlN	D_1	D_2	L_1	L_2
DH2231500	15.0	16	65	115
DH2231550	15.5	16	65	115
DH2231600	16.0	16	65	115
DH2231650	16.5	18	73	123
DH2231700	17.0	18	73	123
DH2231750	17.5	18	73	123
DH2231800	18.0	18	73	123
DH2231850	18.5	20	79	131
DH2231900	19.0	20	79	131
DH2231950	19.5	20	79	131
DH2232000	20.0	20	79	131

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- 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.

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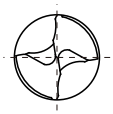

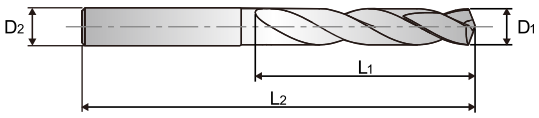

DIN 6537 | CARBIDE | 30° | h6 | m7 | 140°

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DH224 SERIES

Unit : mm

EDP No.	Drill Diameter	Shank Diameter	Flute Length	Overall Length
TiAlN	D1	D2	L1	L2
DH2240100	1.00	3	8	55
DH2240110	1.10	3	12	55
DH2240120	1.20	3	12	55
DH2240130	1.30	3	12	55
DH2240140	1.40	3	12	55
DH2240150	1.50	3	16	55
DH2240160	1.60	3	16	55
DH2240170	1.70	3	16	55
DH2240180	1.80	3	16	55
DH2240183	1.83	3	16	55
DH2240190	1.90	3	16	55
DH2240200	2.00	4	21	57
DH2240210	2.10	4	21	57
DH2240220	2.20	4	21	57
DH2240230	2.30	4	21	57
DH2240240	2.40	4	21	57
DH2240250	2.50	4	21	57
DH2240260	2.60	4	21	57
DH2240270	2.70	4	21	57
DH2240280	2.80	4	21	57
DH2240290	2.90	4	21	57
DH2240300	3.00	6	28	66
DH2240310	3.10	6	28	66
DH2240320	3.20	6	28	66
DH2240325	3.25	6	28	66
DH2240330	3.30	6	28	66
DH2240340	3.40	6	28	66
DH2240350	3.50	6	28	66
DH2240360	3.60	6	28	66
DH2240370	3.70	6	28	66
DH2240375	3.75	6	28	66
DH2240380	3.80	6	36	74
DH2240390	3.90	6	36	74
DH2240400	4.00	6	36	74
DH2240410	4.10	6	36	74
DH2240415	4.15	6	36	74
DH2240420	4.20	6	36	74
DH2240430	4.30	6	36	74
DH2240440	4.40	6	36	74

EDP No.	Drill Diameter	Shank Diameter	Flute Length	Overall Length
TiAlN	D1	D2	L1	L2
DH2240450	4.50	6	36	74
DH2240460	4.60	6	36	74
DH2240465	4.65	6	36	74
DH2240470	4.70	6	36	74
DH2240475	4.75	6	36	74
DH2240480	4.80	6	44	82
DH2240490	4.90	6	44	82
DH2240500	5.00	6	44	82
DH2240510	5.10	6	44	82
DH2240520	5.20	6	44	82
DH2240530	5.30	6	44	82
DH2240540	5.40	6	44	82
DH2240550	5.50	6	44	82
DH2240555	5.55	6	44	82
DH2240560	5.60	6	44	82
DH2240565	5.65	6	44	82
DH2240570	5.70	6	44	82
DH2240575	5.75	6	44	82
DH2240580	5.80	6	44	82
DH2240590	5.90	6	44	82
DH2240600	6.00	6	44	82
DH2240610	6.10	8	53	91
DH2240620	6.20	8	53	91
DH2240630	6.30	8	53	91
DH2240640	6.40	8	53	91
DH2240650	6.50	8	53	91
DH2240655	6.55	8	53	91
DH2240660	6.60	8	53	91
DH2240665	6.65	8	53	91
DH2240670	6.70	8	53	91
DH2240680	6.80	8	53	91
DH2240690	6.90	8	53	91
DH2240700	7.00	8	53	91
DH2240710	7.10	8	53	91
DH2240720	7.20	8	53	91
DH2240730	7.30	8	53	91
DH2240740	7.40	8	53	91
DH2240750	7.50	8	53	91
DH2240760	7.60	8	53	91

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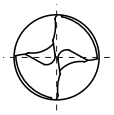

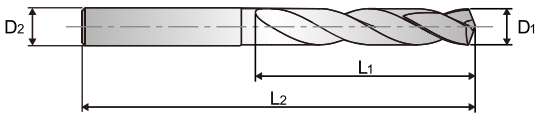

DIN 6537 | CARBIDE | 30° | h6 | m7 | 140°

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DH224 SERIES

Unit : mm

EDP No.	Drill Diameter	Shank Diameter	Flute Length	Overall Length
TiAlN	D_1	D_2	L_1	L_2
DH2240765	7.65	8	53	91
DH2240770	7.70	8	53	91
DH2240780	7.80	8	53	91
DH2240790	7.90	8	53	91
DH2240800	8.00	8	53	91
DH2240810	8.10	10	61	103
DH2240820	8.20	10	61	103
DH2240830	8.30	10	61	103
DH2240840	8.40	10	61	103
DH2240850	8.50	10	61	103
DH2240860	8.60	10	61	103
DH2240870	8.70	10	61	103
DH2240880	8.80	10	61	103
DH2240890	8.90	10	61	103
DH2240900	9.00	10	61	103
DH2240910	9.10	10	61	103
DH2240920	9.20	10	61	103
DH2240930	9.30	10	61	103
DH2240940	9.40	10	61	103
DH2240950	9.50	10	61	103
DH2240960	9.60	10	61	103
DH2240965	9.65	10	61	103
DH2240970	9.70	10	61	103
DH2240980	9.80	10	61	103
DH2240990	9.90	10	61	103
DH2241000	10.00	10	61	103
DH2241010	10.10	12	71	118
DH2241020	10.20	12	71	118
DH2241030	10.30	12	71	118
DH2241040	10.40	12	71	118
DH2241050	10.50	12	71	118
DH2241060	10.60	12	71	118
DH2241070	10.70	12	71	118
DH2241080	10.80	12	71	118
DH2241090	10.90	12	71	118
DH2241100	11.00	12	71	118
DH2241110	11.10	12	71	118
DH2241120	11.20	12	71	118

EDP No.	Drill Diameter	Shank Diameter	Flute Length	Overall Length
TiAlN	D_1	D_2	L_1	L_2
DH2241125	11.25	12	71	118
DH2241130	11.30	12	71	118
DH2241140	11.40	12	71	118
DH2241150	11.50	12	71	118
DH2241160	11.60	12	71	118
DH2241170	11.70	12	71	118
DH2241180	11.80	12	71	118
DH2241190	11.90	12	71	118
DH2241200	12.00	12	71	118
DH2241210	12.10	14	77	124
DH2241230	12.30	14	77	124
DH2241250	12.50	14	77	124
DH2241280	12.80	14	77	124
DH2241300	13.00	14	77	124
DH2241325	13.25	14	77	124
DH2241350	13.50	14	77	124
DH2241400	14.00	14	77	124
DH2241410	14.10	16	83	133
DH2241450	14.50	16	83	133
DH2241500	15.00	16	83	133
DH2241525	15.25	16	83	133
DH2241550	15.50	16	83	133
DH2241560	15.60	16	83	133
DH2241600	16.00	16	83	133
DH2241650	16.50	18	93	143
DH2241680	16.80	18	93	143
DH2241700	17.00	18	93	143
DH2241725	17.25	18	93	143
DH2241750	17.50	18	93	143
DH2241760	17.60	18	93	143
DH2241800	18.00	18	93	143
DH2241850	18.50	20	101	153
DH2241880	18.80	20	101	153
DH2241900	19.00	20	101	153
DH2241925	19.25	20	101	153
DH2241950	19.50	20	101	153
DH2241960	19.60	20	101	153
DH2242000	20.00	20	101	153

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RECOMMENDED CUTTING CONDITIONS

DH223, DH224 SERIES without COOLANT HOLES

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

ISO	VDI 3323	Material Description	Vc (m/min)	Parameter	Drill Diameter (mm)		Vc (m/min)	Parameter	Drill Diameter (mm)										
			1.0~2.9		1.0	2.0	3.0~20.0		3.0	4.0	5.0	6.0	8.0	10.0	12.0	14.0	16.0	18.0	20.0
P	2	Non-alloy steel	70	RPM	22,280	11,140	100	RPM	10,610	7,960	6,370	5,310	3,980	3,180	2,650	2,270	1,990	1,770	1,590
				FEED	0.03-0.05	0.05-0.07		FEED	0.06-0.12	0.08-0.14	0.14-0.20	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		70	RPM	22,280	11,140	100	RPM	10,610	7,960	6,370	5,310	3,980	3,180	2,650	2,270	1,990	1,770	1,590
				FEED	0.03-0.05	0.05-0.07		FEED	0.06-0.12	0.08-0.14	0.14-0.20	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		70	RPM	22,280	11,140	100	RPM	10,610	7,960	6,370	5,310	3,980	3,180	2,650	2,270	1,990	1,770	1,590
				FEED	0.03-0.05	0.05-0.07		FEED	0.04-0.10	0.07-0.13	0.10-0.16	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		60	RPM	19,100	9,550	80	RPM	8,490	6,370	5,090	4,240	3,180	2,550	2,120	1,820	1,590	1,410	1,270
				FEED	0.03-0.05	0.05-0.07		FEED	0.04-0.10	0.07-0.13	0.10-0.16	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	Low alloy steel	70	RPM	22,280	11,140	100	RPM	10,610	7,960	6,370	5,310	3,980	3,180	2,650	2,270	1,990	1,770	1,590
				FEED	0.03-0.05	0.05-0.07		FEED	0.06-0.12	0.08-0.14	0.14-0.20	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		60	RPM	19,100	9,550	80	RPM	8,490	6,370	5,090	4,240	3,180	2,550	2,120	1,820	1,590	1,410	1,270
				FEED	0.03-0.05	0.05-0.07		FEED	0.06-0.12	0.08-0.14	0.14-0.20	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
	8		60	RPM	19,100	9,550	80	RPM	8,490	6,370	5,090	4,240	3,180	2,550	2,120	1,820	1,590	1,410	1,270
				FEED	0.02-0.04	0.03-0.05		FEED	0.04-0.10	0.07-0.13	0.10-0.16	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
	8		30	RPM	9,550	4,770	40	RPM	4,240	3,180	2,550	2,120	1,590	1,270	1,060	910	800	710	640
				FEED	0.02-0.04	0.03-0.05		FEED	0.03-0.08	0.05-0.11	0.08-0.14	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	High alloyed steel, and tool steel	50	RPM	15,920	7,960	70	RPM	7,430	5,570	4,460	3,710	2,790	2,230	1,860	1,590	1,390	1,240	1,110
				FEED	0.03-0.05	0.05-0.07		FEED	0.04-0.10	0.07-0.13	0.10-0.16	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		30	RPM	9,550	4,770	40	RPM	4,240	3,180	2,550	2,120	1,590	1,270	1,060	910	800	710	640
				FEED	0.02-0.04	0.03-0.05		FEED	0.03-0.08	0.05-0.11	0.08-0.14	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
M	12	Stainless steel	50	RPM	15,920	7,960	70	RPM	7,430	5,570	4,460	3,710	2,790	2,230	1,860	1,590	1,390	1,240	1,110
				FEED	0.03-0.05	0.05-0.07		FEED	0.06-0.12	0.08-0.14	0.14-0.20	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		35	RPM	11,140	5,570	45	RPM	4,770	3,580	2,860	2,390	1,790	1,430	1,190	1,020	900	800	720
				FEED	0.02-0.04	0.03-0.05		FEED	0.04-0.10	0.07-0.13	0.10-0.16	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
K	15	Grey cast iron	70	RPM	22,280	11,140	100	RPM	10,610	7,960	6,370	5,310	3,980	3,180	2,650	2,270	1,990	1,770	1,590
				FEED	0.04-0.06	0.04-0.06		FEED	0.08-0.14	0.12-0.18	0.15-0.22	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		65	RPM	20,690	10,350	80	RPM	8,490	6,370	5,090	4,240	3,180	2,550	2,120	1,820	1,590	1,410	1,270
				FEED	0.04-0.06	0.04-0.06		FEED	0.06-0.12	0.08-0.14	0.14-0.20	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	Nodular cast iron	70	RPM	22,280	11,140	100	RPM	10,610	7,960	6,370	5,310	3,980	3,180	2,650	2,270	1,990	1,770	1,590
				FEED	0.04-0.06	0.04-0.06		FEED	0.08-0.14	0.12-0.18	0.15-0.22	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		50	RPM	15,920	7,960	70	RPM	7,430	5,570	4,460	3,710	2,790	2,230	1,860	1,590	1,390	1,240	1,110
				FEED	0.04-0.06	0.04-0.06		FEED	0.06-0.12	0.08-0.14	0.14-0.20	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	Malleable cast iron	60	RPM	19,100	9,550	80	RPM	8,490	6,370	5,090	4,240	3,180	2,550	2,120	1,820	1,590	1,410	1,270
				FEED	0.04-0.06	0.04-0.06		FEED	0.08-0.14	0.12-0.18	0.15-0.22	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		50	RPM	15,920	7,960	70	RPM	7,430	5,570	4,460	3,710	2,790	2,230	1,860	1,590	1,390	1,240	1,110
				FEED	0.03-0.05	0.05-0.07		FEED	0.06-0.12	0.08-0.14	0.14-0.20	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
H	38	Hardened steel	20	RPM	6,370	3,180	25	RPM	2,650	1,990	1,590	1,330	990	800	660	570	500	440	400
				FEED	0.01-0.02	0.01-0.03		FEED	0.01-0.03	0.01-0.04	0.02-0.05	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

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