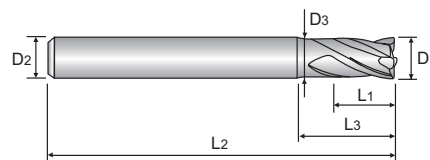


END MILLS for HARDENED MATERIAL

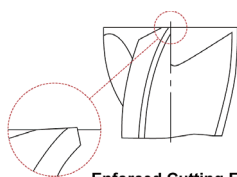


CARBIDE, 4 FLUTE STUB LENGTH

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



p. 82



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 D1	Shank Diameter D2	Length of Cut L1	Length Below Shank L3	Overall Length L2	Neck Diameter 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

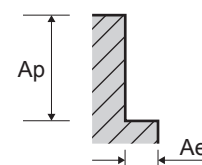
RECOMMENDED CUTTING CONDITIONS

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

GFJ73 SERIES

4 FLUTES - SIDE CUTTING

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	High alloyed steel, and tool 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
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	Hardened steel	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	Hardened steel	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	Hardened steel	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



SOLID CARBIDE, END MILLS for Hardened Material

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

◎ : Excellent ○ : Good

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		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

SERIES

FLUTE

HELIX ANGLE

CUTTING EDGE SHAPE

SIZE MIN

SIZE MAX

PAGE

GFJ69

GFJ68

2

2

30°

30°

BALL NOSE

BALL NOSE

R0.2

R0.1

R2.0

R6.0

66

69

LONG LENGTH

-

Z-VG Coating

Z-VG Coating



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
				
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◎	◎	◎	◎	41

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