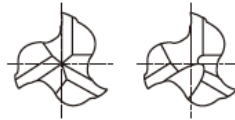
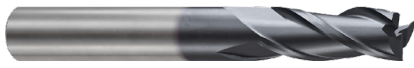


END MILLS for GENERAL

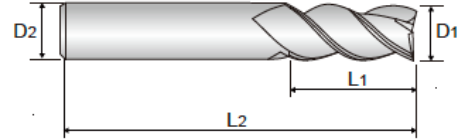


CARBIDE, 3 FLUTE 30° HELIX SHORT LENGTH

- ▶ 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 $\varnothing 3\text{mm}$ from $\varnothing 3\text{mm}$



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
	D1	D2	L1	L2
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

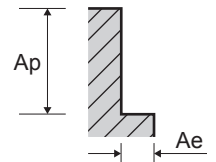
RECOMMENDED CUTTING CONDITIONS

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

G9F43 / G9J59 SERIES

3 FLUTE - SIDE CUTTING

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		
	5	Non-alloy steel	0.05D	1D	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		
	6-7	Low alloy 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		
8-9	Low alloy steel	0.05D	1D	RPM	9200	5550	4710	4100	3730	3400	2750	2500	1850	1450	1150	1000	750	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			
11.1 11.2	High alloyed steel, and tool steel	0.05D	1D	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			
M	14.1	Stainless 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	1150	1000	750	750		
					FEED	125	200	225	235	270	300	305	370	335	265	215	200	180	140		
K	15-16	Grey cast iron	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	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		
K	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		
	40	Chilled Cast Iron	0.05D	1D	RPM	9200	5550	4710	4100	3730	3400	2750	2500	1850	1450	1150	1000	750			
					FEED	125	200	225	235	270	300	305	370	335	265	215	200	180	140		



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

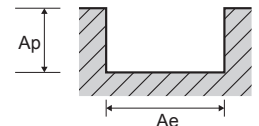
COATED CARBIDE DRILL FOR GENERAL

RECOMMENDED CUTTING CONDITIONS

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

G9F43 / G9J59 SERIES 3 FLUTE - SLOTTING

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					
6-7	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							
8-9	1D	0.5D (Up to Ø3 : 0.2D)	Vc	15450	8500	7385	6600	6000	5550	4650	4100	3100	2350	2000	1850	1600	1250							
			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							
10	1D	0.5D (Up to Ø3 : 0.2D)	Vc	9200	5550	4710	4100	3730	3400	2750	2500	1850	1450	1250	1150	1000	750							
			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							
11.1 11.2	1D	0.5D (Up to Ø3 : 0.2D)	Vc	15450	8500	7385	6600	6000	5550	4650	4100	3100	2350	2000	1850	1600	1250							
			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							
M	14.1	Stainless steel	1D	0.5D (Up to Ø3 : 0.2D)	Vc	9200	5550	4710	4100	3730	3400	2750	2500	1850	1450	1250	1150	1000	750					
					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	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					
					K	15-16	Grey cast iron	1D	1D	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	29	35	37	39						41	43	43	47	46	46	47	51	50	47					
FEED	29	35	37	39						41	43	43	47	46	46	47	51	50	47					
H	38.1	Hardened 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	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					
K	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	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					



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

SOLID CARBIDE, END MILLS for General

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

◎ : 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		Duroplastic, Fiber Reinforced Plastic						
	30	Non Metallic Materials	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	38.1	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

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



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

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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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