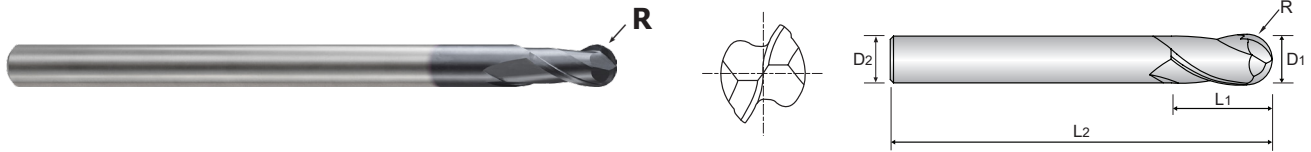


# END MILLS for GENERAL

## 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
R ±0.02
PLAIN
X Coating
p. 47

R1.0-R3.0 R4.0-R10.0

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

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.)

G9F44 / G9J56 SERIES					2 FLUTE BALL NOSE										
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	
	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				
	5	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	
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	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		
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					
8-9	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		
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					
10	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		
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					
11.1 11.2	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		
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					
K	15-16	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	
	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				
	38.1	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	
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					
38.2	Hardened 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		
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	Hardened 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		
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					
41	Hardened 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		
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					

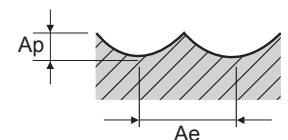
SUPER HARDENED  
HSS END MILL

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