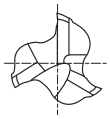
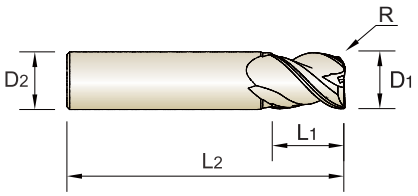
SOLID CARBIDE END MILLS

3 FLUTE CORNER RADIUS for KEYWAY MILLING

▶ Special undersize design for key-way slots to comply with DIN 6885 while ramping, slotting and finishing with one tool
▶ Smooth cutting action, unequal flute geometry and multiple helix eliminate vibrations
▶ Short overhang for applications on Mill-Turn machines or with Driven Tooling at Lathes



Unequal Index



CARBIDE | 3 | 43°/45°/47° | R ±0.020 | PLAIN | FLAT | Y Coating

p.18

D<Ø3, 45° HELIX

Unit : mm

EDP No.		Corner Radius	Mill Diameter	Shank Diameter	Length of Cut	Overall Length
PLAIN	FLAT	R	D_1	D_2	L_1	L_2
GMK60018	**GMK61018**	R0.12	**1.8**	6	4.5	38
GMK60028	**GMK61028**	R0.12	**2.8**	6	5.5	38
GMK60038	**GMK61038**	R0.2	**3.8**	6	7.5	38
GMK60048	**GMK61048**	R0.2	**4.8**	6	9	38
GMK600575	**GMK610575**	R0.2	**5.8**	6	9	38
GMK600775	**GMK610775**	R0.2	**7.8**	8	12	43
GMK60097	**GMK61097**	R0.33	**9.7**	10	14	50
GMK60117	**GMK61117**	R0.33	**11.7**	12	16.5	55

▶ Note: Use of hydraulic chucks requires reducer sleeves to ensure stable clamping

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

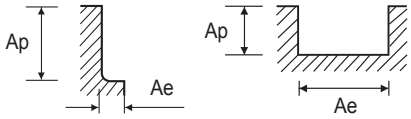
◎ : Excellent ○ : Good

ISO	P												M				K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel			Stainless steel				Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11.1	11.2	12	13	14.1	14.2	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	44	15	23	10	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	409	200	240	180	180	180	260	160	250	130	230
Recommended	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎		○	○	○	○	○	○	○	○	○	○

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

GMK60, GMK61 SERIES

3 FLUTE CORNER RADIUS - SIDE CUTTING & SLOTTING



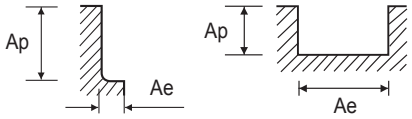
Vc = m/min. fz = mm/tooth
RPM = rev./min. FEED = mm/min.

ISO	VDI 3323	Material Description	Side Ae	Side Ap	Slotting Ae	Slotting Ap	Para-meter	Diameter (Ø) 1.8	2.8	3.8	4.8	5.75	7.75	9.7	11.7
P	1	Non-alloy steel	0.5D	1.0D	1.0D	0.8D	Vc	152	152	152	152	152	152	168	168
							fz	0.003	0.005	0.008	0.011	0.016	0.027	0.038	0.047
							RPM	26880	17280	12732	10080	8414	6243	5513	4571
							FEED	242	259	306	333	404	506	628	645
	2		0.5D	1.0D	1.0D	0.8D	Vc	152	152	152	152	152	152	168	168
							fz	0.003	0.005	0.008	0.011	0.016	0.027	0.038	0.047
							RPM	26880	17280	12732	10080	8414	6243	5513	4571
							FEED	242	259	306	333	404	506	628	645
	3		0.5D	1.0D	1.0D	0.8D	Vc	152	152	152	152	152	152	168	168
							fz	0.003	0.005	0.008	0.011	0.016	0.027	0.038	0.047
							RPM	26880	17280	12732	10080	8414	6243	5513	4571
							FEED	242	259	306	333	404	506	628	645
	4		0.5D	1.0D	1.0D	0.8D	Vc	152	152	152	152	152	152	168	168
							fz	0.003	0.005	0.008	0.011	0.016	0.027	0.038	0.047
							RPM	26880	17280	12732	10080	8414	6243	5513	4571
							FEED	242	259	306	333	404	506	628	645
	5		0.5D	1.0D	1.0D	0.8D	Vc	107	107	107	107	107	107	117	117
							fz	0.003	0.005	0.008	0.011	0.016	0.027	0.038	0.047
							RPM	18922	12164	8963	7096	5923	4395	3839	3183
							FEED	170	182	215	234	284	356	438	449
	6	Low alloy steel	0.5D	1.0D	1.0D	0.8D	Vc	152	152	152	152	152	152	168	168
							fz	0.003	0.005	0.008	0.011	0.016	0.027	0.038	0.047
							RPM	26880	17280	12732	10080	8414	6243	5513	4571
							FEED	242	259	306	333	404	506	628	645
	7		0.5D	1.0D	1.0D	0.8D	Vc	152	152	152	152	152	152	168	168
							fz	0.003	0.005	0.008	0.011	0.016	0.027	0.038	0.047
							RPM	26880	17280	12732	10080	8414	6243	5513	4571
							FEED	242	259	306	333	404	506	628	645
	8		0.5D	1.0D	1.0D	0.8D	Vc	107	107	107	107	107	107	117	117
							fz	0.003	0.005	0.008	0.011	0.016	0.027	0.038	0.047
							RPM	18922	12164	8963	7096	5923	4395	3839	3183
							FEED	170	182	215	234	284	356	438	449
	9		0.5D	1.0D	1.0D	0.8D	Vc	107	107	107	107	107	107	117	117
							fz	0.003	0.005	0.008	0.011	0.016	0.027	0.038	0.047
							RPM	18922	12164	8963	7096	5923	4395	3839	3183
							FEED	170	182	215	234	284	356	438	449
	10	High alloyed steel, and tool steel	0.5D	1.0D	1.0D	0.8D	Vc	64	64	64	64	64	64	70	70
							fz	0.001	0.003	0.006	0.008	0.011	0.019	0.027	0.032
							RPM	11318	7276	5361	4244	3543	2629	2297	1904
							FEED	34	65	96	102	117	150	186	183
	11.1		0.5D	1.0D	1.0D	0.8D	Vc	64	64	64	64	64	64	70	70
							fz	0.001	0.003	0.006	0.008	0.011	0.019	0.027	0.032
							RPM	11318	7276	5361	4244	3543	2629	2297	1904
							FEED	34	65	96	102	117	150	186	183
M	12	Stainless steel	0.5D	1.0D	1.0D	0.8D	Vc	148	148	148	148	148	148	148	148
							fz	0.002	0.004	0.006	0.009	0.013	0.022	0.034	0.039
							RPM	26172	16825	12397	9815	8193	6079	4857	4026
							FEED	157	202	223	265	320	401	495	471
	13		0.5D	1.0D	1.0D	0.8D	Vc	148	148	148	148	148	148	148	148
							fz	0.002	0.004	0.006	0.009	0.013	0.022	0.034	0.039
							RPM	26172	16825	12397	9815	8193	6079	4857	4026
							FEED	157	202	223	265	320	401	495	471
	14.1		0.5D	1.0D	1.0D	0.8D	Vc	106	106	106	106	106	106	106	106
							fz	0.003	0.005	0.008	0.013	0.018	0.028	0.048	0.055
							RPM	18745	12050	8879	7029	5868	4354	3478	2884
							FEED	169	181	213	274	317	366	501	476
	14.2		0.5D	1.0D	1.0D	0.8D	Vc	95	95	95	95	95	95	95	95
							fz	0.003	0.005	0.008	0.013	0.018	0.028	0.048	0.055
							RPM	16800	10800	7958	6300	5259	3902	3117	2585
							FEED	151	162	191	246	284	328	449	427

▶ NEXT PAGE

GMK60, GMK61 SERIES

3 FLUTE CORNER RADIUS - SIDE CUTTING & SLOTTING



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

ISO	VDI 3323	Material Description	Side Ae	Side Ap	Slotting Ae	Slotting Ap	Para-meter	Diameter (Ø) 1.8	2.8	3.8	4.8	5.75	7.75	9.7	11.7
K	15	Grey cast iron	0.5D	1.0D	1.0D	0.8D	Vc	112	112	112	112	112	112	123	123
							fz	0.004	0.006	0.01	0.014	0.02	0.034	0.048	0.058
							RPM	19806	12732	9382	7427	6200	4600	4036	3346
							FEED	238	229	281	312	372	469	581	582
	16		0.5D	1.0D	1.0D	0.8D	Vc	112	112	112	112	112	112	123	123
							fz	0.004	0.006	0.01	0.014	0.02	0.034	0.048	0.058
							RPM	19806	12732	9382	7427	6200	4600	4036	3346
							FEED	238	229	281	312	372	469	581	582
	17	Nodular cast iron	0.5D	1.0D	1.0D	0.8D	Vc	112	112	112	112	112	112	123	123
							fz	0.004	0.006	0.01	0.014	0.02	0.034	0.048	0.058
							RPM	19806	12732	9382	7427	6200	4600	4036	3346
							FEED	238	229	281	312	372	469	581	582
	18		0.5D	1.0D	1.0D	0.8D	Vc	112	112	112	112	112	112	123	123
							fz	0.004	0.006	0.01	0.014	0.02	0.034	0.048	0.058
							RPM	19806	12732	9382	7427	6200	4600	4036	3346
							FEED	238	229	281	312	372	469	581	582
	19	Malleable cast iron	0.5D	1.0D	1.0D	0.8D	Vc	112	112	112	112	112	112	123	123
							fz	0.004	0.006	0.01	0.014	0.02	0.034	0.048	0.058
							RPM	19806	12732	9382	7427	6200	4600	4036	3346
							FEED	238	229	281	312	372	469	581	582
	20		0.5D	1.0D	1.0D	0.8D	Vc	112	112	112	112	112	112	123	123
							fz	0.004	0.006	0.01	0.014	0.02	0.034	0.048	0.058
							RPM	19806	12732	9382	7427	6200	4600	4036	3346
							FEED	238	229	281	312	372	469	581	582
S	31	Heat Resistant Super Alloys	0.25D	1D	1D	0.5D	Vc	26	26	26	26	26	26	26	26
							fz	0.003	0.005	0.007	0.008	0.012	0.019	0.033	0.038
							RPM	4598	2956	2178	1724	1439	1068	853	707
							FEED	41	44	46	41	52	61	84	81
	32		0.25D	1D	1D	0.5D	Vc	26	26	26	26	26	26	26	26
							fz	0.003	0.005	0.007	0.008	0.012	0.019	0.033	0.038
							RPM	4598	2956	2178	1724	1439	1068	853	707
							FEED	41	44	46	41	52	61	84	81
	33		0.25D	1D	1D	0.5D	Vc	26	26	26	26	26	26	26	26
							fz	0.003	0.005	0.007	0.008	0.012	0.019	0.033	0.038
							RPM	4598	2956	2178	1724	1439	1068	853	707
							FEED	41	44	46	41	52	61	84	81
	34		0.25D	1D	1D	0.5D	Vc	26	26	26	26	26	26	26	26
							fz	0.003	0.005	0.007	0.008	0.012	0.019	0.033	0.038
							RPM	4598	2956	2178	1724	1439	1068	853	707
							FEED	41	44	46	41	52	61	84	81
	35		0.25D	1D	1D	0.5D	Vc	26	26	26	26	26	26	26	26
							fz	0.003	0.005	0.007	0.008	0.012	0.019	0.033	0.038
							RPM	4598	2956	2178	1724	1439	1068	853	707
							FEED	41	44	46	41	52	61	84	81
	36	Titanium Alloys	0.35D	1D	1D	0.5D	Vc	58	58	58	58	58	58	58	58
							fz	0.002	0.004	0.007	0.011	0.016	0.025	0.042	0.050
							RPM	10257	6594	4858	3846	3211	2382	1903	1578
							FEED	62	79	102	127	154	179	240	237
	37		0.35D	1D	1D	0.5D	Vc	58	58	58	58	58	58	58	58
							fz	0.002	0.004	0.007	0.011	0.016	0.025	0.042	0.050
							RPM	10257	6594	4858	3846	3211	2382	1903	1578
							FEED	62	79	102	127	154	179	240	237

SERIES	GMK57	GMK62
FLUTE	2	3
HELIX ANGLE	30°	43°/45°/47° (MULTIPLE HELIX)
CUTTING EDGE SHAPE	BALL NOSE	BALL NOSE
SIZE MIN	R1.0	R1.0
SIZE MAX	R6.0	R6.0
PAGE	6	7
	Y-Coating	Y-Coating

SOLID CARBIDE END MILL
EV MILLS


Please visit globalyg1.com/mat for material search

Recommended cutting conditions : p.13-24

◎ : 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	◎	◎
	11.1			Quenched & Tempered	325	35	◎	◎
	11.2			Quenched & Tempered	409	44	◎	
M	12	Stainless steel	Ferritic / Martensitic	Annealed	200	15		○
	13		Martensitic	Quenched & Tempered	240	23		○
	14.1			Austenitic	180	10		○
	14.2			PH Stainless steel	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			
	29.1	Non Metallic Materials	Duroplastic					
	29.2		GRAPHITE					
	29.3		CFRP, GFRP					
	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	421-469	45-49		
	38.2			Hardened	481-560	50-55		
	39.1			Hardened	577-654	56-60		
	39.2			Hardened	670-739	61-65		
	39.3			Hardened		66-70		
	40	Chilled Cast Iron		Cast	400	42		
	41	Hardened Cast Iron		Hardened	550	55		

GMK65	GMK60 GMK61	GMK55 GMK56	GMK58 GMK59	GMK63 GMK64		
4	3	2	3	4		
35°/37° (MULTIPLE HELIX)	43°/45°/47° (MULTIPLE HELIX)	30°	43°/45°/47° (MULTIPLE HELIX)	35°/37° (MULTIPLE HELIX)		
BALL NOSE	CORNER RADIUS	SQUARE	SQUARE	SQUARE		
R1.0	D1.8	D2.0	D2.0	D2.0		
R6.0	D11.7	D12.0	D12.0	D12.0		
8	**9**	**10**	**11**	**12**		
Y-Coating	**Y-Coating**	**Y-Coating**	**Y-Coating**	**Y-Coating**		
						
◎	◎	◎	◎	◎	1	P
◎	◎	◎	◎	◎	2	
◎	◎	◎	◎	◎	3	
◎	◎	◎	◎	◎	4	
◎	◎	◎	◎	◎	5	
◎	◎	◎	◎	◎	6	
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◎	◎	◎	◎	◎	11.1	
		◎			11.2	
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					28	
					29.1	
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					29.3	
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					38.1	H
					38.2	
					39.1	
					39.2	
					39.3	
					40	
					41	