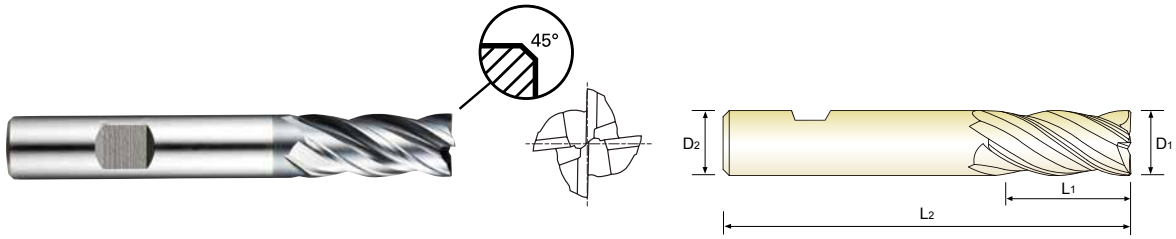
ONLY ONE COATED PM60 END MILLS

FLAT SHANK **GYG52 SERIES**

PM60, 4 FLUTE MULTIPLE HELIX SHORT LENGTH (Center Cut)

- PM60, 4 Schneiden, mit ungleichem Drall, kurz, Zentrumschnitt
- Revêtue YG-AlCrN - PM60, 4 dents, hélice multiple, série courte (Coupe au centre)
- Rivestita PM60, 4 TAGLIENTI elica variabile SERIE CORTA (Tagliente al centro)

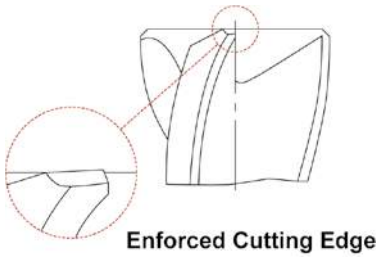


PM 60 | 4 | 35°/37° | FLAT | C x 45° | P.633

Unit : mm

EDP No.	Mill Diameter D_1	Shank Diameter D_2	Length of Cut L_1	Overall Length L_2	Chamfer
GYG52030	3.0	6	8	52	0.1
GYG52040	4.0	6	11	55	0.1
GYG52050	5.0	6	13	57	0.1
GYG52060	6.0	6	13	57	0.1
GYG52070	7.0	8	16	66	0.1
GYG52080	8.0	8	19	69	0.1
GYG52090	9.0	10	19	69	0.1
GYG52100	10.0	10	22	72	0.1
GYG52120	12.0	12	26	83	0.1
GYG52140	14.0	12	26	83	0.2
GYG52160	16.0	16	32	92	0.2
GYG52180	18.0	16	32	92	0.2
GYG52200	20.0	20	38	104	0.2
GYG52220	22.0	20	38	104	0.2
GYG52250	25.0	25	45	121	0.2

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



Enforced Cutting Edge

◎ : 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	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend	◎	◎	◎	◎	◎	◎	◎	◎	○	◎	○	◎	◎	◎	◎	◎	◎	◎	◎	◎

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	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend						○	○	○												○	

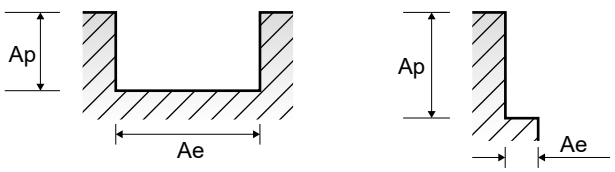
ONLY ONE COATED PM60 END MILLS

RECOMMENDED CUTTING CONDITIONS
EMPFOHLENE SCHNEIDPARAMETER

GYG52 SERIES — 4 FLUTE - SLOTTING, SIDE CUTTING

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

ISO	VDI 3323	Material Description	Slotting Ae	Slotting Ap	Side Cutting Ae	Side Cutting Ap	Parameter	Diameter (Ø) 3.0	4.0	5.0	6.0	8.0	10.0	12.0	14.0	16.0	18.0	20.0	25.0
P	1-2	Non-alloy steel	1.0D	0.5D	0.3D	1.5D	Vc	70	70	70	70	70	77	77	77	77	77	77	77
							fz	0.005	0.008	0.012	0.016	0.028	0.039	0.047	0.049	0.053	0.059	0.065	0.063
							RPM	7427	5570	4456	3714	2785	2451	2042	1751	1532	1362	1225	980
							FEED	149	178	214	238	312	382	384	343	325	321	319	247
	3-4		1.0D	0.5D	0.3D	1.5D	Vc	64	63	63	64	64	70	70	70	70	70	70	70
							fz	0.005	0.008	0.011	0.016	0.028	0.039	0.047	0.049	0.053	0.059	0.065	0.063
							RPM	6791	5013	4011	3395	2546	2228	1857	1592	1393	1238	1114	891
							FEED	136	160	176	217	285	348	349	312	295	292	290	225
	5		1.0D	0.5D	0.3D	1.5D	Vc	44	44	44	44	44	49	49	49	49	49	49	49
							fz	0.005	0.008	0.011	0.016	0.028	0.038	0.047	0.05	0.052	0.059	0.066	0.065
							RPM	4669	3501	2801	2334	1751	1560	1300	1114	975	867	780	624
							FEED	93	112	123	149	196	237	244	223	203	204	206	162
	6	Low alloy steel	1.0D	0.5D	0.3D	1.5D	Vc	70	70	70	70	70	77	77	77	77	77	77	77
							fz	0.005	0.008	0.012	0.016	0.028	0.039	0.047	0.049	0.053	0.059	0.065	0.063
							RPM	7427	5570	4456	3714	2785	2451	2042	1751	1532	1362	1225	980
							FEED	149	178	214	238	312	382	384	343	325	321	319	247
	7		1.0D	0.5D	0.3D	1.5D	Vc	64	63	63	64	64	70	70	70	70	70	70	70
							fz	0.005	0.008	0.011	0.016	0.028	0.039	0.047	0.049	0.053	0.059	0.065	0.063
							RPM	6791	5013	4011	3395	2546	2228	1857	1592	1393	1238	1114	891
							FEED	136	160	176	217	285	348	349	312	295	292	290	225
	8		1.0D	0.5D	0.3D	1.5D	Vc	44	44	44	44	44	49	49	49	49	49	49	49
							fz	0.005	0.008	0.011	0.016	0.028	0.038	0.047	0.05	0.052	0.059	0.066	0.065
							RPM	4669	3501	2801	2334	1751	1560	1300	1114	975	867	780	624
							FEED	93	112	123	149	196	237	244	223	203	204	206	162
	9		1.0D	0.3D	0.15D	1.5D	Vc	27	27	27	27	27	30	29	29	30	29	30	29
							fz	0.004	0.007	0.01	0.014	0.024	0.032	0.04	0.041	0.044	0.05	0.056	0.054
							RPM	2865	2149	1719	1432	1074	955	769	659	597	513	477	369
							FEED	46	60	69	80	103	122	123	108	105	103	107	80
	10	High alloyed steel, and tool steel	1.0D	0.5D	0.3D	1.5D	Vc	70	70	70	70	70	77	77	77	77	77	77	77
							fz	0.005	0.008	0.012	0.016	0.028	0.039	0.047	0.049	0.053	0.059	0.065	0.063
							RPM	7427	5570	4456	3714	2785	2451	2042	1751	1532	1362	1225	980
							FEED	149	178	214	238	312	382	384	343	325	321	319	247
	11.1		1.0D	0.5D	0.3D	1.5D	Vc	44	44	44	44	44	49	49	49	49	49	49	49
							fz	0.005	0.008	0.011	0.016	0.028	0.038	0.047	0.05	0.052	0.059	0.066	0.065
							RPM	4669	3501	2801	2334	1751	1560	1300	1114	975	867	780	624
							FEED	93	112	123	149	196	237	244	223	203	204	206	162
	11.2		1.0D	0.3D	0.15D	1.5D	Vc	27	27	27	27	27	30	29	29	30	29	30	29
							fz	0.004	0.007	0.01	0.014	0.024	0.032	0.04	0.041	0.044	0.05	0.056	0.054
							RPM	2865	2149	1719	1432	1074	955	769	659	597	513	477	369
							FEED	46	60	69	80	103	122	123	108	105	103	107	80
M	14.1	Stainless steel	1.0D	0.5D	0.3D	1.5D	Vc	48	48	48	48	48	48	48	48	48	48	48	48
							fz	0.005	0.008	0.013	0.018	0.029	0.048	0.056	0.06	0.063	0.071	0.077	0.078
							RPM	5093	3820	3056	2546	1910	1528	1273	1091	955	849	764	611
							FEED	102	122	159	183	222	293	285	262	241	241	235	191
K	15-20	Grey cast iron Nodular cast iron Malleable cast iron	1.0D	0.5D	0.3D	1.5D	Vc	70	70	70	70	70	77	77	77	77	77	77	77
							fz	0.005	0.008	0.012	0.016	0.028	0.039	0.047	0.049	0.053	0.059	0.065	0.063
							RPM	7427	5570	4456	3714	2785	2451	2042	1751	1532	1362	1225	980
							FEED	149	178	214	238	312	382	384	343	325	321	319	247
H	40	Chilled Cast Iron	1.0D	0.3D	0.15D	1.5D	Vc	27	27	27	27	27	30	29	29	30	29	30	29
							fz	0.004	0.007	0.01	0.014	0.024	0.032	0.04	0.041	0.044	0.05	0.056	0.054
							RPM	2865	2149	1719	1432	1074	955	769	659	597	513	477	369
							FEED	46	60	69	80	103	122	123	108	105	103	107	80



SELECTION GUIDE

YG MILLING TOOLS

COATED PM60
ONLY ONE
END MILLS

Perfect solution to protect Carbide chipping problems under vibrations

Please visit globalyg1.com/mat for material search

◎ : Excellent ○ : Good

Recommended cutting conditions : P 628

SERIES	GYG77 GYF97	GYG72 GYF99	GYG01
FLUTE	2	2	3
HELIX ANGLE	30°	30°	30°
CUTTING EDGE SHAPE	BALL NOSE	SQUARE	SQUARE
SIZE MIN	R0.5	D1.0	D1.0
SIZE MAX	R12.5	D25.0	D25.0
PAGE	618	619	620
	SHORT LENGTH	SHORT LENGTH	SHORT LENGTH (Center Cut)
	Y-Coating	Y-Coating	Y-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			

GYG74 GYF96	GYG52	GYG76 GYG02	GYF95	GYF94	GYF98	GYG03	
4	4	4	Multi Flute	Multi Flute	Multi Flute	Multi Flute	
30°	35°/37°	30°	4F : 44°/45° 5F : 44°/44.5°/45°	30°	30°	30°	
SQUARE	SQUARE	SQUARE	CORNER RADIUS ROUGHING	ROUGHING	ROUGHING	ROUGHING	
D1.0	D3.0	D2.0	D6.0	D6.0	D6.0	D6.0	
D25.0	D25.0	D25.0	D25.0	D25.0	D25.0	D25.0	
621	**622**	**623**	**624**	**625**	**626**	**627**	
SHORT LENGTH (Center Cut)	SHORT LENGTH (Center Cut)	LONG LENGTH (Center Cut)	SHORT LENGTH (Center Cut)	SHORT LENGTH (Center Cut)	LONG LENGTH (Center Cut)	SHORT LENGTH (Center Cut)	
Y-Coating	Y-Coating	Y-Coating	Y-Coating	Y-Coating	Y-Coating	Y-Coating	
							
◎	◎	◎	◎	◎	◎	◎	1
◎	◎	◎	◎	◎	◎	◎	2
◎	◎	◎	◎	◎	◎	◎	3
◎	◎	◎	◎	◎	◎	◎	4
◎	◎	◎	◎	◎	◎	◎	5
◎	◎	◎	◎	◎	◎	◎	6 P
◎	◎	◎	◎	◎	◎	◎	7
◎	◎	◎	◎	◎	◎	◎	8
○	○	○	○	○	○	○	9
◎	◎	◎	◎	◎	◎	◎	10
○	○	○	○	○	○	○	11
◎	◎	◎	◎	◎	◎	◎	12
◎	◎	◎	◎	◎	◎	◎	13 M
◎	◎	◎	◎	◎	◎	◎	14
◎	◎	◎	◎	◎	◎	◎	15
◎	◎	◎	◎	◎	◎	◎	16
◎	◎	◎	◎	◎	◎	◎	17
◎	◎	◎	◎	◎	◎	◎	18 K
◎	◎	◎	◎	◎	◎	◎	19
◎	◎	◎	◎	◎	◎	◎	20
							21
							22
							23
							24
							25
○	○	○	○	○	○	○	26 N
○	○	○	○	○	○	○	27
○	○	○	○	○	○	○	28
							29
							30
							31
							32
							33
							34 S
							35
							36
							37
							38
							39
○	○	○	○	○	○	○	40 H
							41