SOLID CARBIDE END MILLS

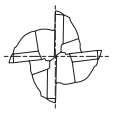
4 FLUTE SQUARE

SERIES

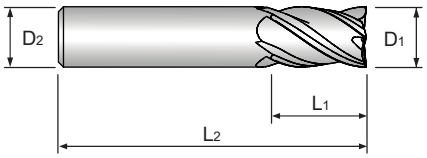
PLAIN SHANK **GML11**

- Short overhang design for superior rigidity and stability
- Reliable Y-Coating for exceptional tool life in all types of steel
- All-in-One solution for roughing, finishing, ramping and helical interpolation
- Highest feed per tooth capability and excellent chip evacuation during slotting





Unequal Index



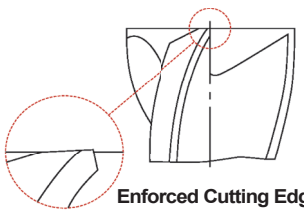
CARBIDE | 4 | 35°/37° | PLAIN | Y Coating | p.6

Unit : mm

EDP No.	Mill Diameter	Shank Diameter	Length of Cut	Overall Length
	D_1	D_2	L_1	L_2
GML110104S	**1.0**	4	2	38
GML11010	**1.0**	6	2	38
GML110154S	**1.5**	4	3	38
GML11015	**1.5**	6	3	38
GML110204S	**2.0**	4	4	38
GML11020	**2.0**	6	4	38
GML110304S	**3.0**	4	5	38
GML11030	**3.0**	6	5	38
GML110404S	**4.0**	4	7	38
GML11040	**4.0**	6	7	38
GML11050	**5.0**	6	8	38
GML11060	**6.0**	6	8	38
GML11080	**8.0**	8	12	43
GML11100	**10.0**	10	15	51
GML11120	**12.0**	12	18	62
GML11160	**16.0**	16	24	78
GML11200	**20.0**	20	30	78

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

OD SIZE	Mill Dia. Tolerance (mm)	Shank Dia. Tolerance
Up to Ø12	0 ~ -0.020	h5
Over Ø12	0 ~ -0.030	



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	11.1	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	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎		○	○	○	○	○	○	○	○	○	○

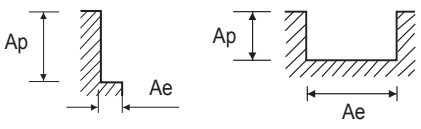
ISO	N										S							H						
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel					Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	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																								

GML11 SERIES

4 FLUTE SQUARE - SIDE CUTTING & SLOTTING

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

ISO	VDI 3323	Material Description	Side		Slotting		Para-meter	Diameter (Ø)											
			Ae	Ap	Ae	Ap		1	1.5	2	3	4	5	6	8	10	12	16	20
P	1-4	Non-alloy steel	0.5D	1.0D	1.0D	0.8D	Vc	137	137	137	152	152	152	152	152	168	168	168	168
							fz	0.001	0.003	0.004	0.007	0.010	0.014	0.021	0.035	0.049	0.061	0.069	0.085
							RPM	43608	29072	21804	16128	12096	9677	8064	6048	5348	4456	3342	2674
							FEED	227	302	340	419	503	554	671	849	1057	1089	921	904
	5		0.5D	1.0D	1.0D	0.8D	Vc	96	96	96	107	107	107	107	107	117	117	117	117
							fz	0.001	0.003	0.004	0.007	0.010	0.014	0.021	0.035	0.049	0.061	0.069	0.085
							RPM	30558	20372	15279	11353	8515	6812	5677	4257	3724	3104	2328	1862
							FEED	159	212	238	295	354	390	472	598	736	759	642	629
	6-7	Low alloy steel	0.5D	1.0D	1.0D	0.8D	Vc	137	137	137	152	152	152	152	152	168	168	168	168
							fz	0.001	0.003	0.004	0.007	0.010	0.014	0.021	0.035	0.049	0.061	0.069	0.085
							RPM	43608	29072	21804	16128	12096	9677	8064	6048	5348	4456	3342	2674
							FEED	227	302	340	419	503	554	671	849	1057	1089	921	904
	8-9		0.5D	1.0D	1.0D	0.8D	Vc	96	96	96	107	107	107	107	107	117	117	117	117
							fz	0.001	0.003	0.004	0.007	0.010	0.014	0.021	0.035	0.049	0.061	0.069	0.085
							RPM	30558	20372	15279	11353	8515	6812	5677	4257	3724	3104	2328	1862
							FEED	159	212	238	295	354	390	472	598	736	759	642	629
	10 - 11.1	High alloyed steel, and tool steel	0.5D	1.0D	1.0D	0.8D	Vc	58	58	58	64	64	64	64	64	70	70	70	70
							fz	0.001	0.001	0.003	0.004	0.008	0.010	0.014	0.025	0.035	0.042	0.048	0.059
							RPM	18462	12308	9231	6791	5093	4074	3395	2546	2228	1857	1393	1114
							FEED	96	64	96	106	159	169	194	252	313	309	268	261
M	12 - 13	Stainless steel	0.5D	1.0D	1.0D	0.8D	Vc	133	133	133	148	148	148	148	148	148	148	148	148
							fz	0.001	0.001	0.003	0.005	0.008	0.012	0.017	0.029	0.044	0.051	0.059	0.072
							RPM	42335	28223	21168	15703	11777	9422	7852	5889	4711	3926	2944	2355
							FEED	220	147	220	327	367	441	531	674	833	796	689	674
	14.1		0.5D	1.0D	1.0D	0.8D	Vc	95	95	95	106	106	106	106	106	106	106	106	106
							fz	0.001	0.003	0.004	0.007	0.010	0.017	0.023	0.036	0.062	0.072	0.081	0.100
							RPM	30239	20160	15120	11247	8435	6748	5623	4218	3374	2812	2109	1687
							FEED	157	210	236	292	351	456	526	614	842	804	680	675
	14.2		0.5D	1.0D	1.0D	0.8D	Vc	85	85	85	95	95	95	95	95	95	95	95	95
							fz	0.001	0.003	0.004	0.007	0.010	0.017	0.023	0.036	0.062	0.072	0.081	0.099
							RPM	27056	18038	13528	10080	7560	6048	5040	3780	3024	2520	1890	1512
							FEED	141	188	211	262	314	409	472	550	755	721	609	598
K	15 - 20	Grey cast iron Nodular cast iron Malleable cast iron	0.5D	1.0D	1.0D	0.8D	Vc	101	101	101	112	112	112	112	112	123	123	123	123
							fz	0.001	0.003	0.005	0.008	0.013	0.018	0.026	0.044	0.062	0.075	0.085	0.105
							RPM	32149	21433	16075	11884	8913	7130	5942	4456	3915	3263	2447	1958
							FEED	167	223	334	371	463	519	618	788	977	984	827	825

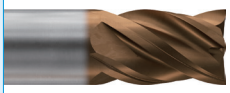




YG SMAXX MILLS

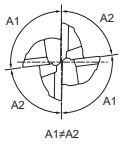
- Solid carbide end mills designed to maximize productivity through high-speed and high-feed dynamic machining
- All-in-One solution for roughing, finishing, ramping, helical interpolation and heavy cutting operations
- Short overhang design enhances tool rigidity, while advanced coating technology maximizes tool life and machining efficiency
- Superior vibration suppression ensures stable performance even under aggressive cutting conditions

PRODUCT FEATURES & LINE UP

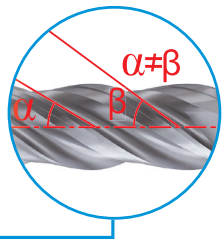
GML11		4-Flute Square End Mill for Steel	Ø1.0 - Ø20.0	• High rigidity through short overhang design • Optimized flute geometry for superior chip evacuation • Suitable for roughing, finishing, slotting and ramping operations
HHL12		4-Flute Square End Mill for Stainless Steel	Ø1.0 - Ø20.0	• Designed for difficult-to-cut materials such as stainless steel, Inconel and titanium alloys • Advanced HiPIMS C-Coating provides excellent heat and wear resistance • Maintains stable cutting performance even in highly adhesive stainless steel materials

PRODUCT GEOMETRY

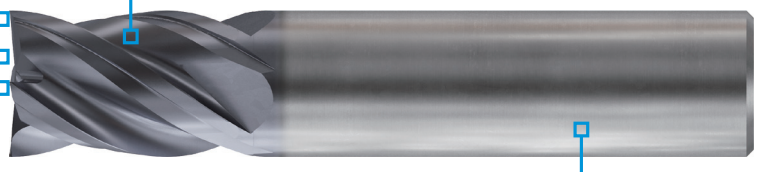
Unequal Index
Unique geometry applied to reduce vibration and also to achieve excellent chip evacuation for better surface finish

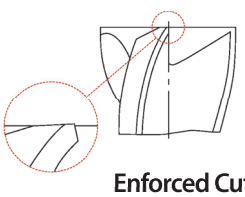


Wide-Gash End Teeth
Wide-gash geometry improves chip evacuation from the bottom cutting edge and ensures stable ramping and helical interpolation



Multiple Helix
For optimal chip formation and chip evacuation concluding faster and heavier cutting providing higher productivity





Enforced Cutting Edge
Increasing corner stability at square end mills to enable higher tool life



Ultra Fine Grain Carbide
Premium carbide substrate achieving exceptional wear resistance

Adapted Straight Shank
Common clamping adaptors are applicable, only hydraulic chucks require use of a sleeve to avoid vibrations

SELECTION GUIDE

SERIES	GML11	HHL12
FLUTE	4	4
HELIX ANGLE	35°/37°	35°/37°
CUTTING EDGE SHAPE	SQUARE	SQUARE
SIZE MIN	1.0	1.0
SIZE MAX	20.0	20.0
PAGE	4	5

YG SMAXX MILLS

Solid Carbide End Mills for Steel and Stainless Steel

Please visit globalyg1.com/mat for material search

Recommended cutting conditions : p.6~7

◎ : Excellent ○ : Good

ISO	VDI 3323	Material Description	Composition / Structure / Heat Treatment		HB	HRc	Y-Coating	C-Coating
								
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		

GUIDE TO ICONS

Tool Material

CARBIDE

The tool is made of Ultra Fine Grain carbide

Helix Angle

35°/37°

No. of Flutes

4

Type of Shank

PLAIN

Type of Coating

Y Coating

YG-1 Y-Coating

C Coating

YG-1 C-Coating

Cutting Conditions