

HIGH PERFORMANCE SOLID CARBIDE END MILLS

5-FLUTE EXTENDED LENGTH (PLAIN SHANK)

Chamfer

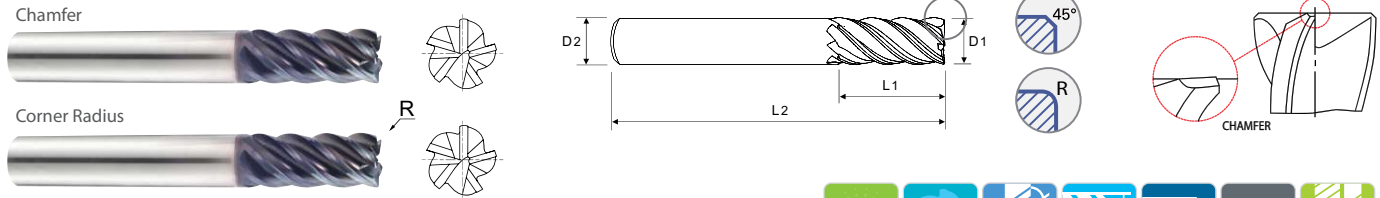
GMG24, GMG26

Corner Radius

GMG28, GMG30

- Suitable for Titanium, Titanium Alloys, Inconel and Stainless Steels.
- Optimized flute design for chip evacuation and rigidity when machining difficult-to-cut materials.

- Special roughing profile for machining Titanium and Titanium Alloys.
- Longer tool life with special coating.



Unit : METRIC

OD (D1)		SD (D2)	LOC (L1)	OAL (L2)	Chamfer	Corner Radius								
						0.30	0.50	1.00	1.50	2.00	2.50	3.00	4.00	5.00
Metric	Inch				EDP No.	EDP No.	EDP No.	EDP No.	EDP No.	EDP No.	EDP No.	EDP No.	EDP No.	EDP No.
6	.2362	6	10	54	GMG24060		GMG28060							
		6	13	57	GMG26060	GMG30060	GMG30901	GMG30902						
8	.315	8	12	58	GMG24080		GMG28080							
		8	19	63	GMG26080		GMG30080	GMG30903	GMG30904	GMG30905				
10	.3937	10	14	66	GMG24100		GMG28100							
		10	22	72	GMG26100		GMG30100	GMG30906	GMG30907	GMG30908				
12	.4724	12	16	73	GMG24120		GMG28120							
		12	26	83	GMG26120		GMG30120	GMG30909	GMG30910	GMG30911	GMG30912	GMG30913		
16	.6299	16	22	82	GMG24160		GMG28160							
		16	36	92	GMG26160		GMG30160	GMG30914	GMG30915	GMG30916	GMG30917	GMG30918		
20	.7874	20	26	92	GMG24200		GMG28200							
		20	44	104	GMG26200		GMG30200	GMG30919	GMG30920	GMG30921	GMG30922	GMG30923	GMG30924	
25	.9843	25	29	100	GMG24250		GMG28250							
		25	54	121	GMG26250		GMG30250	GMG30925	GMG30926	GMG30927	GMG30928	GMG30929	GMG30930	

Mill Dia.Tolerance (mm)	Shank Dia.Tolerance
0 ~ - 0.03	h5 * Shank Dia.≥Ø12 : h6

CHAMFER KEY GMG24 | GMG26

Mill Diameter		Chamfer Size (mm)
Metric	Inch	
6	.2362	0.20
8	.315	0.20
10	.3937	0.30
12	.4724	0.35
16	.6299	0.40
20	.7478	0.50
25	.9843	0.50

◎ : 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	38	10	29	32	38	15	35	15	23	10	10	26	3	25	21	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	21	22	23	24	25	26	27	28	29	30	15	30	25	38	34	36	37	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											○	○	○	○	○	◎	◎						

RECOMMENDED CUTTING CONDITIONS – METRIC

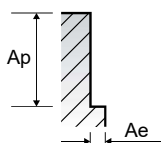
GMG24, GMG26, GMG28, GMG30 SERIES

5 FLUTES - Side Cutting



RPM = rev./min. Feed = in./min.
Vc = ft./min. fz = in./tooth

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø)									
						6.0	8.0	10.0	12.0	14.0	16.0	18.0	20.0	25.0	
P	1-4	Non-alloy steel	0.3D	1.5D	SFM (Vc)	475	475	475	475	475	475	475	475	475	
					IPT (fz)	.0013	.0015	.0020	.0025	.0027	.0030	.0033	.0035	.0040	
					RPM	7680	5760	4610	3840	3290	2880	2560	2300	1840	
					IPM (FEED)	50	43	46	48	44	43	42	40	37	
	5		0.3D	1.5D	SFM (Vc)	330	330	330	330	330	330	330	330	330	
					IPT (fz)	.0013	.0015	.0020	.0025	.0027	.0030	.0033	.0035	.0040	
					RPM	5340	4000	3200	2670	2290	2000	1780	1600	1280	
					IPM (FEED)	35	30	32	33	31	30	29	28	26	
	6-7	Low alloy steel	0.3D	1.5D	SFM (Vc)	475	475	475	475	475	475	475	475	475	
					IPT (fz)	.0013	.0015	.0020	.0025	.0027	.0030	.0033	.0035	.0040	
					RPM	7680	5760	4610	3840	3290	2880	2560	2300	1840	
					IPM (FEED)	50	43	46	48	44	43	42	40	37	
	8-9		0.3D	1.5D	SFM (Vc)	330	330	330	330	330	330	330	330	330	
					IPT (fz)	.0013	.0015	.0020	.0025	.0027	.0030	.0033	.0035	.0040	
					RPM	5340	4000	3200	2670	2290	2000	1780	1600	1280	
					IPM (FEED)	35	30	32	33	31	30	29	28	26	
10-11.1	High alloyed steel, and tool steel	0.3D	1.5D	SFM (Vc)	200	200	200	200	200	200	200	200	200		
				IPT (fz)	.0009	.0011	.0014	.0017	.0019	.0021	.0023	.0024	.0028		
				RPM	3230	2430	1940	1620	1390	1210	1080	970	780		
				IPM (FEED)	15	13	14	14	13	13	12	12	11		
M		12-13	Stainless steel (SUS 420, X40Cr13, 420)	0.3D	1.5D	SFM (Vc)	385	385	385	385	385	385	385	385	385
						IPT (fz)	.0009	.0010	.0012	.0018	.0020	.0021	.0022	.0024	.0028
						RPM	6230	4670	3740	3110	2670	2330	2080	1870	1490
						IPM (FEED)	28	23	22	28	27	24	23	22	21
	14.1	Stainless steel (SUS 316, 316, XSGNiMo 17 122)	0.3D	1.5D	SFM (Vc)	270	270	270	270	270	270	270	270	270	
					IPT (fz)	.0012	.0013	.0015	.0025	.0026	.0027	.0028	.0030	.0035	
					RPM	4370	3270	2620	2180	1870	1640	1460	1310	1050	
					IPM (FEED)	26	21	20	27	24	22	20	20	18	
	14.2	Stainless steel (SUS 630, PH 15-5)	0.3D	1.5D	SFM (Vc)	195	195	195	195	195	195	195	195	195	
					IPT (fz)	.0012	.0013	.0015	.0025	.0026	.0027	.0028	.0030	.0035	
					RPM	3150	2360	1890	1580	1350	1180	1050	950	760	
					IPM (FEED)	19	15	14	20	18	16	15	14	13	
K	15-20	Grey cast iron	0.3D	1.5D	SFM (Vc)	350	350	350	350	350	350	350	350	350	
					IPT (fz)	.0017	.0019	.0025	.0031	.0034	.0038	.0041	.0044	.0050	
					RPM	5660	4240	3400	2830	2430	2120	1890	1700	1360	
					IPM (FEED)	48	40	43	44	41	40	39	37	34	
S	31-35	Heat Resistant Super Alloys (X12 NiCrSi 36-16, 1.4864, Inconel 718, NiCr20TiAl, 2.4631, NiCu30Al, 2.4375, G-X120Mn12, 1.3401)	0.1D	1.5D	SFM (Vc)	100	100	100	100	100	100	100	100	100	
					IPT (fz)	.0008	.0009	.0011	.0017	.0018	.0019	.0019	.0021	.0024	
					RPM	1620	1210	970	810	690	610	540	490	390	
					IPM (FEED)	6	5	5	7	6	6	5	5	5	
	36-37		Titanium Alloys (HB 400 Rm, HB 1050Rm TiAl6V4, 3.7165)	0.3D	1.5D	SFM (Vc)	225	225	225	225	225	225	225	225	225
						IPT (fz)	.0011	.0011	.0013	.0022	.0023	.0024	.0025	.0027	.0031
						RPM	3640	2730	2180	1820	1560	1360	1210	1090	870
						IPM (FEED)	20	15	14	20	18	16	15	15	13



- NOTES:**
- ▶ Maximum recommended depth shown
 - ▶ Finish cuts typically require reduced feed rates and/or higher spindle speed, with radial width of 2% x D1 or less
 - ▶ Feed to be reduced by approximately 50% if L.O.C. (length of cut) is over 3x D
 - ▶ Reduce speed and feed recommendations for materials harder than listed
 - ▶ Recommendations above are based on ideal conditions. Adjust parameters accordingly for smaller taper machining centers or less rigid conditions

YU-TP21 AMERICAS

BEST VALUE IN THE WORLD OF CUTTING TOOLS



FOR TITANIUM, STAINLESS STEELS AND ALLOY STEELS :
TOUGH MATERIALS
TAKE IT ON WITH TITANOX

TitaNox Power

INDUSTRY-LEADING SOLID CARBIDE END MILLS

HIGH-PERFORMANCE
MACHINING MADE EASY:

- Variable Helix and Pitch
- 4 Flute and 5 Flute
- Square End, Chamfer and Radius
- Standard and Extended Lengths
- Inch and Metric Sizes
- 5 Flute Heavy Cutting Solution
TitaNox Power HPC **NEW**

Take It On With

TitaNox Power

HIGH-PERFORMANCE MACHINING MADE EASY.

- Titanium
- Stainless Steels
- Alloy Steels



4 Flute

5 Flute

TitaNox-Power HPC
5 Flute



If you've been looking for a superior carbide end mill that won't back down when the going gets tough, it's time you look at TitaNox.

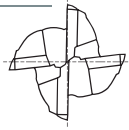
The TitaNox line is built to take on titanium, stainless steels, alloy steels, and more. With a choice of 4- and 5 flute designs and extra-rigid high-speed performance, TitaNox makes the perfect match for aerospace, power generation and medical applications.

TitaNox — Nothing Cuts Better.

With more choices in high-performance carbide end mills, YG-1 is the undisputed leader in end mill offerings. And with the TitaNox line, you have a full selection of extremely durable end mills built to take on the toughest materials in the business. From titanium to stainless steel and more—TitaNox rules. In either 4 flute or 5 flute configurations you get:

- ▶ YG-1 advanced coating for better wear resistance
- ▶ Better thermal stability
- ▶ Optimized edge design provides excellent performance in heavy cutting applications
- ▶ Excellent performance in difficult-to-machine materials
- ▶ Perfect solution for aerospace, power generation and medical applications
- ▶ Premium grade substrate for longer tool life

TitaNox Power 4 FLUTE DOUBLE CORE END MILLS

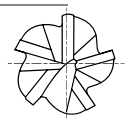


Let the Chips Fly.

For heavy cutting in slotting and profiling applications, our true double-core design provides faster chip evacuation and improved dimensional stability. Experience what a difference double-core design can make in your operation.

- ▶ Highly rigid double core adds stability and improves rigidity
- ▶ Unique 4 flute design provides excellent chip evacuation
- ▶ Variable flute design featuring multiple helix helps increase performance, reduce vibration and eliminate chatter

TitaNox Power 5 FLUTE MULTIPLE HELIX END MILLS



Strong Performance — Right to the Finish.

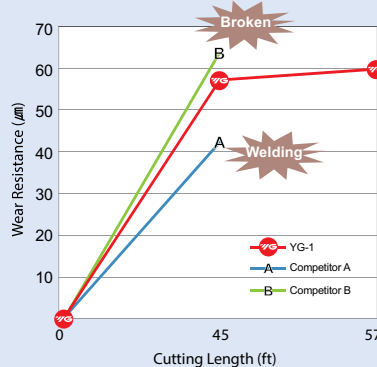
These new 5 flute end mills are built to handle high-speed machining with fine finishing ability.

- ▶ 5 flute multiple helix design for fast, fine finishing in tough materials
- ▶ Multiple-helix geometry delivers smooth cutting with reduced chatter
- ▶ The perfect choice for profiling, finishing, peel milling operations and more
- ▶ New HPC Solution for Heavy Cutting Applications

CASE STUDY

4 Flute Double Core End Mills vs. Competitors

Cutting Conditions	
Milling Method	Slotting
Work Material	- DIN : Ti6Al4V (Titanium) - WR : 3.7165.1
Size	Ø12(R1) x Ø12 x 26 x 80
RPM	1591 rev./min.
IPM	10 in./min.
Axial Depth	.470"
Coolant	Wet Cut
Overhang	1.41"
Machine	Machining Center



YG TitaNox-POWER Total Milling Length : 57 ft.



Competitor A Total Milling Length : 53 ft.

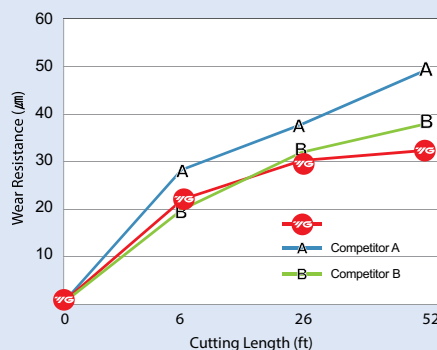


Competitor B Total Milling Length : 53 ft.

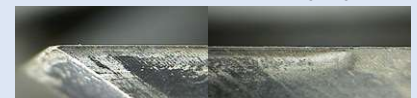


5 Flute Multiple Helix End Mills vs. Competitors

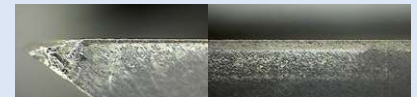
Cutting Conditions	
Milling Method	Down & Side Cutting
Work Material	- DIN : Ti6Al4V (Titanium) - WR : 3.7165.1
Size	Ø12 x Ø12 x 26 x 83
RPM	1591 rev./min.
IPM	15.669 in./min.
Axial Depth	.710"
Radial Depth	.141"
Coolant	Wet Cut
Machine	Machining Center



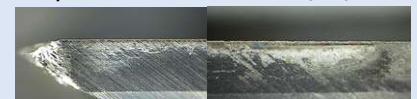
YG TitaNox-POWER Total Milling Length : 52 ft.



Competitor A Total Milling Length : 52 ft.

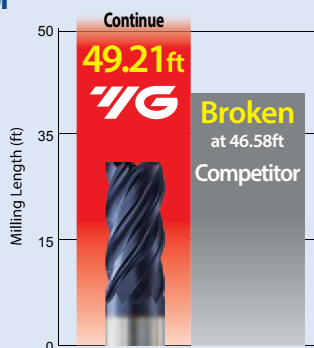


Competitor B Total Milling Length : 52 ft.



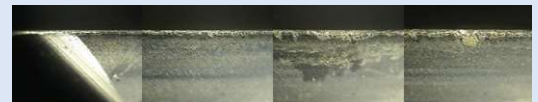
5 Flute TitaNox Power HPC vs. Competitor

Cutting Conditions	
Milling Method	Side Cutting
Work Material	- DIN : Ti6Al4V (Titanium) - WR : 3.7165.1
Size	3/4(R.03")x3/4x1-1/2x4"
RPM	2000 rev./min.
IPM	30 in./min.
Milling Method	Axial : .075" / Radial : 1.5"
Coolant	Wet Cut
Machine	Machining Center



YG TitaNox-POWER

Milling Length = 49.21ft



Competitor A

Broken at 46.58ft

