

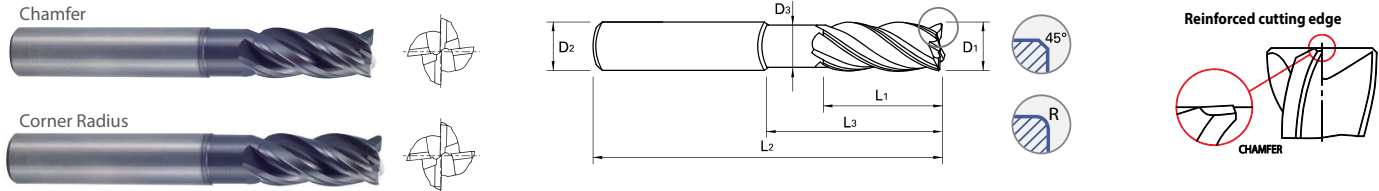
Y-Coated SOLID CARBIDE END MILLS

4 FLUTE EXTENDED LENGTH (PLAIN SHANK)

Chamfer
Corner Radius

GMF60
GMF62

- Special flute geometry and multiple helix eliminate vibrations
- Excellent performance for stainless steels, mild steels, cast iron, low/medium hardness materials and all exotic materials up to HRC40
- Advanced coating for superior performance and tool life



Unit: METRIC

OD (D1)		SD (D2)	LOC (L1)	LBS (L3)	OAL (L2)	Neck Dia (D3)	Chamfer EDP No.	Corner Radius				
Metric	Inch							0.30	0.50	1.00	2.00	3.00
3.0	.1181	6	7	12	54	2.7	GMF60030	GMF62030	GMF62901			
		6	7	17	57	2.7	GMF60901	GMF62902	GMF62903			
		6	8	14	57	2.7	GMF60902					
4.0	.1575	6	8	15	57	3.7	GMF60040	GMF62040	GMF62904			
		6	8	22	63	3.7	GMF60903	GMF62905	GMF62906			
		6	11	16	57	3.7	GMF60904					
5.0	.1969	6	10	17	57	4.7	GMF60050	GMF62050	GMF62907			
		6	10	27	67	4.7	GMF60905	GMF62908	GMF62909			
		6	13	18	57	4.7	GMF60906					
6.0	.2362	6	10	15	57	5.5	GMF60060	GMF62060	GMF62910	GMF62911		
		6	10	20	62	5.5	GMF60907	GMF62912	GMF62913	GMF62914		
		6	10	32	74	5.5	GMF60908	GMF62915	GMF62916	GMF62917		
		6	13	21	57	5.5	GMF60909					
8.0	.3150	8	12	20	63	7.5	GMF60080		GMF62080	GMF62918		
		8	12	30	73	7.5	GMF60910		GMF62919	GMF62920		
		8	12	46	90	7.5	GMF60911		GMF62921	GMF62922		
		8	19	27	63	7.5	GMF60912					
10.0	.3937	10	14	25	72	9.2	GMF60100		GMF62100	GMF62923		
		10	14	35	82	9.2	GMF60913		GMF62924	GMF62925		
		10	14	55	102	9.2	GMF60914		GMF62926	GMF62927		
		10	22	32	72	9.2	GMF60915					
12.0	.4724	12	16	30	83	11.0	GMF60120		GMF62120	GMF62928	GMF62929	
		12	16	40	93	11.0	GMF60916		GMF62930	GMF62931	GMF62932	
		12	16	64	117	11.0	GMF60917		GMF62933	GMF62934	GMF62935	
		12	26	38	83	11.0	GMF60918					
16.0	.6299	16	22	38	92	15.0	GMF60160			GMF62160	GMF62936	GMF62937
		16	22	55	109	15.0	GMF60919			GMF62938	GMF62939	GMF62940
		16	22	87	141	15.0	GMF60920			GMF62941	GMF62942	GMF62943
		16	32	44	92	15.0	GMF60921					
20.0	.7874	20	26	50	104	19.0	GMF60200			GMF62200	GMF62944	GMF62945
		20	26	70	124	19.0	GMF60922			GMF62946	GMF62947	GMF62948
		20	26	110	164	19.0	GMF60923			GMF62949	GMF62950	GMF62951
		20	38	54	104	19.0	GMF60924					

CHAMFER KEY		
Mill Diameter		Chamfer Size (mm)
Metric	Inch	
3.0	.1181	0.10
4.0	.1575	0.15
5.0	.1969	0.15
6.0	.2362	0.20
8.0	.3150	0.20
10.0	.3937	0.30
12.0	.4724	0.35
16.0	.6299	0.40
20.0	.7874	0.50

Mill Dia. Tolerance (mm)	Shank Dia. Tolerance
Up to Ø12 0 ~ -0.02	h5
Over Ø12 0 ~ -0.03	(≥ Ø12 : h6)

◎: 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											○	○	○	○	○	○	○				

GMF52, GMF53, GMF54, GMF55, GMF56, GMF57 GMF58, GMF59, GMF60, GMF61, GMF62, GMF63 SERIES

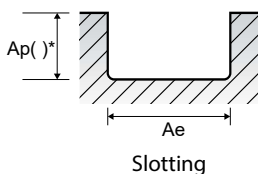
4 FLUTE - SIDE & SLOTTING



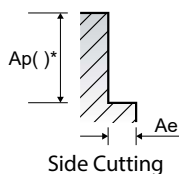
SFM = ft./min. fz = in./tooth
RPM = rev./min. FEED = in./min.

ISO	VDI 3323	Material Description	Ae		Ap		Parameter	Diameter (Ø)											
			Side	Slotting	Side	Slotting		1/8	5/32	3/16	7/32	1/4	9/32	5/16	7/16	1/2	5/8	3/4	1
P	1-4	Non-alloy steel	0.5D	1.0D	1.5D (1.2D)	1.0D (0.8D)	SFM(Vc)	500	500	500	500	500	550	550	550	550	550	550	550
							fz	.0002	.0003	.0004	.0006	.0011	.0015	.0019	.0019	.0021	.0023	.0026	.0025
							RPM	16128	12096	9677	8064	6048	5348	4456	3820	3342	2971	2674	2139
							FEED	12.70	15.24	16.76	20.32	25.72	32.00	32.98	29.47	27.90	27.60	27.37	21.56
	5	Low alloy steel	0.5D	1.0D	1.5D (1.2D)	1.0D (0.8D)	SFM(Vc)	350	350	350	350	350	385	385	385	385	385	385	385
							fz	.0002	.0003	.0004	.0006	.0011	.0015	.0018	.0019	.0021	.0023	.0026	.0025
							RPM	11353	8515	6812	5677	4257	3724	3104	2660	2328	2069	1862	1490
							FEED	8.94	10.71	11.81	14.29	18.11	22.28	22.95	20.51	19.41	19.21	19.06	15.00
	6-7	Low alloy steel	0.5D	1.0D	1.5D (1.2D)	1.0D (0.8D)	SFM(Vc)	500	500	500	500	500	550	550	550	550	550	550	550
							fz	.0002	.0003	.0004	.0006	.0011	.0015	.0019	.0019	.0021	.0023	.0026	.0025
							RPM	16128	12096	9677	8064	6048	5348	4456	3820	3342	2971	2674	2139
							FEED	12.70	15.24	16.76	20.32	25.72	32.00	32.98	29.47	27.90	27.60	27.37	21.56
	8-9	Low alloy steel	0.5D	1.0D	1.5D (1.2D)	1.0D (0.8D)	SFM(Vc)	350	350	350	350	350	385	385	385	385	385	385	385
							fz	.0002	.0003	.0004	.0006	.0011	.0015	.0018	.0019	.0021	.0023	.0026	.0025
							RPM	11353	8515	6812	5677	4257	3724	3104	2660	2328	2069	1862	1490
							FEED	8.94	10.71	11.81	14.29	18.11	22.28	22.95	20.51	19.41	19.21	19.06	15.00
	10-11.1	High alloyed steel, and tool steel	0.5D	1.0D	1.5D (1.2D)	1.0D (0.8D)	SFM(Vc)	210	210	210	210	210	230	230	230	230	230	230	230
							fz	.0001	.0002	.0003	.0004	.0008	.0011	.0013	.0013	.0015	.0016	.0018	.0018
							RPM	6791	5093	4074	3395	2546	2228	1857	1592	1393	1238	1114	891
							FEED	3.19	4.80	5.12	5.87	7.64	9.49	9.37	8.50	8.11	7.99	7.91	6.30
M	12-13	Stainless steel	0.5D	1.0D	1.5D (1.2D)	1.0D (0.8D)	SFM(Vc)	485	485	485	485	485	485	485	485	485	485	485	485
							fz	.0002	.0002	.0004	.0005	.0009	.0013	.0015	.0017	.0018	.0020	.0022	.0022
							RPM	15703	11777	9422	7852	5889	4711	3926	3365	2944	2617	2355	1884
							FEED	9.88	11.14	13.35	16.06	20.39	25.24	24.09	22.24	20.87	20.59	20.39	16.34
	14.1	Stainless steel	0.5D	1.0D	1.5D (1.2D)	1.0D (0.8D)	SFM(Vc)	350	350	350	350	350	350	350	350	350	350	350	350
							fz	.0002	.0003	.0005	.0007	.0011	.0019	.0022	.0023	.0024	.0028	.0030	.0030
							RPM	11247	8435	6748	5623	4218	3374	2812	2410	2109	1874	1687	1350
							FEED	8.86	10.63	13.82	15.94	18.58	25.51	24.37	22.4	20.59	20.67	20.47	16.38
	14.2	Stainless steel	0.5D	1.0D	1.5D (1.2D)	1.0D (0.8D)	SFM(Vc)	310	310	310	310	310	310	310	310	310	310	310	310
							fz	.0002	.0003	.0005	.0007	.0011	.0019	.0022	.0023	.0024	.0027	.0030	.0030
							RPM	10080	7560	6048	5040	3780	3024	2520	2160	1890	1680	1512	1210
							FEED	7.95	9.53	12.36	14.29	16.65	22.87	21.81	20.08	18.46	18.27	18.11	14.49
K	15-20	Grey cast iron	0.5D	1.0D	1.5D (1.2D)	1.0D (0.8D)	SFM(Vc)	365	365	365	365	365	405	405	405	405	405	405	405
							fz	.0002	.0004	.0006	.0008	.0013	.0019	.0023	.0024	.0026	.0029	.0032	.0031
							RPM	11884	8913	7130	5942	4456	3915	3263	2797	2447	2175	1958	1566
							FEED	11.22	14.06	15.71	18.70	23.86	29.61	29.80	26.85	25.04	25.00	24.96	19.49
	31-35	Heat Resistant Super Alloys	0.25D	1.0D	1.0D	0.5D	SFM(Vc)	85	85	85	85	85	85	85	85	85	85	85	85
							fz	.0002	.0003	.0003	.0005	.0008	.0013	.0015	.0016	.0017	.0019	.0021	.0021
							RPM	2759	2069	1655	1379	1035	828	690	591	517	460	414	331
							FEED	2.17	2.28	2.09	2.6	3.11	4.29	4.13	3.74	3.5	3.46	3.5	2.72
	36-37	Titanium Alloys	0.35D	1.0D	1.0D	0.5D	SFM(Vc)	190	190	190	190	190	190	190	190	190	190	190	190
							fz	.0002	.0003	.0004	.0006	.0010	.0017	.0020	.0021	.0022	.0024	.0027	.0027
							RPM	6154	4615	3692	3077	2308	1846	1538	1319	1154	1026	923	738
							FEED	3.86	5.08	6.38	7.76	9.09	12.20	12.13	11.02	10.00	10.00	9.88	8.03

*() : Short length & Neck type



Slotting



Side Cutting

- NOTES:** ▶ The above recommendations are based on ideal conditions; for smaller taper machining centers or less rigid conditions please adjust parameters accordingly on diameters greater than 1/2"
- ▶ In profile operations, engaging more than 2xD, reduce the radial depth of cut by 50%-60%
- ▶ Finish cuts typically require reduced cutting feeds and speeds; also, it is recommended the radial width of cut (AE) should not exceed 2%xD1

YU-VP20

BEST VALUE IN THE WORLD OF CUTTING TOOLS



FOR TOUGH STEEL, CAST IRON, STAINLESS STEEL AND EXOTIC MATERIALS:
NOTHING CUTS IT BETTER

V7 Plus^A

**INDUSTRY-LEADING
HIGH-PERFORMANCE
CARBIDE END MILLS:**

- 4 Flute & 6 Flute
- Square, Chamfer, Radius, Ball Nose
- Standard & Extended Length
- Plain & Weldon Flat Shanks
- Inch & Metric Sizes

NEW

6 Flute Chip Splitter
Size Expansion in 1/2" x 1/2" x 1-1/4" x 3"

**Over 1,500 Items
in Stock.**



**When The Cut Calls For
High-Performance Carbide,
We Have More Options
To Meet Your Needs.**



YG-1 is the undisputed world leader in carbide end mill offerings. And now, with our newly expanded V7 Plus A line, you have even more high-performance choices than ever before. Choose from a full array of 4 Flute and 6 Flute standard-stocked or custom-designed solutions. No matter what your machining challenge, we have a product for you.

How Our Innovative V7 Plus A Design Started a **REVOLUTION** in End Mill Technology

We didn't create the great cutting performance of our V7 Plus A end mills line by just doing what others have done. We engineered our line from the tip of flute to end of shank with performance-enhancing technology in mind. It's what makes the V7 Plus A line the top choice in end mill performance.

For excellent performance in stainless steels, mild steels, low/medium hardness materials and exotic materials to boot, the V7 Plus A's advanced geometry provides:

- ▶ Excellent material removal rates and surface finishes
- ▶ Unequal indexing for reduced chatter (harmonics) and improved stability
- ▶ Advanced coating for superior performance and tool life
- ▶ Improved flute geometry for impressive chip formation and evacuation
- ▶ Noticeably smooth operation in high-speed machining and peel-milling applications
- ▶ Superior slotting and profiling in most ferrous materials for more flexible use
- ▶ Excellent performance in high-speed trochoidal milling applications for improved accuracy, reduced vibration and better heat displacement
- ▶ Premium-grade carbide substrate for longer tool life

GUIDE TO ICONS

The tool is made of
micrograin carbide



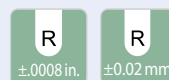
No. of Flutes



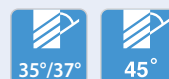
Cutting Conditions



Tolerance of Ball Radius



Helix Angle



Type of Shank



Plain
shank



Weldon
flat

Tool Ends



Square

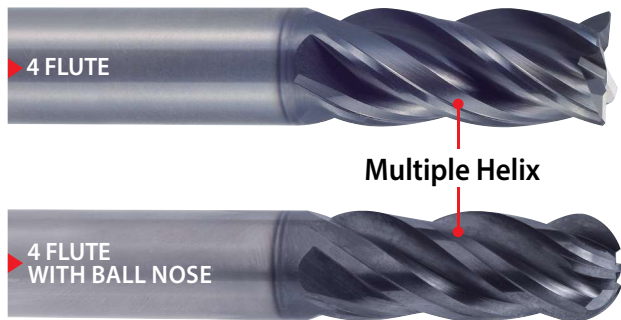
Chamfer



Radius

Ball

V7 Plus A 4 FLUTE END MILLS



Setting a Higher Standard in 4 Flute Design

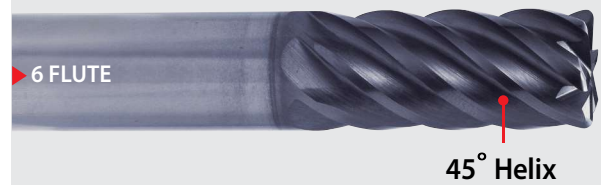
You asked for it. Now you can have state-of-the-art performance in an innovative 4 Flute design. First, you'll notice reduced vibration, optimal chip formation and excellent chip evacuation. And best of all, you'll get longer tool life in heavy cutting conditions. Available in ball nose, too.

NEW

V7 Plus A 6 FLUTE CHIP SPLITTER

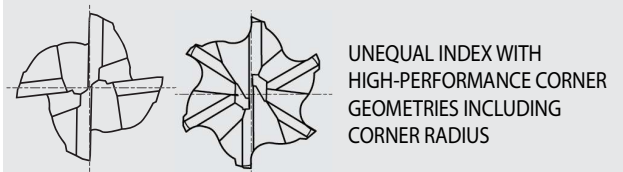


V7 Plus A 6 FLUTE END MILLS



Better by Every Measure

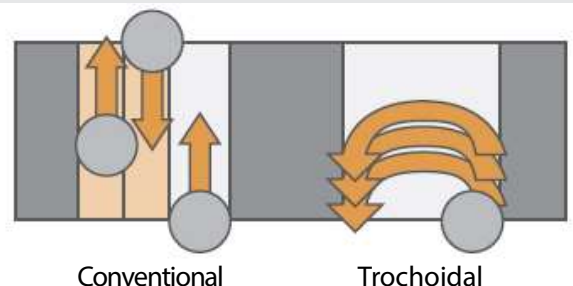
From its higher stability for lower vibration to its improved performance in high-speed and trochoidal milling applications, the V7 Plus A 6 Flute solid carbide, 45-degree helix, was designed with longer tool life and higher productivity in mind.



Trochoidal Milling

With our V7 Plus A 6 Flute's unique cutting geometry, we made it easier to apply a small radial width-of-cut along with higher cutting speeds and excellent feed per tooth. That's why we perform better in trochoidal milling application. Here's why:

- ▶ Smaller arc engagement provides lower cutting force and better heat displacement
- ▶ More flutes provide deeper depth of cut for more productivity and reduced wear
- ▶ Stability-inducing geometry reduces vibration for increased accuracy and longer tool life
- ▶ Aggressive feed-per-tooth provides excellent chip evacuation





4 FLUTE

V7 Plus A

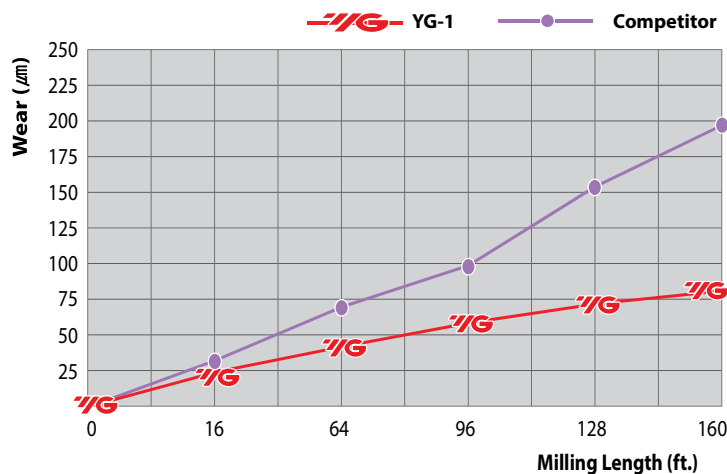
Innovative cutting performance that's not just a chip off the old block.

Our highly engineered flute geometry with multiple-helix design eliminates vibration, and our premium substrate and coating ensures longer tool life. Did we mention better cutting performance, too?

HIGH-PERFORMANCE SOLID CARBIDE 4 FLUTE END MILLS

CASE STUDY

4 Flute vs Competitor



	V7 Plus A	Competitor
Wear (µm)	83.518	203.381
Milling Length (ft.)	160	160
Size (mm)	Ø10 x Ø10 x 22 x 72	
Work Material	- JIS : S45C(HRC30) - WR : 1.0503	- DIN : C45 - AISI: 1405
Cutting Speed	755 ft/min.	
RPM	7,324 rev./min.	
Feed	57.64 inch/min.	
Feed per tooth	.002 inch/tooth	
Milling Method	Down & Side Cutting	
Milling Depth	Axial : .394 inch, Radial : .118 inch	
Coolant	Wet Cut	
Overhang	1.339 inch	
Machine	Machining Center	