

SERIES

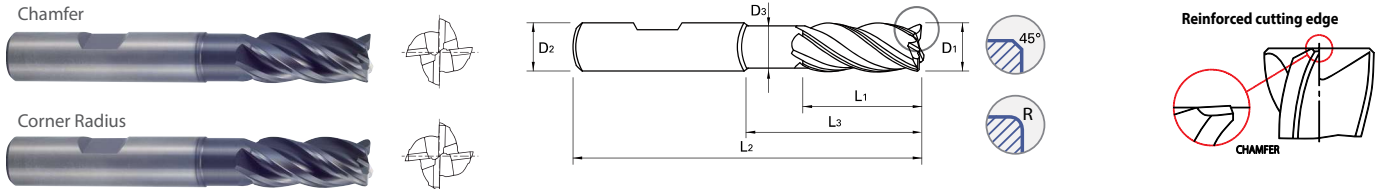
Y-Coated SOLID CARBIDE END MILLS

4 FLUTE EXTENDED LENGTH (FLAT SHANK)

Chamfer
Corner Radius

GMF61
GMF63

- ▶ 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 (D ₁)		SD (D ₂)	LOC (L ₁)	LBS (L ₃)	OAL (L ₂)	Neck Dia (D ₃)	Chamfer	Corner Radius				
Metric	Inch						0.10	0.30	0.50	1.00	2.00	3.00
							EDP No.	EDP No.	EDP No.	EDP No.	EDP No.	EDP No.
3.0	.1181	6	7	12	54	2.7	GMF61030	GMF63030	GMF63901			
		6	7	17	57	2.7	GMF61901	GMF63902	GMF63903			
		6	8	14	57	2.7	GMF61902					
4.0	.1575	6	8	15	57	3.7	GMF61040	GMF63040	GMF63904			
		6	8	22	63	3.7	GMF61903	GMF63905	GMF63906			
		6	11	16	57	3.7	GMF61904					
5.0	.1969	6	10	17	57	4.7	GMF61050	GMF63050	GMF63907			
		6	10	27	67	4.7	GMF61905	GMF63908	GMF63909			
		6	13	18	57	4.7	GMF61906					
6.0	.2362	6	10	15	57	5.5	GMF61060	GMF63060	GMF63910	GMF63911		
		6	10	20	62	5.5	GMF61907	GMF63912	GMF63913	GMF63914		
		6	10	32	74	5.5	GMF61908	GMF63915	GMF63916	GMF63917		
		6	13	21	57	5.5	GMF61909					
8.0	.3150	8	12	20	63	7.5	GMF61080		GMF63080	GMF63918		
		8	12	30	73	7.5	GMF61910		GMF63919	GMF63920		
		8	12	46	90	7.5	GMF61911		GMF63921	GMF63922		
		8	19	27	63	7.5	GMF61912					
10.0	.3937	10	14	25	72	9.2	GMF61100		GMF63100	GMF63923		
		10	14	35	82	9.2	GMF61913		GMF63924	GMF63925		
		10	14	55	102	9.2	GMF61914		GMF63926	GMF63927		
		10	22	32	72	9.2	GMF61915					
12.0	.4724	12	16	30	83	11.0	GMF61120		GMF63120	GMF63928	GMF63929	
		12	16	40	93	11.0	GMF61916		GMF63930	GMF63931	GMF63932	
		12	16	64	117	11.0	GMF61917		GMF63933	GMF63934	GMF63935	
		12	26	38	83	11.0	GMF61918					
16.0	.6299	16	22	38	92	15.0	GMF61160			GMF63160	GMF63936	GMF63937
		16	22	55	109	15.0	GMF61919			GMF63938	GMF63939	GMF63940
		16	22	87	141	15.0	GMF61920			GMF63941	GMF63942	GMF63943
		16	32	44	92	15.0	GMF61921					
20.0	.7874	20	26	50	104	19.0	GMF61200			GMF63200	GMF63944	GMF63945
		20	26	70	124	19.0	GMF61922			GMF63946	GMF63947	GMF63948
		20	26	110	164	19.0	GMF61923			GMF63949	GMF63950	GMF63951
		20	38	54	104	19.0	GMF61924					

CHAMFER KEY		
Mill Diameter		Chamfer Size
Metric	Inch	(mm)
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				
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	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									
Material Description	Aluminum-wrought alloy					Aluminum-cast, alloyed					Copper and Copper Alloys (Bronze / Brass)					Non Metallic Materials				
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40
HRc	60	100	75	90	130	110	90	100			15	30	25	38	34	40	40	55	60	42
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400
Recommend											○	○	○	○	○	○	○			

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

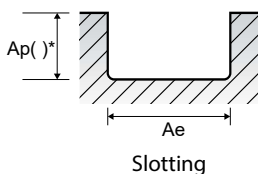
4 FLUTE - SIDE & SLOTING



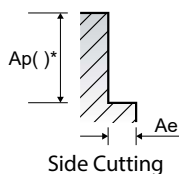
SFM = ft./min. fz = in./tooth
RPM = rev./min. FEED = in./min.

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	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	
	5	Low alloy steel	0.5D	1.0D	1.5D (1.2D)	1.0D (0.8D)	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	
							SFM(Vc)	350	350	350	350	350	385	385	385	385	385	385	385	385
							fz	.0002	.0003	.0004	.0006	.0011	.0015	.0018	.0019	.0021	.0023	.0026	.0025	
	6-7	Low alloy steel	0.5D	1.0D	1.5D (1.2D)	1.0D (0.8D)	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	
							SFM(Vc)	500	500	500	500	500	550	550	550	550	550	550	550	550
	8-9	Low alloy steel	0.5D	1.0D	1.5D (1.2D)	1.0D (0.8D)	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	
	10-11.1	High alloyed steel, and tool 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	
M	12-13	Stainless steel	0.5D	1.0D	1.5D (1.2D)	1.0D (0.8D)	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	
							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	
	14.1	Stainless steel	0.5D	1.0D	1.5D (1.2D)	1.0D (0.8D)	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	
							SFM(Vc)	485	485	485	485	485	485	485	485	485	485	485	485	
	14.2	Stainless steel	0.5D	1.0D	1.5D (1.2D)	1.0D (0.8D)	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	
K	15-20	Grey cast iron	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		
							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	
	31-35	Heat Resistant Super Alloys	0.25D	1.0D	1.0D	0.5D	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	
							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	
S	36-37	Titanium Alloys	0.35D	1.0D	1.0D	0.5D	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	
							SFM(Vc)	365	365	365	365	365	405	405	405	405	405	405	405	
	15-20	Grey cast iron	0.5D	1.0D	1.5D (1.2D)	1.0D (0.8D)	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		
36-37	Titanium Alloys	0.35D	1.0D	1.0D	0.5D	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		
						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		
36-37	Titanium Alloys	0.35D	1.0D	1.0D	0.5D	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



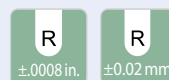
No. of Flutes



Cutting Conditions



Tolerance of Ball Radius



Helix Angle



Type of Shank



Plain
shank



Weldon
flat

Tool Ends



Square

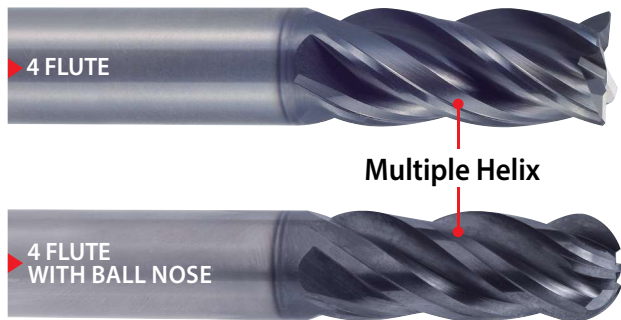
Chamfer



Radius

Ball

V7 Plus A 4 FLUTE END MILLS



Setting a Higher Standard in 4 Flute Design

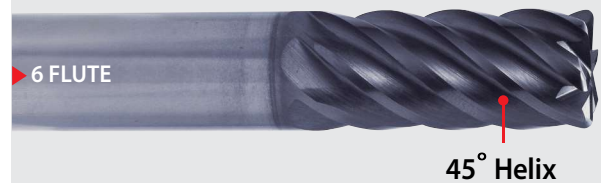
You asked for it. Now you can have state-of-the-art performance in an innovative 4 Flute design. First, you'll notice reduced vibration, optimal chip formation and excellent chip evacuation. And best of all, you'll get longer tool life in heavy cutting conditions. Available in ball nose, too.

NEW

V7 Plus A 6 FLUTE CHIP SPLITTER

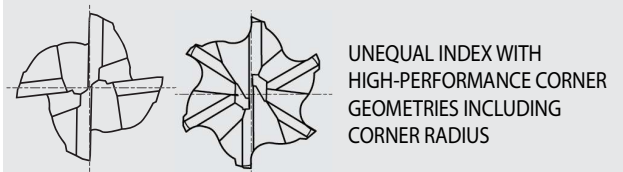


V7 Plus A 6 FLUTE END MILLS



Better by Every Measure

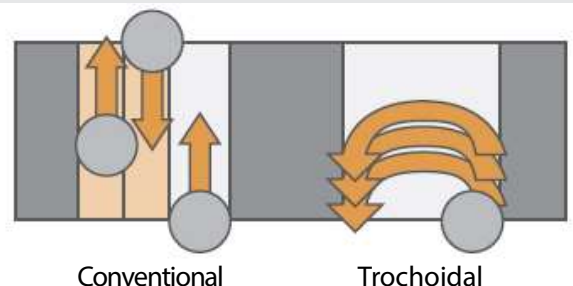
From its higher stability for lower vibration to its improved performance in high-speed and trochoidal milling applications, the V7 Plus A 6 Flute solid carbide, 45-degree helix, was designed with longer tool life and higher productivity in mind.



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

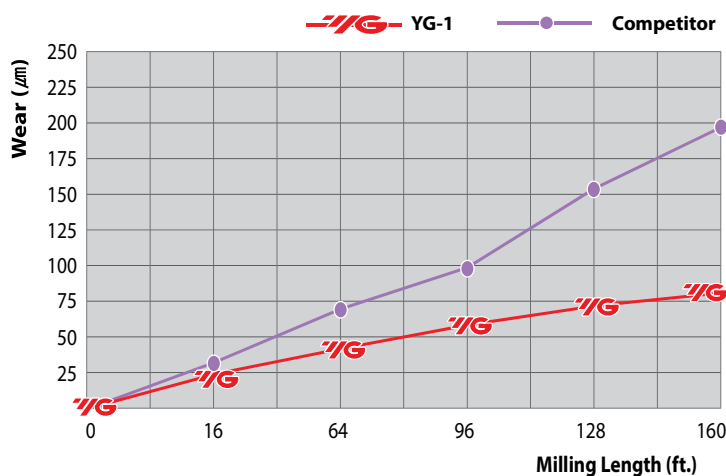
Innovative cutting performance that's not just a chip off the old block.

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	