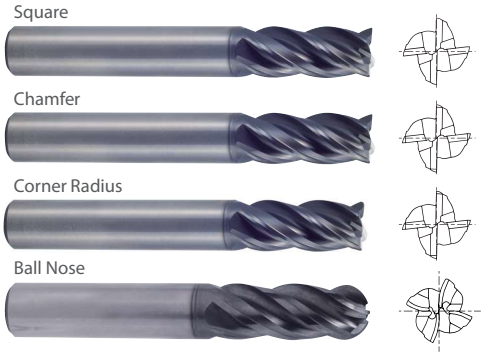
SERIES

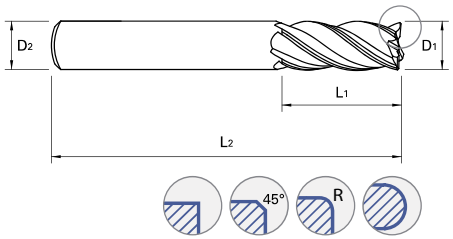
Y-Coated SOLID CARBIDE END MILLS

4 FLUTE STANDARD LENGTH (PLAIN SHANK)

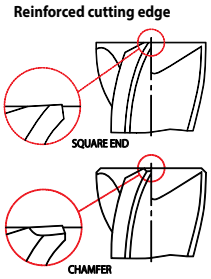
Square **UGMF68** Chamfer **UGMF76**
Corner Radius **UGMF70** Ball Nose **UGMG53**

- 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





SEE CHAMFER AND BALL KEYS ON PAGE 11



CARBIDE | 4 | 35°/37° | PLAIN | R ±.0008 | C x 45° | P.32-33

Unit : INCH

OD (D_1)	SD (D_2)	LOC (L_1)	OAL (L_2)	Square End	Chamfer	Corner Radius .010	Corner Radius .015	Corner Radius .030	Corner Radius .060	Corner Radius .090	Corner Radius .125	Corner Radius .190	Corner Radius .250	Ball Nose
				EDP No.	EDP No.	EDP No.	EDP No.	EDP No.	EDP No.	EDP No.	EDP No.	EDP No.	EDP No.	EDP No.
1/8	1/8	1/8	1-1/2	UGMF68008		UGMF70008		UGMF70955						UGMG53901
		3/8	1-1/2	UGMF68901		UGMF70901		UGMF70902						UGMG53008
		1/2	2-1/2	UGMF68S915		UGMF70S956		UGMF70S957						UGMG53S902
5/32	3/16	3/16	2	UGMF68010		UGMF70010								UGMG53903
		7/16	2	UGMF68902		UGMF70958								UGMG53010
3/16	3/16	3/16	2	UGMF68012		UGMF70012								UGMG53904
		5/16	2	UGMF68916		UGMF70959		UGMF70960						UGMG53905
		7/16	2	UGMF68903		UGMF70903		UGMF70904						UGMG53012
		5/8	2-1/2	UGMF68S917		UGMF70S961		UGMF70S962						UGMG53S906
7/32	1/4	1/4	2	UGMF68014		UGMF70014								UGMG53907
		7/16	2-1/2	UGMF68904		UGMF70963								UGMG53014
1/4	1/4	3/8	2	UGMF68016	UGMF76016	UGMF70016		UGMF70905	UGMF70906					UGMG53908
		1/2	2-1/2	UGMF68918			UGMF70964	UGMF70965	UGMF70966					UGMG53016
		3/4	2-1/2	UGMF68905	UGMF76902	UGMF70907	UGMF70908	UGMF70909	UGMF70967					UGMG53909
		1	3	UGMF68S919			UGMF70S968	UGMF70S969	UGMF70S970					UGMG53S910
9/32	5/16	5/8	2-1/2	UGMF68018			UGMF70018	UGMF70971	UGMF70972					UGMG53018
		1	3	UGMF68S920			UGMF70S973	UGMF70S974						UGMG53S911
5/16	5/16	7/16	2	UGMF68020				UGMF70020						UGMG53912
		13/16	2-1/2	UGMF68906	UGMF76020	UGMF70910		UGMF70911	UGMF70912					UGMG53020
		1-1/4	3	UGMF68S921			UGMF70S975	UGMF70S976	UGMF70S977					UGMG53S913
11/32	3/8	1/2	2-1/2	UGMF68022				UGMF70022						UGMG53914
		13/16	2-1/2	UGMF68922				UGMF70978						UGMG53022

▶ Length of cut in excess of 3 x D on 37° single-helix requires feed reduction of approximately 50%

NEXT PAGE ▶

Mill Dia. Tolerance (inch)	Shank Dia.Tolerance
0 ~ -.0012	h5 (≥ Ø1/2" : 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											○	○	○	○	○	○	○				

NEW SIZES

Y-Coated SOLID CARBIDE END MILLS

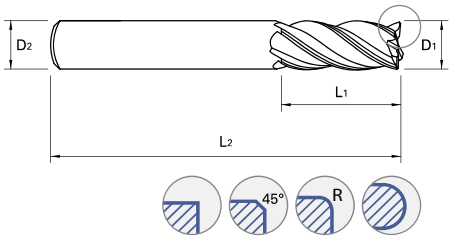
4 FLUTE STANDARD LENGTH (PLAIN SHANK)

SERIES

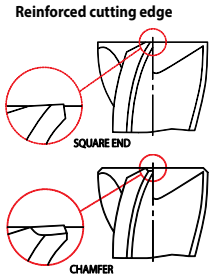
Square **UGMF68** Chamfer **UGMF76**

Corner Radius **UGMF70** Ball Nose **UGMG53**

- 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



SEE CHAMFER AND BALL KEYS ON PAGE 11



CARBIDE | 4 | 35°/37° | PLAIN | R ±.0008 | C x 45° | P. 32-33

Unit : INCH

✳ NEW SIZES

OD (D_1)	SD (D_2)	LOC (L_1)	OAL (L_2)	Square End	Chamfer	Corner Radius .010	Corner Radius .015	Corner Radius .030	Corner Radius .060	Corner Radius .090	Corner Radius .125	Corner Radius .190	Corner Radius .250	Ball Nose
				EDP No.	EDP No.	EDP No.	EDP No.	EDP No.	EDP No.	EDP No.	EDP No.	EDP No.	EDP No.	EDP No.
3/8	3/8	1/2	2-1/2	UGMF68024	UGMF76903	UGMF70024		UGMF70913	UGMF70914	UGMF70979				UGMG53915
		7/8	2-1/2	UGMF68907	UGMF76024	UGMF70915		UGMF70916	UGMF70917	UGMF70980				UGMG53024
		1	3	UGMF68923		UGMF70981		UGMF70982	UGMF70983	UGMF70984				UGMG53916
		1-1/4	3	UGMF68S924		UGMF70S985		UGMF70S986	UGMF70S987	UGMF70S988				UGMG53S917
13/32	7/16	1/2	2-3/4	UGMF68026				UGMF70026						UGMG53026
		15/16	2-3/4	UGMF68925				UGMF70989						UGMG53918
7/16	7/16	5/8	2-1/2	UGMF68028			UGMF70028	UGMF70918	UGMF70990	UGMF70991				UGMG53919
		7/8	2-3/4	UGMF68926	UGMF76028		UGMF70992	UGMF70993	UGMF70994	UGMF70995				UGMG53920
		1	2-3/4	UGMF68908		UGMF70919		UGMF70920	UGMF70921					UGMG53028
15/32	1/2	5/8	2-1/2	UGMF68030				UGMF70030						UGMG53030
		1	3	UGMF68927				UGMF70996						UGMG53921
		1-1/4	3-1/2	UGMF68928				UGMF70997						UGMG53922
1/2	1/2	5/8	2-1/2	UGMF68032	UGMF76032	UGMF70032	UGMF70922	UGMF70923	UGMF70924	UGMF70998	UGMF70999			UGMG53923
		1	3	UGMF68909	UGMF76904	UGMF70925	UGMF70801	UGMF70926	UGMF70927	UGMF70802	UGMF70928			UGMG53032
		1 1/4	3	*UGMF68941	*UGMF76913	*UGMF70899	*UGMF70701	*UGMF70702	*UGMF70703	*UGMF70704	*UGMF70705			*UGMG53941
		1-1/4	3-1/2	UGMF68910	UGMF76901	UGMF70929	UGMF70930	UGMF70931	UGMF70932	UGMF70803	UGMF70933			UGMG53924
		1-5/8	4	UGMF68S929	UGMF76S905		UGMF70S804	UGMF70S805	UGMF70S806	UGMF70S807	UGMF70S808			UGMG53S925
		2	4	UGMF68S939			UGMF70S889	UGMF70S890	UGMF70S891	UGMF70S892	UGMF70S893			UGMG53S939
		2-1/2	4-1/2	UGMF68S940	UGMF76S906		UGMF70S894	UGMF70S895	UGMF70S896	UGMF70S897	UGMF70S898			UGMG53S940

▶ Length of cut in excess of 3 x D on 37° single-helix requires feed reduction of approximately 50%

NEXT PAGE ▶

Mill Dia. Tolerance (inch)	Shank Dia.Tolerance
0 ~ -.0012	h5 (≥ Ø1/2" : 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											○	○	○	○	○	○	○				

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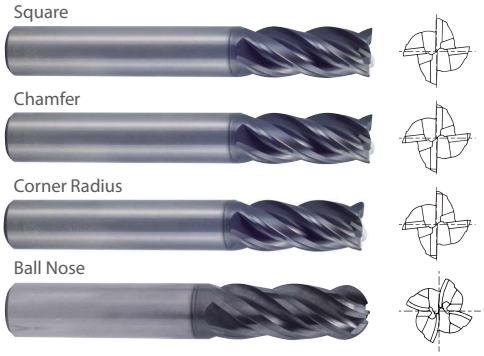

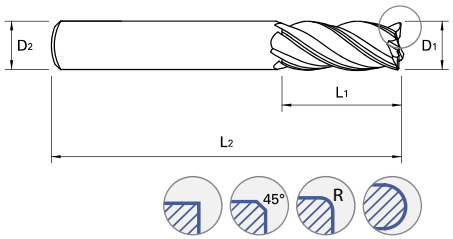

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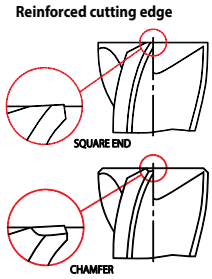


CARBIDE | 4 | 35°/37° | PLAIN | R ±.0008 | C x 45° | P. 32-33

Unit : INCH

OD (D_1)	SD (D_2)	LOC (L_1)	OAL (L_2)	Square End	Chamfer	Corner Radius								Ball Nose
						.010	.015	.030	.060	.090	.125	.190	.250	
				EDP No.	EDP No.	EDP No.	EDP No.	EDP No.	EDP No.	EDP No.	EDP No.	EDP No.	EDP No.	EDP No.
5/8	5/8	3/4	3	UGMF68040		UGMF70040	UGMF70809	UGMF70934	UGMF70935	UGMF70810	UGMF70811			UGMG53926
		1-1/4	3-1/2	UGMF68911	UGMF76040	UGMF70936	UGMF70937	UGMF70938	UGMF70939	UGMF70812	UGMF70940			UGMG53040
		1-5/8	4	UGMF68930	UGMF76907		UGMF70813	UGMF70814	UGMF70815	UGMF70816	UGMF70817			UGMG53927
		2	4	UGMF68S931			UGMF70S818	UGMF70S819	UGMF70S820	UGMF70S821	UGMF70S822			UGMG53S928
		3-1/4	6	UGMF68S932			UGMF70S823	UGMF70S824	UGMF70S825	UGMF70S826	UGMF70S827			UGMG53S929
3/4	3/4	3/4	3	UGMF68048	UGMF76908		UGMF70828	UGMF70048	UGMF70941	UGMF70829	UGMF70830	UGMF70831	UGMF70832	UGMG53930
		1-1/2	4	UGMF68912	UGMF76048		UGMF70942	UGMF70943	UGMF70944	UGMF70833	UGMF70945	UGMF70834	UGMF70835	UGMG53048
		1-7/8	4	UGMF68933			UGMF70836	UGMF70837	UGMF70838	UGMF70839	UGMF70840	UGMF70841	UGMF70842	UGMG53931
		2-1/4	5	UGMF68934	UGMF76909		UGMF70843	UGMF70844	UGMF70845	UGMF70846	UGMF70847	UGMF70848	UGMF70849	UGMG53932
		3-1/4	6	UGMF68S935			UGMF70S850	UGMF70S851	UGMF70S852	UGMF70S853	UGMF70S854	UGMF70S855	UGMF70S856	UGMG53S933
1	1	1	4	UGMF68064	UGMF76910		UGMF70064	UGMF70946	UGMF70947	UGMF70857	UGMF70858	UGMF70859	UGMF70860	UGMG53934
		1-1/2	4	UGMF68913	UGMF76064		UGMF70948	UGMF70949	UGMF70950	UGMF70861	UGMF70951	UGMF70862	UGMF70863	UGMG53064
		2	5	UGMF68914	UGMF76911		UGMF70952	UGMF70953	UGMF70954	UGMF70864	UGMF70865	UGMF70866	UGMF70867	UGMG53935
		2-5/8	5	UGMF68936	UGMF76912		UGMF70868	UGMF70869	UGMF70870	UGMF70871	UGMF70872	UGMF70873	UGMF70874	UGMG53936
		3	6	UGMF68937			UGMF70875	UGMF70876	UGMF70877	UGMF70878	UGMF70879	UGMF70880	UGMF70881	UGMG53937
		4-1/4	7	UGMF68S938			UGMF70S882	UGMF70S883	UGMF70S884	UGMF70S885	UGMF70S886	UGMF70S887	UGMF70S888	UGMG53S938

▶ Length of cut in excess of 3 x D on 37° single-helix requires feed reduction of approximately 50%

Mill Dia. Tolerance (inch)	Shank Dia.Tolerance
0 ~ -.0012	h5 (≥ Ø1/2" : h6)

CHAMFER KEY	
Mill Diameter	Chamfer Size
1/4	.007
5/16	.007
3/8	.011
7/16	.013
1/2	.013
5/8	.015
3/4	.019
1	.019

BALL NOSE KEY			
Mill Diameter	Radius of Ball	Mill Diameter	Radius of Ball
1/8	1/16	11/32	11/64
5/32	5/64	3/8	3/16
3/16	3/32	7/16	7/32
7/32	7/64	1/2	1/4
1/4	1/8	5/8	5/16
9/32	9/64	3/4	3/8
5/16	5/32	1	1/2

◎ : 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											○	○	○	○	○	○	○				

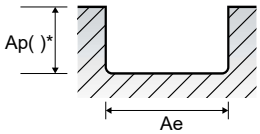
UGMF68, UGMF69, UGMF70, UGMF71, UGMF72 UGMF73, UGMF74, UGMF75, UGMF76, UGMF77 SERIES

4 FLUTE - SIDE & SLOTTING

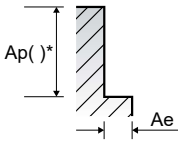
SFM = ft./min. fz = in./tooth
RPM = rev./min. FEED = in./min.

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	11/32	3/8	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	500	500	525	550	550	550	550	550	550
							fz	.0002	.0003	.0004	.0005	.0006	.0008	.0011	.0013	.0015	.0017	.0019	.0021	.0026	.0025
							RPM	15249	12200	10166	8714	7625	6778	6100	5834	5616	4811	4210	3368	2806	2105
							FEED	12.01	15.37	17.61	18.53	19.21	22.95	25.94	29.86	33.59	32.20	31.16	28.11	28.73	21.21
	5	Low alloy steel	0.5D	1.0D	1.5D (1.2D)	1.0D (0.8D)	SFM(Vc)	350	350	350	350	350	350	350	370	385	385	385	385	385	385
							fz	.0002	.0003	.0004	.0005	.0006	.0008	.0011	.0013	.0015	.0017	.0018	.0021	.0026	.0025
							RPM	10727	8581	7151	6129	5363	4767	4291	4089	3912	3353	2934	2347	1956	1467
							FEED	8.45	10.81	12.39	13.03	13.51	16.14	18.24	20.93	23.41	22.44	21.71	19.59	20.02	14.78
	6-7		0.5D	1.0D	1.5D (1.2D)	1.0D (0.8D)	SFM(Vc)	500	500	500	500	500	500	500	525	550	550	550	550	550	550
							fz	.0002	.0003	.0004	.0005	.0006	.0008	.0011	.0013	.0015	.0017	.0019	.0021	.0026	.0025
							RPM	15249	12200	10166	8714	7625	6778	6100	5834	5616	4811	4210	3368	2806	2105
							FEED	12.01	15.37	17.61	18.53	19.21	22.95	25.94	29.86	33.59	32.20	31.16	28.11	28.73	21.21
	8-9		0.5D	1.0D	1.5D (1.2D)	1.0D (0.8D)	SFM(Vc)	350	350	350	350	350	350	350	370	385	385	385	385	385	385
							fz	.0002	.0003	.0004	.0005	.0006	.0008	.0011	.0013	.0015	.0017	.0018	.0021	.0026	.0025
							RPM	10727	8581	7151	6129	5363	4767	4291	4089	3912	3353	2934	2347	1956	1467
							FEED	8.45	10.81	12.39	13.03	13.51	16.14	18.24	20.93	23.41	22.44	21.71	19.59	20.02	14.78
	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	210	210	220	230	230	230	230	230	230
							fz	.0001	.0002	.0003	.0004	.0004	.0006	.0007	.0009	.0011	.0012	.0013	.0015	.0018	.0018
							RPM	6418	5134	4278	3667	3209	2852	2567	2445	2343	2008	1757	1406	1171	879
							FEED	3.03	4.85	5.39	5.49	5.56	6.74	7.68	8.86	9.96	9.33	8.86	8.19	8.30	6.23
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	485	485
							fz	.0002	.0002	.0004	.0004	.0005	.0007	.0009	.0011	.0013	.0014	.0015	.0018	.0022	.0022
							RPM	14852	11882	9901	8487	7426	6601	5941	5401	4951	4243	3713	2970	2475	1857
							FEED	9.36	11.23	14.03	14.7	15.2	18.48	20.58	23.81	26.51	24.39	22.8	21.05	21.44	16.08
	14.1		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	350	350
							fz	.0002	.0003	.0005	.0006	.0007	.0009	.0011	.0015	.0019	.0020	.0022	.0024	.0030	.0030
							RPM	10635	8508	7090	6077	5317	4727	4254	3867	3545	3039	2659	2127	1772	1329
							FEED	8.37	10.72	14.51	14.83	15.07	17.12	18.76	23.14	26.8	24.64	23.03	20.77	21.49	16.12
	14.2		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	310	310
							fz	.0002	.0003	.0005	.0006	.0007	.0009	.0011	.0015	.0019	.0020	.0022	.0024	.0030	.0030
							RPM	9535	7628	6356	5448	4767	4238	3814	3467	3178	2724	2384	1907	1589	1192
							FEED	7.51	9.61	13.01	13.30	13.51	15.35	16.82	20.75	24.02	22.09	20.65	18.62	19.02	14.26
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	365	365	385	405	405	405	405	405	405
							fz	.0002	.0004	.0006	.0007	.0008	.0011	.0013	.0016	.0019	.0021	.0023	.0026	.0032	.0031
							RPM	11216	8972	7477	6409	5608	4985	4486	4290	4115	3527	3087	2469	2058	1543
							FEED	10.60	14.13	16.48	17.16	17.66	21.19	24.02	27.70	31.11	29.44	28.19	25.28	26.25	19.20
S	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	85	85
							fz	.0002	.0003	.0003	.0004	.0005	.0006	.0007	.0010	.0013	.0014	.0015	.0017	.0021	.0020
							RPM	2598	2078	1732	1484	1299	1154	1039	945	866	742	649	520	433	325
							FEED	2.05	2.29	2.18	2.34	2.45	2.82	3.11	3.87	4.5	4.15	3.89	3.52	3.68	2.66
	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	190	190
							fz	.0002	.0003	.0004	.0005	.0006	.0008	.0010	.0013	.0017	.0018	.0020	.0022	.0027	.0027
							RPM	5806	4645	3871	3318	2903	2581	2323	2111	1935	1659	1452	1161	968	726
							FEED	3.66	5.12	6.71	7.05	7.32	8.33	9.14	11.14	12.80	12.02	11.43	10.06	10.36	7.89

*( ) : Short length & Neck type



Slotting



Side Cutting

NOTES:
- Feed to be reduced by approximately 50% if L.O.C. (Length Of Cut) is over 3xD
- 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 that 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 PlusA

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" x3"

Over 1,500 Items in Stock.

V7 Plus A

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

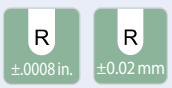
GUIDE TO ICONS

The tool is made of micrograin carbide

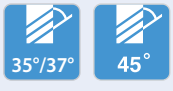
No. of Flutes

Cutting Conditions

Tolerance of Ball Radius



Helix Angle



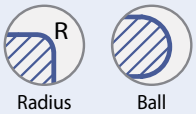
Type of Shank

Plain shank

Weldon flat

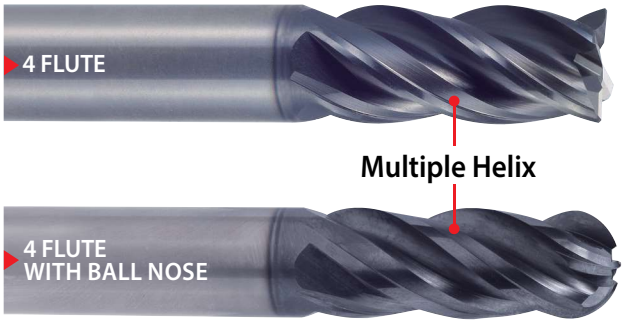
Tool Ends

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**

Unequal Index

Exclusively Designed Unique Geometry applied to Reduce Vibration and also to achieve Excellent Surface Finish

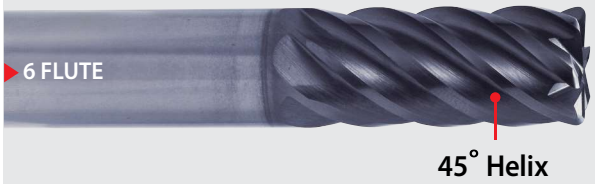
Corner Geometries

YG-1's High Performance Corner Geometries Including Corner Radius, applied for Longer Tool Life with Higher Cutting Speed

Chip Splitters

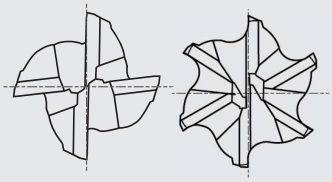
Special Chip Splitter Design Shorter Chip Length at High Axial Machining, improving Chip Removal from both the Component and the Machine

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.

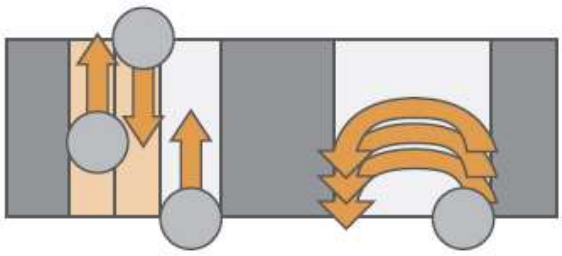


UNEQUAL INDEX WITH HIGH-PERFORMANCE CORNER GEOMETRIES INCLUDING CORNER RADIUS

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:

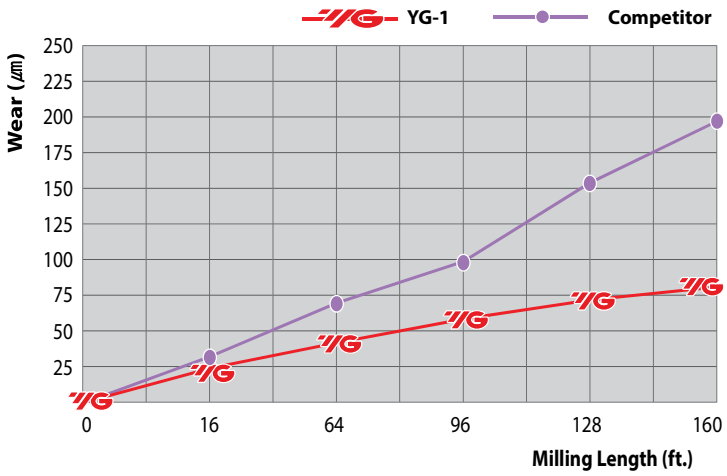
- Smaller arc engagement provides lower cutting force and better heat displacement
- More flutes provide deeper depth of cut for more productivity and reduced wear
- Stability-inducing geometry reduces vibration for increased accuracy and longer tool life
- Aggressive feed-per-tooth provides excellent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



HIGH-PERFORMANCE SOLID CARBIDE
4 FLUTE END MILLS

CASE STUDY

4 Flute vs Competitor



	V7 Plus A	Competitor
Wear(㎛)	83.518	203.381
Milling Length (ft.)	160	160
Size (mm)	Ø10 x Ø10 x 22 x 72	
Work Material	- JIS : S45C(HRc30) - DIN : C45 - WR : 1.0503 - 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	