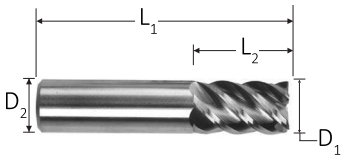


Titanium Alloys & High Temp Alloys

5 Flute • 45° for stainless steels/nickel based alloys

Carbide | 5 | Center Cutting | 45° | Bright AlTiN | +.000 -.002 | Square | Radius | HRc <54 | P K M S

- Unique geometry and higher helix maximizes resistance to heat and wear
- Outstanding performance in heavy profiling applications
- Cost effective for use on short run production

Series: GMG

DIA D_1	SHK D_2	LOC L_2	OAL L_1	CORNER	LENGTH	PART NAME	BRIGHT EDP	AlTiN EDP
1/16	1/8	3/16	1-1/2	SQ	std	GMG-402	14707	54707
3/32	1/8	9/32	1-1/2	SQ	std	GMG-403	14708	54708
1/8	1/8	1/4	1-1/2	SQ	stub	GMGS-404	17698	57698
1/8	1/8	1/4	1-1/2	0.010	stub	GMGS-404-R010	10232	50232
1/8	1/8	1/2	1-1/2	SQ	std	GMG-404	15942	55942
1/8	1/8	1/2	1-1/2	0.010	std	GMG-404-R010	11350	51350
5/32	3/16	5/16	2	SQ	stub	GMGS-605	17699	57699
5/32	3/16	9/16	2	SQ	std	GMG-605	15943	55943
3/16	3/16	5/16	2	SQ	stub	GMGS-606	17700	57700
3/16	3/16	9/16	2	SQ	std	GMG-606	15944	55944
3/16	3/16	9/16	2	0.010	std	GMG-606-R010	11571	51571
7/32	1/4	3/8	2	SQ	stub	GMGS-807	17701	57701
7/32	1/4	3/4	2-1/2	SQ	std	GMG-807	15945	55945
1/4	1/4	3/8	2	SQ	stub	GMGS-808	17702	57702
1/4	1/4	3/8	2	.015	stub	GMGS-808-R015	11648	51648
1/4	1/4	3/4	2-1/2	SQ	std	GMG-808	15946	55946
1/4	1/4	3/4	2-1/2	0.015	std	GMG-808-R015	11704	51704
1/4	1/4	1-1/2	4	SQ	xl	GMG-808-E	15947	55947
5/16	5/16	7/16	2	SQ	stub	GMGS-1010	17703	57703
5/16	5/16	13/16	2-1/2	SQ	std	GMG-1010	15948	55948
5/16	5/16	13/16	2-1/2	0.015	std	GMG-1010-R015	11705	51705
3/8	3/8	1/2	2	SQ	stub	GMGS-1212	17704	57704
3/8	3/8	1/2	2	0.015	stub	GMGS-1212-R015	11706	51706
3/8	3/8	1/2	2	0.030	stub	GMGS-1212-R030	11707	51707
3/8	3/8	1	2-1/2	SQ	std	GMG-1212	15949	55949
3/8	3/8	1	2-1/2	0.015	std	GMG-1212-R015	11708	51708
3/8	3/8	1	2-1/2	0.015	std	GMG-1212-R030	11710	51710
3/8	3/8	1-3/4	4	SQ	xl	GMG-1212-E	15950	55950
13/32	7/16	9/16	2-1/2	SQ	stub	GMGS-1413	10739	50739
7/16	7/16	9/16	2-1/2	SQ	stub	GMGS-1414	17705	57705
7/16	7/16	1	2-3/4	SQ	std	GMG-1414	15951	55951
1/2	1/2	5/8	2-1/2	SQ	stub	GMGS-1616	17706	57706
1/2	1/2	5/8	2-1/2	0.030	stub	GMGS-1616-R030	11711	51711
1/2	1/2	5/8	2-1/2	0.060	stub	GMGS-1616-R060	11716	51716
1/2	1/2	1-1/4	3	SQ	std	GMG-1616	15952	55952
1/2	1/2	1-1/4	3	0.030	std	GMG-1616-R030	11978	51978
1/2	1/2	1-1/4	3	0.060	std	GMG-1616-R060	11781	51781
1/2	1/2	2	4	SQ	std	GMG-1616-M	11886	51886
1/2	1/2	2	4	0.030	std	GMG-1616-R030M	15241	55241
1/2	1/2	3	6	SQ	xl	GMG-1616-E	15953	55953
9/16	9/16	1-1/2	3-1/2	SQ	std	GMG-1818	15954	55954
5/8	5/8	3/4	3	SQ	stub	GMGS-2020	17707	57707
5/8	5/8	3/4	3	0.030	stub	GMGS-2020-R030	15243	55243

Speed & Feed: page 149

sizes continued on next page

Titanium Alloys & High Temp Alloys

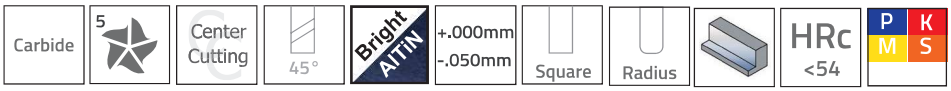
5 Flute • 45° for Stainless Steels/Nickel Based Alloys

Series: GMG

DIA D_1	SHK D_2	LOC L_2	OAL L_1	CORNER	LENGTH	PART NAME	BRIGHT EDP	AlTiN EDP
5/8	5/8	3/4	3	0.060	stub	GMGS-2020-R060	15245	55245
5/8	5/8	1-5/8	3-1/2	SQ	std	GMG-2020	15955	55955
5/8	5/8	1-5/8	3-1/2	0.030	std	GMG-2020-R030	15247	55247
5/8	5/8	1-5/8	3-1/2	0.060	std	GMG-2020-R060	H6836	H6837
5/8	5/8	3	6	SQ	xl	GMG-2020-E	11203	51203
3/4	3/4	1	3	SQ	stub	GMGS-2424	17708	57708
3/4	3/4	1	3	0.030	stub	GMGS-2424-R030	15249	55249
3/4	3/4	1	3	.060	stub	GMGS-2424-R060	15253	55253
3/4	3/4	1-5/8	4	SQ	std	GMG-2424	15956	55956
3/4	3/4	1-5/8	4	0.030	std	GMG-2424-R030	15257	55257
3/4	3/4	1-5/8	4	0.060	std	GMG-2424-R060	15259	55259
3/4	3/4	3	6	SQ	xl	GMG-2424-E	15957	55957
1	1	1-1/4	3	SQ	stub	GMGS-3232	17709	57709
1	1	1-1/2	4	SQ	std	GMG-3232	15958	55958
1	1	1-1/2	4	0.030	std	GMG-3232-R030	15261	55261
1	1	1-1/2	4	0.060	std	GMG-3232-R060	15263	55263
1	1	3	6	SQ	xl	GMG-3232-E	15959	55959
1-1/4	1-1/4	2	4-1/2	SQ	std	GMG-4040	15265	55265
1-1/4	1-1/4	2	4-1/2	0.030	std	GMG-4040-R030	10000	50000
1-1/4	1-1/4	2	4-1/2	0.060	std	GMG-4040-R060	H6816	H6817

Speed & Feed:
page 149

5 Flute • 45° for Stainless Steels/Nickel Based Alloys



Series: GMG-M_M_

DIA D_1	SHK D_2	LOC L_2	OAL L_1	CORNER	LENGTH	PART NAME	BRIGHT EDP	AlTiN EDP
3mm	3mm	12mm	38mm	SQ	std	GMG-M3M3	13405	53405
4mm	4mm	14mm	51mm	SQ	std	GMG-M4M4	13406	53406
5mm	5mm	20mm	51mm	SQ	std	GMG-M5M5	13407	53407
6mm	6mm	20mm	63mm	SQ	std	GMG-M6M6	13408	53408
6mm	6mm	20mm	63mm	0.5mm	std	GMG-M6M6-R0.5	H6818	H6827
6mm	6mm	25mm	75mm	SQ	med	GMG-M6M6-M	H6819	H6828
8mm	8mm	20mm	63mm	SQ	std	GMG-M8M8	13409	53409
8mm	8mm	20mm	63mm	0.5mm	std	GMG-M8M8-R0.5	H6820	H6829
8mm	8mm	25mm	75mm	SQ	med	GMG-M8M8-M	H6821	H6830
10mm	10mm	25mm	70mm	SQ	std	GMG-M10M10	13410	53410
10mm	10mm	25mm	70mm	0.5mm	std	GMG-M10M10-R0.5	H6822	H6831
10mm	10mm	38mm	100mm	SQ	long	GMG-M10M10-L	H6823	H6832
12mm	12mm	25mm	76mm	SQ	std	GMG-M12M12	13411	53411
12mm	12mm	25mm	76mm	1.0mm	std	GMG-M12M12-R1.0	H6824	H6833
12mm	12mm	50mm	100mm	SQ	long	GMG-M12M12-L	H6825	H6834
16mm	16mm	32mm	89mm	SQ	std	GMG-M16M16	13413	53413
16mm	16mm	32mm	89mm	1.0mm	std	GMG-M16M16-R1.0	H6826	H6835
20mm	20mm	38mm	100mm	SQ	std	GMG-M20M20	13415	53415

Speed & Feed:
page 149

Speed & Feed Information

Series: EMG35, EMG60, GMG

MATERIAL	CONDITION	STARTING SFM EMG35 / EMG60	STARTING SFM GMG	CUTTING DIAMETER 1/8"	3/16"	1/4"	3/8"	1/2"	5/8"	3/4"	1"
STAINLESS STEELS	**ISO-M**	**3 Flutes**	**5 Flutes**	**CHIP PER TOOTH**							
Precipitation											
13-8, 15-5, 17-4PH	Slotting @ ≤ .5 x D	175		0.0005	0.0007	0.0009	0.0014	0.0019	0.0024	0.0029	0.0039
	Profiling @ 2 x D Axial / ≤ .15 D Radial		225	0.0007	0.0010	0.0013	0.0019	0.0026	0.0033	0.0040	0.0054
Austenitic											
302, 303, 304L, 316L	Slotting @ ≤ .5 x D	225		0.0006	0.0008	0.0011	0.0017	0.0023	0.0029	0.0035	0.0047
	Profiling @ 2 x D Axial / ≤ .15 D Radial		275	0.0008	0.0011	0.0015	0.0024	0.0032	0.0040	0.0048	0.0064
Martensitic											
403, 410, 416	Slotting @ ≤ .5 x D	200		0.0006	0.0009	0.0012	0.0018	0.0025	0.0031	0.0037	0.0050
	Profiling @ 2 x D Axial / ≤ .15 D Radial		300	0.0009	0.0013	0.0016	0.0025	0.0034	0.0043	0.0051	0.0069
HIGH TEMP ALLOYS	**ISO-S**										
Cobalt Base											
Stellite, Haynes 25, 188, X-40, L-605	Slotting @ .5 x D	85		0.0003	0.0003	0.0004	0.0007	0.0010	0.0013	0.0015	0.0021
	Profiling @ 2 x D Axial / ≤ .15 D Radial		120	0.0003	0.0003	0.0006	0.0006	0.0012	0.0015	0.0019	0.0025
Nickel Base											
Inconel 600, 625, 718, Nickel 200, 270, Invar, Monel 400, 405, K-Monel,	Slotting @ .5 x D	60		0.0004	0.0002	0.0006	0.0009	0.0016	0.0015	0.0025	0.0025
PermaNickel 300, Inconel 600	Profiling @ 2 x D Axial / ≤ .15 D Radial		95	0.0004	0.0003	0.0006	0.0010	0.0017	0.0017	0.0021	0.0021
Iron Base											
Incoloy 800-802, Multimet N-155,	Slotting @ ≤ .5 x D	70		0.0004	0.0004	0.0008	0.0013	0.0018	0.0022	0.0027	0.0036
Timken 16-26-6	Profiling @ 2 x D Axial / ≤ .15 D Radial		110	0.0004	0.0004	0.0009	0.0015	0.0020	0.0025	0.0030	0.0041
STEELS	**ISO-P**										
High Strength Steels											
4140, 4340, 52100	Slotting @ ≤ .5 x D	225		0.0006	0.0008	0.0012	0.0018	0.0025	0.0031	0.0037	0.0050
	Profiling @ 2 x D Axial / ≤ .15 D Radial		300	0.0009	0.0012	0.0016	0.0025	0.0034	0.0043	0.0051	0.0069
High Alloy Steels - Mold & Die											
A-2, P20, 01, 02, D2, H-13	Slotting @ ≤ .5 x D	200		0.0005	0.0007	0.0010	0.0015	0.0021	0.0026	0.0031	0.0042
	Profiling @ 2 x D Axial / ≤ .15 D Radial		290	0.0007	0.001	0.0014	0.0021	0.0028	0.0036	0.0043	0.0058
Medium Alloy Steels											
200, 250, 300	Slotting @ ≤ .5 x D	250		0.0005	0.0004	0.0011	0.0019	0.0024	0.0034	0.0039	0.0049
	Profiling @ 2 x D Axial / ≤ .15 D Radial		315	0.0005	0.0004	0.0014	0.0023	0.0029	0.0039	0.0049	0.0059
Low Alloy Steels-Maraging											
10XX, 11XX, 13XX	Slotting @ ≤ .5 x D	265		0.0007	0.0009	0.0013	0.0020	0.0027	0.0034	0.0041	0.0055
	Profiling @ 2 x D Axial / ≤ .15 D Radial		300	0.0010	0.0014	0.0018	0.0028	0.0037	0.0047	0.0056	0.0075
CAST IRONS	**ISO-K**										
Ductile Iron											
Ductile Cast Iron	Slotting @ ≤ .5 x D	300		0.0005	0.0007	0.0009	0.0014	0.0019	0.0024	0.0029	0.0039
	Profiling @ 2 x D Axial / ≤ .15 D Radial		425	0.0007	0.0009	0.0013	0.0019	0.0026	0.0033	0.0040	0.0054
Cast Iron											
Grey Cast Iron	Slotting @ ≤ .5 x D	375		0.0006	0.0009	0.0011	0.0017	0.0023	0.0029	0.0035	0.0047
	Profiling @ 2 x D Axial / ≤ .15 D Radial		475	0.0008	0.0011	0.0015	0.0024	0.0032	0.004	0.0048	0.0064
TITANIUM	**ISO-S**										
Titanium Alloys											
6AL-4V, ASTM 1, 2, 3, 6AL-2S	Slotting @ ≤ .5 x D	150		0.0005	0.0006	0.0008	0.0013	0.0017	0.0022	0.0027	0.0036
For 5553, decrease SFM and IPM by 25%	Profiling @ 2 x D Axial / ≤ .15 D Radial		225	0.0006	0.0009	0.0012	0.0018	0.0024	0.0030	0.0037	0.0049

Note: All technical data provided are suggested starting points. They may be increase or decreased depending on machine condition, depth of cut, finish required, coolant, etc. Call our Technical Service Team with questions

SERIES: EMG35, EMG60, GMG (METRIC)

MATERIAL	CONDITION	STARTING M/MIN EMG35 / EMG60	STARTING M/MIN GMG	CUTTING DIAMETER - METRIC 4mm	6mm	8mm	10mm	12mm	14mm	16mm	20mm
STAINLESS STEELS	**ISO-M**	**3 Flutes**	**5 Flutes**	**CHIP PER TOOTH**							
Precipitation											
13-8, 15-5, 17-4PH	Slotting @ ≤ .5 x D	53		0.0127	0.0229	0.0279	0.0356	0.0483	0.0559	0.0610	0.0737
	Profiling @ 2 x D Axial / ≤ .15 D Radial		68	0.0178	0.0330	0.0406	0.0483	0.0660	0.0762	0.0838	0.1016
Austenitic											
302, 303, 304L, 316L	Slotting @ ≤ .5 x D	68		0.0152	0.0279	0.0356	0.0432	0.0584	0.0660	0.0737	0.0889
	Profiling @ 2 x D Axial / ≤ .15 D Radial		83	0.0203	0.0381	0.0483	0.0610	0.0813	0.0914	0.1016	0.1219
Martensitic											
403, 410, 416	Slotting @ ≤ .5 x D	61		0.0152	0.0305	0.0381	0.0457	0.0635	0.0711	0.0787	0.0940
	Profiling @ 2 x D Axial / ≤ .15 D Radial		91	0.0229	0.0406	0.0508	0.0635	0.0864	0.0965	0.1092	0.1295
HIGH TEMP ALLOYS	**ISO-S**										
Cobalt Base											
Stellite, Haynes 25, 188, X-40, L-605	Slotting @ .5 x D	26		0.0076	0.0102	0.0127	0.0178	0.0254	0.0305	0.0330	0.0381
	Profiling @ 2 x D Axial / ≤ .15 D Radial		36	0.0076	0.0152	0.0152	0.0152	0.0305	0.0356	0.0381	0.0483
Nickel Base											
Inconel 600, 625, 718, Nickel 200, 270, Invar, Monel 400, 405, K-Monel,	Slotting @ .5 x D	18		0.0102	0.0152	0.0178	0.0229	0.0406	0.0406	0.0406	0.0635
PermaNickel 300, Inconel 600	Profiling @ 2 x D Axial / ≤ .15 D Radial		30	0.0102	0.0152	0.0203	0.0254	0.0432	0.0043	0.0432	0.0533
Iron Base											
Incoloy 800-802, Multimet N-155,	Slotting @ ≤ .5 x D	21		0.0102	0.0203	0.0254	0.0330	0.0457	0.0508	0.0559	0.0686
Timken 16-26-6	Profiling @ 2 x D Axial / ≤ .15 D Radial		34	0.0102	0.0229	0.0305	0.0381	0.0508	0.0559	0.0635	0.0762
STEELS	**ISO-P**										
High Strength Steels											
4140, 4340, 52100	Slotting @ ≤ .5 x D	69		0.0152	0.0305	0.0381	0.0457	0.0635	0.0711	0.0787	0.0940
	Profiling @ 2 x D Axial / ≤ .15 D Radial		91	0.0229	0.0406	0.0508	0.0635	0.0864	0.0991	0.1092	0.1295
High Alloy Steels - Mold & Die											
A-2, P20, 01, 02, D2, H-13	Slotting @ ≤ .5 x D	61		0.0127	0.0254	0.0305	0.0381	0.0533	0.0584	0.0660	0.0787
	Profiling @ 2 x D Axial / ≤ .15 D Radial		88	0.0178	0.0356	0.0432	0.0533	0.0711	0.0813	0.0914	0.1092
Medium Alloy Steels											
200, 250, 300	Slotting @ ≤ .5 x D	76		0.0127	0.0279	0.0381	0.0483	0.0610	0.0660	0.0864	0.0991
	Profiling @ 2 x D Axial / ≤ .15 D Radial		96	0.0127	0.0356	0.0457	0.0584	0.0737	0.0864	0.0991	0.1245
Low Alloy Steels-Maraging											
10XX, 11XX, 13XX	Slotting @ ≤ .5 x D	81		0.0178	0.0330	0.0406	0.0508	0.0686	0.0762	0.0864	0.1041
	Profiling @ 2 x D Axial / ≤ .15 D Radial		91	0.0254	0.0457	0.0584	0.0711	0.0940	0.1067	0.1194	0.1422
CAST IRONS	**ISO-K**										
Ductile Iron											
Ductile Cast Iron	Slotting @ ≤ .5 x D	91		0.0127	0.0229	0.0305	0.0356	0.0483	0.0533	0.0610	0.0737
	Profiling @ 2 x D Axial / ≤ .15 D Radial		130	0.0178	0.0330	0.0381	0.0483	0.0660	0.0737	0.0838	0.1016
Cast Iron											
Grey Cast Iron	Slotting @ ≤ .5 x D	114		0.0152	0.0279	0.0356	0.0432	0.0584	0.0660	0.0737	0.0889
	Profiling @ 2 x D Axial / ≤ .15 D Radial		145	0.0203	0.0381	0.0483	0.0610	0.0813	0.0914	0.1016	0.1219
TITANIUM	**ISO-S**										
Titanium Alloys											
6AL-4V, ASTM 1, 2, 3, 6AL-2S	Slotting @ ≤ .5 x D	46		0.0127	0.0203	0.0254	0.0330	0.0432	0.0508	0.0559	0.0686
For 5553, decrease SFM and IPM by 25%	Profiling @ 2 x D Axial / ≤ .15 D Radial		69	0.0152	0.0305	0.0381	0.0457	0.0610	0.0686	0.0762	0.0940

Note: All technical data provided are suggested starting points. They may be increase or decreased depending on machine condition, depth of cut, finish required, coolant, etc. Call our TECHNICAL SERVICE Team with questions