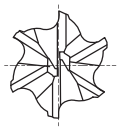
V7 PLUS A END MILLS

UGMG20 SERIES SQUARE
UGMG22 SERIES CORNER RADIUS

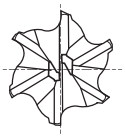
CARBIDE, 6 FLUTE STANDARD LENGTH

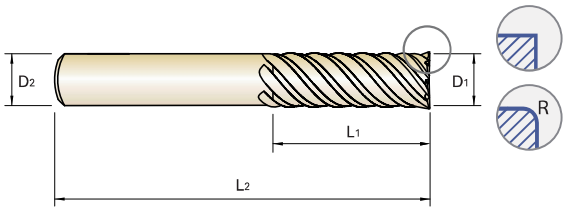
- ▶ The unique geometry of the variable pitch reduces chatter for high-speed and trochoidal milling
- ▶ Excellent performance for stainless steels, mild steels, cast iron and low/medium hardness materials up to HRc40
- ▶ Advanced coating for superior performance and tool life

SQUARE



CORNER RADIUS





MG HM | 6 | 45° | PLAIN

P.1011

Unit : Inch

OD	SD	LOC	LBS	Square End	Corner Radius							
					.015	.030	.060	.090	.120	.125	.190	.250
D1	D2	L1	L2	EDP No.	EDP No.	EDP No.	EDP No.	EDP No.	EDP No.	EDP No.	EDP No.	EDP No.
1/4	1/4	1/2	2-1/2	UGMG20914	UGMG22956	UGMG22957	UGMG22958	-	-	-	-	-
		3/4	2-1/2	UGMG20016	UGMG22016	UGMG22959	UGMG22960	-	-	-	-	-
		1-1/8	3	UGMG20901	UGMG22901	UGMG22902	UGMG22961	-	-	-	-	-
		1-1/2	4	UGMG20902	UGMG22903	UGMG22904	UGMG22962	-	-	-	-	-
5/16	5/16	3/4	2-1/2	UGMG20020	UGMG22020	-	-	-	-	-	-	-
		1-1/4	3	UGMG20903	UGMG22905	UGMG22906	-	-	-	-	-	-
		1-5/8	4	UGMG20904	UGMG22907	UGMG22908	-	-	-	-	-	-
3/8	3/8	5/8	2-1/2	UGMG20915	UGMG22963	UGMG22964	UGMG22965	UGMG22966	-	-	-	-
		1	3	UGMG20024	UGMG22024	UGMG22909	UGMG22910	UGMG22967	-	-	-	-
		1-1/2	4	UGMG20905	UGMG22911	UGMG22912	UGMG22913	UGMG22968	-	-	-	-
		2	4	UGMG20906	UGMG22914	UGMG22915	UGMG22916	UGMG22969	-	-	-	-
1/2	1/2	5/8	3	UGMG20916	UGMG22970	UGMG22971	UGMG22972	UGMG22973	-	UGMG22974	-	-
		1	3	UGMG20917	UGMG22032	UGMG22917	UGMG22918	UGMG22975	-	UGMG22976	-	-
		1	3-1/4	UGMG20032	-	-	-	-	-	-	-	-
		1-1/4	3-1/2	UGMG20907	UGMG22977	UGMG22919	UGMG22920	UGMG22921	UGMG22922	UGMG22978	-	-
		1-5/8	4	UGMG20918	UGMG22979	UGMG22980	UGMG22981	UGMG22982	-	UGMG22983	-	-
		2	4	UGMG20908	UGMG22984	UGMG22923	UGMG22924	UGMG22925	UGMG22926	UGMG22985	-	-
		2-5/8	5	UGMG20919	UGMG22986	UGMG22987	UGMG22988	UGMG22989	-	UGMG22990	-	-
		3	5	UGMG20909	UGMG22991	UGMG22927	UGMG22928	UGMG22929	UGMG22930	UGMG22992	-	-

▶ NEXT PAGE

◎ : Excellent ○ : Good

P					H	M	K	N					S	
Carbon Steels	Alloy Steels	Prehardened Steels	Hardened Steels		High Hardened Steels	Stainless Steels	Cast Iron	Copper	Graphite	Aluminum	Acrylic	CFRP	Titanium	High Temperature Alloy
~HB225	HB225~325	HRc30~40	HRc40~45	HRc45~55	HRc55~70									
◎	◎	◎	○			◎	◎						○	○

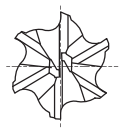
V7 PLUS A END MILLS

UGMG20 SERIES SQUARE
UGMG22 SERIES CORNER RADIUS

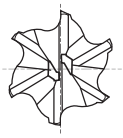
CARBIDE, 6 FLUTE STANDARD LENGTH

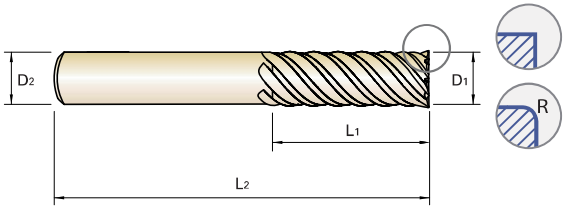
- ▶ The unique geometry of the variable pitch reduces chatter for high-speed and trochoidal milling
- ▶ Excellent performance for stainless steels, mild steels, cast iron and low/medium hardness materials up to HRc40
- ▶ Advanced coating for superior performance and tool life

SQUARE



CORNER RADIUS





MG HM | 6 | 45° | PLAIN

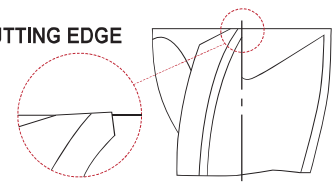
P.1011

Unit : Inch

OD	SD	LOC	LBS	Square End	Corner Radius							
					.015	.030	.060	.090	.120	.125	.190	.250
D1	D2	L1	L2	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	UGMG20920	UGMG22993	UGMG22994	UGMG22995	UGMG22996	-	UGMG22997	-	-
		1-1/4	3-1/2	UGMG20040	UGMG22998	UGMG22040	UGMG22931	UGMG22932	UGMG22933	UGMG22999	-	-
		1-7/8	4	UGMG20921	UGMG22801	UGMG22802	UGMG22803	UGMG22804	-	UGMG22805	-	-
		2	4	UGMG20910	UGMG22806	UGMG22934	UGMG22935	UGMG22936	UGMG22937	UGMG22807	-	-
		2-5/8	5	UGMG20922	UGMG22808	UGMG22809	UGMG22810	UGMG22811	-	UGMG22812	-	-
		3	5	UGMG20911	UGMG22813	UGMG22938	UGMG22939	UGMG22940	UGMG22941	UGMG22814	-	-
3/4	3/4	1	3-1/2	UGMG20923	UGMG22815	UGMG22816	UGMG22817	UGMG22818	-	UGMG22819	UGMG22820	UGMG22821
		1-1/2	4	UGMG20048	UGMG22822	UGMG22048	UGMG22942	UGMG22943	UGMG22944	UGMG22823	UGMG22824	UGMG22825
		1-7/8	5	UGMG20924	UGMG22826	UGMG22827	UGMG22828	UGMG22829	-	UGMG22830	UGMG22831	UGMG22832
		2-1/4	5	UGMG20925	UGMG22833	UGMG22834	UGMG22835	UGMG22836	-	UGMG22837	UGMG22838	UGMG22839
		2-3/4	5	UGMG20926	UGMG22840	UGMG22841	UGMG22842	UGMG22843	-	UGMG22844	UGMG22845	UGMG22846
		3	5-1/2	UGMG20912	UGMG22847	UGMG22945	UGMG22946	UGMG22947	UGMG22948	UGMG22848	UGMG22849	UGMG22850
1	1	1-1/2	4	UGMG20064	UGMG22851	UGMG22064	UGMG22949	UGMG22950	UGMG22951	UGMG22852	UGMG22853	UGMG22854
		2	5	UGMG20927	UGMG22855	UGMG22856	UGMG22857	UGMG22858	-	UGMG22859	UGMG22860	UGMG22861
		2-5/8	5	UGMG20928	UGMG22862	UGMG22863	UGMG22864	UGMG22865	-	UGMG22866	UGMG22867	UGMG22868
		3-1/4	6	UGMG20929	UGMG22869	UGMG22870	UGMG22871	UGMG22872	-	UGMG22873	UGMG22874	UGMG22875
		4	7	UGMG20913	UGMG22876	UGMG22952	UGMG22953	UGMG22954	UGMG22955	UGMG22877	UGMG22878	UGMG22879

Mill Dia. Tolerance (inch)	Shank Dia. Tolerance
0~-.0012	h6

REINFORCED CUTTING EDGE



SQUARE END

◎ : Excellent ○ : Good

P					H	M	K	N					S	
Carbon Steels	Alloy Steels	Prehardened Steels	Hardened Steels		High Hardened Steels	Stainless Steels	Cast Iron	Copper	Graphite	Aluminum	Acrylic	CFRP	Titanium	High Temperature Alloy
~HB225	HB225~325	HRc30~40	HRc40~45	HRc45~55	HRc55~70									
◎	◎	◎	○			◎	◎						○	○

V7 PLUS A END MILLS

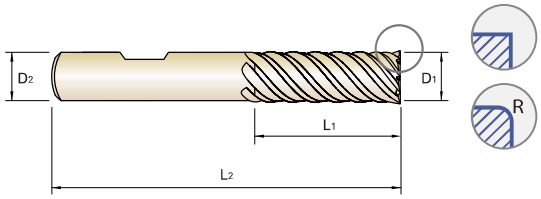
UGMG21 SERIES SQUARE
UGMG23 SERIES CORNER RADIUS

CARBIDE, 6 FLUTE STANDARD LENGTH

- ▶ The unique geometry of the variable pitch reduces chatter for high-speed and trochoidal milling
- ▶ Excellent performance for stainless steels, mild steels, cast iron and low/medium hardness materials up to HRc40
- ▶ Advanced coating for superior performance and tool life

SQUARE

CORNER RADIUS



MG HM | 6 | 45° | FLAT

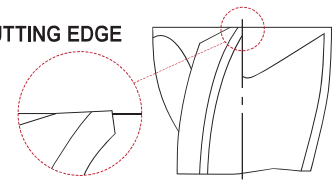
P.1011

Unit : Inch

OD	SD	LOC	LBS	Square End	Corner Radius				
					.015	.030	.060	.090	.120
D_1	D_2	L_1	L_2	EDP No.	EDP No.	EDP No.	EDP No.	EDP No.	EDP No.
3/8	3/8	1	3	UGMG21024	UGMG23024	UGMG23909	UGMG23910	-	-
		1-1/2	4	UGMG21905	UGMG23911	UGMG23912	UGMG23913	-	-
		2	4	UGMG21906	UGMG23914	UGMG23915	UGMG23916	-	-
1/2	1/2	1	3	UGMG21914	UGMG23032	UGMG23917	UGMG23918	-	-
		1	3-1/4	UGMG21032	-	-	-	-	-
		1-1/4	3-1/2	UGMG21907	-	UGMG23919	UGMG23920	UGMG23921	UGMG23922
		2	4	UGMG21908	-	UGMG23923	UGMG23924	UGMG23925	UGMG23926
		3	5	UGMG21909	-	UGMG23927	UGMG23928	UGMG23929	UGMG23930
5/8	5/8	1-1/4	3-1/2	UGMG21040	-	UGMG23040	UGMG23931	UGMG23932	UGMG23933
		2	4	UGMG21910	-	UGMG23934	UGMG23935	UGMG23936	UGMG23937
		3	5	UGMG21911	-	UGMG23938	UGMG23939	UGMG23940	UGMG23941
3/4	3/4	1-1/2	4	UGMG21048	-	UGMG23048	UGMG23942	UGMG23943	UGMG23944
		3	5-1/2	UGMG21912	-	UGMG23945	UGMG23946	UGMG23947	UGMG23948
1	1	1-1/2	4	UGMG21064	-	UGMG23064	UGMG23949	UGMG23950	UGMG23951
		4	7	UGMG21913	-	UGMG23952	UGMG23953	UGMG23954	UGMG23955

Mill Dia. Tolerance (inch)	Shank Dia. Tolerance
0~-.0012	h6

REINFORCED CUTTING EDGE



SQUARE END

◎ : Excellent ○ : Good

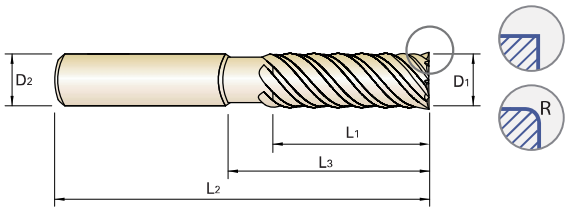
P					H	M	K	N					S	
Carbon Steels	Alloy Steels	Prehardened Steels	Hardened Steels		High Hardened Steels	Stainless Steels	Cast Iron	Copper	Graphite	Aluminum	Acrylic	CFRP	Titanium	High Temperature Alloy
~HB225	HB225~325	HRc30~40	HRc40~45	HRc45~55	HRc55~70									
◎	◎	◎	○			◎	◎						○	○

V7 PLUS A END MILLS

UGMH08 SERIES SQUARE
UGMH09 SERIES CORNER RADIUS

CARBIDE, 6 FLUTE EXTENDED LENGTH

► The unique geometry of the variable pitch reduces chatter for high-speed and trochoidal milling
► Excellent performance for stainless steels, mild steels, cast iron and low/medium hardness materials up to HRc40
► Advanced coating for superior performance and tool life



MG HM | 6 | 45° | PLAIN

P.1011

Unit : Inch

OD	SD	LOC	LBS	OAL	Square End	Corner Radius					
						.030	.060	.090	.125	.190	.250
D1	D2	L1	L3	L2	EDP No.	EDP No.	EDP No.	EDP No.	EDP No.	EDP No.	EDP No.
1/4	1/4	3/8	3/4	4	UGMH08016	UGMH09016	UGMH09901	-	-	-	-
		3/8	1-1/8	4	UGMH08901	UGMH09902	UGMH09903	-	-	-	-
		3/8	2-1/8	4	UGMH08902	UGMH09904	UGMH09905	-	-	-	-
3/8	3/8	1/2	1-1/8	4	UGMH08024	UGMH09024	UGMH09906	UGMH09907	-	-	-
		1/2	2-1/8	4	UGMH08903	UGMH09908	UGMH09909	UGMH09910	-	-	-
		1/2	3-1/8	5	UGMH08919	UGMH09999	UGMH09801	UGMH09802	-	-	-
		1/2	3-1/8	6	UGMH08904	UGMH09911	UGMH09912	UGMH09913	-	-	-
		1/2	4-1/8	6	UGMH08905	UGMH09914	UGMH09915	UGMH09916	-	-	-
1/2	1/2	5/8	1-1/2	4	UGMH08032	UGMH09032	UGMH09917	UGMH09918	UGMH09919	-	-
		5/8	2-1/4	4	UGMH08906	UGMH09920	UGMH09921	UGMH09922	UGMH09923	-	-
		5/8	3-3/8	5	UGMH08920	UGMH09803	UGMH09804	UGMH09805	UGMH09806	-	-
		5/8	3-3/8	6	UGMH08907	UGMH09924	UGMH09925	UGMH09926	UGMH09927	-	-
		5/8	4-1/8	6	UGMH08908	UGMH09928	UGMH09929	UGMH09930	UGMH09931	-	-
5/8	5/8	3/4	1-5/8	4	UGMH08040	UGMH09040	UGMH09932	UGMH09933	UGMH09934	-	-
		3/4	2-3/8	5	UGMH08921	UGMH09807	UGMH09808	UGMH09809	UGMH09810	-	-
		3/4	3-3/8	5	UGMH08922	UGMH09811	UGMH09812	UGMH09813	UGMH09814	-	-
		3/4	2-3/8	6	UGMH08909	UGMH09935	UGMH09936	UGMH09937	UGMH09938	-	-
		3/4	3-3/8	6	UGMH08910	UGMH09939	UGMH09940	UGMH09941	UGMH09942	-	-
		3/4	4-1/8	6	UGMH08911	UGMH09943	UGMH09944	UGMH09945	UGMH09946	-	-
3/4	3/4	1-1/8	2	4	UGMH08048	UGMH09048	UGMH09947	UGMH09948	UGMH09949	UGMH09950	UGMH09951
		1-1/8	2-5/8	5	UGMH08912	UG MH09952	UGMH09953	UGMH09954	UGMH09955	UGMH09956	UGMH09957
		1-1/8	3-1/4	6	UGMH08913	UGMH09958	UGMH09959	UGMH09960	UGMH09961	UGMH09962	UGMH09963
		1-1/8	4-1/4	7	UGMH08914	UGMH09964	UGMH09965	UGMH09966	UGMH09967	UGMH09968	UGMH09969

▶ NEXT PAGE

◎ : Excellent ○ : Good

P					H	M	K	N					S	
Carbon Steels	Alloy Steels	Prehardened Steels	Hardened Steels		High Hardened Steels	Stainless Steels	Cast Iron	Copper	Graphite	Aluminum	Acrylic	CFRP	Titanium	High Temperature Alloy
~HB225	HB225~325	HRc30~40	HRc40~45	HRc45~55	HRc55~70									
◎	◎	◎	○			◎	◎						○	○

V7 PLUS A END MILLS

UGMH08 SERIES SQUARE
UGMH09 SERIES CORNER RADIUS

CARBIDE, 6 FLUTE EXTENDED LENGTH

- ► The unique geometry of the variable pitch reduces chatter for high-speed and trochoidal milling
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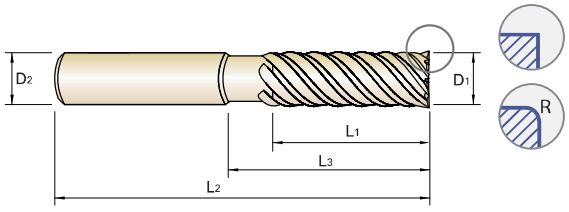


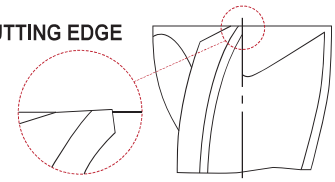
MG HM | 6 | 45° | PLAIN | P.1011

Unit : Inch

OD	SD	LOC	LBS	OAL	Square End	Corner Radius					
						.030	.060	.090	.125	.190	.250
D_1	D_2	L_1	L_3	L_2	EDP No.	EDP No.	EDP No.	EDP No.	EDP No.	EDP No.	EDP No.
1	1	1-1/4	2-1/4	4	UGMH08064	UGMH09064	UGMH09970	UGMH09971	UGMH09972	UGMH09973	UGMH09974
		1-1/4	2-5/8	5	UGMH08915	UGMH09975	UGMH09976	UGMH09977	UGMH09978	UGMH09979	UGMH09980
		1-1/4	3-1/4	6	UGMH08916	UGMH09981	UGMH09982	UGMH09983	UGMH09984	UGMH09985	UGMH09986
		1-1/4	4-1/4	7	UGMH08917	UGMH09987	UGMH09988	UGMH09989	UGMH09990	UGMH09991	UGMH09992
		1-1/4	5-1/4	8	UGMH08918	UGMH09993	UGMH09994	UGMH09995	UGMH09996	UGMH09997	UGMH09998

Mill Dia. Tolerance (inch)	Shank Dia. Tolerance
0~-.0012	h6

REINFORCED CUTTING EDGE



SQUARE END

◎ : Excellent ○ : Good

P					H	M	K	N					S	
Carbon Steels	Alloy Steels	Prehardened Steels	Hardened Steels		High Hardened Steels	Stainless Steels	Cast Iron	Copper	Graphite	Aluminum	Acrylic	CFRP	Titanium	High Temperature Alloy
~HB225	HB225~325	HRc30~40	HRc40~45	HRc45~55	HRc55~70									
◎	◎	◎	○			◎	◎						○	○

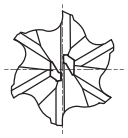
V7 PLUS A END MILLS

GMG12 / GMG14 SERIES SQUARE
GMG16 / GMG18 SERIES CORNER RADIUS

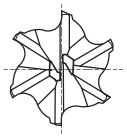
CARBIDE, 6 FLUTE STANDARD LENGTH

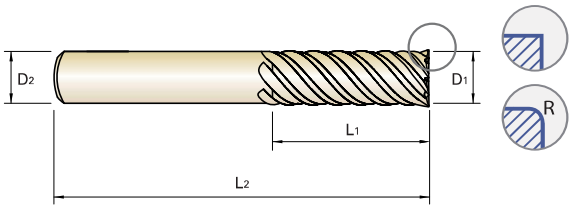
- ► The unique geometry of the variable pitch reduces chatter for high-speed and trochoidal milling
- ► Excellent performance for stainless steels, mild steels, cast iron and low/medium hardness materials up to HRc40
- ► Advanced coating for superior performance and tool life

SQUARE



CORNER RADIUS





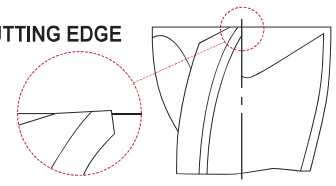
MG HM | 6 | 45° | PLAIN | P.1015

Unit : mm

OD D1 Metric	OD D1 Inch	SD D2	LOC L1	OAL L2	Square End	Corner Radius 0.50	1.00	1.50	2.00	3.00	4.00	5.00
					EDP No.	EDP No.	EDP No.	EDP No.	EDP No.	EDP No.	EDP No.	EDP No.
6.0	.2362	6	13	57	GMG12060	GMG16060	GMG16901	-	-	-	-	-
		6	24	75	GMG14060	GMG18060	GMG18901	-	-	-	-	-
8.0	.3150	8	19	63	GMG12080	GMG16080	GMG16902	-	-	-	-	-
		8	32	75	GMG14080	GMG18080	GMG18902	-	GMG18903	-	-	-
10.0	.3937	10	22	72	GMG12100	GMG16100	GMG16903	GMG16904	GMG16905	-	-	-
		10	40	100	GMG14100	GMG18100	GMG18904	GMG18905	GMG18906	-	-	-
12.0	.4724	12	26	83	GMG12120	GMG16120	GMG16906	GMG16907	GMG16908	GMG16909	-	-
		12	48	120	GMG14120	GMG18120	GMG18907	GMG18908	GMG18909	GMG18910	-	-
16.0	.6299	16	32	92	GMG12160	-	GMG16160	GMG16910	GMG16911	GMG16912	-	-
		16	64	140	GMG14160	-	GMG18160	GMG18911	GMG18912	GMG18913	-	-
20.0	.7874	20	38	104	GMG12200	-	GMG16200	GMG16913	GMG16914	GMG16915	-	-
		20	80	150	GMG14200	-	GMG18200	GMG18914	GMG18915	GMG18916	GMG18917	GMG18918
25.0	.9843	25	44	104	GMG12250	-	GMG16250	GMG16916	GMG16917	GMG16918	-	-
		25	100	170	GMG14250	-	GMG18250	GMG18919	GMG18920	GMG18921	GMG18922	GMG18923

Mill Dia. Tolerance (inch)	Shank Dia. Tolerance
0~-.0012	h6

REINFORCED CUTTING EDGE



SQUARE END

◎ : Excellent ○ : Good

P					H	M	K	N					S	
Carbon Steels	Alloy Steels	Prehardened Steels	Hardened Steels		High Hardened Steels	Stainless Steels	Cast Iron	Copper	Graphite	Aluminum	Acrylic	CFRP	Titanium	High Temperature Alloy
~HB225	HB225~325	HRc30~40	HRc40~45	HRc45~55	HRc55~70									
◎	◎	◎	○			◎	◎						○	○

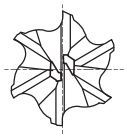
V7 PLUS A END MILLS

GMG13 / GMG15 SERIES SQUARE
GMG17 / GMG19 SERIES CORNER RADIUS

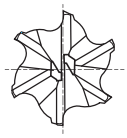
CARBIDE, 6 FLUTE STANDARD LENGTH

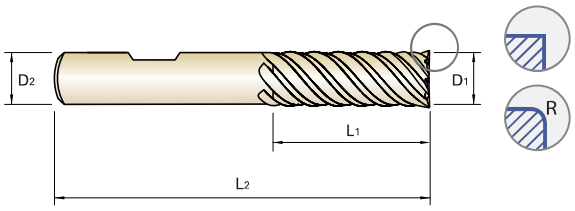
► The unique geometry of the variable pitch reduces chatter for high-speed and trochoidal milling
► Excellent performance for stainless steels, mild steels, cast iron and low/medium hardness materials up to HRc40
► Advanced coating for superior performance and tool life

SQUARE



CORNER RADIUS





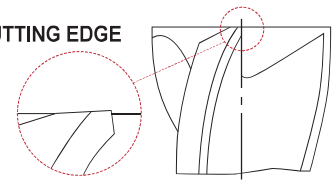
MG HM | 6 | 45° | FLAT | P.1015

Unit : mm

OD D1 Metric	OD D1 Inch	SD D2	LOC L1	OAL L2	Square End EDP No.	Corner Radius 0.50 EDP No.	1.00 EDP No.	1.50 EDP No.	2.00 EDP No.	3.00 EDP No.	4.00 EDP No.	5.00 EDP No.
6.0	.2362	6	13	57	GMG13060	GMG17060	GMG17901	-	-	-	-	-
		6	24	75	GMG15060	GMG19060	GMG19901	-	-	-	-	-
8.0	.3150	8	19	63	GMG13080	GMG17080	GMG17902	-	-	-	-	-
		8	32	75	GMG15080	GMG19080	GMG19902	-	GMG19903	-	-	-
10.0	.3937	10	22	72	GMG13100	GMG17100	GMG17903	GMG17904	GMG17905	-	-	-
		10	40	100	GMG15100	GMG19100	GMG19904	GMG19905	GMG19906	-	-	-
12.0	.4724	12	26	83	GMG13120	GMG17120	GMG17906	GMG17907	GMG17908	GMG17909	-	-
		12	48	120	GMG15120	GMG19120	GMG19907	GMG19908	GMG19909	GMG19910	-	-
16.0	.6299	16	32	92	GMG13160	-	GMG17160	GMG17910	GMG17911	GMG17912	-	-
		16	64	140	GMG15160	-	GMG19160	GMG19911	GMG19912	GMG19913	-	-
20.0	.7874	20	38	104	GMG13200	-	GMG17200	GMG17913	GMG17914	GMG17915	-	-
		20	80	150	GMG15200	-	GMG19200	GMG19914	GMG19915	GMG19916	GMG19917	GMG19918
25.0	.9843	25	44	104	GMG13250	-	GMG17250	GMG17916	GMG17917	GMG17918	-	-
		25	100	170	GMG15250	-	GMG19250	GMG19919	GMG19920	GMG19921	GMG19922	GMG19923

Mill Dia. Tolerance (inch)	Shank Dia. Tolerance
0~-.0012	h6

REINFORCED CUTTING EDGE



SQUARE END

◎ : Excellent ○ : Good

P					H	M	K	N					S	
Carbon Steels	Alloy Steels	Prehardened Steels	Hardened Steels		High Hardened Steels	Stainless Steels	Cast Iron	Copper	Graphite	Aluminum	Acrylic	CFRP	Titanium	High Temperature Alloy
~HB225	HB225~325	HRc30~40	HRc40~45	HRc45~55	HRc55~70									
◎	◎	◎	○			◎	◎						○	○

V7 PLUS A END MILLS

RECOMMENDED CUTTING CONDITIONS

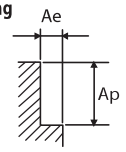
CARBIDE, 6 FLUTE - INCH

UGMG20, UGMG21, UGMG22, UGMG23, UGMH08, UGMH09 SERIES

ISO Hardness (BHN)	Work Materials	Speed and Feed Recommendations				Diameter (in.)						
		Type of Cut	Ap x D1	Ae x D1	Parameters	1/4	5/16	3/8	1/2	5/8	3/4	1
P <300	CARBON STEEL 10**, 11**, 12**, 12L**, 15**	Side Cutting	2 (*)	0.05	SFM (VC)	984 (787-1181)						
					RPM	15036	12028	10024	7518	6014	5012	3759
					Fz	.0027	.0046	.0057	.0068	.0080	.0089	.0091
					FEED	241.52	329.60	340.96	307.22	286.98	266.38	206.00
P >300 P <380	ALLOY STEEL 41**, 43**, 51**, 86**	Side Cutting	2 (*)	0.05	SFM (VC)	666 (533-799)						
					RPM	10176	8141	6784	5088	4071	3392	2544
					Fz	.0020	.0033	.0042	.0050	.0059	.0066	.0069
					FEED	120.19	163.46	169.88	153.85	143.27	133.82	104.57
P <380	TOOL STEEL A2, D2, H13, P20, T15	Side Cutting	2 (*)	0.05	SFM (VC)	328 (262-394)						
					RPM	5012	4009	3341	2506	2005	1671	1253
					Fz	.0016	.0028	.0035	.0041	.0048	.0054	.0057
					FEED	48.54	67.25	69.46	62.15	58.25	54.06	42.62
M	STAINLESS STEELS 300 304, 316, 304L, 316LSUS316	Side Cutting	2 (*)	0.05	SFM (VC)	482 (386-578)						
					RPM	7365	5892	4910	3682	2946	2455	1841
					Fz	.0016	.0028	.0035	.0041	.0048	.0054	.0056
					FEED	71.33	98.82	102.07	91.34	85.60	79.45	62.20
M	STAINLESS STEELS 400 416, 420F, 430F, 440F	Side Cutting	2 (*)	0.05	SFM (VC)	699 (559-839)						
					RPM	10681	8545	7120	5340	4272	3560	2670
					Fz	.0019	.0033	.0041	.0049	.0057	.0064	.0066
					FEED	123.63	169.55	174.93	157.69	147.34	136.24	105.97
M	STAINLESS STEELS (PH) 17-4PH, 15-5PH, 13-8PH	Side Cutting	2 (*)	0.05	SFM (VC)	440 (352-528)						
					RPM	6723	5379	4482	3362	2689	2241	1681
					Fz	.0016	.0028	.0035	.0041	.0048	.0054	.0056
					FEED	65.11	90.21	93.17	83.38	78.14	72.53	56.38
S	TITANIUM TI6AL4V, TI5AL5V5MO, TI7AL4MO	Side Cutting	2 (*)	0.05	SFM (VC)	381 (305-457)						
					RPM	5822	4657	3881	2911	2329	1941	1455
					Fz	.0013	.0022	.0028	.0033	.0038	.0044	.0046
					FEED	45.38	60.51	64.18	57.07	53.36	51.80	40.22
S	HIGH-TEMPERATURE ALLOY INCONEL, HASTALLOY, RENE	Side Cutting	2 (*)	0.05	SFM (VC)	108 (86-130)						
					RPM	1650	1320	1100	825	660	550	413
					Fz	.0013	.0022	.0028	.0032	.0038	.0044	.0045
					FEED	12.86	17.15	18.19	15.98	15.13	14.55	11.21

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

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"
* Finish cuts typically require reduced cutting feeds and speeds; also, it is recommended the radial width of cut (AE) should not exceed 2% x D1
* If product's length of cut (L.O.C.) is below 2D, it must be applied L.O.C. x 90%

V7 PLUS A END MILLS

RECOMMENDED CUTTING CONDITIONS

CARBIDE, 6 FLUTE - METRIC

GMG12, GMG13, GMG14, GMG15, GMG16, GMG17, GMG18, GMG19 SERIES

ISO Hardness (BHN)	Work Materials	Speed and Feed Recommendations				Diameter (mm)						
		Type of Cut	Ap x D1	Ae x D1	Parameters	6	8	10	12	16	20	25
P < 300	CARBON STEEL 10**, 11**, 12**, 12L**, 15**	Side Cutting	2 (*)	0.05	SFM (VC)	984 (787-1181)						
					RPM	15915	11937	9549	7958	5968	4775	3820
					Fz	.0027	.0046	.0057	.0068	.0080	.0089	.0091
					FEED	255.65	327.08	324.83	325.20	284.79	253.77	209.33
P > 300 P < 380	ALLOY STEEL 41**, 43**, 51**, 86**	Side Cutting	2 (*)	0.05	SFM (VC)	666 (533-799)						
					RPM	10769	8077	6462	5385	4039	3231	2585
					FZ	.0020	.0033	.0042	.0050	.0059	.0066	.0069
					FEED	127.20	162.18	161.80	162.81	142.14	127.45	106.24
P < 380	TOOL STEEL A2, D2, H13, P20, T15	Side Cutting	2 (*)	0.05	SFM (VC)	328 (262-394)						
					RPM	5305	3979	3183	2653	1989	1592	1273
					FZ	.0016	.0028	.0035	.0041	.0048	.0054	.0057
					FEED	51.38	66.73	66.17	65.79	57.80	51.51	43.31
M	STAINLESS STEELS 300 304, 316, 304L, 316LSUS316	Side Cutting	2 (*)	0.05	SFM (VC)	482 (386-579)						
					RPM	7799	5849	4679	3899	2924	2340	1872
					FZ	.0016	.0028	.0035	.0041	.0048	.0054	.0056
					FEED	75.53	98.10	97.27	96.71	84.97	75.71	63.22
M	STAINLESS STEELS 400 416, 420F, 430F, 440F	Side Cutting	2 (*)	0.05	SFM (VC)	699 (559-839)						
					RPM	11300	8475	6780	5650	4238	3390	2712
					FZ	.0019	.0033	.0041	.0049	.0057	.0064	.0066
					FEED	130.80	168.17	166.56	166.83	146.14	129.73	107.63
M	STAINLESS STEELS (PH) 17-4PH, 15-5PH, 13-8PH	Side Cutting	2 (*)	0.05	SFM (VC)	440 (352-528)						
					RPM	7109	5332	4265	3554	2666	2133	1706
					FZ	.0016	.0028	.0035	.0041	.0048	.0054	.0056
					FEED	68.85	89.42	88.67	88.16	77.46	69.02	57.23
S	TITANIUM TI6AL4V TI5AL5V5MO TI7AL4MO	Side Cutting	2 (*)	0.05	SFM (VC)	381 (304-457)						
					RPM	6154	4615	3692	3077	2308	1846	1477
					FZ	.0013	.0022	.0028	.0033	.0038	.0044	.0046
					FEED	47.97	59.97	61.06	60.33	52.88	49.28	40.82
S	HIGH-TEMPERATURE ALLOY INCONEL HASTALLOY, RENE	Side Cutting	2 (*)	0.05	SFM (VC)	108 (87-130)						
					RPM	1751	1313	1050	875	657	525	420
					FZ	.0013	.0022	.0028	.0032	.0038	.0044	.0045
					FEED	13.65	17.06	17.37	16.96	15.04	13.90	11.41

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

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 12mm
* Finish cuts typically require reduced cutting feeds and speeds; also, it is recommended the radial width of cut (AE) should not exceed 2% x D1
* If product's length of cut (L.O.C.) is below 2D, it must be applied L.O.C. x 90%