# TOOLS FOR Die/Mold & Hardened Materials

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### Die/Mold

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### Featured Tools: TM/MTM Series – High Feed Mill







- High Speed Geometry
  This Tool Works Great in High Speed Tool
- in High Speed Tool Paths and in Tight Areas



Best Tool for 3-D Cutting



### DM/MDM Series – 3-D Cutting of Cavities









### HM/MHM Series – Straight Walls, Flat Floors, Open Areas





## **Die/Mold & Hardened Materials Tools**



79

Die/Mold

# **DM** Die/Mold End Mills

2 2 Flute 30° 30° Helix Ball End **Characteristics** 3-D <u>vv</u> vvv Dry Cold Air Semi-Finishing Finishing Roughing High Performance Ramping Applications Conventional <sup>≤</sup>40 64 Materials Hardr Altin Coatings Aluminum Titan. Nitride Overall Length Overall Length Cutter Blend Angle Ť Style A Style C Shank Diameter ↓ Shank Diameter Flute Length Overall Length **DM Tolerances** Blend Angle Cutte Draft Angle Cutting Dia.  $(1/32"-3/16") = \pm .0003"$ Shank Diamete † Style **B** (1/4"-1/2") = -.0007/-.0013"4

✓ Flute Length ►

Shank Dia. = -.0001/-.0002"

Flute Length (1/32"-1/2") = +.000/+.020" $0AL = \pm .060"$ 

#### **MDM Tolerances**

Cutting Dia. $(0.5-5.0) = \pm .008$  mm (6.0-12.0) = -.018/-.033 mm Shank Dia. = -.002/-.005 mm Flute Length (0.5–12.0) = +.000/+.500 mm  $OAL = \pm 1.000 \, \text{mm}$ 





D	М	2 Flute	Grade	<b>Rall Fnd</b>	Fytended	l enath
		<u> </u>	uluuu	Dull Lilu	LALUIIUUU	LUIIUII

			- ing in					AIT
Cutting Diameter	Shank Diameter	Flute Length	Reach Length	Draft Angle	Blend Angle	Tool Style	Overall Length	Tool Number AlTiN Coated
1/32"	1/4"	1/32"	_	_	8°	А	2-1/2"	DM-201-01
1/32"	1/4"	1/32"	1/8"	3°	18°	В	2-1/2"	DM-202-01
1/32"	1/4"	1/32"	3/16"	1.5°	16.5°	В	2-1/2"	DM-203-01
1/32"	1/4"	1/32"	3/8"	1.5°	16.5°	В	2-1/2"	DM-204-01
1/32"	1/4"	1/32"	9/16"	1.5°	16.5°	В	2-1/2"	DM-205-01
1/16"	1/4"	1/16"	-	-	8°	А	2-1/2"	DM-201-02
1/16"	1/4"	1/16"	3/16"	3°	18°	В	2-1/2"	DM-202-02
1/16"	1/4"	1/16"	3/8"	1.5°	16.5°	В	2-1/2"	DM-203-02
1/16"	1/4"	1/16"	3/4"	1.5°	16.5°	В	2-1/2"	DM-204-02
1/16"	1/4"	1/16"	1-1/8"	1.5°	16.5°	В	2-1/2"	DM-205-02
3/32"	1/4"	3/32"	_	_	8°	А	2-1/2"	DM-201-03
3/32"	1/4"	3/32"	1/4"	3°	18°	В	2-1/2"	DM-202-03
3/32"	1/4"	3/32"	1/2"	1.5°	16.5°	В	2-1/2"	DM-203-03
3/32"	1/4"	3/32"	15/16"	1.5°	16.5°	В	2-1/2"	DM-204-03
3/32"	1/4"	3/32"	1-5/16"	1.5°	16.5°	В	2-1/2"	DM-205-03
1/8"	1/4"	1/8"	_	_	8°	А	3"	DM-201-04
1/8"	1/4"	1/8"	5/16"	3°	18°	В	3"	DM-202-04
1/8"	1/4"	1/8"	5/8"	1.5°	16.5°	В	3"	DM-203-04
1/8"	1/4"	1/8"	1"	1°	16°	В	3"	DM-204-04
1/8"	1/4"	1/8"	1-1/2"	1°	16°	В	3"	DM-205-04

Flute

Reach Length

# Die/Mold End Mills **DM/MDM**

Altin

DM 2 Flut	e Grade Ball En	d Extended Le	ength —continued	FROM PREVIOUS				
Cutting Diameter	Shank Diameter	Flute Length	Reach Length	Draft Angle	Blend Angle	Tool Style	Overall Length	Tool Number AlTiN Coated
3/16"	1/4"	3/16"	_	_	8°	А	3"	DM-201-06
3/16"	1/4"	3/16"	3/8"	2°	17°	В	3"	DM-202-06
3/16"	1/4"	3/16"	3/4"	1.5°	16.5°	В	3"	DM-203-06
3/16"	1/4"	3/16"	1-1/8"	1°	16°	В	3"	DM-204-06
3/16"	1/4"	3/16"	1-9/16"	1°	16°	В	3"	DM-205-06
1/4"	1/4"	1/4"	—	-	_	С	3"	DM-201-08
5/16"	5/16"	5/16"	—	-	—	С	3-1/8"	DM-201-10
3/8"	3/8"	3/8"	—	-	-	С	3-1/2"	DM-201-12
7/16"	7/16"	7/16"	_	_	-	С	3-3/4"	DM-201-14
1/2"	1/2"	1/2"	_	-	_	С	4"	DM-201-16



### MDM 2 Flute Tuffy Ball End Extended Length (METRIC)

Cutting Diameter	Shank Diameter	Flute Length	Reach Length	Draft Angle	Blend Angle	Tool Style	Overall Length	Tool Number AlTiN Coated
0.5mm	6mm	0.5mm	_	_	8°	Α	63mm	MDM-201-0.5
0.5mm	6 m m	0.5mm	1.mm	3°	18°	В	63mm	MDM-203-0.5
0.5mm	6mm	0.5mm	3mm	1.5°	16.5°	В	63mm	MDM-204-0.5
0.5mm	6mm	0.5mm	5mm	1.5°	16.5°	В	63mm	MDM-205-0.5
0.5mm	6mm	0.5mm	10mm	1.5°	16.5°	В	63mm	MDM-206-0.5
0.8mm	6mm	0.8mm	_	_	8°	Α	63mm	MDM-201-0.8
0.8mm	6mm	0.8mm	3mm	3°	18°	В	63mm	MDM-203-0.8
0.8mm	6 m m	0.8mm	5mm	1.5°	16.5°	В	63mm	MDM-204-0.8
0.8mm	6 m m	0.8mm	10mm	1.5°	16.5°	В	63mm	MDM-205-0.8
0.8mm	6mm	0.8mm	15mm	1.5°	16.5°	В	63mm	MDM-206-0.8
1 m m	6 m m	1 mm	_	_	8°	Α	63mm	MDM-201-01
1 mm	6 m m	1 mm	3mm	3°	18°	В	63mm	MDM-203-01
1 m m	6 m m	1 mm	5mm	1.5°	16.5°	В	63mm	MDM-204-01
1 mm	6 m m	1 mm	10mm	1.5°	16.5°	В	63mm	MDM-205-01
1 m m	6mm	1 mm	20mm	1.5°	16.5°	В	63mm	MDM-206-01
1.5mm	6 m m	1.5mm	_	-	8°	А	63mm	MDM-201-01.5
1.5mm	6 m m	1.5mm	5mm	3°	18°	В	63mm	MDM-203-01.5
1.5mm	6 m m	1.5mm	10mm	1.5°	16.5°	В	63mm	MDM-204-01.5
1.5mm	6 m m	1.5mm	20mm	1.5°	16.5°	В	63mm	MDM-205-01.5
1.5mm	6 m m	1.5mm	30mm	1.5°	16.5°	В	63mm	MDM-206-01.5
2.mm	6 m m	2 mm	_	_	8°	Α	63mm	MDM-201-02
2 m m	6 m m	2 mm	5mm	3°	18°	В	63mm	MDM-203-02
2.mm	6 m m	2 mm	10mm	1.5°	16.5°	В	63mm	MDM-204-02
2 m m	6 m m	2.mm	20mm	1.5°	16.5°	В	63mm	MDM-205-02
2.mm	6mm	2 mm	30mm	1.5°	16.5°	В	63mm	MDM-206-02
3 mm	6 m m	3 m m	-	-	8°	А	75mm	MDM-201-03
3 mm	6 m m	3 mm	5mm	3°	18°	В	75mm	MDM-203-03
3 m m	6 m m	3 m m	15mm	1.5°	16.5°	В	75mm	MDM-204-03
3 m m	6 m m	3 mm	30mm	1°	16°	В	75mm	MDM-205-03
3 m m	6mm	3 mm	45mm	1°	16°	В	75mm	MDM-206-03
4mm	6 m m	4 mm	_	-	8°	Α	75mm	MDM-201-04
4 m m	6 m m	4mm	10mm	2°	17°	В	75mm	MDM-203-04
4mm	6 m m	4 mm	15mm	1.5°	16.5°	В	75mm	MDM-204-04
4mm	6mm	4mm	20mm	1°	16°	В	75mm	MDM-205-04
5mm	6mm	5mm	-	-	8°	В	75mm	MDM-201-05
5mm	6mm	5mm	10mm	2°	17°	В	75mm	MDM-203-05
	<u>6</u> mm	5mm	25mm	1°	16°	В	75mm	MDM-204-05
6mm	6 m m	6 m m	_	-	-	С	75mm	MDM-201-06
8mm	8mm	8.mm	_	_	_	С	80mm	MDM-201-08
10mm	10mm	10mm	-	-	-	С	82mm	MDM-201-10
12.mm	12.mm	12.mm	_	_	_	C.	100mm	MDM-201-12



### DM SERIES SPEEDS & FEEDS (Chipload per Tooth)

Tool Number	Cutter Diameter ·	Steels 30–40 HRc		Ste 40–5	eels 0 HRc	Steels 50–60 HRc	
Mulliber		ROUGHING	FINISHING	ROUGHING	FINISHING	ROUGHING	FINISHING
DM-201-01	1/32"	0.0006-0.0008	0.0005-0.0006	0.0005-0.0006	0.0004-0.0005	0.0004-0.0005	0.0003-0.0004
DM-201-02	1/16"	0.0013-0.0015	0.0010-0.0013	0.0010-0.0013	0.0008-0.0010	0.0008-0.0010	0.0005-0.0008
DM-201-03	3/32"	0.0019-0.0023	0.0015-0.0019	0.0015-0.0019	0.0011-0.0015	0.0011-0.0015	0.0008-0.0011
DM-201-04	1/8"	0.0025-0.0030	0.0020-0.0025	0.0020-0.0025	0.0015-0.0020	0.0015-0.0020	0.0010-0.0015
DM-201-06	3/16"	0.0038-0.0045	0.0030-0.0038	0.0030-0.0038	0.0023-0.0030	0.0023-0.0030	0.0015-0.0023
DM-201-08	1/4"	0.0050-0.0060	0.0040-0.0050	0.0040-0.0050	0.0030-0.0040	0.0030-0.0040	0.0020-0.0030
DM-201-10	5/16"	0.0063-0.0075	0.0050-0.0063	0.0050-0.0063	0.0038-0.0050	0.0038-0.0050	0.0025-0.0038
DM-201-12	3/8"	0.0075-0.0090	0.0060-0.0075	0.0060-0.0075	0.0045-0.0060	0.0045-0.0060	0.0030-0.0045
DM-201-14	7/16"	0.0088-0.0105	0.0070-0.0088	0.0070-0.0088	0.0053-0.0070	0.0053-0.0070	0.0035-0.0053
DM-201-16	1/2"	0.0100-0.0120	0.0080-0.0100	0.0080-0.0100	0.0060-0.0080	0.0060-0.0080	0.0040-0.0060

### DM SERIES SPEEDS & FEEDS (Roughing & Semi-Finishing)

Tool	Cutter	Rotations Per Minute (RPM)						
Number	Diameter	STEELS 30–40HRc	STEELS 40–50HRc	STEELS 50–60HRc				
DM-201-01	1/32"	20,000-40,000	20,000-40,000	20,000-40,000				
DM-201-02	1/16"	20,000-40,000	20,000-40,000	20,000-36,000				
DM-201-03	3/32"	20,000-32,000	20,000-32,000	16,000-24,000				
DM-201-04	1/8"	15,000-24,000	18,000-24,000	12,000-18,000				
DM-201-06	3/16"	10,000-16,000	12,000-16,000	8,100-12,000				
DM-201-08	1/4"	7,600–12,000	9,100-12,000	6,100-9,100				
DM-201-10	5/16"	6,000-9,700	7,300-9,700	4,800-7,300				
DM-201-12	3/8"	5,000-8,100	6,100-8,100	4,000-6,100				
DM-201-14	7/16"	4,300-6,900	5,200-6,900	3,400-5,200				
DM-201-16	1/2"	3.800-6.100	4.500-6.100	3.000-4.500				

#### **DM Series Guidelines**

- Special diameters and lengths are available on a make-to-order basis.
- Air or mist coolant on materials greater than 40 HRc.

#### Radial Step Over



 
 Roughing or Semi-Finishing
 Radial Step Over for finishing depends on finish requirements.

 25%-40% of tool diameter
 -40%

#### Axial Depth



**30–40 HRc** Axial depth = 10% of tool diameter **40–50 HRc** Axial depth = 5% of tool diameter **50–60 HRc** Axial depth = 4% of tool diameter

### DM SERIES SPEEDS & FEEDS (Finishing)

Tool	Cutter	Rotations Per Minute (RPM)						
NUMDER	Diameter	STEELS 30–40HRc	STEELS 40–50HRc	STEELS 50–60HRc				
DM-201-01	1/32"	20,000-40,000	20,000-40,000	20,000-40,000				
DM-201-02	1/16"	20,000-40,000	20,000-40,000	20,000–36,000				
DM-201-03	3/32"	20,000-32,000	20,000-32,000	16,000-24,000				
DM-201-04	1/8"	15,000-24,000	18,000-24,000	12,000-18,000				
DM-201-06	3/16"	10,000-16,000	12,000-16,000	8,100-12,000				
DM-201-08	1/4"	7,600-12,000	9,100-12,000	6,100-9,100				
DM-201-10	5/16"	6,000-9,700	7,300-9,700	4,800-7,300				
DM-201-12	3/8"	5,000-8,100	6,100-8,100	4,000-6,100				
DM-201-14	7/16"	4,300-6,900	5,200-6,900	3,400-5,200				
DM-201-16	1/2"	3,800-6,100	4,500-6,100	3,000-4,500				

# Solid Carbide Toroid Style End Mills TM/MTM

			<b>30°</b>					
Char	acteristics Corner Radius	2 2 Flute	30° Helix				Best	
Aj	oplications Side Milling	Helical Interpolation	Conventional Ramping	High Performance	Semi- Finishing	Ing Dry Cold Air Spray Mist	Tool for Helical Bol	res
	Materials <sup>40</sup> HRc Hardness	SO HRC Hardness	Sector Contraction				Corners	
	Coatings Auminum Titan. Nitride						• •	
∱ Shank Diameter	Style A		- Overall Length	Blend Angle	Flute Length	t Shank Diameter ↓ Style C	h → Cutter Diameter	-
↑ Shank Diameter	<		- Overall Length Blend /	ngle Draft Angle	Cutter Diameter Flute Length	$\label{eq:thm:total_transform} \begin{array}{llllllllllllllllllllllllllllllllllll$	MTM Tolerances Cutting Dia. $=025/050$ mm Shank Dia. $=002/005$ mm Flute Length $= +0.50/+1.50$ mm OAL $= \pm 1.000$ mm	13
R				← Reach Length -		NEW Sizes Now Available	A	



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	Cutting Diameter	Shank Diameter	Flute Length	Reach Length	Draft Angle	Blend Angle	Corner Radius	Tool Style	Overall Length	Tool Number AlTiN Coated
	1/32"	1/4"	1/32"	_	_	8°	.008"	Α	2-1/2"	TM-201-01
	1/32"	1/4"	1/32"	1/8"	3°	18°	.008"	В	2-1/2"	TM-202-01
	1/32"	1/4"	1/32"	3/16"	1.5°	16.5°	.008"	В	2-1/2"	TM-203-01
	1/32"	1/4"	1/32"	3/8"	1.5°	16.5°	.008"	В	2-1/2"	TM-204-01
	1/32"	1/4"	1/32"	9/16"	1.5°	16.5°	.008"	В	2-1/2"	TM-205-01
	1/16"	1/4"	1/16"	_	_	8°	.012"	А	2-1/2"	TM-201-02
	1/16"	1/4"	1/16"	3/16"	3°	18°	.012"	В	2-1/2"	TM-202-02
	1/16"	1/4"	1/16"	3/8"	1.5°	16.5°	.012"	В	2-1/2"	TM-203-02
	1/16"	1/4"	1/16"	3/4"	1.5°	16.5°	.012"	В	2-1/2"	TM-204-02
	1/16"	1/4"	1/16"	1-1/8"	1.5°	16.5°	.012"	В	2-1/2"	TM-205-02
	3/32"	1/4"	3/32"	_	_	8°	.020"	А	2-1/2"	TM-201-03
	3/32"	1/4"	3/32"	1/4"	3°	18°	.020"	В	2-1/2"	TM-202-03
	3/32"	1/4"	3/32"	1/2"	1.5°	16.5°	.020"	В	2-1/2"	TM-203-03
	3/32"	1/4"	3/32"	15/16"	1.5°	16.5°	.020"	В	2-1/2"	TM-204-03
L	3/32"	1/4"	3/32"	1-5/16"	1.5°	16.5°	.020"	В	2-1/2"	TM-205-03
	1/8"	1/4"	1/8"	_	_	8°	.020"	А	3"	TM-201-04
	1/8"	1/4"	1/8"	5/16"	3°	18°	.020"	В	3"	TM-202-04
	1/8"	1/4"	1/8"	5/8"	1.5°	16.5°	.020"	В	3"	TM-203-04
	1/8"	1/4"	1/8"	1"	1°	16°	.020"	В	3"	TM-204-04
	1/8"	1/4"	1/8"	1-1/2"	1°	16°	.020"	В	3"	TM-205-04
L	3/16"	1/4"	3/16"	-	-	8°	.040"	Α	3"	TM-201-06
	3/16"	1/4"	3/16"	3/8"	2°	17°	.040"	В	3"	TM-202-06
L	3/16"	1/4"	3/16"	3/4"	1.5°	16.5°	.040"	В	3"	TM-203-06
	3/16"	1/4"	3/16"	1-1/8"	1°	16°	.040"	В	3"	TM-204-06
L	3/16"	1/4"	3/16"	1-9/16"	1°	16°	.040"	В	3"	TM-205-06
	1/4"	1/4"	1/4"	-	_	-	.040"	С	3"	TM-201-08
L	5/16"	5/16"	5/16"	_	_	_	.040"	C	3-1/8"	TM-201-10
	3/8"	3/8"	3/8"	-	-	-	.080"	С	3-1/5"	TM-201-12
L	7/16"	7/16"	7/16"	_	_	_	.080"	С	3-3/4"	TM-201-14
	1/2"	1/2"	1/2"	-	-	-	.120"	С	4"	TM-201-16

Altin

# TM/MTM Solid Carbide Toroid Style End Mills



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### HI MTM Metrics 2 Flute Tuffy Grade Toroid End Mill METRIC

Cutting Diameter	Shank Diameter	Flute Length	Reach Length	Draft Angle	Blend Angle	Corner Radius	Tool Style	Overall Length	Tool Number AlTiN Coated
0.8mm	6mm	0.8mm	_	_	8°	0.2mm	А	63mm	MTM-201-0.8
0.8mm	6mm	0.8mm	3 mm	3°	18°	0.2mm	В	63mm	MTM-202-0.8
0.8mm	6mm	0.8mm	5 m m	1.5°	16.5°	0.2mm	В	63mm	MTM-203-0.8
0.8mm	6mm	0.8mm	10mm	1.5°	16.5°	0.2mm	В	63mm	MTM-204-0.8
0.8mm	6.mm	0.8mm	15mm	1.5°	16.5°	0.2mm	В	63mm	MTM-205-0.8
1 mm	6.mm	1 mm	-	_	8°	0.3mm	А	63mm	MTM-201-01
1 mm	6.mm	1 mm	3 mm	3°	18°	0.3mm	В	63mm	MTM-202-01
1 mm	6 m m	1 mm	5 mm	1.5°	16.5°	0.3mm	В	63mm	MTM-203-01
1 mm	6.mm	1 m m	10mm	1.5°	16.5°	0.3mm	В	63mm	MTM-204-01
1 mm	6 m m	1 mm	20mm	1.5°	16.5°	0.3mm	В	63mm	MTM-205-01
1.5mm	6 m m	1.5mm	_	_	8°	0.5mm	А	63mm	MTM-201-01.5
1.5mm	6 m m	1.5mm	5 mm	3°	18°	0.5mm	В	63mm	MTM-202-01.5
1.5mm	6.mm	1.5mm	10mm	1.5°	16.5°	0.5mm	В	63mm	MTM-203-01.5
1.5mm	6 m m	1.5mm	20mm	1.5°	16.5°	0.5mm	В	63mm	MTM-204-01.5
1.5mm	6.mm	1.5mm	30mm	1.5°	16.5°	0.5mm	В	63mm	MTM-205-01.5
2 mm	6 m m	2.mm	-	-	8°	0.5mm	А	63mm	MTM-201-02
2 mm	6 m m	2.mm	5mm	3°	18°	0.5mm	В	63mm	MTM-202-02
2 mm	6 m m	2.mm	10mm	1.5°	16.5°	0.5mm	В	63mm	MTM-203-02
2 mm	6 m m	2.mm	20mm	1.5°	16.5°	0.5mm	В	63mm	MTM-204-02
2 mm	6 m m	2.mm	30mm	1.5°	16.5°	0.5mm	В	63mm	MTM-205-02
3 mm	6 m m	3 mm	_	_	8°	0.5mm	А	75mm	MTM-201-03
3 mm	6 m m	3 mm	5 mm	3°	18°	0.5mm	В	75mm	MTM-202-03
3 mm	6 m m	3 m m	15mm	1.5°	16.5°	0.5mm	В	75mm	MTM-203-03
3 mm	6 m m	3mm	30mm	1°	16°	0.5mm	В	75mm	MTM-204-03
3 mm	6.mm	3mm	45mm	1°	16°	0.5mm	В	75mm	MTM-205-03
4 <sub>mm</sub>	6 m m	4 <sub>mm</sub>	-	-	8°	0.5mm	А	75mm	MTM-201-04
4 mm	6.mm	4 <sub>mm</sub>	10mm	2°	17°	0.5mm	В	75mm	MTM-202-04
4 <sub>mm</sub>	6 m m	4 <sub>mm</sub>	15mm	1.5°	16.5°	0.5mm	В	75mm	MTM-203-04
4 mm	6.mm	4 <sub>mm</sub>	20mm	1°	16°	0.5mm	В	75mm	MTM-204-04
5mm	6 m m	5mm	-	-	8°	1.mm	А	75mm	MTM-201-05
5mm	6 m m	5mm	10mm	3°	18°	1mm	В	75mm	MTM-202-05
5 mm	6 m m	5mm	25mm	1°	16°	1mm	В	75mm	MTM-203-05
6 mm	6.mm	6.mm	-	-	-	1mm	С	75mm	MTM-201-06
8.mm	8mm	8mm	-	-	-	1mm	С	80mm	MTM-201-08
10mm	10mm	10mm	-	-	-	2mm	С	82mm	MTM-201-10
12mm	12mm	12mm	-	_	-	3mm	С	100mm	MTM-201-12

### TM SERIES SPEEDS & FEEDS (Semi-Finishing & Finishing)

Tool Number	Cutter Diameter	Ste 30–4	eels O HRc	Ste 40–5	els 0 HRc	Steels 50–60 HRc	
Mulliber		ROUGHING	FINISHING	ROUGHING	FINISHING	ROUGHING	FINISHING
TM-201-01	1/32"	34,000–40,000	0.0001-0.00025	26,000-30,000	0.0001-0.0002	16,000-18,000	0.0001-0.0002
TM-201-02	1/16"	34,000–40,000	0.0003-0.0005	25000–30,000	0.0003-0.0005	16,000-18,000	0.0002-0.0004
TM-201-03	3/32"	22,000–26,000	0.0006-0.00075	16,000-19,000	0.0005-0.0007	10,000-12,000	0.0005-0.0006
TM-201-04	1/8"	17,000–20,000	0.0008-0.001	13,000-17,000	0.0007-0.0009	8,000-13,000	0.0006-0.0008
TM-201-06	3/16"	12,000-14,000	0.0011-0.0015	9,000-12,000	0.0001-0.0014	5,300-9,000	0.0009-0.0012
TM-201-08	1/4"	9,000–10400	0.0015-0.002	7,000–9,000	0.0014-0.0018	4,000-6,600	0.0012-0.0016
TM-201-10	5/16"	7,200-8,300	0.0019-0.0025	5,500-7,200	0.0017-0.0023	3,200-5,400	0.0015-0.0020
TM-201-12	3/8"	6,000–6,900	0.0020-0.003	4,600-6,000	0.0018-0.0027	2,700-4,500	0.0016-0.0024
TM-201-14	7/16"	5,200-6,000	0.0023-0.0035	4,000-5,200	0.0021-0.0032	2,300-3,900	0.0019-0.0028
TM-201-16	1/2"	4,500-5,200	0.0025-0.004	3,500-4,500	0.0023-0.0036	2,100-3,500	0.0020-0.0032

(Use maximum RPM if suggested RPM is higher than the machine's capabilities)

#### **TM Series Guidelines**

- Speeds and feeds are only general starting points and may vary depending on specific applications.
- Use Climb Milling for better finish and longer tool life.
- Air or mist coolant on materials greater than 40 HRc.

• Good machines, tool holders, and

extending tool life.

programming methods all help in

bores or tight corners. For large open areas use HM/MHM Series.



### Additional Notes

 Special diameters, lengths, and corner radii are available on a make-to-order basis.
 Special draft angles

 Special draft angles (blend angle) or necked shanks for part clearance are available upon request and usually ship within the next business day.

Facing/I	Floor Finis	25% of Diamote	
	<b>-</b>	*	(Radial Width)
			_ <b>2% of Diameter</b> (Axial Depth)

**Die/Mold** 

# Die/Mold End Mills **HM/MHM**

Altin

AltiN





Shank Diamete



Flute Length

### **HM** Multi-Flute Tuffy Grade

	•						
Cutting Diameter	Shank Diameter	Number of Flutes	Flute Length	Corner Radius	Tool Style	Overall Length	Tool Number AlTiN Coated
1/8"	1/4"	4	3/8"	0.015"	А	3"	HM-402-04
3/16"	1/4"	4	9/16"	0.02"	А	3"	HM-402-06
1/4"	1/4"	6	5/8"	0.02"	С	3-1/2"	HM-602-08
5/16"	5/16"	6	3/4"	0.03"	С	4"	HM-602-10
3/8"	3/8"	6	1"	0.03"	С	4"	HM-602-12
7/16"	7/16"	6	1-1/8"	0.04"	С	4"	HM-602-14
1/2"	1/2"	6	1-1/4"	0.04"	С	4"	HM-602-16
5/8"	5/8"	6	1-5/8"	0.04"	С	6"	HM-602-20
3/4"	3/4"	8	1-3/4"	0.06"	С	6"	HM-802-24
1"	1"	10	2"	0.06"	С	6"	HM-102-32



### MHM Metric Multi-Flute Tuffy Grade METRIC



# **HM** Die/Mold End Mills

### HM SERIES SPEEDS & FEEDS (Semi-Finishing & Finishing)

Tool Number	Cutter Diameter	Steels 30–40 HRc		Steels 40–50 HRc		Steels 50–60 HRc	
Number	Branieter	RPM	CLPT	RPM	CLPT	RPM	CLPT
HM-402-04	1/8"	17,000–20,000	0.0008-0.001	13,000-17,000	0.0007-0.0009	8,000-13,000	0.0006-0.0008
HM-402-06	3/16"	12,000-14,000	0.0011-0.0015	9,000–12,000	0.0010-0.0014	5,300-9,000	0.0009-0.0012
HM-602-08	1/4"	9,000-10,400	0.0015-0.002	7,000–9,000	0.0014-0.0018	4,000-6,600	0.0012-0.0016
HM-602-10	5/16"	7,200–8,300	0.0019-0.0025	5,500-7,200	0.0017-0.0023	3,200-5,400	0.0015-0.0020
HM-602-12	3/8"	6,000-6,900	0.0020-0.003	4,600-6,000	0.0018-0.0027	2,700-4,500	0.0016-0.0024
HM-602-14	7/16"	5,200–6,000	0.0023-0.0035	4,000–5,200	0.0021-0.0032	2,300-3,900	0.0019-0.0028
HM-602-16	1/2"	4,500-5,200	0.0025-0.004	3,500-4,500	0.0023-0.0036	2,100-3,500	0.0020-0.0032
HM-602-20	5/8"	3,600-4,150	0.0026-0.0042	2,800–3,600	0.0023-0.0038	1,600-2,750	0.0021-0.0034
HM-802-24	3/4"	3,000-3,500	0.0028-0.005	2,300-3,000	0.0025-0.0045	1,350-2,250	0.0023-0.0041
HM-102-32	1"	2,200-2,600	0.0030-0.006	1,700-2,200	0.0027-0.0054	1,000-1,700	0.0024-0.0049

#### **HM Series Guidelines**

- Speeds and feeds are only general starting points and may vary depending on specific applications.
- Use Climb Milling for better finish and longer tool life.
- Air or mist coolant on materials greater than 40 HRc.
- Good machines, tool holders, and programming methods all help in extending tool life.
- The best way to engage into the material is by helical interpolation or entering from off the part.
- Use for open areas of floors or walls. For tight areas like helical bores or tight corners use TM/MTM Series.

#### **Additional Notes**

- Special draft angles (blend angle) or necked shanks for part clearance are available upon request.
- Special diameters, lengths, and corner radii are available on a make-to-order basis.

Profiling	→  ←	— 30—40 HRc	Profiling Radial Width = 5% of Diameter
	•	<sup>–</sup> 40–50 HRc	Profiling Radial Width = 5% of Diameter
		50–60 HRc	Profiling Radial Width = $2\%$ of Diameter
		_ 1 × Diamete (Axial Depth	; <b>r</b> )

### Facing/Floor Finishing 25% of Diameter



### **Die/Mold Tools in Other Sections**

ET

Engraving Tools (See Multiple Applications) 118