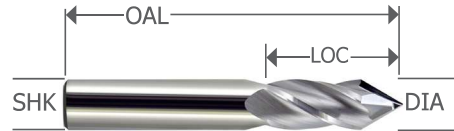
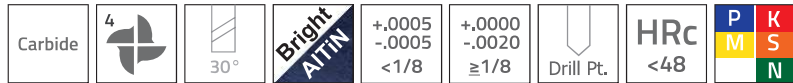


SPECIAL USE CARBIDE END MILLS

4 FLUTE • 60°, 82°, 90° DRILL POINT END MILLS



SERIES: CCMG-__-DP60

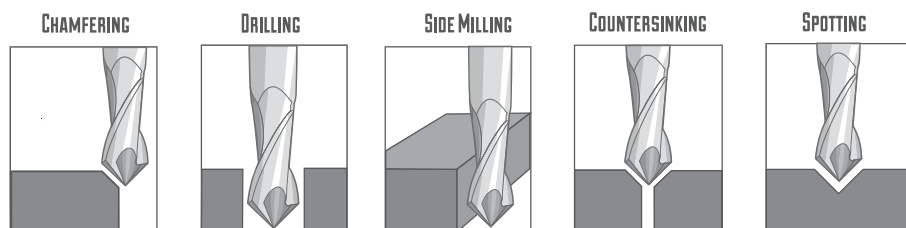
DIA	SHK	LOC	OAL	ANGLE	LENGTH	TOOL	BRIGHT EDP	ALTiN EDP
1/16	1/8	3/16	1-1/2	60°	std	CCMG-402-DP60	19764	59764
3/32	1/8	3/8	1-1/2	60°	std	CCMG-403-DP60	19765	59765
1/8	1/8	1/2	1-1/2	60°	std	CCMG-404-DP60	19766	59766
3/16	3/16	5/8	2	60°	std	CCMG-606-DP60	19767	59767
1/4	1/4	3/4	2-1/2	60°	std	CCMG-808-DP60	19768	59768
5/16	5/16	13/16	2-1/2	60°	std	CCMG-1010-DP60	19769	59769
3/8	3/8	1	2-1/2	60°	std	CCMG-1212-DP60	19770	59770
7/16	7/16	1	2-3/4	60°	std	CCMG-1414-DP60	19771	59771
1/2	1/2	1	3	60°	std	CCMG-1616-DP60	19772	59772
5/8	5/8	1-1/4	3-1/2	60°	std	CCMG-2020-DP60	19773	59773
3/4	3/4	1-1/2	4	60°	std	CCMG-2424-DP60	19774	59774

SERIES: CCMG-__-DP82

DIA	SHK	LOC	OAL	ANGLE	LENGTH	TOOL	BRIGHT EDP	ALTiN EDP
1/16	1/8	3/16	1-1/2	82°	std	CCMG-402-DP82	19775	59775
3/32	1/8	3/8	1-1/2	82°	std	CCMG-403-DP82	19776	59776
1/8	1/8	1/2	1-1/2	82°	std	CCMG-404-DP82	19777	59777
3/16	3/16	5/8	2	82°	std	CCMG-606-DP82	19778	59778
1/4	1/4	3/4	2-1/2	82°	std	CCMG-808-DP82	19779	59779
5/16	5/16	13/16	2-1/2	82°	std	CCMG-1010-DP82	19780	59780
3/8	3/8	1	2-1/2	82°	std	CCMG-1212-DP82	19781	59781
1/2	1/2	1	3	82°	std	CCMG-1616-DP82	19783	59783
5/8	5/8	1-1/4	3-1/2	82°	std	CCMG-2020-DP82	19784	59784
3/4	3/4	1-1/2	4	82°	std	CCMG-2424-DP82	19785	59785

SERIES: CCMG-__-DP

DIA	SHK	LOC	OAL	ANGLE	LENGTH	TOOL	BRIGHT EDP	ALTiN EDP
1/16	1/8	3/16	1-1/2	90°	std	CCMG-402-DP	11629	51629
3/32	1/8	3/8	1-1/2	90°	std	CCMG-403-DP	11631	51631
1/8	1/8	1/2	1-1/2	90°	std	CCMG-404-DP	11633	51633
3/16	3/16	5/8	2	90°	std	CCMG-606-DP	11635	51635
1/4	1/4	3/4	2-1/2	90°	std	CCMG-808-DP	11637	51637
5/16	5/16	13/16	2-1/2	90°	std	CCMG-1010-DP	11639	51639
3/8	3/8	1	2-1/2	90°	std	CCMG-1212-DP	11640	51640
7/16	7/16	1	2-3/4	90°	std	CCMG-1414-DP	11641	51641
1/2	1/2	1	3	90°	std	CCMG-1616-DP	11642	51642
5/8	5/8	1-1/4	3-1/2	90°	std	CCMG-2020-DP	11643	51643
3/4	3/4	1-1/2	4	90°	std	CCMG-2424-DP	11644	51644



General Purpose Carbide End Mills

SERIES: General Purpose Carbide End Mills

MATERIAL		CONDITIONS		CUTTING DIAMETER							
				1/8"	1/4"	5/16"	3/8"	1/2"	5/8"	3/4"	1"
		Under 32 HRc	Over 32 HRc	CHIP PER TOOTH							
STAINLESS STEELS		ISO-M									
Precipitation 13-8, 15-5, 17-4PH	Slotting .5 x Dia.	110-200	80-115	0.0005	0.0010	0.0012	0.0014	0.0020	0.0025	0.0030	0.0040
	Profiling ≤ .5 x Dia.	110-200	80-115	0.0006	0.0012	0.0015	0.0018	0.0025	0.0031	0.0038	0.0050
Austenitic 302, 303, 304L, 316L	Slotting .5 x Dia.	150-275	80-180	0.0005	0.0011	0.0014	0.0016	0.0023	0.0029	0.0035	0.0046
	Profiling ≤ .5 x Dia.	150-275	80-180	0.0007	0.0014	0.0018	0.0021	0.0030	0.0038	0.0045	0.0060
Martensitic 403, 410, 416	Slotting .5 x Dia.	200-400	80-160	0.0005	0.0011	0.0014	0.0016	0.0023	0.0029	0.0035	0.0046
	Profiling ≤ .5 x Dia.	200-400	80-160	0.0007	0.0014	0.0018	0.0021	0.0030	0.0038	0.0045	0.0060
HIGH TEMP ALLOYS		ISO-S									
Cobalt Base Stellite, Haynes 25, 188, X-40, L-605	Slotting .5 x Dia.	60-125	60-125	0.0004	0.0007	0.0009	0.0011	0.0015	0.0019	0.0023	0.0030
	Profiling ≤ .5 x Dia.	60-125	60-125	0.0005	0.0010	0.0012	0.0014	0.0020	0.0025	0.0030	0.0040
Nickel Base Inconel 600, 625, 718, Nickel 200, 270, Invar, Monel 400, 405, K-Monel, PermaNickel 300, Incoly 600	Slotting .5 x Dia.	60-125	60-125	0.0004	0.0007	0.0009	0.0011	0.0015	0.0019	0.0023	0.0030
	Profiling ≤ .5 x Dia.	60-125	60-125	0.0005	0.0010	0.0012	0.0014	0.0020	0.0025	0.0030	0.0040
Iron Base Incoloy 800-802, Multimet N-155, Timken 16-26-6	Slotting .5 x Dia.	60-125	60-125	0.0004	0.0007	0.0009	0.0011	0.0015	0.0019	0.0023	0.0030
	Profiling ≤ .5 x Dia.	60-125	60-125	0.0005	0.0010	0.0012	0.0014	0.0020	0.0025	0.0030	0.0040
STEELS		ISO-P									
High Strength Steels 4140, 4340, 52100	Slotting .5 x Dia.	150-300	80-180	0.0005	0.0010	0.0012	0.0014	0.0020	0.0025	0.0030	0.004
	Profiling ≤ .5 x Dia.	150-300	80-180	0.0006	0.0010	0.0012	0.0018	0.0025	0.0031	0.0038	0.005
High Alloy Steels - Mold & Die A-2, P20, 01, 02, D2, H-13	Slotting .5 x Dia.	150-275	80-185	0.0005	0.0010	0.0012	0.0014	0.0020	0.0025	0.0030	0.004
	Profiling ≤ .5 x Dia.	150-275	80-185	0.0006	0.0010	0.0012	0.0018	0.0025	0.0031	0.0038	0.005
Medium Alloy Steels 200, 250, 300	Slotting .5 x Dia.	175-350	100-225	0.0005	0.0010	0.0012	0.0014	0.0020	0.0025	0.0030	0.004
	Profiling ≤ .5 x Dia.	175-350	100-225	0.0006	0.0010	0.0012	0.0018	0.0025	0.0031	0.0038	0.005
Low Alloy Steels-Maraging 10XX, 11XX, 13XX	Slotting .5 x Dia.	200-450	100-250	0.0006	0.0012	0.0015	0.0018	0.0025	0.0031	0.0038	0.005
	Profiling ≤ .5 x Dia.	200-450	100-250	0.0007	0.0014	0.0018	0.0021	0.0030	0.0038	0.0045	0.006
CAST IRONS		ISO-K									
Ductile Iron Ductile Cast Iron	Slotting .5 x Dia.	120-325	80-140	0.0005	0.0010	0.0012	0.0014	0.0020	0.0025	0.0030	0.0040
	Profiling ≤ .5 x Dia.	120-325	80-140	0.0006	0.0012	0.0015	0.0018	0.0025	0.0031	0.0038	0.0050
Cast Iron Grey Cast Iron	Slotting .5 x Dia.	250-425	125-285	0.0005	0.0010	0.0012	0.0014	0.0020	0.0025	0.0030	0.0040
	Profiling ≤ .5 x Dia.	250-425	125-285	0.0006	0.0012	0.0015	0.0018	0.0025	0.0031	0.0038	0.0050
TITANIUMS		ISO-S									
Titanium Alloys 6AL-4V, ASTM 1, 2, 3, 6AL-2S For 5553, decrease SFM and IPM by 25%	Slotting .5 x Dia.	140-200	90-145	0.0005	0.0010	0.0012	0.0014	0.0020	0.0025	0.0030	0.0040
	Profiling ≤ .5 x Dia.	140-200	90-145	0.0006	0.0012	0.0015	0.0018	0.0025	0.0031	0.0038	0.0050
ALUMINUM		ISO-N									
Aluminum Alloys 6061-T6, 7075	Slotting .5 x Dia.	600-1000	NA	0.0006	0.0012	0.0015	0.0018	0.003	0.005	0.006	0.0080
	Profiling ≤ .5 x Dia.	600-1000	NA	0.0007	0.0014	0.0018	0.0025	0.0035	0.006	0.0068	0.0100

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

SPEED & FEED INFORMATION

Calculations

End mill speed & feed formulas are the various individual equations that determine the proper overall machining setup or more specifically the speed of the cutting tool and the rate which it is fed into the work piece. Each individual formula is distinct in what it determines but coordinates with the others to ensure successful cutting tool application. You can visit the **TECHNICAL** section on www.melintool.com for more information.

INCH

$$\text{RPM} = \frac{\text{Revolutions Per Minute}}{3.82 \times \text{SFM} / \text{Tool Dia}}$$

$$\text{SFM} = \frac{\text{Surface Foot Per Minute}}{.262 \times \text{RPM} \times \text{Tool Dia}}$$

$$\text{CPT or IPT} = \frac{\text{Chip-Load Per Tooth}}{\text{IPM} / \text{RPM} / \text{No. Of Flutes}}$$

$$\text{IPM} = \frac{\text{Inches Per Minute}}{\text{CPT} \times \text{RPM} \times \text{No. Of Flutes}}$$

$$\text{MRRCI} = \frac{\text{Metal Removal Rate Cubic Inches}}{\text{IPM} \times \text{Axial Doc} \times \text{Radial Woc}}$$

$$\text{IPR} = \frac{\text{Inches Per Revolution}}{\text{IPM} / \text{RPM}}$$

METRIC

$$\text{RPM} = \frac{\text{Revolutions Per Minute}}{1000 \times \text{M/MIN} / (3.14 \times \text{D})}$$

$$\text{M/MIN} = \frac{\text{Meters Per Minute}}{(3.14 \times \text{D} \times \text{RPM}) / 1000}$$

$$\text{Fz OR CPT} = \frac{\text{Chip-Load Per Tooth}}{\text{Feedrate (mm) per MIN} / (\text{Z} \times \text{RPM})}$$

$$\text{VF OR FPM} = \frac{\text{Feedrate (mm) Per Minute}}{\text{Feedrate (mm) per Tooth} \times \text{Z} \times \text{RPM}}$$

$$\begin{aligned} \text{D} &= \text{Cutter Dia.} \\ \text{Z} &= \text{No. Of Teeth.} \end{aligned}$$

EQUIVALENTS & CONVERSIONS:

ABBREVIATIONS

RPM	Revolutions Per Minute
SFM	Surface Feet Per Minute
CPT	Chip Load Per Tooth
IPM	Inches Per Minute
V_f	Millimeters Per Minute
ae	Radial Width of Cut
ap	Axial Depth of Cut
Vc	Surface Meters Per Minute
Fz	Metric Chip Load Per Tooth

$$\text{N, n or Min}^{-1} = \text{RPM}$$

$$\text{Vc or M/MIN} = \text{SFM}$$

$$\text{Fz or mm/TOOTH} = \text{CPT}$$

$$\text{V}_f \text{ or mm/MIN} = \text{IPM}$$

$$\text{SFM} / 3.281 = \text{M/MIN}$$

$$\text{M/MIN} \times 3.281 = \text{SFM}$$

$$\text{mm/MIN} / 25.4 = \text{IPM}$$

$$\text{mm/TOOTH} / 25.4 = \text{CPT}$$



IMPERIAL

METRIC

$$\text{Inch} \times 25.4 = \text{Millimeter}$$

$$\text{Millimeter} \times .03937 = \text{Inch}$$