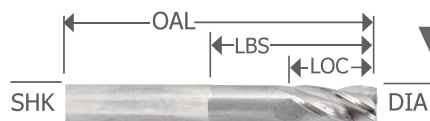


GENERAL PURPOSE CARBIDE END MILL



4 FLUTE • GENERAL PURPOSE END MILLS

Carbide	4	30°	Bright AlTiN	+0.0005 -0.0005 <1/8	+0.0000 -0.0020 ≥1/8	Square				HRC <48	P M	K S	N
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SERIES: CCMG

DIA	SHK	LOC	LBS	OAL	LENGTH	TOOL	BRIGHT EDP	ALTiN EDP
1/64	1/8	3/64		1-1/2	std	CCMG-400-1/2	13386	53386
1/32	1/8	1/16		1-1/2	stub	CCMGS-401	16224	56224
1/32	1/8	3/32		1-1/2	std	CCMG-401	14121	54121
1/32	1/8	9/64		1-1/2	long	CCMG-401-L	19139	59139
1/32	1/8	0.150		2-1/2	long	CCMG-401-LF	12382	52382
3/64	1/8	3/32		1-1/2	stub	CCMGS-401-1/2	16225	56225
3/64	1/8	1/8		1-1/2	std	CCMG-401-1/2	14122	54122
3/64	1/8	3/16		1-1/2	long	CCMG-401-1/2-L	12365	52365
3/64	1/8	1/4		2-1/2	long	CCMG-401-1/2-LF	12385	52385
1/16	1/8	1/8		1-1/2	stub	CCMGS-402	16226	56226
1/16	1/8	3/16		1-1/2	std	CCMG-402	14124	54124
1/16	1/8	1/4		1-1/2	med	CCMG-402-M	11040	51040
1/16	1/8	3/8		1-1/2	long	CCMG-402-L	17860	57860
1/16	1/8	1/2		2-1/2	long	CCMG-402-LF	12388	52388
5/64	1/8	1/8		1-1/2	stub	CCMGS-402-1/2	16595	56595
5/64	1/8	3/16		1-1/2	std	CCMG-402-1/2	14126	54126
5/64	1/8	1/4		1-1/2	med	CCMG-402-1/2-M	11042	51042
5/64	1/8	3/8		1-1/2	med/long	CCMG-402-1/2-ML	19149	59149
5/64	1/8	1/2		1-1/2	long	CCMG-402-1/2-L	19141	59141
5/64	1/8	1/2		2-1/2	long	CCMG-402-1/2-LF	10540	50540
3/32	1/8	3/16		1-1/2	stub	CCMGS-403	16227	56227
3/32	1/8	3/8		1-1/2	std	CCMG-403	14128	54128
3/32	1/8	3/8	3/4	2	ext neck	CCMGN-403	19142	59142
3/32	1/8	1/2		1-1/2	med	CCMG-403-M	19150	59150
3/32	1/8	9/16		3	long	CCMG-403-L	16186	56186
3/32	1/8	0.600		2-1/2	long	CCMG-403-LF	12589	52589
7/64	1/8	7/32		1-1/2	stub	CCMGS-403-1/2	14025	54025
7/64	1/8	3/8		1-1/2	std	CCMG-403-1/2	14130	54130
7/64	1/8	3/4		2	long	CCMG-403-1/2-L	19143	59143
1/8	1/8	1/4		1-1/2	stub	CCMGS-404	16228	56228
1/8	1/8	1/2		1-1/2	std	CCMG-404	14132	54132
1/8	1/8	5/8		2	med	CCMG-404-M	11489	51489
1/8	1/8	5/8	1	2	ext neck	CCMGN-404	16731	56731
1/8	1/8	3/4		2-1/4	med/long	CCMG-404-ML	12745	52745
1/8	1/8	3/4		3	long	CCMG-404-L	16071	56071
1/8	1/8	1		3	xl	CCMG-404-E	16072	56072
9/64	3/16	9/32		2	stub	CCMGS-604-1/2	10965	50965
9/64	3/16	9/16		2	std	CCMG-604-1/2	14134	54134
5/32	3/16	5/16		1-1/2	stub	CCMGS-605	16229	56229
5/32	3/16	9/16		2	std	CCMG-605	14136	54136
5/32	3/16	3/4		3	long	CCMG-605-L	16187	56187
11/64	3/16	9/16		2	std	CCMG-605-1/2	15919	55919
3/16	3/16	3/8		1-1/2	stub	CCMGS-606	16230	56230
3/16	3/16	5/8		2	std	CCMG-606	14138	54138
3/16	3/16	3/4		2-1/2	med/long	CCMG-606-ML	12747	52747
3/16	3/16	3/4		3	long	CCMG-606-L	16073	56073
3/16	3/16	1	1-5/8	3	ext neck	CCMGN-606	16732	56732
3/16	3/16	1	2-5/8	4	ext neck	CCMGN-606-2	16733	56733
3/16	3/16	1		4	no neck	CCMG-606-NN	11922	51922
3/16	3/16	1-1/8		3	xl	CCMG-606-E	16074	56074

sizes continued on next page

GENERAL PURPOSE CARBIDE END MILL

4 FLUTE • GENERAL PURPOSE END MILLS



SERIES: CCMG

DIA	SHK	LOC	LBS	OAL	LENGTH	TOOL	BRIGHT EDP	ALTIN EDP
13/64	1/4	5/8		2-1/2	std	CCMG-806-1/2	15920	55920
7/32	1/4	1/2		2	stub	CCMGS-807	16231	56231
7/32	1/4	5/8		2-1/2	std	CCMG-807	14140	54140
15/64	1/4	3/4		2-1/2	std	CCMG-807-1/2	15921	55921
1/4	1/4	1/2		2	stub	CCMGS-808	16232	56232
1/4	1/4	3/4		2-1/2	std	CCMG-808	14142	54142
1/4	1/4	1	2-1/4	4	ext neck	CCMGN-808	16734	56734
1/4	1/4	1-1/8		3	long	CCMG-808-L	14144	54144
1/4	1/4	1-1/2		4	xl	CCMG-808-E	14146	54146
1/4	1/4	1-1/2	4-1/4	6	ext neck	CCMGN-808-2	16735	56735
1/4	1/4	1-1/2	no neck	6	no neck	CCMG-808-NN	19144	59144
17/64	5/16	3/4		2-1/2	std	CCMG-1008-1/2	15922	55922
9/32	5/16	3/4		2-1/2	std	CCMG-1009	14148	54148
19/64	5/16	13/16		2-1/2	std	CCMG-1009-1/2	15923	55923
5/16	5/16	1/2		2	stub	CCMGS-1010	16233	56233
5/16	5/16	13/16		2-1/2	std	CCMG-1010	14150	54150
5/16	5/16	1	2-5/16	4	ext neck	CCMGN-1010	16736	56736
5/16	5/16	1-1/8		3	long	CCMG-1010-L	16075	56075
5/16	5/16	1-1/2	4-5/16	6	ext neck	CCMGN-1010-2	16737	56737
5/16	5/16	1-5/8		4	xl	CCMG-1010-E	16076	56076
21/64	3/8	7/8		2-1/2	std	CCMG-1210-1/2	16197	56197
11/32	3/8	7/8		2-1/2	std	CCMG-1211	15924	55924
23/64	3/8	7/8		2-1/2	std	CCMG-1211-1/2	16198	56198
3/8	3/8	5/8		2	stub	CCMGS-1212	16234	56234
3/8	3/8	1		2-1/2	std	CCMG-1212	14152	54152
3/8	3/8	1	2-3/8	4	ext neck	CCMGN-1212	16738	56738
3/8	3/8	1-1/8		3	long	CCMG-1212-L	14154	54154
3/8	3/8	1-1/2		6	xl	CCMG-1212-LL	11881	51881
3/8	3/8	1-1/2	4-3/8	6	ext neck	CCMGN-1212-2	16739	56739
3/8	3/8	1-1/2	no neck	6	no neck	CCMG-1212-NN	11940	51940
3/8	3/8	1-3/4		4	xl	CCMG-1212-E	14156	54156
3/8	3/8	2		4	xl	CCMG-1212-EL	19145	59145
3/8	3/8	3		6	xxl	CCMG-1212-EE	17735	57735
25/64	7/16	1		2-3/4	std	CCMG-1412-1/2	16199	56199
13/32	7/16	1		2-3/4	std	CCMG-1413	15925	55925
27/64	7/16	1		2-3/4	std	CCMG-1413-1/2	16200	56200
7/16	7/16	5/8		2-1/2	stub	CCMGS-1414	16235	56235
7/16	7/16	1		2-3/4	std	CCMG-1414	14158	54158
7/16	7/16	1	2-1/4	4	ext neck	CCMGN-1414	16740	56740
7/16	7/16	1-1/2	4-1/4	6	ext neck	CCMGN-1414-2	16741	56741
7/16	7/16	2		4	long	CCMG-1414-L	16077	56077
7/16	7/16	3		6	xl	CCMG-1414-E	16078	56078
29/64	1/2	1		3	std	CCMG-1614-1/2	16201	56201
15/32	1/2	1		3	std	CCMG-1615	15926	55926
31/64	1/2	1		3	std	CCMG-1615-1/2	16202	56202
1/2	1/2	5/8		2-1/2	stub	CCMGS-1616	16236	56236
1/2	1/2	1		3	std	CCMG-1616	14160	54160
1/2	1/2	1	2	4	ext neck	CCMGN-1616	16742	56742
1/2	1/2	1-1/4		3	med	CCMG-1616-M	16466	56466
1/2	1/2	1-1/2		4	med/long	CCMG-1616-ML	19146	59146
1/2	1/2	1-1/2	4	6	ext neck	CCMGN-1616-2	16743	56743
1/2	1/2	1-1/2	no neck	6	no neck	CCMG-1616-NN	11941	51941

sizes continued on next page

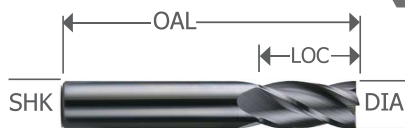
GENERAL PURPOSE CARBIDE END MILL

4 FLUTE • GENERAL PURPOSE END MILLS

SERIES: CCMG

DIA	SHK	LOC	LBS	OAL	LENGTH	TOOL	BRIGHT EDP	ALTIN EDP
1/2	1/2	2		4	long	CCMG-1616-L	14162	54162
1/2	1/2	1-1/2		6	xl	CCMG-1616-LL	11883	51883
1/2	1/2	3		6	xl	CCMG-1616-E	14164	54164
17/32	9/16	1-1/4		3-1/2	std	CCMG-1817	16785	56785
9/16	9/16	1/2		3-1/2	stub	CCMGS-1818	12731	52731
9/16	9/16	1-1/4		3-1/2	std	CCMG-1818	15927	55927
9/16	9/16	2	3-3/4	6	ext neck	CCMGN-1818	16744	56744
9/16	9/16	3		6	xl	CCMG-1818-E	12799	52799
5/8	5/8	3/4		3	stub	CCMGS-2020	16237	56237
5/8	5/8	1-1/4		3-1/2	std	CCMG-2020	14166	54166
5/8	5/8	2-1/4		5	long	CCMG-2020-L	16079	56079
5/8	5/8	2		6	xl	CCMG-2020-LL	11885	51885
5/8	5/8	2	3-3/4	6	ext neck	CCMGN-2020	16746	56746
5/8	5/8	3		6	xl	CCMG-2020-E	16080	56080
11/16	3/4	1-3/8		4	std	CCMG-2422	15723	55723
3/4	3/4	1		3	stub	CCMGS-2424	16238	56238
3/4	3/4	1-1/2		4	std	CCMG-2424	14168	54168
3/4	3/4	2	3-1/2	6	ext neck	CCMGN-2424	16747	56747
3/4	3/4	2	no neck	6	no neck	CCMG-2424-NN	19147	59147
3/4	3/4	2-1/4		5	long	CCMG-2424-L	16081	56081
3/4	3/4	3		6	xl	CCMG-2424-E	14170	54170
3/4	3/4	4		7	xxl	CCMG-2424-EE	17736	57736
7/8	7/8	1-1/2		4	std	CCMG-2828	16203	56203
1	1	1-1/2		4	std	CCMG-3232	14172	54172
1	1	2	3-1/2	6	ext neck	CCMGN-3232	16748	56748
1	1	2	no neck	6	no neck	CCMG-3232-NN	19148	59148
1	1	2-1/4		5	long	CCMG-3232-L	12749	52749
1	1	3		6	xl	CCMG-3232-E	14174	54174
1	1	4		7	xxl	CCMG-3232-EE	16315	56315

4 FLUTE • GENERAL PURPOSE METRIC/INCH END MILLS



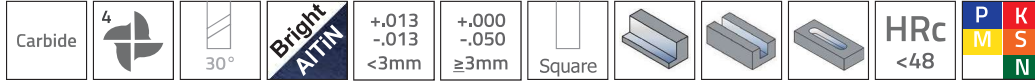
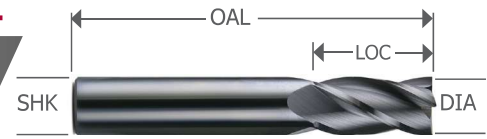
Carbide	4	30°	Bright ALTIN	+0.013 -0.013 <3mm	+0.000 -0.050 ≥3mm	Square				HRC <48	
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SERIES: CCMG- _M_

DIA	SHK	LOC	OAL	LENGTH	TOOL	BRIGHT EDP	ALTIN EDP
3mm	1/8	3/8	1-1/2	std	CCMG-4M3	15977	55977
4mm	3/16	1/2	2	std	CCMG-6M4	15978	55978
5mm	1/4	5/8	2-1/2	std	CCMG-8M5	15979	55979
6mm	1/4	5/8	2-1/2	std	CCMG-8M6	15980	55980
7mm	5/16	3/4	2-1/2	std	CCMG-10M7	15981	55981
8mm	3/8	7/8	2-1/2	std	CCMG-12M8	15982	55982
9mm	3/8	7/8	2-1/2	std	CCMG-12M9	15983	55983
10mm	7/16	1	2-3/4	std	CCMG-14M10	15984	55984
11mm	7/16	1	2-3/4	std	CCMG-14M11	15985	55985
12mm	1/2	1	3	std	CCMG-16M12	15986	55986

GENERAL PURPOSE CARBIDE END MILL

4 FLUTE • GENERAL PURPOSE END MILLS



SERIES: CCMG-M_M_

DIA	SHK	LOC	OAL	LENGTH	TOOL	BRIGHT EDP	ALTiN EDP
1mm	3mm	2mm	38mm	stub	CCMGS-M3M1	13747	53747
1mm	3mm	3mm	38mm	std	CCMG-M3M1	16933	56933
1.5mm	3mm	3mm	38mm	stub	CCMGS-M3M1.5	13957	53957
1.5mm	3mm	6mm	38mm	std	CCMG-M3M1.5	16934	56934
2mm	3mm	4mm	38mm	stub	CCMGS-M3M2	13981	53981
2mm	3mm	9mm	38mm	std	CCMG-M3M2	16000	56000
2.5mm	3mm	5mm	38mm	stub	CCMGS-M3M2.5	14053	54053
2.5mm	3mm	12mm	38mm	std	CCMG-M3M2.5	16001	56001
3mm	3mm	6mm	38mm	stub	CCMGS-M3M3	13982	53982
3mm	3mm	12mm	38mm	std	CCMG-M3M3	16002	56002
3mm	6mm	12mm	63mm	std	CCMG-M6M3	11693	51693
3mm	3mm	18mm	57mm	long	CCMG-M3M3-L	13637	53637
3mm	3mm	20mm	75mm	xl	CCMG-M3M3-E	14729	54729
3.5mm	4mm	7mm	51mm	stub	CCMGS-M4M3.5	14055	54055
3.5mm	4mm	12mm	51mm	std	CCMG-M4M3.5	16003	56003
4mm	4mm	8mm	51mm	stub	CCMGS-M4M4	13983	53983
4mm	4mm	14mm	51mm	std	CCMG-M4M4	16004	56004
4mm	6mm	14mm	63mm	std	CCMG-M6M4	11694	51694
4mm	4mm	20mm	63mm	long	CCMG-M4M4-L	13638	53638
4mm	4mm	20mm	75mm	x long	CCMG-M4M4-LL	14731	54731
4mm	4mm	25mm	75mm	xl	CCMG-M4M4-E	14732	54732
4.5mm	5mm	9mm	51mm	stub	CCMGS-M5M4.5	13709	53709
4.5mm	5mm	14mm	51mm	std	CCMG-M5M4.5	16005	56005
5mm	5mm	10mm	51mm	stub	CCMGS-M5M5	19747	59747
5mm	5mm	20mm	51mm	std	CCMG-M5M5	16006	56006
5mm	6mm	20mm	63mm	std	CCMG-M6M5	10889	50889
5mm	5mm	25mm	64mm	long	CCMG-M5M5-L	13986	53986
5mm	5mm	25mm	75mm	x long	CCMG-M5M5-LL	14735	54735
6mm	6mm	12mm	51mm	stub	CCMGS-M6M6	13748	53748
6mm	6mm	20mm	63mm	std	CCMG-M6M6	16007	56007
6mm	6mm	28mm	75mm	long	CCMG-M6M6-L	13639	53639
6mm	6mm	32mm	100mm	x long	CCMG-M6M6-LL	14741	54741
6mm	6mm	38mm	150mm	xl	CCMG-M6M6-E	14744	54744
7mm	8mm	12mm	51mm	stub	CCMGS-M8M7	14037	54037
7mm	8mm	20mm	63mm	std	CCMG-M8M7	16008	56008
8mm	8mm	12mm	51mm	stub	CCMGS-M8M8	19748	59748
8mm	8mm	20mm	63mm	std	CCMG-M8M8	16009	56009
8mm	8mm	32mm	75mm	long	CCMG-M8M8-L	13640	53640
8mm	8mm	41mm	100mm	x long	CCMG-M8M8-LL	14751	54751
9mm	10mm	14mm	51mm	stub	CCMGS-M10M9	19749	59749
9mm	10mm	22mm	70mm	std	CCMG-M10M9	16010	56010
10mm	10mm	14mm	51mm	stub	CCMGS-M10M10	11679	51679
10mm	10mm	25mm	70mm	std	CCMG-M10M10	16011	56011
10mm	10mm	38mm	76mm	med	CCMG-M10M10-M	13966	53966
10mm	10mm	40mm	100mm	long	CCMG-M10M10-L	13641	53641
11mm	12mm	25mm	76mm	std	CCMG-M12M11	13988	53988
12mm	12mm	16mm	64mm	stub	CCMGS-M12M12	13059	53059
12mm	12mm	25mm	76mm	std	CCMG-M12M12	16012	56012
12mm	12mm	50mm	100mm	long	CCMG-M12M12-L	13642	53642
12mm	12mm	75mm	150mm	xl	CCMG-M12M12-E	14768	54768

sizes continued on next page

GENERAL PURPOSE CARBIDE END MILL

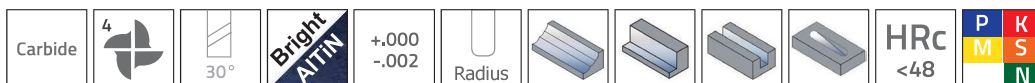
4 FLUTE • GENERAL PURPOSE END MILLS

SERIES: CCMG-M_M_

DIA	SHK	LOC	OAL	LENGTH	TOOL	BRIGHT EDP	ALTIN EDP
13mm	13mm	26mm	76mm	std	CCMG-M13M13	12762	52762
14mm	14mm	32mm	89mm	std	CCMG-M14M14	16795	56795
14mm	14mm	51mm	127mm	long	CCMG-M14M14-L	13749	53749
14mm	14mm	75mm	150mm	xl	CCMG-M14M14-E	14769	5476914768
16mm	16mm	32mm	89mm	std	CCMG-M16M16	16796	56796
16mm	16mm	57mm	127mm	long	CCMG-M16M16-L	19754	59754
16mm	16mm	50mm	150mm	x long	CCMG-M16M16-LL	14776	54776
16mm	16mm	75mm	150mm	xl	CCMG-M16M16-E	14777	54777
18mm	18mm	38mm	100mm	std	CCMG-M18M18	16797	56797
18mm	18mm	57mm	127mm	long	CCMG-M18M18-L	14869	54869
20mm	20mm	38mm	100mm	std	CCMG-M20M20	16798	56798
20mm	20mm	57mm	127mm	long	CCMG-M20M20-L	13990	53990
20mm	20mm	75mm	150mm	xl	CCMG-M20M20-E	14781	54781
22mm	22mm	38mm	100mm	std	CCMG-M22M22	16799	56799
25mm	25mm	38mm	100mm	std	CCMG-M25M25	16800	56800



4 FLUTE • CORNER RADIUS END MILLS



SERIES: CCMG-___-R___

DIA	SHK	LOC	OAL	RADIUS	LENGTH	TOOL	BRIGHT EDP	ALTIN EDP
3/32	1/8	3/8	1-1/2	0.010	std	CCMG-403-R010	11061	51061
3/32	1/8	3/8	1-1/2	0.015	std	CCMG-403-R015	11063	51063
3/32	1/8	3/8	1-1/2	0.020	std	CCMG-403-R020	11065	51065
1/8	1/8	1/4	1-1/2	0.010	stub	CCMGS-404-R010	16904	56904
1/8	1/8	1/2	1-1/2	0.005	std	CCMG-404-R005	H1906	H1907
1/8	1/8	1/2	1-1/2	0.010	std	CCMG-404-R010	11067	51067
1/8	1/8	1/2	1-1/2	0.015	std	CCMG-404-R015	15422	55422
1/8	1/8	1/2	1-1/2	0.020	std	CCMG-404-R020	11069	51069
1/8	1/8	1/2	1-1/2	0.030	std	CCMG-404-R030	11071	51071
5/32	3/16	5/16	2	0.010	stub	CCMGS-605-R010	16905	56905
5/32	3/16	5/16	2	0.010	std	CCMG-605-R010	H2076	H1910
5/32	3/16	5/16	2	0.015	std	CCMG-605-R015	H1911	H1912
5/32	3/16	5/16	2	0.030	std	CCMG-605-R030	H1913	H1914
3/16	3/16	5/16	2	0.010	stub	CCMGS-606-R010	16906	56906
3/16	3/16	5/8	2	0.010	std	CCMG-606-R010	11073	51073
3/16	3/16	5/8	2	0.015	std	CCMG-606-R015	11075	51075
3/16	3/16	5/8	2	0.020	std	CCMG-606-R020	15424	55424
3/16	3/16	5/8	2	0.030	std	CCMG-606-R030	15426	55426
3/16	3/16	5/8	2	0.045	std	CCMG-606-R045	H1915	H1916
7/32	1/4	3/8	2	0.020	stub	CCMGS-807-R020	16907	56907
1/4	1/4	1/2	2	0.020	stub	CCMGS-808-R020	16463	56463
1/4	1/4	3/4	2-1/2	0.010	std	CCMG-808-R010	H1918	H1919
1/4	1/4	3/4	2-1/2	0.015	std	CCMG-808-R015	15360	55360
1/4	1/4	3/4	2-1/2	0.020	std	CCMG-808-R020	15362	55362
1/4	1/4	3/4	2-1/2	0.030	std	CCMG-808-R030	15364	55364
1/4	1/4	3/4	2-1/2	0.045	std	CCMG-808-R045	15366	55366
1/4	1/4	3/4	2-1/2	0.060	std	CCMG-808-R060	H1921	H1922

sizes continued on next page

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"	CHIP PER TOOTH			
		Under 32 HRc	Over 32 HRc										
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, Incoloy 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

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

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

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

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

D = Cutter Dia.
Z = No. Of Teeth.

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

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

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

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

$$V_f \text{ or } \text{mm/MIN} = \text{IPM}$$

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

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

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

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



IMPERIAL METRIC

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

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