

HIGH PERFORMANCE TOOL CATALOG

AEROSPACE • MEDICAL • DIE & MOLD • ENGINEERING



2016



MELIN HIGH PERFORMANCE CATALOG

- » Aluminum Alloys
- » Titanium Alloys
- » Stainless & Steel Alloys
- » Nickel & Cobalt Based Alloys
- » Hardened Material > 45 HRC
- » Graphite & Composite Materials



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SPEED & FEED INFORMATION

SERIES: HVMG2

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MATERIAL	CONDITION	CUTTING DIAMETER							
		3/16"	1/4"	3/8"	1/2"	5/8"	3/4"	1"	1-1/4"
Aluminum+Aluminum Alloys	ISO-N	CHIP PER TOOTH							
2024-T4/T6, 2014, 6061-T6/T651, 7075-T6									
4000-8000 SFM	Slotting	0.0027	0.0030	0.0044	0.0060	0.0076	0.0090	0.0120	0.0150
4000-8000 SFM	Profiling up to 35% of Dia	0.0040	0.0045	0.0066	0.0090	0.0114	0.0135	0.0180	0.0225

MATERIAL	CONDITION	CUTTING DIAMETER - METRIC				
		10mm	12mm	16mm	20mm	25mm
Aluminum+Aluminum Alloys	ISO-N	CHIP PER TOOTH				
2024-T4/T6, 2014, 6061-T6/T651, 7075-T6						
4000-8000 SFM	Slotting	0.1118	0.1524	0.1930	0.2286	0.3048
4000-8000 SFM	Profiling up to 35% of Dia	0.1676	0.2286	0.2896	0.3429	0.4572

Note: These cutters can be used on 80 Kw and 120 Kw spindles

SERIES: HVMG3

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MATERIAL	CONDITION	CUTTING DIAMETER							
		3/16"	1/4"	3/8"	1/2"	5/8"	3/4"	1"	1-1/4"
Aluminum+Aluminum Alloys	ISO-N	CHIP PER TOOTH							
2024-T4/T6, 2014, 6061-T6/T651, 7075-T6									
4000-8000 SFM	Slotting up to 50% of Dia. Deep	0.0027	0.0030	0.0044	0.0060	0.0076	0.0090	0.0120	0.0150
4000-8000 SFM	Profiling up to 60% of Dia	0.0040	0.0045	0.0066	0.0090	0.0114	0.0135	0.0180	0.0225

MATERIAL	CONDITION	CUTTING DIAMETER - METRIC				
		10mm	12mm	16mm	20mm	25mm
Aluminum+Aluminum Alloys	ISO-N	CHIP PER TOOTH				
2024-T4/T6, 2014, 6061-T6/T651, 7075-T6						
4000-8000 SFM	Slotting up to 50% of Dia. Deep	0.1118	0.1524	0.1930	0.2286	0.3048
4000-8000 SFM	Profiling up to 60% of Dia	0.1676	0.2286	0.2896	0.3429	0.4572

Note: These cutters should be used on 120 Kw spindles only

SERIES: HVRMG3

[BACK TO SERIES](#)

MATERIAL	CONDITION	CUTTING DIAMETER							
		3/16"	1/4"	3/8"	1/2"	5/8"	3/4"	1"	1-1/4"
Aluminum+Aluminum Alloys	ISO-N	CHIP PER TOOTH							
2024-T4/T6, 2014, 6061-T6/T651, 7075-T6									
4000-8000 SFM	Slotting up to 5/8 of Dia. Deep	0.0032	0.0036	0.0053	0.0072	0.0091	0.0108	0.0144	0.0180
4000-8000 SFM	Profiling up to 70% of Dia	0.0048	0.0054	0.0079	0.0108	0.0137	0.0162	0.0216	0.0270

MATERIAL	CONDITION	CUTTING DIAMETER - METRIC				
		10mm	12mm	16mm	20mm	25mm
Aluminum+Aluminum Alloys	ISO-N	CHIP PER TOOTH				
2024-T4/T6, 2014, 6061-T6/T651, 7075-T6						
4000-8000 SFM	Slotting up to 5/8 of Dia. Deep	0.1341	0.1829	0.2316	0.2743	0.3658
4000-8000 SFM	Profiling up to 70% of Dia	0.2012	0.2743	0.3475	0.4115	0.5486

Note: These cutters should be used on 120 Kw spindles only

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

MATERIAL	CONDITION	CUTTING DIAMETER							
		1/8"	3/16"	1/4"	3/8"	1/2"	5/8"	3/4"	1"
Aluminum+Aluminum Alloys	ISO-N	CHIP PER TOOTH							
6061-T6/T651, 7075-T6, 2024-T4/T6, 2014, 850-1400 SFM	Slotting	.0010	0.002	0.002	0.003	0.004	0.005	0.006	0.007
1700-2000 SFM	25-40% Dia. Profiling	.0025	0.003	0.004	0.006	0.008	0.010	0.012	0.014
Copper	ISO-N								
Red Brass, High Lead Brass, Yellow Brass									
C-17200, Naval Brass, A-17, High Silicon Bronze									
800-1100 SFM	Slotting	.0010	.0010	.0020	.0025	.0030	.0040	.0040	0.005
1000-1200 SFM	25-40% Dia. Profiling	.0014	.0014	.0028	.0035	.0042	.0056	.0056	0.007
Copper Alloys	ISO-N								
Low Silicon Bronze, Alum/Bronze									
Beryllium Copper, Nickel Silver, Oxygen-Free Copper									
500-800 SFM	Slotting	.0010	.0010	.0020	.0025	.0030	.0040	.0040	0.005
600-850 SFM	25-40% Dia. Profiling	.0014	.0014	.0028	.0035	.0042	.0056	.0056	0.007
Magnesium	ISO-N								
700-1000 SFM	Slotting	.0010	0.002	0.002	0.003	0.004	0.006	0.008	0.009
750-1300 SFM	25-40% Dia. Profiling	.0025	0.003	0.004	0.006	0.008	0.010	0.012	0.014
Plastics	ISO-N								
Acrylics, Polycarbonate, Phenolics									
350-600 SFM	Slotting	.0025	0.003	0.004	0.006	0.008	0.010	0.012	0.014
400-800 SFM	25-40% Dia. Profiling	.0010	0.002	0.003	0.004	0.006	0.008	0.010	0.015

MATERIAL	CONDITION	CUTTING DIAMETER - METRIC							
		3mm	4mm	6mm	8mm	10mm	12mm	16mm	20mm
Aluminum+Aluminum Alloys	ISO-N	CHIP PER TOOTH							
6061-T6/T651, 7075-T6, 2024-T4/T6, 2014, 850-1400 SFM	Slotting	0.0254	0.0254	0.0508	0.0508	0.0762	0.1016	0.1270	0.1524
1700-2000 SFM	25-40% Dia. Profiling	0.0635	0.0635	0.1016	0.1270	0.1524	0.2032	0.2540	0.3048
Copper	ISO-N								
Red Brass, High Lead Brass, Yellow Brass									
C-17200, Naval Brass, A-17, High Silicon Bronze									
800-1100 SFM	Slotting	0.0254	0.0254	0.0508	0.0508	0.0635	0.0762	0.1016	0.1016
1000-1200 SFM	25-40% Dia. Profiling	0.0356	0.0356	0.0711	0.0787	0.0889	0.1067	0.1422	0.1422
Copper Alloys	ISO-N								
Low Silicon Bronze, Alum/Bronze									
Beryllium Copper, Nickel Silver, Oxygen-Free Copper									
500-800 SFM	Slotting	0.0254	0.0254	0.0508	0.0508	0.0635	0.0762	0.1016	0.1016
600-850 SFM	25-40% Dia. Profiling	0.0356	0.0356	0.0711	0.0787	0.0889	0.1067	0.1422	0.1422
Magnesium	ISO-N								
700-1000 SFM	Slotting	0.0254	0.0254	0.0508	0.0508	0.0762	0.1016	0.1524	0.2032
750-1300 SFM	25-40% Dia. Profiling	0.0635	0.0635	0.1016	0.1270	0.1524	0.2032	0.2540	0.3048
Plastics	ISO-N								
Acrylics, Polycarbonate, Phenolics									
350-600 SFM	Slotting	0.0254	0.0254	0.0762	0.0762	0.1016	0.1524	0.2032	0.2540
400-800 SFM	25-40% Dia. Profiling	0.0635	0.0635	0.1016	0.1016	0.1524	0.2032	0.2540	0.3048

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

SPEED & FEED INFORMATION

SERIES: AXMG45 & AXMG45-__-B

BACK TO SERIES

MATERIAL	CONDITION	CUTTING DIAMETER								
		1/8"	3/16"	1/4"	3/8"	1/2"	5/8"	3/4"	1"	1-1/4"
Aluminum+Aluminum Alloys	ISO-N	CHIP PER TOOTH								
6061-T6/T651, 7075-T6, 2024-T4/T6, 2014, 1200-2000 SFM	Slotting	0.0010	0.002	0.002	0.003	0.004	0.005	0.006	0.007	0.008
1700-2000 SFM	10-25 % Dia. Profiling	0.0025	0.003	0.004	0.006	0.008	0.010	0.012	0.014	0.016
Copper	ISO-N									
Red Brass, High Lead Brass, Yellow Brass C-17200, Navel Brass, A-17, High Silicon Bronze										
800-1500 SFM	Slotting	0.0010	0.0010	0.0020	.0025	0.0030	0.0040	0.0040	0.005	0.0060
1000-1200 SFM	10-25 % Dia. Profiling	0.0014	0.0014	0.0028	.0035	0.0042	0.0056	0.0056	0.007	0.0084
Copper Alloys	ISO-N									
Low Silicon Bronze, Alum/Bronze Beryllium Copper, Nickel Silver, Oxygen-Free Copper										
500-800 SFM	Slotting	0.0010	0.0010	0.0020	.0025	0.0030	0.0040	0.0040	0.005	0.0060
600-850 SFM	10-25 % Dia. Profiling	0.0014	0.0014	0.0028	.0035	0.0042	0.0056	0.0056	0.007	0.0084
Magnesium	ISO-N									
700-1000 SFM	Slotting	0.0010	0.002	0.002	0.003	0.004	0.006	0.008	0.009	0.010
750-1300 SFM	10-25 % Dia. Profiling	0.0025	0.003	0.004	0.006	0.008	0.010	0.012	0.014	0.016
Plastics	ISO-N									
Acrylics, Polycarbonate, Phenolics										
350-600 SFM	Slotting	0.0025	0.003	0.004	0.006	0.008	0.010	0.012	0.014	0.016
400-800 SFM	10-25 % Dia. Profiling	0.0010	0.002	0.003	0.004	0.006	0.008	0.010	0.015	0.020

MATERIAL	CONDITION	CUTTING DIAMETER - METRIC								
		3mm	4.5mm	6mm	10mm	12mm	16mm	20mm	25mm	32mm
Aluminum+Aluminum Alloys	ISO-N	CHIP PER TOOTH								
6061-T6/T651, 7075-T6, 2024-T4/T6, 2014, 366-610 M/MIN	Slotting	0.0254	0.0508	0.0508	0.0762	0.1016	0.1270	0.1524	0.1778	0.2032
518-610 M/MIN	10-25 % Dia. Profiling	0.0635	0.0762	0.1016	0.1524	0.2032	0.2540	0.3048	0.3556	0.4064
Copper	ISO-N									
Red Brass, High Lead Brass, Yellow Brass C-17200, Navel Brass, A-17, High Silicon Bronze										
244-458 M/MIN	Slotting	0.0254	0.0254	0.0508	0.0635	0.0762	0.1016	0.1016	0.1270	0.1524
304-366 M/MIN	10-25 % Dia. Profiling	0.0356	0.0356	0.0711	0.0889	0.1067	0.1422	0.1422	0.1778	0.2134
Copper Alloys	ISO-N									
Low Silicon Bronze, Alum/Bronze Beryllium Copper, Nickel Silver, Oxygen-Free Copper										
152-244 M/MIN	Slotting	0.0254	0.0254	0.0508	0.0635	0.0762	0.1016	0.1016	0.1270	0.1524
182-259 M/MIN	10-25 % Dia. Profiling	0.0356	0.0356	0.0711	0.0889	0.1067	0.1422	0.1422	0.1778	0.2134
Magnesium	ISO-N									
213-305 M/MIN	Slotting	0.0254	0.0508	0.0508	0.0762	0.1016	0.1524	0.2032	0.2286	0.2540
228-396 M/MIN	10-25 % Dia. Profiling	0.0635	0.0762	0.1016	0.1524	0.2032	0.2540	0.3048	0.3556	0.4064
Plastics	ISO-N									
Acrylics, Polycarbonate, Phenolics										
106-182 M/MIN	Slotting	0.0254	0.0508	0.0762	0.1016	0.1524	0.2032	0.2540	0.3556	0.4064
122-244 M/MIN	10-25 % Dia. Profiling	0.0635	0.0762	0.1016	0.1524	0.2032	0.2540	0.3048	0.3810	0.5080

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

SPEED & FEED INFORMATION

[BACK TO SERIES](#)

SERIES: GXMG5

MATERIAL	CONDITION	CUTTING DIAMETER							
		1/8"	3/16"	1/4"	3/8"	1/2"	5/8"	3/4"	1"
Aluminum+Aluminum Alloys	ISO-N	CHIP PER TOOTH							
2024-T4/T6, 2014, 6061-T6/T651, 7075-T6 1200-2000 SFM	12 % Max Dia. Profiling	.0025	.0030	.0040	.0060	.0080	.0100	.0120	.0140
Copper	ISO-N								
Red Brass, High Lead Brass, Yellow Brass C-17200, Naval Brass, A-17, High Silicon Bronze 1000-12000 SFM	12 % Max Dia. Profiling	.0014	.0014	.0028	.0035	.0042	.0056	.0056	.0070
Copper Alloys	ISO-N								
Low Silicon Bronze, Alum/Bronze Beryllium Copper, Nickel Silver, Oxygen-Free Copper 600-850 SFM	12 % Max Dia. Profiling	.0014	.0014	.0028	.0035	.0042	.0056	.0056	.0070
Magnesium	ISO-N								
750-1300 SFM	12 % Max Dia. Profiling	.0025	.0030	.0040	.0060	.0080	.0100	.0120	.0140

MATERIAL	CONDITION	CUTTING DIAMETER - METRIC							
		3mm	4.5mm	6mm	10mm	12mm	16mm	20mm	25mm
Aluminum+Aluminum Alloys	ISO-N	CHIP PER TOOTH							
2024-T4/T6, 2014, 6061-T6/T651, 7075-T6 366-610 M/MIN	12 % Max Dia. Profiling	0.0635	0.0762	0.1016	0.1524	0.2032	0.2540	0.3048	0.3556
Copper	ISO-N								
Red Brass, High Lead Brass, Yellow Brass C-17200, Naval Brass, A-17, High Silicon Bronze 304-365 M/MIN	12 % Max Dia. Profiling	0.0356	0.0356	0.0711	0.0889	0.1067	0.1422	0.1422	0.1778
Copper Alloys	ISO-N								
Low Silicon Bronze, Alum/Bronze Beryllium Copper, Nickel Silver, Oxygen-Free Copper 182-25- M/MIN	12 % Max Dia. Profiling	0.0356	0.0356	0.0711	0.0889	0.1067	0.1422	0.1422	0.1778
Magnesium	ISO-N								
228-396 M/MIN	12 % Max Dia. Profiling	0.0635	0.0762	0.1016	0.1524	0.2032	0.2540	0.3048	0.3556

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

SPEED & FEED INFORMATION

SERIES: ALMG

[BACK TO SERIES](#)

MATERIAL	CONDITION	CUTTING DIAMETER							
		1/8"	3/16"	1/4"	3/8"	1/2"	5/8"	3/4"	1"
Aluminum+Aluminum Alloys	ISO-N	CHIP PER TOOTH							
6061-T6/T651, 7075-T6, 2024-T4/T6, 2014, 850-1400 SFM	Slotting	0.0008	0.0016	0.0016	0.0024	0.0032	0.0040	0.0048	0.0056
1700-2000 SFM	35 % Dia. Profiling	0.0020	0.0024	0.0032	0.0048	0.0064	0.0080	0.0096	0.0112
Copper	ISO-N								
Red Brass, High Lead Brass, Yellow Brass	Slotting 35 % Dia. Profiling								
C-17200, Navel Brass, A-17, High Silicon Bronze									
800-1100 SFM		0.0008	0.0008	0.0016	0.0020	0.0024	0.0032	0.0032	0.0040
1000-1200 SFM		0.0011	0.0011	0.0022	0.0028	0.0034	0.0045	0.0045	0.0056
Copper Alloys	ISO-N								
Low Silicon Bronze, Alum/Bronze	Slotting 35 % Dia. Profiling								
Beryllium Copper, Nickel Silver, Oxygen-Free Copper									
500-800 SFM		0.0008	0.0008	0.0016	0.0020	0.0024	0.0032	0.0032	0.0040
600-850 SFM		0.0011	0.0011	0.0022	0.0028	0.0034	0.0045	0.0045	0.0056
Magnesium	ISO-N								
700-1000 SFM	Slotting	0.0008	0.0016	0.0016	0.0024	0.0032	0.0048	0.0064	0.0072
750-1300 SFM	35 % Dia. Profiling	0.0020	0.0024	0.0032	0.0048	0.0064	0.0080	0.0096	0.0112
Plastics	ISO-N								
Acrylics, Polycarbonate, Phenolics	Slotting 35% Dia. Profiling								
350-600 SFM		0.0020	0.0024	0.0032	0.0048	0.0064	0.0080	0.0096	0.0112
400-800 SFM		0.0008	0.0016	0.0024	0.0032	0.0048	0.0064	0.0080	0.0120

MATERIAL	CONDITION	CUTTING DIAMETER - METRIC							
		3mm	4.5mm	6mm	10mm	12mm	16mm	20mm	25mm
Aluminum+Aluminum Alloys	ISO-N	CHIP PER TOOTH							
6061-T6/T651, 7075-T6, 2024-T4/T6, 2014, 259-426 M/MIN	Slotting	0.0203	0.0406	0.0406	0.0610	0.0813	0.1016	0.1067	0.1422
518-610 M/MIN	35 % Dia. Profiling	0.0508	0.0610	0.0813	0.1219	0.1626	0.2032	0.2438	0.2845
Copper	ISO-N								
Red Brass, High Lead Brass, Yellow Brass	Slotting 35 % Dia. Profiling								
C-17200, Navel Brass, A-17, High Silicon Bronze									
243-535 M/MIN		0.0203	0.0203	0.0406	0.0508	0.0610	0.0813	0.0813	0.1016
305-366 M/MIN		0.0279	0.0279	0.0559	0.0711	0.0864	0.1143	0.1143	0.1422
Copper Alloys	ISO-N								
Low Silicon Bronze, Alum/Bronze	Slotting 35 % Dia. Profiling								
Beryllium Copper, Nickel Silver, Oxygen-Free Copper									
152-243 M/MIN		0.0203	0.0203	0.0406	0.0508	0.0610	0.0813	0.0813	0.1016
182-259 M/MIN		0.0279	0.0279	0.0559	0.0711	0.0864	0.1143	0.1143	0.1422
Magnesium	ISO-N								
213-305 M/MIN	Slotting	0.0203	0.0406	0.0406	0.0610	0.0813	0.1219	0.1626	0.1829
228-396 M/MIN	35 % Dia. Profiling	0.0508	0.0610	0.0813	0.1219	0.1626	0.2032	0.2438	0.2845
Plastics	ISO-N								
Acrylics, Polycarbonate, Phenolics	Slotting 35% Dia. Profiling								
106-182 M/MIN		0.0203	0.0406	0.0610	0.0813	0.1219	0.1626	0.2032	0.2845
122-244 M/MIN		0.0508	0.0610	0.0813	0.1219	0.1626	0.2032	0.2438	0.3048

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

MATERIAL	CONDITION	CUTTING DIAMETER							
		1/8"	3/16"	1/4"	3/8"	1/2"	5/8"	3/4"	1"
Aluminum+Aluminum Alloys	ISO-N	CHIP PER TOOTH							
6061-T6/T651, 7075-T6, 2024-T4/T6, 2014, 850-1400 SFM	Slotting	0.0008	0.0016	0.0016	0.0024	0.0032	0.0040	0.0048	0.0056
1700-2000 SFM	10-25 % Dia. Profiling	0.0020	0.0024	0.0032	0.0048	0.0064	0.0080	0.0096	0.0112
Copper	ISO-N								
Red Brass, High Lead Brass, Yellow Brass									
C-17200, Navel Brass, A-17, High Silicon Bronze									
800-1100 SFM	Slotting	0.0008	0.0008	0.0016	0.0020	0.0024	0.0032	0.0032	0.0040
1000-1200 SFM	10-25 % Dia. Profiling	0.0011	0.0011	0.0022	0.0028	0.0034	0.0045	0.0045	0.0056
Copper Alloys	ISO-N								
Low Silicon Bronze, Alum/Bronze									
Beryllium Copper, Nickel Silver, Oxygen-Free Copper									
500-800 SFM	Slotting	0.0008	0.0008	0.0016	0.0020	0.0024	0.0032	0.0032	0.0040
600-850 SFM	10-25 % Dia. Profiling	0.0011	0.0011	0.0022	0.0028	0.0034	0.0045	0.0045	0.0056
Magnesium	ISO-N								
700-1000 SFM	Slotting	0.0008	0.0016	0.0016	0.0024	0.0032	0.0048	0.0064	0.0072
750-1300 SFM	10-25 % Dia. Profiling	0.0020	0.0024	0.0032	0.0048	0.0064	0.0080	0.0096	0.0112
Plastics	ISO-N								
Acrylics, Polycarbonate, Phenolics									
350-600 SFM	Slotting	0.0020	0.0024	0.0032	0.0048	0.0064	0.0080	0.0096	0.0112
400-800 SFM	10-25 % Dia. Profiling	0.0008	0.0016	0.0024	0.0032	0.0048	0.0064	0.0080	0.0120

MATERIAL	CONDITION	CUTTING DIAMETER - METRIC								
		4mm	6mm	8mm	10mm	12mm	16mm	18mm	20mm	25mm
Aluminum+Aluminum Alloys	ISO-N	CHIP PER TOOTH								
6061-T6/T651, 7075-T6, 2024-T4/T6, 2014, 259-426 M/MIN	Slotting	0.0203	0.0406	0.0508	0.0610	0.0813	0.1016	0.1118	0.1219	0.1422
518-609 M/MIN	10-25 % Dia. Profiling	0.0508	0.0813	0.1016	0.1219	0.1626	0.2032	0.2184	0.2438	0.2845
Copper	ISO-N									
Red Brass, High Lead Brass, Yellow Brass										
C-17200, Navel Brass, A-17, High Silicon Bronze										
243-335 M/MIN	Slotting	0.0203	0.0406	0.0457	0.0508	0.0610	0.0813	0.0813	0.0813	0.1016
304-365 M/MIN	10-25 % Dia. Profiling	0.0284	0.0569	0.0635	0.0711	0.0853	0.1138	0.1143	0.1138	0.1422
Copper Alloys	ISO-N									
Low Silicon Bronze, Alum/Bronze										
Beryllium Copper, Nickel Silver, Oxygen-Free Copper										
152-243 M/MIN	Slotting	0.0203	0.0406	0.0457	0.0508	0.0610	0.0813	0.0813	0.0813	0.1016
182-259 M/MIN	10-25 % Dia. Profiling	0.0284	0.0569	0.0635	0.0711	0.0853	0.1138	0.1143	0.1138	0.1422
Magnesium	ISO-N									
213-304 M/MIN	Slotting	0.0203	0.0406	0.0508	0.0610	0.0813	0.1219	0.1422	0.1626	0.1829
228-396 M/MIN	10-25 % Dia. Profiling	0.0508	0.0813	0.1016	0.1219	0.1626	0.2032	0.2235	0.2438	0.2845
Plastics	ISO-N									
Acrylics, Polycarbonate, Phenolics										
106-182 M/MIN	Slotting	0.0203	0.0610	0.0914	0.0813	0.1219	0.1626	0.1829	0.2032	0.2845
122-244 M/MIN	10-25 % Dia. Profiling	0.0508	0.0813	0.1016	0.1219	0.1626	0.2032	0.2235	0.2438	0.3048

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

SPEED & FEED INFORMATION

SERIES: AA



MATERIAL	HEAT-RESISTANT COBALT BASE ALLOYS, HIGH TENSILE STEELS (50-55 C)		HEAT-RESISTANT AUSTENITIC ALLOYS, HIGH TENSILE STEELS (46-50 C)		HEAT-RESISTANT NICKEL BASE ALLOYS, HIGH STRENGTH STAINLESS STEELS, HIGH STRENGTH TITANIUM ALLOYS		HIGH STRENGTH STAINLESS STEELS, HIGH TENSILE STEELS (40-60 C) MEDIUM STRENGTH TITANIUM ALLOYS		HEAT RESISTANT FERRITIC BASE ALLOYS MEDIUM STRENGTH STAINLESS STEELS UNALLOYED TITANIUM TOOL STEELS (30-40 C)	
	SPEED	FEED	SPEED	FEED	SPEED	FEED	SPEED	FEED	SPEED	FEED
DIA. OF END MILLS	5-10 SFM	CHIP LOAD PER TOOTH	10-15 SFM	CHIP LOAD PER TOOTH	15-20 SFM	CHIP LOAD PER TOOTH	20-40 SFM	CHIP LOAD PER TOOTH	40-60 SFM	CHIP LOAD PER TOOTH
1/16	-	-	-	-	-	-	1222-2444	.0002-.0005	2444-3667	.0002-.0005
3/32	-	-	-	-	611-815	.0002-.0005	815-1629	.0002-.0005	1629-2750	.0002-.0005
1/8	-	-	-	-	456-611	.0002-.0005	611-1222	.0002-.0005	1222-1833	.0002-.0005
3/16	-	-	204-306	.0002-.0005	306-407	.0002-.0005	407-815	.0002-.0005	815-1222	.0002-.0005
1/4	76-153	.0002-.001	153-230	.0002-.001	229-306	.0002-.001	306-611	.0002-.001	611-917	.0002-.001
5/16	61-122	.0002-.001	122-183	.0002-.001	183-244	.0002-.001	244-489	.0002-.001	489-733	.0002-.001
3/8	51-102	.0002-.001	102-153	.0002-.001	153-203	.0002-.001	203-407	.0005-.002	406-611	.0005-.002
7/16	44-88	.0005-.001	88-132	.0005-.001	131-175	.0005-.002	175-349	.0005-.002	349-524	.0005-.002
1/2	38-76	.0005-.001	76-115	.0005-.001	115-153	.0005-.002	153-306	.0005-.003	306-458	.001-.003
9/16	34-68	.0005-.002	68-104	.0005-.002	104-136	.0005-.002	136-272	.0005-.003	272-412	.001-.003
5/8	31-61	.0005-.002	61-92	.0005-.002	92-122	.0005-.002	122-244	.001-.004	244-367	.001-.004
11/16	28-56	.0005-.002	56-84	.0005-.002	84-111	.0005-.002	111-222	.001-.004	222-337	.001-.004
3/4	26-51	.0005-.002	51-76	.0005-.002	76-102	.001-.004	102-203	.001-.004	203-306	.001-.004
13/16	24-47	.001-.003	47-71	.001-.003	71-94	.001-.004	94-189	.001-.004	189-284	.001-.004
7/8	22-44	.001-.003	44-65	.001-.003	65-87	.001-.004	87-175	.001-.004	175-262	.002-.006
15/16	20-40	.001-.003	40-62	.001-.003	62-81	.001-.004	81-163	.001-.004	163-246	.002-.006
1	19-38	.001-.003	38-58	.001-.003	58-76	.001-.004	76-153	.002-.006	153-229	.002-.006
1 1/8	34	.0015-.004	34-51	.0015-.004	51-68	.0015-.005	68-136	.002-.006	136-204	.002-.006
1 1/4	31	.0015-.004	31-46	.0015-.004	46-61	.0015-.005	61-122	.002-.006	122-183	.002-.006
1 3/8	28	.0015-.004	28-42	.0015-.004	42-55	.0015-.005	55-111	.002-.006	111-167	.003 UP
1 1/2	26	.0015-.004	26-38	.0015-.004	38-51	.002 UP	51-102	.003 UP	102-153	.003 UP
1 5/8	24	.002 UP	35	.002 UP	35-47	.002 UP	47-94	.003 UP	94-141	.003 UP
1 3/4	22	.002 UP	32	.002 UP	32-43	.002 UP	43-87	.003 UP	87-131	.003 UP
1 7/8	20	.002 UP	30	.002 UP	30-40	.003 UP	40-81	.003 UP	81-122	.003 UP
2	19	.002 UP	29	.003 UP	29-38	.003 UP	38-76	.003 UP	76-115	.003 UP
2 1/8	18	.003 UP	28	.003 UP	36	.003 UP	36-72	.003 UP	72-108	.003 UP
2 1/4	17	.003 UP	26	.003 UP	34	.003 UP	34-68	.003 UP	68-102	.003 UP
2 3/8	16	.003 UP	25	.003 UP	32	.003 UP	32-64	.003 UP	64-97	.003 UP
2 1/2	15	.003 UP	23	.003 UP	30	.003 UP	30-61	.003 UP	61-92	.003 UP
2 5/8	15	.003 UP	22	.003 UP	29	.003 UP	29-58	.003 UP	58-88	.003 UP
2 3/4	14	.003 UP	21	.003 UP	28	.003 UP	28-56	.003 UP	56-83	.003 UP
2 7/8	14	.003 UP	20	.003 UP	27	.003 UP	27-53	.003 UP	53-80	.003 UP
3	13	.003 UP	19	.003 UP	26	.003 UP	26-51	.003 UP	51-76	.003 UP

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



MATERIAL	MACHINE STEEL, HARD BRASS AND BRONZE, ELECTROLYTIC COPPER MILD STEEL FORGINGS (20-30 C)		CAST IRON, MILD STEEL, HALF-HARD BRASS AND BRONZE		BRASS, BRONZE, ALLOYED ALUMINUM, ABRASIVE PLASTICS		ALUMINUM, PLASTICS, WOOD	
	SPEED 60-80 SFM	FEED	SPEED 80-100 SFM	FEED	SPEED 100-200 SFM	FEED	SPEED 200-600 SFM	FEED
DIA. OF END MILLS	RPM	CHIP LOAD PER TOOTH	RPM	CHIP LOAD PER TOOTH	RPM	CHIP LOAD PER TOOTH	RPM	CHIP LOAD PER TOOTH
1/16	3667-4888	.0002 -.0005	4888-6111	.0002 -.0005	611-1222	.0002 -.0005	1222 UP	.0002 -.0005
3/32	2750-3259	.0002 -.0005	3259-4073	.0002 -.0005	4073-8146	.0002 -.0005	8146 UP	.0002 -.0005
1/8	1833-2440	.0002 -.001	2440-3056	.0002 -.001	3056-6112	.0002 -.001	6112 UP	.0002 -.001
3/16	1222-1625	.0002 -.001	1625-2037	.0002 -.001	2037-4074	.0002 -.001	4074-12222	.0002 -.001
1/4	917-1222	.0005 -.002	1222-1528	.0005 -.002	1528-3056	.0005 -.002	3056-9168	.0005 -.002
5/16	733-978	.0005 -.002	978-1222	.0005 -.002	1222-2444	.0005 -.002	2444-7332	.0005 -.002
3/8	611-815	.001 -.003	815-1019	.001 -.003	1019-2038	.0005 -.003	2038-6114	.0005 -.002
7/16	524-698	.001 -.003	698-873	.001 -.003	873-1746	.0005 -.003	1746-5238	.0005 -.002
1/2	458-611	.001 -.003	611-764	.001 -.003	764-1528	.0005 -.003	1528-4584	.0005 -.002
9/16	412-543	.001 -.004	543-678	.001 -.004	678-1356	.0005 -.004	1356-4071	.0005 -.003
5/8	367-489	.001 -.004	489-611	.001 -.004	611-1222	.0005 -.004	1222-3666	.0005 -.003
11/16	337-444	.001 -.004	444-555	.001 -.004	555-1110	.0005 -.004	1110-3330	.0005 -.003
3/4	306-407	.001 -.004	407-509	.002 -.006	509-1018	.001 -.006	1018-3054	.001 -.004
13/16	284-379	.002 -.006	379-469	.002 -.006	469-938	.001 -.006	938-2814	.001 -.004
7/8	262-349	.002 -.006	349-436	.002 -.006	436-872	.001 -.006	872-2616	.001 -.004
15/16	246-326	.002 -.006	326-407	.002 -.006	407-814	.001 -.006	514-2442	.001 -.004
1	229-306	.002 -.006	306-382	.002 -.006	382-764	.002 UP	764-2292	.002 UP
1 1/8	204-272	.002 -.006	272-340	.003 UP	340-680	.002 UP	680-2040	.002 UP
1 1/4	183-244	.003 UP	244-306	.003 UP	306-612	.002 UP	612-1836	.002 UP
1 3/8	167-222	.003 UP	222-278	.003 UP	278-556	.002 UP	556-1668	.002 UP
1 1/2	153-204	.003 UP	204-255	.003 UP	255-510	.003 UP	510-1530	.002 UP
1 5/8	141-188	.003 UP	188-235	.003 UP	235-470	.003 UP	470-1410	.002 UP
1 3/4	131-175	.003 UP	175-218	.003 UP	218-436	.003 UP	436-1308	.002 UP
1 7/8	122-163	.003 UP	163-204	.003 UP	204-408	.003 UP	408-1224	.003 UP
2	115-153	.003 UP	153-191	.003 UP	191-382	.003 UP	382-1146	.003 UP
2 1/8	108-144	.003 UP	144-179	.003 UP	179-358	.003 UP	358-1074	.003 UP
2 1/4	103-136	.003 UP	136-170	.003 UP	170-340	.003 UP	340-1020	.003 UP
2 3/8	97-128	.003 UP	128-161	.003 UP	161-322	.003 UP	322-966	.003 UP
2 1/2	92-122	.003 UP	122-153	.003 UP	153-306	.003 UP	306-918	.003 UP
2 5/8	88-116	.003 UP	116-145	.003 UP	145-290	.003 UP	290-870	.003 UP
2 3/4	83-111	.003 UP	111-139	.003 UP	139-278	.003 UP	278-834	.003 UP
2 7/8	80-106	.003 UP	106-132	.003 UP	132-264	.003 UP	264-792	.003 UP
3	76-102	.003 UP	102-127	.003 UP	127-154	.003 UP	254-762	.003 UP

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

SPEED & FEED INFORMATION

SERIES: ERFPM

[BACK TO SERIES](#)

MATERIAL	CONDITION	CUTTING DIAMETER								
		1/8"	3/16"	1/4"	3/8"	1/2"	5/8"	3/4"	1"	1-1/4"
Aluminum+Aluminum Alloys	ISO-N	CHIP PER TOOTH								
6061-T6/T651, 7075-T6, 2024-T4/T6, 2014, 1200-2000 SFM	Slotting	0.0010	0.002	0.002	0.003	0.004	0.005	0.006	0.007	0.008
1700-2000 SFM	10-25 % Dia. Profiling	0.0025	0.003	0.004	0.006	0.008	0.010	0.012	0.014	0.016
Copper	ISO-N									
Red Brass, High Lead Brass, Yellow Brass C-17200, Navel Brass, A-17, High Silicon Bronze										
800-1500 SFM	Slotting	0.0010	0.0010	0.0020	.0025	0.0030	0.0040	0.0040	0.005	0.0060
1000-12000 SFM	10-25 % Dia. Profiling	0.0014	0.0014	0.0028	.0035	0.0042	0.0056	0.0056	0.007	0.0084
Copper Alloys	ISO-N									
Low Silicon Bronze, Alum/Bronze Beryllium Copper, Nickel Silver, Oxygen-Free Copper										
500-800 SFM	Slotting	0.0010	0.0010	0.0020	.0025	0.0030	0.0040	0.0040	0.005	0.0060
600-850 SFM	10-25 % Dia. Profiling	0.0014	0.0014	0.0028	.0035	0.0042	0.0056	0.0056	0.007	0.0084
Magnesium	ISO-N									
700-1000 SFM	Slotting	0.0010	0.002	0.002	0.003	0.004	0.006	0.008	0.009	0.010
750-1300 SFM	10-25 % Dia. Profiling	0.0025	0.003	0.004	0.006	0.008	0.010	0.012	0.014	0.016
Plastics	ISO-N									
Acrylics, Polycarbonate, Phenolics										
350-600 SFM	Slotting	0.0025	0.003	0.004	0.006	0.008	0.010	0.012	0.014	0.016
400-800 SFM	10-25 % Dia. Profiling	0.0010	0.002	0.003	0.004	0.006	0.008	0.010	0.015	0.020

SERIES: CCAC

[BACK TO SERIES](#)

MATERIAL	CONDITION	CUTTING DIAMETER				
		3/4"	1"	1-1/4"	1-1/2"	2"
STAINLESS STEELS	ISO-M	CHIP PER TOOTH				
Stainless Steels < 28 HRc						
75 SFM	Slotting	0.0025	0.0030	0.0035	0.0035	0.0040
90 SFM	30-40 % Dia. Profiling	0.0035	0.0040	0.0050	0.0050	0.0055
Stainless Steels 30 - 40 HRc						
65 SFM	Slotting	0.0020	0.0025	0.0030	0.0035	0.0035
80 SFM	30-40 % Dia. Profiling	0.0030	0.0035	0.0040	0.0040	0.0045
Stainless Steels > 42 HRc						
45 SFM	Slotting	0.0020	0.0025	0.0030	0.0035	0.0035
60 SFM	30-40 % Dia. Profiling	0.0030	0.0035	0.0040	0.0040	0.0045
TITANIUM ALLOYS	ISO-S					
Titanium < 28 HRc						
50 SFM	Slotting	0.0025	0.0030	0.0035	0.0035	0.0040
65 SFM	30-40 % Dia. Profiling	0.0035	0.0040	0.0050	0.0050	0.0055
Titanium 30 - 40 HRc						
40 SFM	Slotting	0.0020	0.0025	0.0030	0.0035	0.0035
50 SFM	30-40 % Dia. Profiling	0.0030	0.0035	0.0040	0.0040	0.0045
Titanium > 42 HRc						
35 SFM	Slotting	0.0020	0.0025	0.0030	0.0035	0.0035
45 SFM	30-40 % Dia. Profiling	0.0030	0.0035	0.0040	0.0040	0.0045

Note: Chip load Recommendations based upon Regular Flute Length Tools

Chip load Multiplier: Stub **increase** by 1.15, Med Length **decrease** by .95, Long Length **decrease** by .9, X-Long Length by .8

Extended Reach Chip load Multiplier: Med Reach **decrease** by 1.35, Long Reach **decrease** by 1.25. X-Long Reach **decrease** by 1.15

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

		STARTING SFM		CUTTING DIAMETER				
MATERIAL	CONDITION		1/32"	3/64"	0.055"	1/16"	5/64"	3/32"
STAINLESS STEELS		ISO-M	CHIP PER TOOTH					
Precipitation 13-8, 15-5, 17-4PH	Slotting @ ≤ .5 x D	250	0.00012	0.00019	0.00023	0.00025	0.00037	0.00042
	Profiling @ 2 x D Axial / ≤ .1 D Radial	325	0.00021	0.00030	0.00035	0.00040	0.00062	0.00071
Martensitic 403, 410, 416	Slotting @ ≤ .5 x D	250	0.00012	0.00019	0.00023	0.00025	0.00037	0.00042
	Profiling @ 2 x D Axial / ≤ .1 D Radial	325	0.00021	0.00030	0.00035	0.00040	0.00062	0.00071
HIGH TEMP ALLOYS		ISO-S						
Nickel Base Inconel 600, 625, 718, Nickel 200, 270, Invar, Monel 400, 405, K-Monel, PermaNickel 300, Inconel 600	Slotting @ .5 x D	75	0.00008	0.00012	0.00015	0.00016	0.00024	0.00027
	Profiling @ 2 x D Axial / ≤ .1 D Radial	115	0.00013	0.00019	0.00022	0.00026	0.00040	0.00045
STEELS		ISO-P						
High Alloy Steels - Mold & Die A-2, P20, 01, 02, D2, H-13	Slotting @ ≤ .5 x D	275	0.00010	0.00015	0.00018	0.00020	0.00030	0.00034
	Profiling @ 2 x D Axial / ≤ .1 D Radial	350	0.00017	0.00024	0.00028	0.00032	0.00050	0.00056
TITANIUM		ISO-S						
Titanium Alloys 6AL-4V, ASTM 1, 2, 3, 6AL-2S For 5553, decrease SFM and IPM by 25%	Slotting @ ≤ .5 x D	175	0.00012	0.00019	0.00023	0.00025	0.00037	0.00042
	Profiling @ 2 x D Axial / ≤ .1 D Radial	275	0.00021	0.00030	0.00035	0.00040	0.00062	0.00070

Note: For length of cut 3x-5x reduce chip load by 20-40%

SERIES: VXM3T (METRIC)

STARTING M/MIN								
MATERIAL		CONDITION	CUTTING DIAMETER - METRIC					
			1mm	1.5mm	1.6mm	2mm	2.5mm	3mm
STAINLESS STEELS		ISO-M	CHIP PER TOOTH					
Precipitation 13-8, 15-5, 17-4PH	Slotting @ ≤ .5 x D	76	0.00305	0.05635	0.05635	0.05635	0.01067	0.01067
	Profiling @ 2 x D Axial / ≤ .1 D Radial	99	0.00533	0.01016	0.09016	0.09016	0.01803	0.01803
Martensitic 403, 410, 416	Slotting @ ≤ .5 x D	76	0.00305	0.05635	0.05635	0.05635	0.01067	0.01067
	Profiling @ 2 x D Axial / ≤ .1 D Radial	99	0.00533	0.01016	0.09016	0.09016	0.01803	0.01803
HIGH TEMP ALLOYS		ISO-S						
Nickel Base Inconel 600, 625, 718, Nickel 200, 270, Invar, Monel 400, 405, K-Monel, PermaNickel 300, Inconel 600	Slotting @ .5 x D	23	0.00195	0.03606	0.03606	0.03606	0.00686	0.00686
	Profiling @ 2 x D Axial / ≤ .1 D Radial	35	0.00341	0.00650	0.05770	0.05770	0.01143	0.01143
STEELS		ISO-P						
High Alloy Steels - Mold & Die A-2, P20, 01, 02, D2, H-13	Slotting @ ≤ .5 x D	84	0.00244	0.04508	0.04508	0.04508	0.00864	0.00864
	Profiling @ 2 x D Axial / ≤ .1 D Radial	107	0.00427	0.00813	0.07213	0.07213	0.01422	0.01422
TITANIUM		ISO-S						
Titanium Alloys 6AL-4V, ASTM 1, 2, 3, 6AL-2S For 5553, decrease SFM and IPM by 25%	Slotting @ ≤ .5 x D	53	0.00305	0.05635	0.05635	0.05635	0.01067	0.01067
	Profiling @ 2 x D Axial / ≤ .1 D Radial	84	0.00533	0.01016	0.09016	0.09016	0.01778	0.01778

Note: For length of cut 3x-5x reduce chip load by 20-40%

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

SPEED & FEED INFORMATION

SERIES: VXM4T & VXM4T-__-B

[BACK TO SERIES](#)

MATERIAL	MATERIAL ROCKWELL	CONDITION	SFM	CUTTING DIAMETER										
				1/32"	1/16"	1/8"	3/16"	1/4"	3/8"	1/2"	5/8"	3/4"	1"	
STAINLESS STEELS		ISO-M	CHIP PER TOOTH											
Precipitation 13-8, 15-5, 17-4PH	Less than 32 Rc	Slotting @ ≤ .5 to 1 x D	80-175	.0002	.0005	.0008	.0013	.0015	.0018	.0024	.0028	.0034	.0050	
	Over 32 Rc	Profiling @ 1-1/2 to 2 x D Axial / ≤.2 to .5 D Radial	80-115	.0008	.0015	.0024	.0031	.0033	.0045	.0055	.0068	.0081	.0102	
Austenitic 302, 303, 304L, 316L	Less than 32 Rc	Slotting @ ≤ .5 to 1 x Dia.	150-250	.0002	.0005	.0008	.0013	.0015	.0018	.0024	.0028	.0034	.0050	
	Over 32 Rc	Profiling @ 1-1/2 to 2 x D Axial / ≤.2 to .5 D Radial	80-175	.0008	.0015	.0024	.0031	.0033	.0045	.0055	.0068	.0081	.0102	
Martensitic 403, 410, 416	Less than 32 Rc	Slotting @ ≤ .5 to 1 x Dia.	200-350	.0002	.0005	.0008	.0013	.0015	.0018	.0024	.0028	.0034	.0050	
	Over 32 Rc	Profiling @ 1-1/2 to 2 x D Axial / ≤.2 to .5 D Radial	100-200	.0008	.0015	.0024	.0031	.0033	.0045	.0055	.0068	.0081	.0102	
HIGH TEMP ALLOYS		ISO-S												
Cobalt Base Stellite, Haynes 25, 188, X-40, L-605	Less than 32 Rc	Slotting @ ≤ .5 to 1 x Dia.	175-165	.0003	.0005	.0007	.0009	.0011	.0015	.0018	.0022	.0028	.0035	
	Over 32 Rc	Profiling @ 1-1/2 to 2 x D Axial / ≤.2 to .5 D Radial	50-120	.0006	.0012	.0021	.0023	.0025	.0045	.0047	.0066	.0080	.0085	
Nickel Base - Inconel 600, 625, 718, Nickel 200, 270, Invar, Monel 400, 405, K-Monel, PermaNickel 300, Inconel 600	Less than 32 Rc	Slotting @ ≤ .5 to 1 x Dia.	75-165	.0003	.0005	.0007	.0009	.0011	.0015	.0018	.0022	.0028	.0035	
	Over 32 Rc	Profiling @ 1-1/2 to 2 x D Axial / ≤.2 to .5 D Radial	50-120	.0006	.0012	.0021	.0023	.0025	.0045	.0047	.0066	.0080	.0085	
TITANIUM		ISO-S												
Titanium Alloys 6AL-4V, ASTM 1, 2, 3, 6AL-2S	Less than 32 Rc	Slotting @ ≤ .5 to 1 x Dia.	175-225	.0003	.0006	.0010	.0013	.0013	.0018	.0022	.0030	.0035	.0050	
	Over 32 Rc	Profiling @ 1-1/2 to 2 x D Axial / ≤.2 to .5 D Radial	100-165	.0010	.0016	.0025	.0031	.0038	.0045	.0063	.0072	.0086	.0105	
For 5553, decrease SFM and IPM by 25%														

For 5553, decrease SFM and IPM by 25%

MATERIAL	MATERIAL ROCKWELL	CONDITION	M/ MIN	CUTTING DIAMETER - METRIC											
				1MM	1.5MM	3MM	4.5MM	6MM	10MM	12MM	16MM	20MM	25MM		
STAINLESS STEELS		ISO-M	CHIP PER TOOTH												
Precipitation 13-8, 15-5, 17-4PH	Less than 32 Rc	Slotting @ ≤ .5 to 1 x D	24-53	.0051	.0127	.0203	.0330	.0381	.0457	.0610	.0711	.0864	.1270		
	Over 32 Rc	Profiling @ 1-1/2 to 2 x D Axial / ≤2 to .5 D Radial	24-35	.0203	.0381	.0610	.0787	.0838	.1143	.1397	.1727	.2057	.2591		
Austenitic 302, 303, 304L, 316L	Less than 32 Rc	Slotting @ ≤ .5 to 1 x Dia.	45-76	.0051	.0127	.0203	.0330	.0381	.0457	.0610	.0711	.0864	.1270		
	Over 32 Rc	Profiling @ 1-1/2 to 2 x D Axial / ≤2 to .5 D Radial	24-53	.0203	.0381	.0610	.0787	.0838	.1143	.1397	.1727	.2057	.2591		
Martensitic 403, 410, 416	Less than 32 Rc	Slotting @ ≤ .5 to 1 x Dia.	60-106	.0051	.0127	.0203	.0330	.0381	.0457	.0610	.0711	.0864	.1270		
	Over 32 Rc	Profiling @ 1-1/2 to 2 x D Axial / ≤2 to .5 D Radial	30-60	.0203	.0381	.0610	.0787	.0838	.1143	.1397	.1727	.2057	.2591		
HIGH TEMP ALLOYS		ISO-S													
Cobalt Base Stellite, Haynes 25, 188, X-40, L-605	Less than 32 Rc	Slotting @ ≤ .5 to 1 x Dia.	22-50	.0076	.0127	.0178	.0229	.0279	.0381	.0457	.0559	.0711	.0889		
	Over 32 Rc	Profiling @ 1-1/2 to 2 x D Axial / ≤2 to .5 D Radial	15-36	.0152	.0305	.0533	.0584	.0635	.1143	.1194	.1676	.2032	.2159		
Nickel Base - Inconel 600, 625, 718, Nickel 200, 270, Invar, Monel 400, 405, K-Monel, PermaNickel 300, Inconel 600	Less than 32 Rc	Slotting @ ≤ .5 to 1 x Dia.	22-50	.0076	.0127	.0178	.0229	.0279	.0381	.0457	.0559	.0711	.0889		
	Over 32 Rc	Profiling @ 1-1/2 to 2 x D Axial / ≤2 to .5 D Radial	15-36	.0152	.0305	.0533	.0584	.0635	.1143	.1194	.1676	.2032	.2159		
TITANIUM		ISO-S													
Titanium Alloys 6AL-4V, ASTM 1, 2, 3, 6AL-2S	Less than 32 Rc	Slotting @ ≤ .5 to 1 x Dia.	53-68	.0076	.0152	.0254	.0330	.0330	.0457	.0559	.0762	.0889	.1270		
	Over 32 Rc	Profiling @ 1-1/2 to 2 x D Axial / ≤2 to .5 D Radial	30-50	.0254	.0406	.0635	.0787	.0965	.1143	.1600	.1829	.2184	.2667		
For 5553, decrease SFM and IPM by 25%															

For 5553, decrease SFM and IPM by 25%

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

MATERIAL	MATERIAL ROCKWELL	CONDITION	SFM	CUTTING DIAMETER									
				1/16"	1/8"	3/16"	1/4"	3/8"	1/2"	5/8"	3/4"	1"	
STAINLESS STEELS		ISO-M	CHIP PER TOOTH										
Precipitation 13-8, 15-5, 17-4PH	Less than 32 Rc	Slotting @ ≤ .65 to 1 x Dia.	80-175	.0005	.0008	.0013	.0015	.0018	.0024	.0028	.0034	.0050	
	Over 32 Rc	Profiling @ 1-1/2 to 2 x D Axial / ≤.1-1/2 to .3 D Radial	80-115	.0015	.0024	.0031	.0033	.0045	.0055	.0068	.0081	.0102	
Austenitic 302, 303, 304L, 316L	Less than 32 Rc	Slotting @ ≤ .65 to 1 x Dia.	150-250	.0005	.0008	.0013	.0015	.0018	.0024	.0028	.0034	.0050	
	Over 32 Rc	Profiling @ 1-1/2 to 2 x D Axial / ≤.1-1/2 to .3 D Radial	80-175	.0015	.0024	.0031	.0033	.0045	.0055	.0068	.0081	.0102	
Martensitic 403, 410, 416	Less than 32 Rc	Slotting @ ≤ .65 to 1 x Dia.	200-350	.0005	.0008	.0013	.0015	.0018	.0024	.0028	.0034	.0050	
	Over 32 Rc	Profiling @ 1-1/2 to 2 x D Axial / ≤.1-1/2 to .3 D Radial	100-200	.0015	.0024	.0031	.0033	.0045	.0055	.0068	.0081	.0102	
HIGH TEMP ALLOYS		ISO-S											
Cobalt Base Stellite, Haynes 25, 188, X-40, L-605	Less than 32 Rc	Slotting @ ≤ .65 to 1 x Dia.	175-165	.0005	.0007	.0009	.0011	.0015	.0018	.0022	.0028	.0035	
	Over 32 Rc	Profiling @ 1-1/2 to 2 x D Axial / ≤.1-1/2 to .3 D Radial	50-120	.0012	.0021	.0023	.0025	.0045	.0047	.0066	.0080	.0085	
Nickel Base Inconel 600, 625, 718, Nickel 200, 270, Invar, Monel 400, 405, K-Monel, PermaNickel 300, Inconel 600	Less than 32 Rc	Slotting @ ≤ .65 to 1 x Dia.	75-165	.0005	.0007	.0009	.0011	.0015	.0018	.0022	.0028	.0035	
	Over 32 Rc	Profiling @ 1-1/2 to 2 x D Axial / ≤.1-1/2 to .3 D Radial	50-120	.0012	.0021	.0023	.0025	.0045	.0047	.0066	.0080	.0085	
TITANIUM		ISO-S											
Titanium Alloys 6AL-4V, ASTM 1, 2, 3, 6AL-2S	Less than 32 Rc	Slotting @ ≤ .65 to 1 x Dia.	175-225	.0006	.0010	.0013	.0013	.0018	.0022	.0030	.0035	.0050	
	Over 32 Rc	Profiling @ 1-1/2 to 2 x D Axial / ≤.1-1/2 to .3 D Radial	100-165	.0016	.0025	.0031	.0038	.0045	.0063	.0072	.0086	.0105	
For 5553, decrease SFM and IPM by 25%													

For 5553, decrease SFM and IPM by 25%

MATERIAL	MATERIAL ROCKWELL	CONDITION	M/ MIN	CUTTING DIAMETER - METRIC									
				1.5MM	3MM	4.5MM	6MM	10MM	12MM	16MM	20MM	25MM	
STAINLESS STEELS		ISO-M	CHIP PER TOOTH										
Precipitation 13-8, 15-5, 17-4PH	Less than 32 Rc	Slotting @ ≤ .65 to 1 x Dia.	24-53	.0127	.0203	.0330	.0381	.0457	.0610	.0711	.0864	.1270	
	Over 32 Rc	Profiling @ 1-1/2 to 2 x D Axial / ≤.1-1/2 to .3 D Radial	24-35	.0381	.0610	.0787	.0838	.1143	.1397	.1727	.2057	.2591	
Austenitic 302, 303, 304L, 316L	Less than 32 Rc	Slotting @ ≤ .65 to 1 x Dia.	45-76	.0127	.0203	.0330	.0381	.0457	.0610	.0711	.0864	.1270	
	Over 32 Rc	Profiling @ 1-1/2 to 2 x D Axial / ≤.1-1/2 to .3 D Radial	24-53	.0381	.0610	.0787	.0838	.1143	.1397	.1727	.2057	.2591	
Martensitic 403, 410, 416	Less than 32 Rc	Slotting @ ≤ .65 to 1 x Dia.	60-106	.0127	.0203	.0330	.0381	.0457	.0610	.0711	.0864	.1270	
	Over 32 Rc	Profiling @ 1-1/2 to 2 x D Axial / ≤.1-1/2 to .3 D Radial	30-60	.0381	.0610	.0787	.0838	.1143	.1397	.1727	.2057	.2591	
HIGH TEMP ALLOYS		ISO-S											
Cobalt Base Stellite, Haynes 25, 188, X-40, L-605	Less than 32 Rc	Slotting @ ≤ .65 to 1 x Dia.	22-50	.0127	.0178	.0229	.0279	.0381	.0457	.0559	.0711	.0889	
	Over 32 Rc	Profiling @ 1-1/2 to 2 x D Axial / ≤.1-1/2 to .3 D Radial	15-36	.0305	.0533	.0584	.0635	.1143	.1194	.1676	.2032	.2159	
Nickel Base Inconel 600, 625, 718, Nickel 200, 270, Invar, Monel 400, 405, K-Monel, PermaNickel 300, Inconel 600	Less than 32 Rc	Slotting @ ≤ .65 to 1 x Dia.	22-50	.0127	.0178	.0229	.0279	.0381	.0457	.0559	.0711	.0889	
	Over 32 Rc	Profiling @ 1-1/2 to 2 x D Axial / ≤.1-1/2 to .3 D Radial	15-36	.0305	.0533	.0584	.0635	.1143	.1194	.1676	.2032	.2159	
TITANIUM		ISO-S											
Titanium Alloys 6AL-4V, ASTM 1, 2, 3, 6AL-2S	Less than 32 Rc	Slotting @ ≤ .65 to 1 x Dia.	53-68	.0152	.0254	.0330	.0330	.0457	.0559	.0762	.0889	.1270	
	Over 32 Rc	Profiling @ 1-1/2 to 2 x D Axial / ≤.1-1/2 to .3 D Radial	30-50	.0406	.0635	.0787	.0965	.1143	.1600	.1829	.2184	.2667	
For 5553, decrease SFM and IPM by 25%													

For 5553, decrease SFM and IPM by 25%

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

SPEED & FEED INFORMATION

SERIES: EMG35, EMG60, GMG

[BACK TO SERIES](#)

MATERIAL		CONDITION	STARTING SFM	STARTING SFM	CUTTING DIAMETER							
			EMG35 / EMG60	GMG	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, PermaNickel 300, Inconel 600	Slotting @ .5 x D	60		0.0004	0.0002	0.0006	0.0009	0.0016	0.0015	0.0025	0.0025	
	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, Timken 16-26-6	Slotting @ ≤ .5 x D	70		0.0004	0.0004	0.0008	0.0013	0.0018	0.0022	0.0027	0.0036	
	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 For 5553, decrease SFM and IPM by 25%	Slotting @ ≤ .5 x D	150		0.0005	0.0006	0.0008	0.0013	0.0017	0.0022	0.0027	0.0036	
	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

MATERIAL	CONDITION	STARTING M/MIN	STARTING M/MIN	CUTTING DIAMETER - METRIC							
		EMG35 / EMG60	GMG	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, PermaNickel 300, Inconel 600	Slotting @ .5 x D	18		0.0102	0.0152	0.0178	0.0229	0.0406	0.0406	0.0406	0.0635
	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, Timken 16-26-6	Slotting @ ≤ .5 x D	21		0.0102	0.0203	0.0254	0.0330	0.0457	0.0508	0.0559	0.0686
	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 For 5553, decrease SFM and IPM by 25%	Slotting @ ≤ .5 x D	46		0.0127	0.0203	0.0254	0.0330	0.0432	0.0508	0.0559	0.0686
	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

SPEED & FEED INFORMATION

SERIES: VXM4

[BACK TO SERIES](#)

MATERIAL		CONDITION	SFM	FL	1/8"	3/16"	CUTTING DIAMETER						
					1/4"	3/8"	1/2"	5/8"	3/4"	1"			
STAINLESS STEELS		ISO-M	CHIP PER TOOTH										
Precipitation		Slotting @ $\leq .5 \times D$	250	4	0.0005	0.0008	0.0010	0.0015	0.0020	0.0025	0.0030	0.0040	
13-8, 15-5, 17-4PH		Profiling @ $2 \times D$ Axial / $\leq .3 D$ Radial	325	4	0.0007	0.0011	0.0014	0.0020	0.0027	0.0034	0.0041	0.0055	
Austenitic		Slotting @ $\leq .5 \times D$	275	4	0.0006	0.0009	0.0012	0.0018	0.0024	0.0030	0.0036	0.0048	
302, 303, 304L, 316L		Profiling @ $2 \times D$ Axial / $\leq .3 D$ Radial	350	4	0.0008	0.0012	0.0016	0.0025	0.0033	0.0041	0.0049	0.0065	
Martensitic		Slotting @ $\leq .5 \times D$	300	4	0.0006	0.0010	0.0013	0.0019	0.0026	0.0032	0.0038	0.0051	
403, 410, 416		Profiling @ $2 \times D$ Axial / $\leq .3 D$ Radial	375	4	0.0009	0.0014	0.0017	0.0026	0.0035	0.0044	0.0052	0.0070	
HIGH TEMP ALLOYS		ISO-S											
Cobalt Base		Slotting @ $.5 \times D$	110	4	0.0003	0.0004	0.0005	0.0008	0.0011	0.0014	0.0016	0.0022	
Stellite, Haynes 25, 188, X-40, L-605		Profiling @ $2 \times D$ Axial / $\leq .3 D$ Radial	150	4	0.0003	0.0004	0.0007	0.0007	0.0013	0.0016	0.002	0.0026	
Nickel Base - Inconel 600, 625, 718, Nickel 200, 270, Invar, Monel 400, 405, K-Monel, PermaNickel 300, Inconel 600		Slotting @ $.5 \times D$	75	4	0.0004	0.0003	0.0007	0.0010	0.0017	0.0016	0.0026	0.0026	
		Profiling @ $2 \times D$ Axial / $\leq .3 D$ Radial	115	4	0.0004	0.0004	0.0007	0.0011	0.0018	0.0018	0.0022	0.0022	
Iron Base		Slotting @ $.5 \times D$	95	4	0.0004	0.0005	0.0009	0.0014	0.0019	0.0023	0.0028	0.0037	
Inconel 800-802, Multimet N-155, Timken 16-26-6		Profiling @ $2 \times D$ Axial / $\leq .3 D$ Radial	130	4	0.0004	0.0005	0.0010	0.0016	0.0021	0.0026	0.0031	0.0042	
STEELS		ISO-P											
High Strength Steels		Slotting @ $\leq .5 \times D$	300	4	0.0006	0.0009	0.0013	0.0019	0.0026	0.0032	0.0038	0.0051	
4140, 4340, 52100		Profiling @ $2 \times D$ Axial / $\leq .3 D$ Radial	375	4	0.0009	0.0013	0.0017	0.0026	0.0035	0.0044	0.0052	0.0070	
High Alloy Steels - Mold & Die		Slotting @ $\leq .5 \times D$	275	4	0.0005	0.0008	0.0011	0.0016	0.0022	0.0027	0.0032	0.0043	
A-2, P20, 01, 02, 06, D2, H-13		Profiling @ $2 \times D$ Axial / $\leq .3 D$ Radial	350	4	0.0007	0.0011	0.0015	0.0022	0.0029	0.0037	0.0044	0.0059	
Medium Alloy Steels		Slotting @ $\leq .75 \times D$	325	4	0.0005	0.0005	0.0012	0.0020	0.0025	0.0035	0.0040	0.0050	
200, 250, 300		Profiling @ $2 \times D$ Axial / $\leq .3 D$ Radial	400	4	0.0005	0.0005	0.0015	0.0024	0.0030	0.0040	0.0050	0.0060	
Low Alloy Steels-Maraging		Slotting @ $\leq .75 \times D$	325	4	0.0007	0.0010	0.0014	0.0021	0.0028	0.0035	0.0042	0.0056	
10XX, 11XX, 13XX		Profiling @ $2 \times D$ Axial / $\leq .3 D$ Radial	400	4	0.0010	0.0015	0.0019	0.0029	0.0038	0.0048	0.0057	0.0076	
CAST IRONS		ISO-K											
Ductile Iron		Slotting @ $1 \times D$	400	4	0.0005	0.0008	0.0010	0.0015	0.0020	0.0025	0.0030	0.0040	
Ductile Cast Iron		Profiling @ $2 \times D$ Axial / $\leq .3 D$ Radial	550	4	0.0007	0.0010	0.0014	0.0020	0.0027	0.0034	0.0041	0.0055	
Cast Iron		Slotting @ $1 \times D$	450	4	0.0006	0.0010	0.0012	0.0018	0.0024	0.0030	0.0036	0.0048	
Grey Cast Iron		Profiling @ $2 \times D$ Axial / $\leq .3 D$ Radial	600	4	0.0008	0.0012	0.0016	0.0025	0.0033	0.0041	0.0049	0.0065	
TITANIUM		ISO-S											
Titanium Alloys		Slotting @ $\leq .5 \times D$	175	4	0.0005	0.0007	0.0009	0.0014	0.0018	0.0023	0.0028	0.0037	
6AL-4V, ASTM 1, 2, 3, 6AL-2S		Profiling @ $2 \times D$ Axial / $\leq .3 D$ Radial	275	4	0.0006	0.0010	0.0013	0.0019	0.0025	0.0031	0.0038	0.0050	
For 5553, decrease SFM and IPM by 25%													

For 5553, decrease SFM and IPM by 25%

MATERIAL		CONDITION	M/MIN	FL	3MM	5MM	6MM	10MM	12MM	16MM	20MM	25MM
STAINLESS STEELS		ISO-M	CHIP PER TOOTH									
Precipitation		Slotting @ ≤ .5 x D	76	4	0.0127	0.0203	0.0254	0.0381	0.0508	0.0635	0.0762	0.1016
13-8, 15-5, 17-4PH		Profiling @ 2 x D Axial / ≤ .3 D Radial	100	4	0.0178	0.0279	0.0356	0.0508	0.0685	0.0864	0.1041	0.1397
Austenitic		Slotting @ ≤ .5 x D	83	4	0.0152	0.0229	0.0305	0.0457	0.0610	0.0762	0.0914	0.1219
302, 303, 304L, 316L		Profiling @ 2 x D Axial / ≤ .3 D Radial	110	4	0.0203	0.0305	0.0406	0.0635	0.0838	0.1041	0.1214	0.1651
Martensitic		Slotting @ ≤ .5 x D	90	4	0.0152	0.0254	0.0330	0.0482	0.0660	0.0812	0.0965	0.1295
403, 410, 416		Profiling @ 2 x D Axial / ≤ .3 D Radial	115	4	0.0229	0.0355	0.0431	0.0660	0.0889	0.1117	0.1320	0.1778
HIGH TEMP ALLOYS		ISO-S										
Cobalt Base		Slotting @ .5 x D	34	4	0.0076	0.0102	0.0127	0.0203	0.0279	0.0355	0.0406	0.0558
Stellite, Haynes 25, 188, X-40, L-605		Profiling @ 2 x D Axial / ≤ .3 D Radial	45	4	0.0076	0.0102	0.0178	0.0178	0.0330	0.0406	0.0508	0.0660
Nickel Base - Inconel 600, 625, 718, Nickel 200, 270		Slotting @ .5 x D	23	4	0.0102	0.0102	0.0178	0.0254	0.0431	0.0406	0.0660	0.0660
Invar, Monel 400, 405, K-Monel, PermaNickel 300, Inconel 600		Profiling @ 2 x D Axial / ≤ .3 D Radial	35	4	0.0106	0.0102	0.0178	0.0279	0.0457	0.0457	0.0558	0.0558
Iron Base		Slotting @ .5 x D	30	4	0.0102	0.0127	0.0229	0.0355	0.0482	0.0584	0.0711	0.0939
Incoloy 800-802, Multimet N-155, Timken 16-26-6		Profiling @ 2 x D Axial / ≤ .3 D Radial	40	4	0.0102	0.0127	0.0254	0.0406	0.0533	0.0660	0.0787	0.1066
STEELS		ISO-P										
High Strength Steels		Slotting @ ≤ .5 x D	92	4	0.0152	0.0229	0.0330	0.0482	0.0660	0.0812	0.0965	0.1295
4140, 4340, 52100		Profiling @ 2 x D Axial / ≤ .3 D Radial	115	4	0.0229	0.0330	0.0431	0.0660	0.0889	0.1117	0.1320	0.1778
High Alloy Steels - Mold & Die		Slotting @ ≤ .5 x D	84	4	0.0127	0.0203	0.0279	0.0406	0.0558	0.0685	0.0812	0.1092
A-2, P20, 01, 02, 06, D2, H-13		Profiling @ 2 x D Axial / ≤ .3 D Radial	110	4	0.0177	0.0279	0.0381	0.0558	0.0737	0.0939	0.1117	0.1498
Medium Alloy Steels		Slotting @ ≤ .75 x D	100	4	0.0127	0.0127	0.0304	0.0508	0.0635	0.0889	0.1016	0.1270
200, 250, 300		Profiling @ 2 x D Axial / ≤ .3 D Radial	122	4	0.0127	0.0127	0.0381	0.0609	0.0762	0.1016	0.1270	0.1524
Low Alloy Steels-Maraging		Slotting @ ≤ .75 x D	100	4	0.0178	0.0254	0.0355	0.0533	0.0711	0.0889	0.1066	0.1422
10XX, 11XX, 13XX		Profiling @ 2 x D Axial / ≤ .3 D Radial	122	4	0.0254	0.0381	0.0482	0.0736	0.0965	0.1219	0.1447	0.1930
CAST IRONS		ISO-K										
Ductile Iron		Slotting @ 1 x D	122	4	0.0127	0.0203	0.0254	0.0381	0.0508	0.0635	0.0762	0.1016
Ductile Cast Iron		Profiling @ 2 x D Axial / ≤ .3 D Radial	168	4	0.0178	0.0254	0.0355	0.0508	0.0685	0.0863	0.1041	0.1397
Cast Iron		Slotting @ 1 x D	137	4	0.0152	0.0254	0.0304	0.0457	0.0609	0.0762	0.0914	0.1219
Grey Cast Iron		Profiling @ 2 x D Axial / ≤ .3 D Radial	183	4	0.0203	0.0304	0.0406	0.0635	0.0838	0.1041	0.1244	0.1651
TITANIUM		ISO-S										
Titanium Alloys		Slotting @ ≤ .5 x D	53	4	0.0127	0.0178	0.0229	0.0355	0.0457	0.0584	0.0711	0.0939
6AL-4V, ASTM 1, 2, 3, 6AL-2S		Profiling @ 2 x D Axial / ≤ .3 D Radial	84	4	0.0152	0.0254	0.0330	0.0482	0.0635	0.0787	0.0965	0.1270
For 5553, decrease SFM and IPM by 25%												

For 5553, decrease SFM and IPM by 25%

Note: All technical data provided are suggested starting points.

MATERIAL		CONDITION	SFM	FL	1/8"	3/16"	1/4"	3/8"	1/2"	5/8"	3/4"	1"
STAINLESS STEELS		ISO-M	CUTTING DIAMETER									
			CHIP PER TOOTH									
Precipitation		Slotting @ 1 x D	250	5	0.0005	0.0008	0.0010	0.0015	0.0020	0.0025	0.0030	0.0040
13-8, 15-5, 17-4PH		Profiling @ 2 x D Axial / ≤ .3 D Radial	325	5	0.0007	0.0011	0.0014	0.0020	0.0027	0.0034	0.0041	0.0055
Austenitic		Slotting @ 1 x D	275	5	0.0006	0.0009	0.0012	0.0018	0.0024	0.0030	0.0036	0.0048
302, 303, 304L, 316L		Profiling @ 2 x D Axial / ≤ .3 D Radial	350	5	0.0008	0.0012	0.0016	0.0025	0.0033	0.0041	0.0049	0.0065
Martensitic		Slotting @ 1 x D	300	5	0.0006	0.0010	0.0013	0.0019	0.0026	0.0032	0.0038	0.0051
403, 410, 416		Profiling @ 2 x D Axial / ≤ .3 D Radial	375	5	0.0009	0.0014	0.0017	0.0026	0.0035	0.0044	0.0052	0.0070
HIGH TEMP ALLOYS		ISO-S										
Cobalt Base		Slotting @ .5 x D	110	5	0.0003	0.0004	0.0005	0.0008	0.0011	0.0014	0.0016	0.0022
Stellite, Haynes 25, 188, X-40, L-605		Profiling @ 2 x D Axial / ≤ .3 D Radial	150	5	0.0003	0.0004	0.0007	0.0007	0.0013	0.0016	0.0020	0.0026
Nickel Base - Inconel 600, 625, 718, Nickel 200, 270, Invar, Monel 400, 405, K-Monel, PermaNickel 300, Inconel 600		Slotting @ .5 x D	75	5	0.0004	0.0003	0.0007	0.0010	0.0017	0.0016	0.0026	0.0026
		Profiling @ 2 x D Axial / ≤ .3 D Radial	115	5	0.0004	0.0004	0.0007	0.0011	0.0018	0.0018	0.0022	0.0022
Iron Base		Slotting @ .5 x D	95	5	0.0004	0.0005	0.0009	0.0014	0.0019	0.0023	0.0028	0.0037
Incoloy 800-802, Multimet N-155, Timken 16-26-6		Profiling @ 2 x D Axial / ≤ .3 D Radial	130	5	0.0004	0.0005	0.0010	0.0016	0.0021	0.0026	0.0031	0.0042
STEELS		ISO-P										
High Strength Steels		Slotting @ 1 x D	300	5	0.0006	0.0009	0.0013	0.0019	0.0026	0.0032	0.0038	0.0051
4140, 4340, 52100		Profiling @ 2 x D Axial / ≤ .3 D Radial	375	5	0.0009	0.0013	0.0017	0.0026	0.0035	0.0044	0.0052	0.0070
High Alloy Steels - Mold & Die		Slotting @ 1 x D	275	5	0.0005	0.0008	0.0011	0.0016	0.0022	0.0027	0.0032	0.0043
A-2, P20, 01, 02, D2, H-13		Profiling @ 2 x D Axial / ≤ .3 D Radial	350	5	0.0007	0.0011	0.0015	0.0022	0.0029	0.0037	0.0044	0.0059
Medium Alloy Steels		Slotting @ 1 x D	325	5	0.0005	0.0005	0.0012	0.0020	0.0025	0.0035	0.0040	0.0050
200, 250, 300		Profiling @ 2 x D Axial / ≤ .3 D Radial	400	5	0.0005	0.0005	0.0015	0.0024	0.0030	0.0040	0.0050	0.0060
Low Alloy Steels-Maraging		Slotting @ 1 x D	325	5	0.0007	0.0010	0.0014	0.0021	0.0028	0.0035	0.0042	0.0056
10XX, 11XX, 13XX		Profiling @ 2 x D Axial / ≤ .3 D Radial	400	5	0.0010	0.0015	0.0019	0.0029	0.0038	0.0048	0.0057	0.0076
CAST IRONS		ISO-K										
Ductile Iron		Slotting @ 1 x D	300	5	0.0005	0.0008	0.0010	0.0015	0.0020	0.0025	0.0030	0.0040
Ductile Cast Iron		Profiling @ 2 x D Axial / ≤ .3 D Radial	375	5	0.0007	0.0010	0.0014	0.0020	0.0027	0.0034	0.0041	0.0055
Cast Iron		Slotting @ 1 x D	275	5	0.0006	0.0010	0.0012	0.0018	0.0024	0.0030	0.0036	0.0048
Grey Cast Iron		Profiling @ 2 x D Axial / ≤ .3 D Radial	350	5	0.0008	0.0012	0.0016	0.0025	0.0033	0.0041	0.0049	0.0065
TITANIUM		ISO-S										
Titanium Alloys		Slotting @ 1 x D	250	5	0.0005	0.0007	0.0009	0.0014	0.0018	0.0023	0.0028	0.0037
6AL-4V, ASTM 1, 2, 3, 6AL-2S		Profiling @ 2 x D Axial / ≤ .3 D Radial	300	5	0.0006	0.0010	0.0013	0.0019	0.0025	0.0031	0.0038	0.0050

For 5553, decrease SFM and IPM by 25%

MATERIAL		CONDITION	M/MIN	FL	3MM	5MM	6MM	10MM	12MM	16MM	20MM	25MM
STAINLESS STEELS		ISO-M	CUTTING DIAMETER - METRIC									
			CHIP PER TOOTH									
Precipitation		Slotting @ 1 x D	76	5	0.0127	0.0203	0.0254	0.0381	0.0508	0.0635	0.0762	0.1016
13-8, 15-5, 17-4PH		Profiling @ 2 x D Axial / ≤ .3 D Radial	100	5	0.0178	0.0279	0.0355	0.0685	0.0863	0.1041	0.1397	
Austenitic		Slotting @ 1 x D	83	5	0.0152	0.0229	0.0304	0.0457	0.0609	0.0762	0.0914	0.1219
302, 303, 304L, 316L		Profiling @ 2 x D Axial / ≤ .3 D Radial	105	5	0.0203	0.0304	0.0406	0.0635	0.0838	0.1041	0.1244	0.1651
Martensitic		Slotting @ 1 x D	90	5	0.0152	0.0254	0.0330	0.0482	0.0660	0.0812	0.0965	0.1295
403, 410, 416		Profiling @ 2 x D Axial / ≤ .3 D Radial	115	5	0.0229	0.0355	0.0431	0.0660	0.0889	0.1117	0.1320	0.1778
HIGH TEMP ALLOYS		ISO-S										
Cobalt Base		Slotting @ .5 x D	35	5	0.0076	0.0102	0.0127	0.0203	0.0279	0.0355	0.0406	0.0558
Stellite, Haynes 25, 188, X-40, L-605		Profiling @ 2 x D Axial / ≤ .3 D Radial	45	5	0.0076	0.0102	0.0178	0.0178	0.0330	0.0406	0.0508	0.0660
Nickel Base - Inconel 600, 625, 718, Nickel 200, 270, Invar, Monel 400, 405, K-Monel, PermaNickel 300, Inconel 600		Slotting @ .5 x D	23	5	0.0101	0.0101	0.0178	0.0254	0.0431	0.0406	0.0660	0.0660
		Profiling @ 2 x D Axial / ≤ .3 D Radial	35	5	0.0102	0.0102	0.0178	0.0279	0.0457	0.0457	0.0558	0.0558
Iron Base - Incoloy 800-802, Multimet N-155, Timken 16-26-6		Slotting @ .5 x D	30	5	0.0102	0.0127	0.0228	0.0355	0.0482	0.0584	0.0711	0.0939
		Profiling @ 2 x D Axial / ≤ .3 D Radial	40	5	0.0102	0.0127	0.0254	0.0406	0.0503	0.0660	0.0787	0.1066
STEELS		ISO-P										
High Strength Steels		Slotting @ 1 x D	90	5	0.0152	0.0228	0.0330	0.0482	0.0660	0.0812	0.0905	0.1295
4140, 4340, 52100		Profiling @ 2 x D Axial / ≤ .3 D Radial	115	5	0.0228	0.0330	0.0431	0.0660	0.0889	0.1117	0.1320	0.1778
High Alloy Steels - Mold & Die		Slotting @ 1 x D	83	5	0.0127	0.0203	0.0279	0.0406	0.0558	0.0605	0.0812	0.1092
A-2, P20, 01, 02, D2, H-13		Profiling @ 2 x D Axial / ≤ .3 D Radial	110	5	0.0178	0.0279	0.0308	0.0558	0.0736	0.0939	0.1117	0.1498
Medium Alloy Steels		Slotting @ 1 x D	100	5	0.0127	0.0127	0.0304	0.0508	0.0635	0.0889	0.1016	0.1270
200, 250, 300		Profiling @ 2 x D Axial / ≤ .3 D Radial	120	5	0.0127	0.0127	0.0381	0.0609	0.0762	0.1016	0.1270	0.1524
Low Alloy Steels-Maraging		Slotting @ 1 x D	100	5	0.0178	0.0254	0.0355	0.0533	0.0711	0.0889	0.1066	0.1422
10XX, 11XX, 13XX		Profiling @ 2 x D Axial / ≤ .3 D Radial	120	5	0.0254	0.0381	0.0482	0.0736	0.0965	0.1210	0.1447	0.1930
CAST IRONS		ISO-K										
Ductile Iron		Slotting @ 1 x D	90	5	0.0127	0.0203	0.0254	0.0381	0.0508	0.0635	0.0762	0.1016
Ductile Cast Iron		Profiling @ 2 x D Axial / ≤ .3 D Radial	115	5	0.0178	0.0254	0.0355	0.0508	0.0685	0.0863	0.1041	0.1397
Cast Iron		Slotting @ 1 x D	83	5	0.0152	0.0254	0.0304	0.0457	0.0609	0.0762	0.0914	0.1219
Grey Cast Iron		Profiling @ 2 x D Axial / ≤ .3 D Radial	110	5	0.0203	0.0304	0.0406	0.0635	0.0838	0.1041	0.1244	0.1651
TITANIUM		ISO-S										
Titanium Alloys		Slotting @ 1 x D	75	5	0.0128	0.0178	0.0229	0.0355	0.0457	0.0584	0.0711	0.0939
6AL-4V, ASTM 1, 2, 3, 6AL-2S		Profiling @ 2 x D Axial / ≤ .3 D Radial	90	5	0.0152	0.0254	0.0330	0.0482	0.0636	0.0787	0.0965	0.1270

For 5553, decrease SFM and IPM by 25%

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

SPEED & FEED INFORMATION

SERIES: VXM7

BACK TO SERIES 

MATERIAL			CONDITION	SFM	FL	CUTTING DIAMETER							
						1/8"	3/16"	1/4"	3/8"	1/2"	5/8"	3/4"	1"
STAINLESS STEELS		ISO-M	CHIP PER TOOTH										
Precipitation 13-8, 15-5, 17-4PH		High Speed Profiling @ Full Length Axial / < .1 D Radial	450	7	0.0012	0.0017	0.0023	0.0035	0.0047	0.0059	0.0070	0.0094	
		Profiling @ Full Length Axial / < .08 D Radial	325	7	0.0012	0.0016	0.0023	0.0034	0.0045	0.0057	0.0068	0.0091	
Austenitic 302, 303, 304L, 316L		High Speed Profiling @ Full Length Axial / < .1 D Radial	475	7	0.0014	0.0019	0.0028	0.0042	0.0057	0.0070	0.0085	0.0113	
		Profiling @ Full Length Axial / < .08 D Radial	325	7	0.0014	0.0020	0.0027	0.0041	0.0054	0.0068	0.0081	0.0109	
Martensitic 403, 410, 416		High Speed Profiling @ Full Length Axial / < .1 D Radial	500	7	0.0013	0.0019	0.0025	0.0038	0.0050	0.0063	0.0076	0.0101	
		Profiling @ Full Length Axial / < .08 D Radial	375	7	0.0014	0.0022	0.0029	0.0043	0.0058	0.0072	0.0086	0.0116	
HIGH TEMP ALLOYS		ISO-S											
Cobalt Base Stellite, Haynes 25, 188, X-40		High Speed Profiling @ Full Length Axial / < .1 D Radial	175	7	0.0003	0.0004	0.0005	0.0008	0.0011	0.0014	0.0016	0.0022	
		Profiling @ Full Length Axial / < .08 D Radial	150	7	0.0003	0.0005	0.0007	0.0007	0.0013	0.0016	0.0020	0.0026	
Nickel Base -Inconel 600, 625, 718, Nickel 200 Monel 400, 405, K-Monel, Inconel 600		High Speed Profiling @ Full Length Axial / < .1 D Radial	160	7	0.0004	0.0005	0.0007	0.0010	0.0017	0.0016	0.0026	0.0026	
		Profiling @ Full Length Axial / < .08 D Radial	145	7	0.0004	0.0005	0.0007	0.0011	0.0018	0.0018	0.0022	0.0022	
Iron Base Incoloy 800-802, Multimet N-155		High Speed Profiling @ Full Length Axial / < .1 D Radial	155	7	0.0004	0.0005	0.0008	0.0013	0.0017	0.0021	0.0025	0.0033	
		Profiling @ Full Length Axial / < .08 D Radial	130	7	0.0004	0.0006	0.0009	0.0014	0.0019	0.0023	0.0028	0.0038	
STEELS		ISO-P											
High Strength Steels 4140, 4340, 52100		High Speed Profiling @ Full Length Axial / < .1 D Radial	500	7	0.0013	0.0019	0.0025	0.0038	0.0050	0.0063	0.0076	0.0101	
		Profiling @ Full Length Axial / < .08 D Radial	375	7	0.0014	0.0023	0.0029	0.0043	0.0058	0.0072	0.0086	0.0116	
High Alloy Steels - Mold & Die A-2, P20, 01, 02, D2, H-13		High Speed Profiling @ Full Length Axial / < .1 D Radial	475	7	0.0011	0.0016	0.0022	0.0032	0.0042	0.0053	0.0064	0.0086	
		Profiling @ Full Length Axial / < .08 D Radial	350	7	0.0013	0.0018	0.0024	0.0037	0.0049	0.0061	0.0073	0.0098	
Medium Alloy Steels 200, 250, 300		High Speed Profiling @ Full Length Axial / < .1 D Radial	425	7	0.0013	0.0019	0.0025	0.0038	0.0050	0.0063	0.0076	0.0101	
		Profiling @ Full Length Axial / < .08 D Radial	375	7	0.0014	0.0023	0.0029	0.0043	0.0058	0.0072	0.0086	0.0116	
Low Alloy Steels-Maraging 10XX, 11XX, 13XX		High Speed Profiling @ Full Length Axial / < .1 D Radial	525	7	0.0014	0.0023	0.0028	0.0041	0.0055	0.0069	0.0083	0.0111	
		Profiling @ Full Length Axial / < .08 D Radial	400	7	0.0016	0.0024	0.0032	0.0057	0.0063	0.0079	0.0095	0.0127	
CAST IRONS		ISO-K											
Ductile Iron Ductile Cast Iron		High Speed Profiling @ Full Length Axial / < .1 D Radial	475	7	0.0010	0.0014	0.0020	0.0030	0.0040	0.0050	0.0059	0.0079	
		Profiling @ Full Length Axial / < .08 D Radial	350	7	0.0012	0.0015	0.0023	0.0034	0.0045	0.0057	0.0068	0.0091	
Cast Iron Grey Cast Iron		High Speed Profiling @ Full Length Axial / < .1 D Radial	500	7	0.0012	0.0018	0.0023	0.0035	0.0048	0.0059	0.0071	0.0095	
		Profiling @ Full Length Axial / < .08 D Radial	375	7	0.0014	0.0022	0.0027	0.0041	0.0054	0.0068	0.0081	0.0109	
TITANIUM		ISO-S											
Titanium Alloys 6AL-4V, ASTM 1, 2, 3, 6AL-2S		High Speed Profiling @ Full Length Axial / < .1 D Radial	425	7	0.0011	0.0016	0.0022	0.0032	0.0043	0.0054	0.0065	0.0086	
		Profiling @ Full Length Axial / < .08 D Radial	300	7	0.0011	0.0016	0.0021	0.0032	0.0041	0.0052	0.0062	0.0083	
For 5553, decrease SFM and IPM by 25%													

For 5553, decrease SFM and IPM by 25%

MATERIAL		CONDITION	M/MIN	FL	CUTTING DIAMETER - METRIC							
			M/MIN		3MM	4.5MM	6MM	10MM	12MM	16MM	20MM	25MM
STAINLESS STEELS		ISO-M	CHIP PER TOOTH									
Precipitation 13-8, 15-5, 17-4PH		High Speed Profiling @ Full Length Axial / < .1 D Radial	137	7	0.0305	0.0432	0.0584	0.0889	0.1194	0.1499	0.1778	0.2388
		Profiling @ Full Length Axial / < .08 D Radial	99	7	0.0305	0.0406	0.0584	0.0864	0.1143	0.1448	0.1727	0.2311
Austenitic 302, 303, 304L, 316L		High Speed Profiling @ Full Length Axial / < .1 D Radial	145	7	0.0356	0.0483	0.0711	0.1067	0.1448	0.1778	0.2159	0.2870
		Profiling @ Full Length Axial / < .08 D Radial	99	7	0.0356	0.0508	0.0686	0.1041	0.1372	0.1727	0.2057	0.2769
Martensitic 403, 410, 416		High Speed Profiling @ Full Length Axial / < .1 D Radial	152	7	0.0330	0.0483	0.0635	0.0965	0.1270	0.1600	0.1930	0.2565
		Profiling @ Full Length Axial / < .08 D Radial	114	7	0.0356	0.0559	0.0737	0.1092	0.1473	0.1829	0.2184	0.2946
HIGH TEMP ALLOYS		ISO-S										
Cobalt Base Stellite, Haynes 25, 188, X-40		High Speed Profiling @ Full Length Axial / < .1 D Radial	53	7	0.0076	0.0102	0.0127	0.0203	0.0279	0.0356	0.0406	0.0559
		Profiling @ Full Length Axial / < .08 D Radial	46	7	0.0076	0.0127	0.0178	0.0178	0.0330	0.0406	0.0508	0.0660
Nickel Base -Inconel 600, 625, 718, Nickel 200 Monel 400, 405, K-Monel, Inconel 600		High Speed Profiling @ Full Length Axial / < .1 D Radial	49	7	0.0102	0.0127	0.0178	0.0254	0.0432	0.0406	0.0660	0.0660
		Profiling @ Full Length Axial / < .08 D Radial	44	7	0.0102	0.0127	0.0178	0.0279	0.0457	0.0457	0.0559	0.0559
Iron Base Incoloy 800-802, Multimet N-155		High Speed Profiling @ Full Length Axial / < .1 D Radial	47	7	0.0102	0.0127	0.0203	0.0330	0.0432	0.0533	0.0635	0.0838
		Profiling @ Full Length Axial / < .08 D Radial	40	7	0.0102	0.0152	0.0229	0.0356	0.0483	0.0584	0.0711	0.0965
STEELS		ISO-P										
High Strength Steels 4140, 4340, 52100		High Speed Profiling @ Full Length Axial / < .1 D Radial	152	7	0.0330	0.0483	0.0635	0.0965	0.1270	0.1600	0.1930	0.2565
		Profiling @ Full Length Axial / < .08 D Radial	114	7	0.0356	0.0584	0.0737	0.1092	0.1473	0.1829	0.2184	0.2946
High Alloy Steels - Mold & Die A-2, P20, 01, 02, D2, H-13		High Speed Profiling @ Full Length Axial / < .1 D Radial	145	7	0.0279	0.0406	0.0559	0.0813	0.1067	0.1346	0.1626	0.2184
		Profiling @ Full Length Axial / < .08 D Radial	107	7	0.0330	0.0457	0.0610	0.0940	0.1245	0.1549	0.1854	0.2489
Medium Alloy Steels 200, 250, 300		High Speed Profiling @ Full Length Axial / < .1 D Radial	130	7	0.0330	0.0483	0.0635	0.0965	0.1270	0.1600	0.1930	0.2565
		Profiling @ Full Length Axial / < .08 D Radial	114	7	0.0356	0.0584	0.0737	0.1092	0.1473	0.1829	0.2184	0.2946
Low Alloy Steels-Maraging 10XX, 11XX, 13XX		High Speed Profiling @ Full Length Axial / < .1 D Radial	160	7	0.0356	0.0584	0.0711	0.1041	0.1397	0.1753	0.2108	0.2819
		Profiling @ Full Length Axial / < .08 D Radial	122	7	0.0406	0.0610	0.0813	0.1448	0.1600	0.2007	0.2413	0.3226
CAST IRONS		ISO-K										
Ductile Iron Ductile Cast Iron		High Speed Profiling @ Full Length Axial / < .1 D Radial	145	7	0.0254	0.0356	0.0508	0.0762	0.1016	0.1270	0.1499	0.2007
		Profiling @ Full Length Axial / < .08 D Radial	107	7	0.0305	0.0381	0.0584	0.0864	0.1143	0.1448	0.1727	0.2311
Cast Iron Grey Cast Iron		High Speed Profiling @ Full Length Axial / < .1 D Radial	152	7	0.0305	0.0457	0.0584	0.0889	0.1219	0.1499	0.1803	0.2413
		Profiling @ Full Length Axial / < .08 D Radial	114	7	0.0356	0.0559	0.0686	0.1041	0.1372	0.1727	0.2057	0.2769
TITANIUM		ISO-S										
Titanium Alloys 6AL-4V, ASTM 1, 2, 3, 6AL-2S		High Speed Profiling @ Full Length Axial / < .1 D Radial	130	7	0.0279	0.0406	0.0559	0.0813	0.1092	0.1372	0.1651	0.2184
		Profiling @ Full Length Axial / < .08 D Radial	91	7	0.0279	0.0406	0.0533	0.0813	0.1041	0.1321	0.1575	0.2108
For 5553, decrease SFM and IPM by 25%												

For 5553, decrease SFM and IPM by 25%

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

MATERIAL		CONDITION	SFM	FL	CUTTING DIAMETER					
					1/4"	3/8"	1/2"	5/8"	3/4"	1"
STAINLESS STEELS		ISO-M	CHIP PER TOOTH							
Precipitation		High Speed Profiling @ 1.5 x D Axial / < .025 D Radial	450	9	0.0023	0.0035	0.0047	0.0059	0.0070	0.0094
13-8, 15-5, 17-4PH		Profiling @ Full Length Axial / < .015 D Radial	325	9	0.0023	0.0034	0.0045	0.0057	0.0068	0.0091
Austenitic		High Speed Profiling @ 1.5 x D Axial / < .025 D Radial	475	9	0.0028	0.0042	0.0057	0.0070	0.0085	0.0113
302, 303, 304L, 316L		Profiling @ Full Length Axial / < .015 D Radial	350	9	0.0027	0.0041	0.0054	0.0068	0.0081	0.0109
Martensitic		High Speed Profiling @ 1.5 x D Axial / < .025 D Radial	500	9	0.0025	0.0038	0.0050	0.0063	0.0076	0.0101
403, 410, 416		Profiling @ Full Length Axial / < .015 D Radial	375	9	0.0029	0.0043	0.0058	0.0072	0.0086	0.0116
HIGH TEMP ALLOYS		ISO-S								
Cobalt Base		High Speed Profiling @ .5 D Axial / < .02 D Radial	175	9	0.0005	0.0008	0.0011	0.0014	0.0016	0.0022
Stellite, Haynes 25, 188, X-40		Profiling @ Full Length Axial / < .01 D Radial	150	9	0.0007	0.0007	0.0013	0.0016	0.0020	0.0026
Nickel Base - Inconel 600, 625, 718, Nickel 200		High Speed Profiling @ .5 D Axial / < .02 D Radial	160	9	0.0007	0.0010	0.0017	0.0016	0.0026	0.0026
Monel 400, 405, K-Monel, Inconel 600		Profiling @ Full Length Axial / < .01 D Radial	145	9	0.0007	0.0011	0.0018	0.0018	0.0022	0.0022
Iron Base		High Speed Profiling @ .5 D Axial / < .02 D Radial	155	9	0.0008	0.0013	0.0017	0.0021	0.0025	0.0033
Incoloy 800-802, Multimet N-155		Profiling @ Full Length Axial / < .01 D Radial	130	9	0.0009	0.0014	0.0019	0.0023	0.0028	0.0038
STEELS		ISO-P								
High Strength Steels		High Speed Profiling @ 1 x D Axial / < .025 D Radial	500	9	0.0025	0.0038	0.0050	0.0063	0.0076	0.0101
4140, 4340, 52100		Profiling @ Full Length Axial / < .015 D Radial	375	9	0.0029	0.0043	0.0058	0.0072	0.0086	0.0116
High Alloy Steels - Mold & Die		High Speed Profiling @ 1 x D Axial / < .025 D Radial	475	9	0.0022	0.0032	0.0042	0.0053	0.0064	0.0086
A-2, P20, 01, 02, D2, H-13		Profiling @ Full Length Axial / < .015 D Radial	350	9	0.0024	0.0037	0.0049	0.0061	0.0073	0.0098
Medium Alloy Steels		High Speed Profiling @ Full Length Axial / < .025 D Radial	425	9	0.0025	0.0038	0.0050	0.0063	0.0076	0.0101
200, 250, 300		Profiling @ Full Length Axial / < .015 D Radial	375	9	0.0029	0.0043	0.0058	0.0072	0.0086	0.0116
Low Alloy Steels-Maraging		High Speed Profiling @ Full Length Axial / < .025 D Radial	525	9	0.0028	0.0041	0.0055	0.0069	0.0083	0.0111
10XX, 11XX, 13XX		Profiling @ Full Length Axial / < .015 D Radial	400	9	0.0032	0.0057	0.0063	0.0079	0.0095	0.0127
CAST IRONS		ISO-K								
Ductile Iron		High Speed Profiling @ Full Length Axial / < .025 D Radial	475	9	0.0020	0.0030	0.0040	0.0050	0.0059	0.0079
Ductile Cast Iron		Profiling @ Full Length Axial / < .015 D Radial	350	9	0.0023	0.0034	0.0045	0.0057	0.0068	0.0091
Cast Iron		High Speed Profiling @ Full Length Axial / < .025 D Radial	500	9	0.0023	0.0035	0.0048	0.0059	0.0071	0.0095
Grey Cast Iron		Profiling @ Full Length Axial / < .015 D Radial	375	9	0.0027	0.0041	0.0054	0.0068	0.0081	0.0109
TITANIUM		ISO-S								
Titanium Alloys		High Speed Profiling @ 1.5 x D Axial / < .025 D Radial	425	9	0.0022	0.0032	0.0043	0.0054	0.0065	0.0086
6AL-4V, ASTM 1, 2, 3, 6AL-2S		Profiling @ Full Length Axial / < .015 D Radial	300	9	0.0021	0.0032	0.0041	0.0052	0.0062	0.0083
For 5553, decrease SFM and IPM by 25%										

For 5553, decrease SFM and IPM by 25%

MATERIAL		CONDITION	M/MIN	FL	CUTTING DIAMETER - METRIC					
					6MM	10MM	12MM	16MM	20MM	25MM
STAINLESS STEELS		ISO-M	CHIP PER TOOTH							
Precipitation 13-8, 15-5, 17-4PH		High Speed Profiling @ 1.5 x D Axial / < .025 D Radial	137	9	0.0584	0.0889	0.1194	0.1499	0.1778	0.2388
		Profiling @ Full Length Axial / < .015 D Radial	99	9	0.0584	0.0864	0.1143	0.1448	0.1727	0.2311
Austenitic 302, 303, 304L, 316L		High Speed Profiling @ 1.5 x D Axial / < .025 D Radial	145	9	0.0711	0.1067	0.1448	0.1778	0.2159	0.2870
		Profiling @ Full Length Axial / < .015 D Radial	107	9	0.0686	0.1041	0.1372	0.1727	0.2057	0.2769
Martensitic 403, 410, 416		High Speed Profiling @ 1.5 x D Axial / < .025 D Radial	152	9	0.0635	0.0965	0.1270	0.1600	0.1930	0.2565
		Profiling @ Full Length Axial / < .015 D Radial	114	9	0.0737	0.1092	0.1473	0.1829	0.2184	0.2946
HIGH TEMP ALLOYS		ISO-S								
Cobalt Base Stellite, Haynes 25, 188, X-40		High Speed Profiling @ .5 D Axial / < .02 D Radial	53	9	0.0127	0.0203	0.0279	0.0356	0.0406	0.0559
		Profiling @ Full Length Axial / < .01 D Radial	46	9	0.0178	0.0178	0.0330	0.0406	0.0508	0.0660
Nickel Base - Inconel 600, 625, 718, Nickel 200 Monel 400, 405, K-Monel, Inconel 600		High Speed Profiling @ .5 D Axial / < .02 D Radial	49	9	0.0178	0.0254	0.0432	0.0406	0.0660	0.0660
		Profiling @ Full Length Axial / < .01 D Radial	44	9	0.0178	0.0279	0.0457	0.0457	0.0559	0.0559
Iron Base Incoloy 800-802, Multimet N-155		High Speed Profiling @ .5 D Axial / < .02 D Radial	47	9	0.0203	0.0330	0.0432	0.0533	0.0635	0.0838
		Profiling @ Full Length Axial / < .01 D Radial	40	9	0.0229	0.0356	0.0483	0.0584	0.0711	0.0965
STEELS		ISO-P								
High Strength Steels 4140, 4340, 52100		High Speed Profiling @ 1 x D Axial / < .025 D Radial	152	9	0.0635	0.0965	0.1270	0.1600	0.1930	0.2565
		Profiling @ Full Length Axial / < .015 D Radial	114	9	0.0737	0.1092	0.1473	0.1829	0.2184	0.2946
High Alloy Steels - Mold & Die A-2, P20, 01, 02, D2, H-13		High Speed Profiling @ 1 x D Axial / < .025 D Radial	145	9	0.0559	0.0813	0.1067	0.1346	0.1626	0.2184
		Profiling @ Full Length Axial / < .015 D Radial	107	9	0.0610	0.0940	0.1245	0.1549	0.1854	0.2489
Medium Alloy Steels 200, 250, 300		High Speed Profiling @ Full Length Axial / < .025 D Radial	130	9	0.0635	0.0965	0.1270	0.1600	0.1930	0.2565
		Profiling @ Full Length Axial / < .015 D Radial	114	9	0.0737	0.1092	0.1473	0.1829	0.2184	0.2946
Low Alloy Steels-Maraging 10XX, 11XX, 13XX		High Speed Profiling @ Full Length Axial / < .025 D Radial	160	9	0.0711	0.1041	0.1397	0.1753	0.2108	0.2819
		Profiling @ Full Length Axial / < .015 D Radial	122	9	0.0813	0.1448	0.1600	0.2007	0.2413	0.3226
CAST IRONS		ISO-K								
Ductile Iron Ductile Cast Iron		High Speed Profiling @ Full Length Axial / < .025 D Radial	145	9	0.0508	0.0762	0.1016	0.1270	0.1499	0.2007
		Profiling @ Full Length Axial / < .015 D Radial	107	9	0.0584	0.0864	0.1143	0.1448	0.1727	0.2311
Cast Iron Grey Cast Iron		High Speed Profiling @ Full Length Axial / < .025 D Radial	152	9	0.0584	0.0889	0.1219	0.1499	0.1803	0.2413
		Profiling @ Full Length Axial / < .015 D Radial	114	9	0.0686	0.1041	0.1372	0.1727	0.2057	0.2769
TITANIUM		ISO-S								
Titanium Alloys 6AL-4V, ASTM 1, 2, 3, 6AL-2S		High Speed Profiling @ 1.5 x D Axial / < .025 D Radial	130	9	0.0559	0.0813	0.1092	0.1372	0.1651	0.2184
		Profiling @ Full Length Axial / < .015 D Radial	91	9	0.0533	0.0813	0.1041	0.1321	0.1575	0.2108

For 5553, decrease SFM and IPM by 25%

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

SPEED & FEED INFORMATION

SERIES: VHMGM

[BACK TO SERIES](#)

MATERIAL		CONDITION	STARTING SFM	CUTTING DIAMETER							
				1/8"	3/16"	1/4"	3/8"	1/2"	5/8"	3/4"	1"
STAINLESS STEELS		ISO-M	CHIP PER TOOTH								
Precipitation 13-8, 15-5, 17-4PH	Slotting @ ≤ .5 x D	250	0.0004	0.0006	0.0008	0.0011	0.0015	0.0019	0.0023	0.0030	
	Profiling @ 2 x D Axial / ≤ .3 D Radial	325	0.0005	0.0008	0.0011	0.0015	0.0020	0.0026	0.0031	0.0041	
Austenitic 302, 303, 304L, 316L	Slotting @ ≤ .5 x D	275	0.0005	0.0007	0.0009	0.0014	0.0018	0.0023	0.0027	0.0036	
	Profiling @ 2 x D Axial / ≤ .3 D Radial	350	0.0006	0.0009	0.0012	0.0019	0.0025	0.0031	0.0037	0.0049	
Martensitic 403, 410, 416	Slotting @ ≤ .5 x D	300	0.0005	0.0008	0.0010	0.0014	0.0020	0.0024	0.0029	0.0038	
	Profiling @ 2 x D Axial / ≤ .3 D Radial	375	0.0007	0.0011	0.0013	0.0020	0.0026	0.0033	0.0039	0.0053	
HIGH TEMP ALLOYS		ISO-S									
Cobalt Base Stellite, Haynes 25, 188, X-40, L-605	Slotting @ .5 x D	110	0.0002	0.0003	0.0004	0.0006	0.0008	0.0011	0.0012	0.0017	
	Profiling @ 2 x D Axial / ≤ .3 D Radial	150	0.0002	0.0003	0.0005	0.0005	0.0010	0.0012	0.0015	0.0020	
Nickel Base Inconel 600, 625, 718, Nickel 200, 270, Invar, Monel 400, 405, K-Monel, PermaNickel 300, Inconel 600	Slotting @ .5 x D	75	0.0003	0.0002	0.0005	0.0008	0.0013	0.0012	0.0020	0.0020	
	Profiling @ 2 x D Axial / ≤ .3 D Radial	115	0.0003	0.0003	0.0005	0.0008	0.0014	0.0014	0.0017	0.0017	
Iron Base Incoloy 800-802, Multimet N-155, Timken 16-26-6	Slotting @ ≤ .5 x D	95	0.0003	0.0004	0.0007	0.0011	0.0014	0.0017	0.0021	0.0028	
	Profiling @ 2 x D Axial / ≤ .3 D Radial	130	0.0003	0.0004	0.0008	0.0012	0.0016	0.0020	0.0023	0.0032	
STEELS		ISO-P									
High Strength Steels 4140, 4340, 52100	Slotting @ ≤ .5 x D	300	0.0005	0.0007	0.0010	0.0014	0.0020	0.0024	0.0029	0.0038	
	Profiling @ 2 x D Axial / ≤ .3 D Radial	375	0.0007	0.0010	0.0013	0.0020	0.0026	0.0033	0.0039	0.0053	
High Alloy Steels - Mold & Die A-2, P20, 01, 02, D2, H-13	Slotting @ ≤ .5 x D	275	0.0004	0.0006	0.0008	0.0012	0.0017	0.0020	0.0024	0.0032	
	Profiling @ 2 x D Axial / ≤ .3 D Radial	350	0.0005	0.0008	0.0011	0.0017	0.0022	0.0028	0.0033	0.0044	
Medium Alloy Steels 200, 250, 300	Slotting @ ≤ .5 x D	325	0.0004	0.0004	0.0009	0.0015	0.0019	0.0026	0.0030	0.0038	
	Profiling @ 2 x D Axial / ≤ .3 D Radial	400	0.0004	0.0004	0.0011	0.0018	0.0023	0.0030	0.0038	0.0045	
Low Alloy Steels-Maraging 10XX, 11XX, 13XX	Slotting @ ≤ .5 x D	325	0.0005	0.0008	0.0011	0.0016	0.0021	0.0026	0.0032	0.0042	
	Profiling @ 2 x D Axial / ≤ .3 D Radial	400	0.0008	0.0011	0.0014	0.0022	0.0029	0.0036	0.0043	0.0057	
CAST IRONS		ISO-K									
Ductile Iron Ductile Cast Iron	Slotting @ ≤ .5 x D	400	0.0004	0.0006	0.0008	0.0011	0.0015	0.0019	0.0023	0.0030	
	Profiling @ 2 x D Axial / ≤ .3 D Radial	550	0.0005	0.0008	0.0011	0.0015	0.0020	0.0026	0.0031	0.0041	
Cast Iron Grey Cast Iron	Slotting @ ≤ .5 x D	450	0.0005	0.0008	0.0009	0.0014	0.0018	0.0023	0.0027	0.0036	
	Profiling @ 2 x D Axial / ≤ .3 D Radial	600	0.0006	0.0009	0.0012	0.0019	0.0025	0.0031	0.0037	0.0049	
TITANIUM		ISO-S									
Titanium Alloys 6AL-4V, ASTM 1, 2, 3, 6AL-2S For 5553, decrease SFM and IPM by 25%	Slotting @ ≤ .5 x D	175	0.0004	0.0005	0.0007	0.0011	0.0014	0.0017	0.0021	0.0028	
	Profiling @ 2 x D Axial / ≤ .3 D Radial	275	0.0005	0.0008	0.0010	0.0014	0.0019	0.0023	0.0029	0.0038	

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

MATERIAL		CONDITION	STARTING M/MIN	CUTTING DIAMETER - METRIC							
				4mm	6mm	8mm	10mm	12mm	16mm	20mm	25mm
STAINLESS STEELS		ISO-M	CHIP PER TOOTH								
Precipitation 13-8, 15-5, 17-4PH	Slotting @ ≤ .5 x D	75	0.0102	0.0191	0.0229	0.0286	0.0381	0.0476	0.0572	0.0762	
	Profiling @ 2 x D Axial / ≤ .3 D Radial	99	0.0127	0.0267	0.0330	0.0381	0.0514	0.0648	0.0781	0.1048	
Austenitic 302, 303, 304L, 316L	Slotting @ ≤ .5 x D	84	0.0114	0.0229	0.0279	0.0343	0.0457	0.0572	0.0686	0.0914	
	Profiling @ 2 x D Axial / ≤ .3 D Radial	107	0.0152	0.0305	0.0381	0.0476	0.0629	0.0781	0.0933	0.1238	
Martensitic 403, 410, 416	Slotting @ ≤ .5 x D	91	0.0114	0.0248	0.0305	0.0362	0.0495	0.0610	0.0724	0.0972	
	Profiling @ 2 x D Axial / ≤ .3 D Radial	114	0.0171	0.0324	0.0406	0.0495	0.0667	0.0838	0.0991	0.1334	
HIGH TEMP ALLOYS		ISO-S									
Cobalt Base Stellite, Haynes 25, 188, X-40, L-605	Slotting @ .5 x D	34	0.0057	0.0095	0.0102	0.0152	0.0210	0.0267	0.0305	0.0419	
	Profiling @ 2 x D Axial / ≤ .3 D Radial	46	0.0057	0.0133	0.0127	0.0133	0.0248	0.0305	0.0381	0.0495	
Nickel Base Inconel 600, 625, 718, Nickel 200, 270, Invar, Monel 400, 405, K-Monel, PermaNickel 300, Inconel 600	Slotting @ .5 x D	23	0.0076	0.0133	0.0152	0.0191	0.0324	0.0305	0.0495	0.0495	
	Profiling @ 2 x D Axial / ≤ .3 D Radial	35	0.0076	0.0133	0.0178	0.0210	0.0343	0.0343	0.0419	0.0419	
Iron Base Incoloy 800-802, Multimet N-155, Timken 16-26-6	Slotting @ ≤ .5 x D	29	0.0076	0.0171	0.0229	0.0267	0.0362	0.0438	0.0533	0.0705	
	Profiling @ 2 x D Axial / ≤ .3 D Radial	40	0.0076	0.0191	0.0254	0.0305	0.0400	0.0495	0.0591	0.0800	
STEELS		ISO-P									
High Strength Steels 4140, 4340, 52100	Slotting @ ≤ .5 x D	91	0.0114	0.0248	0.0305	0.0362	0.0495	0.0610	0.0724	0.0972	
	Profiling @ 2 x D Axial / ≤ .3 D Radial	114	0.0171	0.0324	0.0406	0.0495	0.0667	0.0838	0.0991	0.1334	
High Alloy Steels - Mold & Die A-2, P20, 01, 02, D2, H-13	Slotting @ ≤ .5 x D	84	0.0095	0.0210	0.0254	0.0305	0.0419	0.0514	0.0610	0.0819	
	Profiling @ 2 x D Axial / ≤ .3 D Radial	107	0.0133	0.0286	0.0356	0.0419	0.0552	0.0705	0.0838	0.1124	
Medium Alloy Steels 200, 250, 300	Slotting @ ≤ .5 x D	99	0.0095	0.0229	0.0330	0.0381	0.0476	0.0667	0.0762	0.0953	
	Profiling @ 2 x D Axial / ≤ .3 D Radial	122	0.0095	0.0286	0.0381	0.0457	0.0572	0.0762	0.0953	0.1143	
Low Alloy Steels-Maraging 10XX, 11XX, 13XX	Slotting @ ≤ .5 x D	99	0.0133	0.0267	0.0330	0.0400	0.0533	0.0667	0.0800	0.1067	
	Profiling @ 2 x D Axial / ≤ .3 D Radial	122	0.0191	0.0362	0.0432	0.0552	0.0724	0.0914	0.1086	0.1448	
CAST IRONS		ISO-K									
Ductile Iron Ductile Cast Iron	Slotting @ ≤ .5 x D	122	0.0095	0.0191	0.0229	0.0286	0.0381	0.0476	0.0572	0.0762	
	Profiling @ 2 x D Axial / ≤ .3 D Radial	168	0.0133	0.0267	0.0330	0.0381	0.0514	0.0648	0.0781	0.1048	
Cast Iron Grey Cast Iron	Slotting @ ≤ .5 x D	140	0.0114	0.0229	0.0279	0.0343	0.0457	0.0572	0.0686	0.0914	
	Profiling @ 2 x D Axial / ≤ .3 D Radial	183	0.0152	0.0305	0.0406	0.0476	0.0629	0.0781	0.0933	0.1238	
TITANIUM		ISO-S									
Titanium Alloys 6AL-4V, ASTM 1, 2, 3, 6AL-2S For 5553, decrease SFM and IPM by 25%	Slotting @ ≤ .5 x D	53	0.0095	0.0171	0.0229	0.0267	0.0343	0.0438	0.0533	0.0705	
	Profiling @ 2 x D Axial / ≤ .3 D Radial	84	0.0114	0.0248	0.0305	0.0362	0.0476	0.0591	0.0724	0.0953	

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

SPEED & FEED INFORMATION

SERIES: GVHMG

[BACK TO SERIES](#)

MATERIAL		CONDITION	STARTING	CUTTING DIAMETER							
			SFM	1/8"	3/16"	1/4"	3/8"	1/2"	5/8"	3/4"	1"
STAINLESS STEELS		ISO-M	CHIP PER TOOTH								
Precipitation 13-8, 15-5, 17-4PH	Slotting @ ≤ .5 x D	250	0.0004	0.0006	0.0008	0.0011	0.0015	0.0019	0.0023	0.0030	
	Profiling @ 2 x D Axial / ≤ .2 D Radial	325	0.0005	0.0008	0.0011	0.0015	0.0020	0.0026	0.0031	0.0041	
Austenitic 302, 303, 304L, 316L	Slotting @ ≤ .5 x D	275	0.0005	0.0007	0.0009	0.0014	0.0018	0.0023	0.0027	0.0036	
	Profiling @ 2 x D Axial / ≤ .2 D Radial	350	0.0006	0.0009	0.0012	0.0019	0.0025	0.0031	0.0037	0.0049	
Martensitic 403, 410, 416	Slotting @ ≤ .5 x D	300	0.0005	0.0008	0.0010	0.0014	0.0020	0.0024	0.0029	0.0038	
	Profiling @ 2 x D Axial / ≤ .2 D Radial	375	0.0007	0.0011	0.0013	0.0020	0.0026	0.0033	0.0039	0.0053	
HIGH TEMP ALLOYS		ISO-S									
Cobalt Base Stellite, Haynes 25, 188, X-40, L-605	Slotting @ .5 x D	110	0.0002	0.0003	0.0004	0.0006	0.0008	0.0011	0.0012	0.0017	
	Profiling @ 2 x D Axial / ≤ .2 D Radial	150	0.0002	0.0003	0.0005	0.0005	0.0010	0.0012	0.0015	0.0020	
Nickel Base Inconel 600, 625, 718, Nickel 200, 270, Invar, Monel 400, 405, K-Monel, PermaNickel 300, Inconel 600	Slotting @ .5 x D	75	0.0003	0.0002	0.0005	0.0008	0.0013	0.0012	0.0020	0.0020	
	Profiling @ 2 x D Axial / ≤ .2 D Radial	115	0.0003	0.0003	0.0005	0.0008	0.0014	0.0014	0.0017	0.0017	
Iron Base Incoloy 800-802, Multimet N-155, Timken 16-26-6	Slotting @ ≤ .5 x D	95	0.0003	0.0004	0.0007	0.0011	0.0014	0.0017	0.0021	0.0028	
	Profiling @ 2 x D Axial / ≤ .2 D Radial	130	0.0003	0.0004	0.0008	0.0012	0.0016	0.0020	0.0023	0.0032	
STEELS		ISO-P									
High Strength Steels 4140, 4340, 52100	Slotting @ ≤ .5 x D	300	0.0005	0.0007	0.0010	0.0014	0.0020	0.0024	0.0029	0.0038	
	Profiling @ 2 x D Axial / ≤ .2 D Radial	375	0.0007	0.0010	0.0013	0.0020	0.0026	0.0033	0.0039	0.0053	
High Alloy Steels - Mold & Die A-2, P20, 01, 02, D2, H-13	Slotting @ ≤ .5 x D	275	0.0004	0.0006	0.0008	0.0012	0.0017	0.0020	0.0024	0.0032	
	Profiling @ 2 x D Axial / ≤ .2 D Radial	350	0.0005	0.0008	0.0011	0.0017	0.0022	0.0028	0.0033	0.0044	
Medium Alloy Steels 200, 250, 300	Slotting @ ≤ .5 x D	325	0.0004	0.0004	0.0009	0.0015	0.0019	0.0026	0.0030	0.0038	
	Profiling @ 2 x D Axial / ≤ .2 D Radial	400	0.0004	0.0004	0.0011	0.0018	0.0023	0.0030	0.0038	0.0045	
Low Alloy Steels-Maraging 10XX, 11XX, 13XX	Slotting @ ≤ .5 x D	325	0.0005	0.0008	0.0011	0.0016	0.0021	0.0026	0.0032	0.0042	
	Profiling @ 2 x D Axial / ≤ .2 D Radial	400	0.0008	0.0011	0.0014	0.0022	0.0029	0.0036	0.0043	0.0057	
CAST IRONS		ISO-K									
Ductile Iron Ductile Cast Iron	Slotting @ ≤ .5 x D	400	0.0004	0.0006	0.0008	0.0011	0.0015	0.0019	0.0023	0.0030	
	Profiling @ 2 x D Axial / ≤ .2 D Radial	550	0.0005	0.0008	0.0011	0.0015	0.0020	0.0026	0.0031	0.0041	
Cast Iron Grey Cast Iron	Slotting @ ≤ .5 x D	450	0.0005	0.0008	0.0009	0.0014	0.0018	0.0023	0.0027	0.0036	
	Profiling @ 2 x D Axial / ≤ .2 D Radial	600	0.0006	0.0009	0.0012	0.0019	0.0025	0.0031	0.0037	0.0049	
TITANIUM		ISO-S									
Titanium Alloys 6AL-4V, ASTM 1, 2, 3, 6AL-2S For 5553, decrease SFM and IPM by 25%	Slotting @ ≤ .5 x D	175	0.0004	0.0005	0.0007	0.0011	0.0014	0.0017	0.0021	0.0028	
	Profiling @ 2 x D Axial / ≤ .2 D Radial	275	0.0005	0.0008	0.0010	0.0014	0.0019	0.0023	0.0029	0.0038	

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

MATERIAL		CONDITION	SFM	CUTTING DIAMETER							
				3/16"	1/4"	3/8"	1/2"	5/8"	3/4"	1"	
STAINLESS STEELS ISO-M		CHIP PER TOOTH									
Precipitation 13-8, 15-5, 17-4PH	Slotting @ $\leq .5 \times D$	175	0.00063	0.00081	0.00126	0.00171	0.00216	0.00261	0.0035		
	Profiling @ $2 \times D$ Axial / $\leq .5 D$ Radial		0.00090	0.00117	0.00171	0.00234	0.00297	0.00360	0.0048		
Austenitic 302, 303, 304L, 316L	Slotting @ $\leq .5 \times D$	225	0.00072	0.00099	0.00153	0.00207	0.00261	0.00315	0.0042		
	Profiling @ $2 \times D$ Axial / $\leq .5 D$ Radial		0.00099	0.00135	0.00216	0.00288	0.0036	0.00432	0.0057		
Martensitic 403, 410, 416	Slotting @ $\leq .5 \times D$	200	0.00081	0.00108	0.00162	0.00225	0.00279	0.00333	0.0045		
	Profiling @ $2 \times D$ Axial / $\leq .5 D$ Radial		0.00117	0.00144	0.00225	0.00306	0.00387	0.00459	0.0062		
HIGH TEMP ALLOYS ISO-S											
Cobalt Base Stellite, Haynes 25, 188, X-40, L-605	Slotting @ $\leq .5 \times D$	85	0.00027	0.00036	0.00063	0.0009	0.00117	0.00135	0.0018		
	Profiling @ $2 \times D$ Axial / $\leq .5 D$ Radial		0.00027	0.00054	0.00054	0.00108	0.00135	0.00171	0.0022		
Nickel Base Inconel 600, 625, 718, Nickel 200, 270, Invar, Monel 400, 405, K-Monel, PermaNickel 300, Inconel 600	Slotting @ $\leq .5 \times D$	60	0.00018	0.00054	0.00081	0.00144	0.00135	0.00225	0.0022		
	Profiling @ $2 \times D$ Axial / $\leq .5 D$ Radial		0.00027	0.00054	0.00090	0.00153	0.00153	0.00189	0.0018		
Iron Base Incoloy 800-802, Multimet N-155, Timken 16-26-6	Slotting @ $\leq .5 \times D$	70	0.00036	0.00072	0.00117	0.00162	0.00198	0.00243	0.0032		
	Profiling @ $2 \times D$ Axial / $\leq .5 D$ Radial		0.00036	0.00081	0.00135	0.0018	0.00225	0.00270	0.0036		
STEELS ISO-P											
High Strength Steels 4140, 4340, 52100	Slotting @ $\leq .5 \times D$	225	0.00072	0.00108	0.00162	0.00225	0.00279	0.00333	0.0045		
	Profiling @ $2 \times D$ Axial / $\leq .5 D$ Radial		0.00108	0.00144	0.00225	0.00306	0.00387	0.00459	0.0062		
High Alloy Steels - Mold & Die A-2, P20, 01, 02, D2, H-13	Slotting @ $\leq .5 \times D$	200	0.00063	0.00090	0.00135	0.00189	0.00234	0.00279	0.0037		
	Profiling @ $2 \times D$ Axial / $\leq .5 D$ Radial		0.00090	0.00126	0.00189	0.00252	0.00324	0.00387	0.0052		
Medium Alloy Steels 200, 250, 300	Slotting @ $\leq .5 \times D$	250	0.00036	0.00099	0.00171	0.00216	0.00306	0.00351	0.0044		
	Profiling @ $2 \times D$ Axial / $\leq .5 D$ Radial		0.00036	0.00126	0.00207	0.00261	0.00351	0.00441	0.0053		
Low Alloy Steels-Maraging 10XX, 11XX, 13XX	Slotting @ $\leq .5 \times D$	265	0.00081	0.00117	0.0018	0.00243	0.00306	0.00369	0.0049		
	Profiling @ $2 \times D$ Axial / $\leq .5 D$ Radial		0.00126	0.00162	0.00252	0.00333	0.00423	0.00504	0.0067		

MATERIAL		CONDITION	M/MIN	CUTTING DIAMETER - METRIC								
				6mm	8mm	10mm	12mm	14mm	16mm	16mm	16mm	1"
STAINLESS STEELS		ISO-M	CHIP PER TOOTH									
Precipitation 13-8, 15-5, 17-4PH	Slotting @ $\leq .5 \times D$	53	0.0206	0.0254	0.0330	0.0432	0.0483	0.0549	0.0610	0.0663	0.1016	
	Profiling @ $2 \times D$ Axial / $\leq .5 D$ Radial		0.0297	0.0356	0.0432	0.0584	0.0660	0.0754	0.0838	0.0914	0.1397	
Austenitic 302, 303, 304L, 316L	Slotting @ $\leq .5 \times D$	68	0.0251	0.0305	0.0381	0.0533	0.0610	0.0663	0.0737	0.0800	0.1219	
	Profiling @ $2 \times D$ Axial / $\leq .5 D$ Radial		0.0343	0.0457	0.0559	0.0737	0.0838	0.0914	0.0838	0.1097	0.1651	
Martensitic 403, 410, 416	Slotting @ $\leq .5 \times D$	61	0.0274	0.0330	0.0406	0.0584	0.0660	0.0709	0.0787	0.0846	0.1295	
	Profiling @ $2 \times D$ Axial / $\leq .5 D$ Radial		0.0366	0.0483	0.0584	0.0787	0.0889	0.0983	0.1067	0.1166	0.1778	
HIGH TEMP ALLOYS		ISO-S										
Cobalt Base Stellite, Haynes 25, 188, X-40, L-605	Slotting @ $.5 \times D$	26	0.0091	0.0127	0.0152	0.0229	0.0279	0.0297	0.0330	0.0343	0.0559	
	Profiling @ $2 \times D$ Axial / $\leq .5 D$ Radial		0.0137	0.0127	0.0127	0.0279	0.0330	0.0343	0.0381	0.0434	0.0660	
Nickel Base Inconel 600, 625, 718, Nickel 200, 270, Invar, Monel 400, 405, K-Monel, PermaNickel 300, Inconel 600	Slotting @ $.5 \times D$	18	0.0137	0.0152	0.0203	0.0356	0.0356	0.0343	0.0508	0.0572	0.0660	
	Profiling @ $2 \times D$ Axial / $\leq .5 D$ Radial		0.0137	0.0178	0.0229	0.0381	0.0381	0.0389	0.0432	0.0480	0.0559	
Iron Base Incoloy 800-802, Multimet N-155, Timken 16-26-6	Slotting @ $\leq .5 \times D$	21	0.0183	0.0229	0.0305	0.0406	0.0457	0.0503	0.0559	0.0617	0.0940	
	Profiling @ $2 \times D$ Axial / $\leq .5 D$ Radial		0.0206	0.0279	0.0356	0.0457	0.0508	0.0572	0.0635	0.0686	0.1067	
STEELS		ISO-P										
High Strength Steels 4140, 4340, 52100	Slotting @ $\leq .5 \times D$	68	0.0274	0.0330	0.0406	0.0584	0.0635	0.0709	0.0762	0.0846	0.1295	
	Profiling @ $2 \times D$ Axial / $\leq .5 D$ Radial		0.0366	0.0483	0.0584	0.0787	0.0889	0.0983	0.1067	0.1166	0.1778	
High Alloy Steels - Mold & Die A-2, P20, 01, 02, D2, H-13	Slotting @ $\leq .5 \times D$	61	0.0229	0.0254	0.0356	0.0483	0.0533	0.0594	0.0635	0.0709	0.1092	
	Profiling @ $2 \times D$ Axial / $\leq .5 D$ Radial		0.0320	0.0406	0.0483	0.0635	0.0711	0.0823	0.0914	0.0983	0.1499	
Medium Alloy Steels 200, 250, 300	Slotting @ $\leq .5 \times D$	76	0.0251	0.0330	0.0432	0.0559	0.0660	0.0777	0.0838	0.0892	0.1270	
	Profiling @ $2 \times D$ Axial / $\leq .5 D$ Radial		0.0320	0.0432	0.0533	0.0660	0.0762	0.0892	0.0991	0.1120	0.1524	
Low Alloy Steels-Maraging 10XX, 11XX, 13XX	Slotting @ $\leq .5 \times D$	80	0.0297	0.0381	0.0457	0.0610	0.0711	0.0777	0.0889	0.0937	0.1422	
	Profiling @ $2 \times D$ Axial / $\leq .5 D$ Radial		0.0406	0.0508	0.0635	0.0838	0.0965	0.1074	0.1168	0.1280	0.1930	

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

SPEED & FEED INFORMATION

SERIES: CRFMG

[BACK TO SERIES](#)

MATERIAL		CONDITION	STARTING SFM	1/4"	3/8"	CUTTING DIAMETER 1/2" 5/8" 3/4" 1"				
STAINLESS STEELS		ISO-M	CHIP PER TOOTH							
Precipitation 13-8, 15-5, 17-4PH	Slotting @ $\leq .5 \times D$	175	0.0007	0.0011	0.0014	0.0018	0.0022	0.0029		
	Profiling @ $2 \times D$ Axial / $\leq .35 D$ Radial		0.0010	0.0014	0.0020	0.0025	0.0030	0.0041		
Austenitic 302, 303, 304L, 316L	Slotting @ $\leq .5 \times D$	225	0.0008	0.0013	0.0017	0.0022	0.0026	0.0035		
	Profiling @ $2 \times D$ Axial / $\leq .35 D$ Radial		0.0011	0.0018	0.0024	0.0030	0.0036	0.0048		
Martensitic 403, 410, 416	Slotting @ $\leq .5 \times D$	200	0.0009	0.0014	0.0019	0.0023	0.0028	0.0038		
	Profiling @ $2 \times D$ Axial / $\leq .35 D$ Radial		0.0012	0.0019	0.0026	0.0032	0.0038	0.0052		
HIGH TEMP ALLOYS		ISO-S								
Cobalt Base Stellite, Haynes 25, 188, X-40, L-605	Slotting @ $.5 \times D$	85	0.0003	0.0005	0.0008	0.0010	0.0011	0.0016		
	Profiling @ $2 \times D$ Axial / $\leq .35 D$ Radial		0.0005	0.0005	0.0009	0.0011	0.0014	0.0019		
Nickel Base Inconel 600, 625, 718, Nickel 200, 270, Invar, Monel 400, 405, K-Monel, PermaNickel 300, Inconel 600	Slotting @ $.5 \times D$	60	0.0005	0.0007	0.0012	0.0011	0.0019	0.0019		
	Profiling @ $2 \times D$ Axial / $\leq .35 D$ Radial		0.0005	0.0008	0.0013	0.0013	0.0016	0.0016		
Iron Base Incoloy 800-802, Multimet N-155, Timken 16-26-6	Slotting @ $\leq .5 \times D$	70	0.0006	0.0010	0.0014	0.0017	0.0020	0.0027		
	Profiling @ $2 \times D$ Axial / $\leq .35 D$ Radial		0.0007	0.0011	0.0015	0.0019	0.0023	0.0031		
STEELS		ISO-P								
High Strength Steels 4140, 4340, 52100	Slotting @ $\leq .5 \times D$	225	0.0009	0.0014	0.0019	0.0023	0.0028	0.0038		
	Profiling @ $2 \times D$ Axial / $\leq .35 D$ Radial		0.0012	0.0019	0.0026	0.0032	0.0038	0.0052		
High Alloy Steels - Mold & Die A-2, P20, 01, 02, D2, H-13	Slotting @ $\leq .5 \times D$	200	0.0008	0.0011	0.0016	0.0020	0.0023	0.0032		
	Profiling @ $2 \times D$ Axial / $\leq .35 D$ Radial		0.0011	0.0016	0.0021	0.0027	0.0032	0.0044		
Medium Alloy Steels 200, 250, 300	Slotting @ $\leq .5 \times D$	250	0.0008	0.0014	0.0018	0.0026	0.0029	0.0037		
	Profiling @ $2 \times D$ Axial / $\leq .35 D$ Radial		0.0011	0.0017	0.0022	0.0029	0.0037	0.0044		
Low Alloy Steels-Maraging 10XX, 11XX, 13XX	Slotting @ $\leq .5 \times D$	265	0.0010	0.0015	0.0020	0.0026	0.0031	0.0041		
	Profiling @ $2 \times D$ Axial / $\leq .35 D$ Radial		0.0014	0.0021	0.0028	0.0035	0.0042	0.0056		

MATERIAL		CONDITION	STARTING M/MIN	CUTTING DIAMETER-METRIC						
				6mm	8mm	10mm	12mm	14mm	16mm	20mm
STAINLESS STEELS		ISO-M	CHIP PER TOOTH							
Precipitation 13-8, 15-5, 17-4PH	Slotting @ $\leq .5 \times D$	53	0.0171	0.0229	0.0267	0.0362	0.0406	0.0457	0.0552	
	Profiling @ $2 \times D$ Axial / $\leq .35 D$ Radial		0.0248	0.0305	0.0362	0.0495	0.0584	0.0629	0.0762	
Austenitic 302, 303, 304L, 316L	Slotting @ $\leq .5 \times D$	68	0.0210	0.0254	0.0324	0.0438	0.0508	0.0552	0.0667	
	Profiling @ $2 \times D$ Axial / $\leq .35 D$ Radial		0.0286	0.0356	0.0457	0.0610	0.0686	0.0762	0.0914	
Martensitic 403, 410, 416	Slotting @ $\leq .5 \times D$	61	0.0229	0.0305	0.0343	0.0476	0.0533	0.0591	0.0705	
	Profiling @ $2 \times D$ Axial / $\leq .35 D$ Radial		0.0305	0.0381	0.0476	0.0648	0.0737	0.0819	0.0972	
HIGH TEMP ALLOYS		ISO-S								
Cobalt Base Stellite, Haynes 25, 188, X-40, L-605	Slotting @ $.5 \times D$	26	0.0076	0.0102	0.0133	0.0191	0.0229	0.0248	0.0286	
	Profiling @ $2 \times D$ Axial / $\leq .35 D$ Radial		0.0114	0.0127	0.0114	0.0229	0.0254	0.0286	0.0362	
Nickel Base Inconel 600, 625, 718, Nickel 200, 270, Invar, Monel 400, 405, K-Monel, PermaNickel 300, Inconel 600	Slotting @ $.5 \times D$	18	0.0114	0.0152	0.0171	0.0305	0.0305	0.0286	0.0476	
	Profiling @ $2 \times D$ Axial / $\leq .35 D$ Radial		0.0114	0.0152	0.0191	0.0324	0.0330	0.0324	0.0400	
Iron Base Incoloy 800-802, Multimet N-155, Timken 16-26-6	Slotting @ $\leq .5 \times D$	21	0.0152	0.0203	0.0248	0.0343	0.0381	0.0419	0.0514	
	Profiling @ $2 \times D$ Axial / $\leq .35 D$ Radial		0.0171	0.0229	0.0286	0.0381	0.0432	0.0476	0.0572	
STEELS		ISO-P								
High Strength Steels 4140, 4340, 52100	Slotting @ $\leq .5 \times D$	68	0.0229	0.0305	0.0343	0.0476	0.0533	0.0591	0.0705	
	Profiling @ $2 \times D$ Axial / $\leq .35 D$ Radial		0.0305	0.0381	0.0476	0.0648	0.0737	0.0819	0.0972	
High Alloy Steels - Mold & Die A-2, P20, 01, 02, D2, H-13	Slotting @ $\leq .5 \times D$	61	0.0191	0.0254	0.0286	0.0400	0.0457	0.0495	0.0591	
	Profiling @ $2 \times D$ Axial / $\leq .35 D$ Radial		0.0267	0.0330	0.0400	0.0533	0.0610	0.0686	0.0819	
Medium Alloy Steels 200, 250, 300	Slotting @ $\leq .5 \times D$	76	0.0210	0.0279	0.0362	0.0457	0.0559	0.0648	0.0743	
	Profiling @ $2 \times D$ Axial / $\leq .35 D$ Radial		0.0267	0.0356	0.0438	0.0552	0.0635	0.0743	0.0933	
Low Alloy Steels-Maraging 10XX, 11XX, 13XX	Slotting @ $\leq .5 \times D$	81	0.0248	0.0305	0.0381	0.0514	0.0584	0.0648	0.0781	
	Profiling @ $2 \times D$ Axial / $\leq .35 D$ Radial		0.0343	0.0432	0.0533	0.0705	0.0787	0.0895	0.1067	

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

[BACK TO SERIES](#)

SERIES: HMG1-__-SF-R

MATERIAL	STANDARD	CUTTING DIAMETER								
	MACHINING	1/32"	0.0394"	3/64"	1/16"	5/64"	3/32"	1/8"	3/16"	1/2"
HARDENED STEELS	ISO-H	CHIP PER TOOTH								
Hardenized Steels										
25-35 HRc	375 SFM	0.0004	0.0008	0.0008	0.0009	0.0015	0.0016	0.0019	0.0028	0.0038
Hardenized Steels										
35-45 HRc	300 SFM	0.0004	0.0007	0.0007	0.0008	0.0015	0.0016	0.0019	0.0028	0.0038
Hardenized Steels										
45-55 HRc	275 SFM	0.0003	0.0007	0.0007	0.0007	0.0012	0.0013	0.0015	0.0022	0.0030
Hardenized Steels										
55-65 HRc	250 SFM	0.0003	0.0006	0.0006	0.0006	0.0011	0.0012	0.0014	0.0021	0.0028

STANDARD		CUTTING DIAMETER-METRIC								
MATERIAL	MACHINING	.8mm	1mm	1.2mm	1.5mm	2mm	2.5mm	3mm	4mm	6mm
HARDENED STEELS		ISO-H		CHIP PER TOOTH						
Hardened Steels										
25-35 HRc	115 M/Min	0.0102	0.0203	0.0203	0.0229	0.0381	0.0406	0.0483	0.0711	0.0965
Hardened Steels										
35-45 HRc	92 M/Min	0.0102	0.0178	0.0178	0.0203	0.0381	0.0406	0.0483	0.0711	0.0965
Hardened Steels										
45-55 HRc	84 M/Min	0.0076	0.0178	0.0178	0.0178	0.0305	0.0330	0.0381	0.0559	0.0762
Hardened Steels										
55-65 HRc	76 M/Min	0.0076	0.0152	0.0152	0.0152	0.0279	0.0305	0.0356	0.0533	0.0711

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SERIES: HMG1-__-SF-B

MATERIAL	STANDARD	CUTTING DIAMETER											
	MACHINING	1/64"	0.0200"	1/32"	0.0394"	3/64"	1/16"	5/64"	3/32"	0.1181"	1/8"	3/16"	1/4"
HARDENED STEELS	ISO-H	CHIP PER TOOTH											
Harden Steels 25-35 HRc	275 SFM	0.0010	0.0010	0.0010	0.0015	0.0020	0.0020	0.0030	0.0030	0.0030	0.0032	0.0040	0.0045
Harden Steels 35-45 HRc	250 SFM	0.0010	0.0010	0.0010	0.0015	0.0020	0.0020	0.0030	0.0030	0.0030	0.0032	0.0040	0.0045
Harden Steels 45-55 HRc	225 SFM	0.0010	0.0010	0.0010	0.0015	0.0020	0.0020	0.0030	0.0030	0.0030	0.0032	0.0040	0.0045
Harden Steels 55-65 HRc	175 SFM	0.0010	0.0010	0.0010	0.0010	0.0010	0.0010	0.0020	0.0020	0.0020	0.0022	0.0030	0.0035

MATERIAL	STANDARD	CUTTING DIAMETER-METRIC											
	MACHINING	.5mm	.6mm	.8mm	1mm	1.5mm	2mm	2.5mm	3mm	4mm	5mm	6mm	
HARDENED STEELS		ISO-H	CHIP PER TOOTH										
Hardened Steels	84 M/Min												
25-35 HRc		0.0254	0.0254	0.0254	0.0381	0.0508	0.0762	0.0762	0.0762	0.0813	0.1016	0.1143	
Hardened Steels	76 M/Min												
35-45 HRc		0.0254	0.0254	0.0254	0.0381	0.0508	0.0762	0.0762	0.0762	0.0813	0.1016	0.1143	
Hardened Steels	68 M/Min												
45-55 HRc		0.0254	0.0254	0.0254	0.0381	0.0508	0.0762	0.0762	0.0762	0.0813	0.1016	0.1143	
Hardened Steels	53 M/Min												
55-65 HRc		0.0254	0.0254	0.0254	0.0254	0.0254	0.0508	0.0508	0.0508	0.0559	0.0762	0.0888	

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

SPEED & FEED INFORMATION

SERIES: HMG-__-B

BACK TO SERIES 

CUTTING DIAMETER											
MATERIAL	CONDITION	HIGH SPEED MACHINING	STANDARD MACHINING	1/32"	3/32"	1/8"	3/16"	1/4"	5/16"	3/8"	1/2"
HARDENED STEELS		ISO-H	CHIP PER TOOTH								
Hardened Steels 55-65 HRc	Roughing ≤ .04 x D doc and .25 x D woc	180-240 SFM	60-120 SFM	0.004	0.001	0.002	0.002	0.003	0.004	0.005	0.006
	Roughing ≤ .03 x D doc and .25 x D woc			0.004	0.001	0.002	0.002	0.003	0.004	0.005	0.005
Hardened Steels 55-65 HRc	Roughing ≤ .02 x D doc and .2 x D woc	120-160 SFM	50-80 SFM	0.004	0.001	0.002	0.002	0.003	0.004	0.005	0.006
	Roughing ≤ .03 x D doc and .2 x D woc			0.004	0.001	0.001	0.002	0.003	0.004	0.005	0.005
Hardened Steels 65 HRc and above	Finishing ≤ .04 x D doc and .4 x D woc	200-250 SFM	60-150 SFM	0.001	0.002	0.002	0.003	0.004	0.004	0.005	0.005
	Finishing ≤ .02 x D doc and .4 x D woc			0.001	0.002	0.002	0.003	0.004	0.004	0.005	0.005
Hardened Steels 65 HRc and above	Finishing ≤ .03 x D doc and .02-.03 x D woc	150-200 SFM	60-120 SFM	0.001	0.002	0.002	0.003	0.004	0.004	0.005	0.005
	Finishing ≤ .03 x D doc and .02-.03 x D woc			0.001	0.002	0.002	0.003	0.004	0.004	0.005	0.005

		HIGH SPEED	STANDARD	CUTTING DIAMETER-METRIC							
MATERIAL	CONDITION	MACHINING	MACHINING	1mm	2mm	3mm	4mm	6mm	8mm	10mm	12mm
HARDENED STEELS		ISO-H	CHIP PER TOOTH								
Hardened Steels 55-65 HRc	Roughing ≤ .04 x D doc and .25 x D woc	54 - 73 M/MIN	18 - 36 M/MIN	0.1016	0.0254	0.0254	0.0508	0.0762	0.1016	0.1270	0.1524
	Roughing ≤ .03 x D doc and .25 x D woc			0.1016	0.0254	0.0254	0.0508	0.0762	0.1016	0.1270	0.1270
Hardened Steels 55-65 HRc	Roughing ≤ .02 x D doc and .2 x D woc	36 - 48 M/MIN	15 - 24 M/MIN	0.1016	0.0254	0.0254	0.0508	0.0762	0.1016	0.1270	0.1524
	Roughing ≤ .03 x D doc and .2 x D woc			0.1016	0.0254	0.0254	0.0508	0.0762	0.1016	0.1270	0.1270
Hardened Steels 65 HRc and above	Finishing ≤ .04 x D doc and .4 x D woc	60 - 76 M/MIN	18 - 45 M/MIN	0.0254	0.0508	0.0508	0.0762	0.1016	0.1016	0.1270	0.1270
	Finishing ≤ .02 x D doc and .4 x D woc			0.0254	0.0508	0.0508	0.0762	0.1016	0.1016	0.1270	0.1270
Hardened Steels 65 HRc and above	Finishing ≤ .03 x D doc and .02-.03 x D woc	45 - 60 M/MIN	60 - 36 M/MIN	0.0254	0.0508	0.0508	0.0762	0.1016	0.1016	0.1270	0.1270
	Finishing ≤ .03 x D doc and .02-.03 x D woc			0.0254	0.0508	0.0508	0.0762	0.1016	0.1016	0.1270	0.1270

For light periphery profiling $\leq .005 \times D$ increase above
profiling chip load by 20-25%

SERIES: CCMG45

BACK TO SERIES 

MATERIAL	CONDITION	HIGH SPEED	STANDARD	CUTTING DIAMETER							
		MACHINING	MACHINING	1/8"	1/4"	5/16"	3/8"	1/2"	5/8"	3/4"	1"
HARDENED STEELS	ISO-H	CHIP PER TOOTH									
Hardened Steels 55-65 HRc	Profiling ≤ 1.5 x D doc and .02 x D woc	150-180		0.001	0.002	0.002	0.003	0.003	0.004	0.005	0.0060
	Profiling ≤ 1.5 x D doc and .04 x D woc		60-80	0.001	0.001	0.002	0.002	0.002	0.003	0.003	0.0035
Hardened Steels 65 HRc and above	Profiling ≤ 1.5 x D doc and .02 x D woc	100-130		0.001	0.002	0.002	0.003	0.003	0.003	0.004	0.0045
	Profiling ≤ 1.5 x D doc and .04 x D woc		40-60	0.001	0.001	0.002	0.002	0.002	0.002	0.003	0.0030

MATERIAL		CONDITION	HIGH SPEED MACHINING	STANDARD MACHINING	CUTTING DIAMETER - METRIC						
					3mm	6mm	8mm	10mm	12mm	16mm	20mm
HARDENED STEELS		ISO-H	CHIP PER TOOTH								
Hardened Steels 55-65 HRc	Profiling ≤ 1.5 x D doc and .02 x D woc	46 - 60 M/MIN	18 - 24 M/MM	0.0254	0.0508	0.0508	0.0762	0.0762	0.1016	0.1270	
	Profiling ≤ 1.5 x D doc and .04 x D woc			0.0254	0.0254	0.0508	0.0508	0.0508	0.0762	0.0762	
Hardened Steels 65 HRc and above	Profiling ≤ 1.5 x D doc and .02 x D woc	30 - 40 M/MIN	12 - 18 M/MIN	0.0254	0.0508	0.0508	0.0762	0.0762	0.0762	0.1016	
	Profiling ≤ 1.5 x D doc and .04 x D woc			0.0254	0.0254	0.0508	0.0508	0.0508	0.0508	0.0762	

For light periphery profiling $\leq .005 \times D$
increase above profiling chip load by 20-25%

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

SPEED & FEED INFORMATION

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SERIES: DIAMOND COATED

MATERIAL	CONDITION	STARTING SFM	CUTTING DIAMETER
Aluminum+Aluminum Alloys	ISO-N		CHIP PER TOOTH
<i>Aluminum</i>			
5-8% Si	Rough Milling	1500-3500	0.006-0.018
	Finish Milling	1500-4600	0.003-0.008
<i>Aluminum Cast</i>			
8-12% Si	Rough Milling	1200-2850	0.0055-0.013
	Finish Milling	1200-3600	0.003-0.0065
Carbon Fiber	ISO-N		
<i>Carbon Fiber</i>		500-1200	0.003-0.009
Glass Fiber	ISO-N		
<i>Glass Fiber</i>		500-1100	0.001-0.0075
Copper/Bronze	ISO-N		
<i>Copper/Bronze</i>		700-1300	0.001-0.0068
Graphite	ISO-N		
<i>Graphite</i>	Rough Milling	500-1600	0.003-0.005
	Finish Milling	500-2000	0.001-0.003
Green Ceramic	ISO-N		
<i>Green Ceramic</i>		750-1200	0.002-0.0076

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SERIES: CRMGD

MATERIAL	CONDITION	CUTTING DIAMETER					
		1/8"	3/16"	1/4"	5/16"	3/8"	1/2"
Non- Ferrous	ISO-N	CHIP PER TOOTH					
<i>Aramid Fiber / Carbon Fiber - CRFP & AFRP</i>							
440 SFM	Slotting	0.0030	0.0050	0.0060	0.0075	0.0090	0.0120
525 SFM	Profiling	0.0030	0.0050	0.0060	0.0075	0.0090	0.0120
<i>Fiberglass - GFRP</i>							
340 SFM	Slotting	0.0030	0.0050	0.0060	0.0075	0.0090	0.0120
440 SFM	Profiling	0.0030	0.0050	0.0060	0.0075	0.0090	0.0120
<i>Plastics</i>							
525 SFM	Slotting	0.0050	0.0060	0.0075	0.0090	0.0110	0.0140
650 SFM	Profiling	0.0050	0.0060	0.0075	0.0090	0.0110	0.0140

MATERIAL	CONDITION	CUTTING DIAMETER - METRIC					
		3mm	5mm	6mm	8mm	10mm	12mm
Non- Ferrous	ISO-N	CHIP PER TOOTH					
<i>Aramid Fiber / Carbon Fiber - CRFP & AFRP</i>							
135 M/MIN	Slotting	0.0762	0.1270	0.1524	0.1905	0.2286	0.3048
160 M/MIN	Profiling	0.0762	0.1270	0.1524	0.1905	0.2286	0.3048
<i>Fiberglass - GFRP</i>							
104 M/MIN	Slotting	0.0762	0.1270	0.1524	0.1905	0.2286	0.3048
135 M/MIN	Profiling	0.0762	0.1270	0.1524	0.1905	0.2286	0.3048
<i>Plastics</i>							
160 M/MIN	Slotting	0.1270	0.1524	0.1905	0.2286	0.2794	0.3556
200 M/MIN	Profiling	0.1270	0.1524	0.1905	0.2286	0.2794	0.3556

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

SPEED & FEED INFORMATION

SERIES: VBMG

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		HIGH SPEED	STANDARD	CUTTING DIAMETER						
MATERIAL	CONDITION	MACHINING	MACHINING	1/16"	3/32"	1/8"	3/16"	1/4"	3/8"	1/2"
HARDENED STEELS		ISO-H	CHIP PER TOOTH							
Pre Hardened Steels 25-45 HRc	Roughing ≤ .06 x D doc and .3 x D woc	250-340		0.0008	0.001	0.002	0.003	0.004	0.006	0.007
	Roughing ≤ .06 x D doc and .3 x D woc		60-180	0.0008	0.001	0.002	0.003	0.004	0.006	0.007
Pre Hardened Steels 25-45 HRc	Finishing ≤ .07 x D doc and .02-.6 x D woc	250-350		0.002	0.002	0.003	0.004	0.004	0.005	0.006
	Finishing ≤ .07 x D doc and .02-.6 x D woc		60-200	0.002	0.002	0.003	0.004	0.004	0.005	0.006
HARDENED STEELS		ISO-H								
Hardened Steels 65 HRc and above	Roughing ≤ .05 x D doc and .25 x D woc	240-280		0.004	0.001	0.002	0.004	0.004	0.006	0.006
	Roughing ≤ .05 x D doc and .25 x D woc		60-140	0.004	0.001	0.002	0.004	0.004	0.006	0.006
Hardened Steels 65 HRc and above	Finishing ≤ .06 x D doc and .02-.4 x D woc	250-280		0.002	0.002	0.003	0.004	0.004	0.005	0.006
	Finishing ≤ .06 x D doc and .02-.4 x D woc		60-150	0.002	0.002	0.003	0.004	0.004	0.005	0.006

		HIGH SPEED MACHINING	STANDARD MACHINING	CUTTING DIAMETER - METRIC				
MATERIAL	CONDITION	M/MIN	M/MIN	4mm	6mm	8mm	10mm	12mm
HARDENED STEELS		ISO-H		CHIP PER TOOTH				
Pre Hardened Steels 25-45 HRc	Roughing ≤ .06 x D doc and .3 x D woc	76-104		0.0508	0.1016	0.1270	0.1524	0.1778
	Roughing ≤ .06 x D doc and .3 x D woc		18-54	0.0508	0.1016	0.1270	0.1524	0.1778
Pre Hardened Steels 25-45 HRc	Finishing ≤ .07 x D doc and .02-.6 x D woc	76-106		0.0762	0.1016	0.1270	0.1270	0.1524
	Finishing ≤ .07 x D doc and .02-.6 x D woc		18-60	0.0762	0.1016	0.1270	0.1270	0.1524
HARDENED STEELS		ISO-H						
Hardened Steels 65 HRc and above	Roughing ≤ .05 x D doc and .25 x D woc	73-85		0.0508	0.1016	0.1270	0.1524	0.1524
	Roughing ≤ .05 x D doc and .25 x D woc		18-42	0.0508	0.1016	0.1270	0.1524	0.1524
Hardened Steels 65 HRc and above	Finishing ≤ .06 x D doc and .02-.4 x D woc	76-85		0.0762	0.1016	0.1270	0.1270	0.1524
	Finishing ≤ .06 x D doc and .02-.4 x D woc		18-45	0.0762	0.1016	0.1270	0.1270	0.1524

For light periphery profiling $\leq .005 \times D$ increase above profiling chip load by 20%

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

		AXIAL DEPTH MAX & 75% CUTTING WIDTH						CUTTING DIAMETER				
MATERIAL		1/8	1/4	3/8	1/2	5/8	SFM	1/8"	1/4"	3/8"	1/2"	5/8"
STAINLESS STEELS	ISO-M	CONDITION						CHIP PER TOOTH				
Precipitation <35 HRc 13-8, 15-5, 17-4PH		0.007	0.011	0.018	0.022	0.026	600-900	.005-.008	.006-.012	.010-.018	.012-.024	.014-.026
Precipitation >35 HRc 13-8, 15-5, 17-4PH		0.006	0.009	0.014	0.017	0.022	325-650	.003-.007	.006-.012	.010-.018	.012-.024	.012-.024
Austenitic < 28 HRc 302, 303, 304L, 316L		0.007	0.010	0.015	0.022	0.026	275-400	.005-.009	.006-.014	.010-.019	.012-.026	.012-.026
STEELS	ISO-P											
High Strength Steels 4140, 4340, 52100		0.007	0.011	0.018	0.022	0.026	600-1250	.005-.008	.006-.013	.010-.020	.012-.025	.014-.028
High Alloy Steels - Mold & Die <50 HRc A-2, P20, 01, 02, D2, H-13		0.007	0.010	0.017	0.020	0.022	600-1200	.005-.008	.006-.012	.010-.018	.012-.022	.014-.024
High Alloy Steels - Mold & Die >50 HRc A-2, P20, 01, 02, D2, H-13		0.006	0.009	0.013	0.018	0.020	275-675	.004-.006	.006-.012	.010-.018	.012-.022	.014-.024
Medium Alloy Steels 200, 250, 300		0.008	0.012	0.019	0.025	0.028	800-1475	.005-.009	.006-.014	.010-.021	.012-.026	.014-.028
CAST IRONS	ISO-K											
Cast Iron <40 HRc		0.006	0.010	0.016	0.020	0.022	1000-3000	.003-.006	.006-.011	.009-.016	.012-.022	.012-.024
Cast Iron >40 HRc		0.006	0.010	0.016	0.020	0.022	800-1200	.003-.006	.006-.011	.009-.016	.012-.022	.012-.024
TITANIUM	ISO-S											
Titanium Alloys 6AL-4V, ASTM 1, 2, 3, 6AL-2S		0.006	0.010	0.016	0.020	0.022	400-600	.003-.006	.006-.011	.009-.016	.012-.022	.012-.024

		AXIAL DEPTH MAX & 75% CUTTING WIDTH						CUTTING DIAMETER-METRIC				
MATERIAL		3mm	6mm	8mm	10mm	12mm	M/MIN	3mm	6mm	8mm	10mm	12mm
STAINLESS STEELS	ISO-M	CONDITION						CHIP PER TOOTH				
Precipitation <35 HRc 13-8, 15-5, 17-4PH		0.170	0.260	0.370	0.480	0.530	180-275	.13-.20	.15-.30	.20-.46	.25-.46	.30-.61
Precipitation >35 HRc 13-8, 15-5, 17-4PH		0.140	0.210	0.290	0.370	0.410	100-200	.08-.18	.15-.30	.20-.46	.25-.46	.30-.61
Austenitic < 28 HRc 302, 303, 304L, 316L		0.170	0.240	0.320	0.400	0.530	85-120	.13-.23	.15-.36	.20-.50	.25-.48	.30-.63
STEELS	ISO-P											
High Strength Steels 4140, 4340, 52100		0.170	0.260	0.370	0.480	0.530	185-380	.13-.20	.15-.33	.20-.48	.25-.50	.30-.63
High Alloy Steels - Mold & Die <50 HRc A-2, P20, 01, 02, D2, H-13		0.190	0.290	0.400	0.510	0.600	245-450	.13-.23	.15-.36	.20-.50	.25-.53	.30-.64
High Alloy Steels - Mold & Die >50 HRc A-2, P20, 01, 02, D2, H-13		0.170	0.240	0.350	0.450	0.480	185-360	.13-.20	.15-.30	.20-.43	.25-.46	.30-.56
Medium Alloy Steels 200, 250, 300		0.140	0.210	0.280	0.350	0.430	85-205	.10-.15	.15-.30	.20-.43	.25-.46	.30-.56
CAST IRONS	ISO-K											
Cast Iron <40 HRc		0.140	0.240	0.330	0.430	0.480	300-900	.08-.15	.15-.25	.19-.41	.23-.41	.30-.56
Cast Iron >40 HRc		0.140	0.240	0.330	0.430	0.480	245-365	.08-.15	.15-.25	.19-.41	.23-.41	.30-.56
TITANIUM	ISO-S											
Titanium Alloys 6AL-4V, ASTM 1, 2, 3, 6AL-2S		0.140	0.240	0.330	0.430	0.480	120-180	.08-.15	.15-.25	.19-.41	.23-.41	.30-.56

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

SPEED & FEED INFORMATION

SERIES: CDR & MDR

[BACK TO SERIES](#)

MATERIAL	MATERIAL HARDNESS	RECOMMENDED SFM		CUTTING DIAMETER					
		NON-COOLANT	COOLANT FED	1/16" - 1/8"	1/8" - 1/4"	1/4" - 3/8"	3/8" - 1/2"	1/2" - 5/8"	5/8" - 3/4"
		INCH PER REV (IPR)							
STAINLESS STEELS	ISO-M								
Precipitation 13-8, 15-5, 17-4PH	Under 35 Rc	225	300	.0005 - .0015	.0015 - .0025	.0025 - .0030	.0030 - .0035	.0035 - .0045	.0040 - .0055
	Over 35 Rc	175	240	.0002 - .0005	.0005 - .0015	.0015 - .0025	.0025 - .0030	.0030 - .0035	.0035 - .0045
Austenitic 302, 303, 304L, 316L	Under 35 Rc	125	175	.0005 - .0010	.0010 - .0015	.0015 - .0020	.0020 - .0030	.0030 - .0040	.0025 - .0040
	Over 35 Rc	80	100	.0001 - .0003	.0003 - .0010	.0010 - .0015	.0015 - .0025	.0025 - .0035	.0020 - .0040
Martensitic 403, 410, 416	Under 35 Rc	225	300	.0007 - .0015	.0015 - .0025	.0025 - .0030	.0030 - .0035	.0035 - .0045	.0040 - .0055
	Over 35 Rc	175	240	.0002 - .0005	.0005 - .0015	.0015 - .0025	.0025 - .0030	.0030 - .0035	.0035 - .0045
HIGH TEMP ALLOYS	ISO-S								
Cobalt Base Stellite, Haynes 25, 188, X-40	Under 35 Rc	185	225	.0005 - .0010	.0010 - .0020	.0020 - .0030	.0025 - .0035	.0030 - .0040	.0035 - .0055
	Over 35 Rc	125	180	.0002 - .0005	.0005 - .0015	.0015 - .0025	.0020 - .0030	.0025 - .0035	.0030 - .0045
Nickel Base Inconel 600, 625, 718, Nickel 200 Monel 400, 405, K-Monel, Inconel 600	Under 35 Rc	150	225	.0005 - .0010	.0010 - .0020	.0020 - .0030	.0025 - .0035	.0030 - .0040	.0035 - .0055
	Over 35 Rc	125	180	.0002 - .0005	.0005 - .0015	.0015 - .0025	.0020 - .0030	.0025 - .0035	.0030 - .0045
Iron Base Incoloy 800-802, Multimet N-155	Under 35 Rc	200	300	.0007 - .0015	.0015 - .0025	.0025 - .0030	.0025 - .0035	.0035 - .0045	.0035 - .0055
	Over 35 Rc	150	240	.0002 - .0005	.0005 - .0015	.0015 - .0025	.0025 - .0030	.0030 - .0035	.0030 - .0045
STEELS	ISO-P								
High Strength Steels 4140, 4340, 52100	Under 35 Rc	200	300	.0007 - .0015	.0015 - .0025	.0025 - .0030	.0030 - .0035	.0035 - .0045	.0045 - .0055
	Over 35 Rc	175	240	.0002 - .0005	.0005 - .0015	.0015 - .0025	.0025 - .0030	.0030 - .0035	.0035 - .0045
High Alloy Steels - Mold & Die A-2, P20, 01, 02, D2, H-13	Under 35 Rc	200	300	.0005 - .0015	.0015 - .0025	.0025 - .0030	.0030 - .0035	.0035 - .0045	.0045 - .0055
	Over 35 Rc	175	240	.0002 - .0005	.0005 - .0015	.0015 - .0025	.0025 - .0030	.0030 - .0035	.0035 - .0045
Medium Alloy Steels 200, 250, 300, 8620	Under 35 Rc	200	300	.0005 - .0015	.0015 - .0025	.0025 - .0030	.0030 - .0035	.0035 - .0045	.0045 - .0055
	Over 35 Rc	175	240	.0002 - .0005	.0005 - .0015	.0015 - .0025	.0025 - .0030	.0030 - .0035	.0035 - .0045
Low Alloy Steels-Maraging 10XX, 11XX, 13XX	Under 35 Rc	200	300	.0007 - .0015	.0015 - .0025	.0025 - .0030	.0030 - .0035	.0035 - .0045	.0045 - .0055
	Over 35 Rc	175	240	.0002 - .0005	.0005 - .0015	.0015 - .0025	.0025 - .0030	.0030 - .0035	.0035 - .0045
CAST IRONS	ISO-K								
Ductile Iron Ductile Cast Iron		250	350	.0013 - .0025	.0025 - .0035	.0035 - .0045	.0035 - .0045	.0045 - .0055	.0065 - .0075
Cast Iron Grey Cast Iron		250	400	.0013 - .0025	.0025 - .0035	.0035 - .0045	.0035 - .0045	.0045 - .0055	.0065 - .0075
TITANIUM	ISO-S								
Titanium Alloys 6AL-4V, ASTM 1, 2, 3, 6AL-2S For 5553, decrease SFM and IPM by 25%		225	350	.0005 - .0010	.0010 - .0020	.0020 - .0030	.0025 - .0035	.0030 - .0040	.0035 - .0055
COPPER	ISO-N								
Copper Alloys		300	400	.0015 - .0025	.0025 - .0035	.0035 - .0045	.0035 - .0045	.0045 - .0055	.0065 - .0075
BRASS	ISO-N								
Short Chips Long Chips		300	400	.0015 - .0035	.0035 - .0045	.0045 - .0055	.0065 - .0075	.0085 - .0095	.0085 - .0095
		200	300	.0015 - .0025	.0025 - .0035	.0035 - .0045	.0055 - .0065	.0075 - .0085	.0075 - .0085
BRONZE	ISO-N								
Short Chips Long Chips		200	300	.0015 - .0025	.0025 - .0035	.0035 - .0045	.0035 - .0045	.0055 - .0065	.0075 - .0085
		150	250	.0007 - .0015	.0015 - .0025	.0025 - .0035	.0025 - .0035	.0045 - .0055	.0065 - .0075
MAGNESIUM	ISO-N								
		300	400	.0020 - .0035	.0035 - .0045	.0045 - .0055	.0065 - .0075	.0085 - .0095	.0085 - .0095
ALUMINUM	ISO-N								
6061-T6, 7075 Die Cast		400	500	.0020 - .0035	.0035 - .0045	.0045 - .0055	.0065 - .0075	.0085 - .0095	.0085 - .0095
		300	400	.0015 - .0025	.0025 - .0035	.0035 - .0045	.0055 - .0065	.0075 - .0085	.0075 - .0085

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

SPEED & FEED INFORMATION

SERIES: CDR & MDR (METRIC)

MATERIAL	MATERIAL HARDNESS	RECOMMENDED M/MIN		CUTTING DIAMETER - METRIC					
		NON-COOLANT	COOLANT FED	1.5MM-3MM	3MM-6.5MM	6.5MM-10MM	10MM-13MM	13MM-16MM	16MM-20MM
		(M/MIN)	(M/MIN)	MILLIMETERS PER REV (MMPR)					
STAINLESS STEELS ISO-M									
Precipitation									
13-8, 15-5, 17-4PH	Under 35 Rc	68	90	.0127-.0381	.0381-.0635	.0635-.0762	.0762-.0889	.0889-.1143	.1016-.1397
	Over 35 Rc	53	73	.0050-.0203	.0127-.0381	.0381-.0635	.0635-.0762	.0762-.0889	.0889-.1143
Austenitic									
302, 303, 304L, 316L	Under 35 Rc	38	53	.0127-.0254	.0254-.0381	.0381-.0508	.0508-.0762	.0762-.1016	.0635-.1016
	Over 35 Rc	24	30	.0025-.0076	.0076-.0254	.0254-.0381	.0381-.0635	.0635-.0889	.0508-.1016
Martensitic									
403, 410, 416	Under 35 Rc	67	90	.0177-.0381	.0381-.0635	.0635-.0762	.0762-.0889	.0889-.1016	.1016-.1397
	Over 35 Rc	53	73	.0058-.0127	.0127-.0381	.0381-.0635	.0635-.0762	.0762-.0889	.0889-.1143
HIGH TEMP ALLOYS ISO-S									
Cobalt Base									
Stellite, Haynes 25, 188, X-40	Under 35 Rc	56	69	.0127-.0254	.0254-.0508	.0508-.0762	.0635-.0889	.0762-.1016	.0889-.1397
	Over 35 Rc	38	55	.0050-.0254	.0127-.0381	.0381-.0635	.0508-.0762	.0635-.0889	.0762-.1016
Nickel Base									
Inconel 600, 625, 718, Nickel 200 Monel 400, 405, K-Monel, Inconel 600	Under 35 Rc	45	69	.0127-.0254	.0254-.0508	.0508-.0762	.0635-.0889	.0762-.1143	.0889-.1397
	Over 35 Rc	38	55	.0050-.0127	.0127-.0381	.0381-.0635	.0508-.0762	.0635-.0889	.0762-.1143
Iron Base									
Incoloy 800-802, Multimet N-155	Under 35 Rc	60	90	.0177-.0381	.0381-.0635	.0635-.0762	.0635-.0889	.0889-.1143	.0889-.1397
	Over 35 Rc	45	73	.0050-.0127	.0127-.0381	.0381-.0635	.0635-.0762	.0762-.0889	.0762-.1143
STEELS ISO-P									
High Strength Steels									
4140, 4340, 52100	Under 35 Rc	60	90	.0177-.0381	.0381-.0635	.0635-.0762	.0762-.0889	.0889-.1143	.1143-.1397
	Over 35 Rc	53	73	.0050-.0127	.0127-.0381	.0381-.0635	.0635-.0762	.0762-.0889	.0889-.1143
High Alloy Steels - Mold & Die									
A-2, P20, O1, O2, D2, H-13	Under 35 Rc	60	90	.0127-.0381	.0381-.0635	.0635-.0762	.0762-.0889	.0889-.1143	.1143-.1397
	Over 35 Rc	53	73	.0050-.0127	.0127-.0381	.0281-.0635	.0635-.0762	.0762-.0889	.0889-.1143
Medium Alloy Steels									
200, 250, 300, 8620	Under 35 Rc	60	90	.0127-.0381	.0381-.0635	.0635-.0762	.0762-.0889	.0889-.1143	.1143-.1397
	Over 35 Rc	53	73	.0050-.0127	.0127-.0381	.0281-.0635	.0635-.0762	.0762-.0889	.0889-.1143
Low Alloy Steels-Maraging									
10XX, 11XX, 13XX	Under 35 Rc	60	90	.0177-.0381	.0381-.0635	.0635-.0762	.0762-.0889	.0889-.1143	.1143-.1397
	Over 35 Rc	53	73	.0050-.0127	.0127-.0381	.0281-.0635	.0635-.0762	.0762-.0889	.0889-.1143
CAST IRONS ISO-K									
Ductile Iron									
Ductile Cast Iron		76	106	.0330-.0635	.0635-.0889	.0889-.1143	.0889-.1143	.1143-.1397	.1651-.1905
Cast Iron									
Grey Cast Iron		76	122	.0330-.0635	.0635-.0889	.0889-.1143	.0889-.1143	.1143-.1397	.1651-.1905
TITANIUM ISO-S									
Titanium Alloys									
6AL-4V, ASTM 1, 2, 3, 6AL-2S For 5553, decrease SFM and IPM by 25%		68	106	.0127-.0254	.0254-.0508	.0508-.0672	.0635-.0889	.0762-.1016	.0889-.1397
COPPER ISO-N									
Copper Alloys									
		90	122	.0381-.0635	.0635-.0889	.0889-.1143	.0889-.1143	.1143-.1397	.1651-.1905
BRASS ISO-N									
Short Chips		90	122	.0381-.0889	.0889-.1143	.1143-.1397	.1651-.1905	.2159-.2413	.2519-.2413
Long Chips		60	90	.0254-.0635	.0635-.0889	.0889-.1143	.1397-.1651	.1905-.2159	.1905-.2159
BRONZE ISO-N									
Short Chips		60	90	.0254-.0635	.0635-.0889	.0889-.1143	.0889-.1143	.1397-.1651	.1905-.2159
Long Chips		45	76	.0177-.0381	.0381-.0635	.0365-.0889	.0635-.0889	.1143-.1397	.1651-.1905
MAGNESIUM ISO-N									
		90	122	.0580-.0889	.0889-.1143	.1143-.1397	.1651-.1905	.2159-.2413	.2159-.2413
ALUMINUM ISO-N									
6061-T6, 7075		122	152	.0580-.0889	.0889-.1143	.1143-.1397	.1651-.1905	.2159-.2431	.2159-.2413
Die Cast		90	122	.0254-.0635	.0635-.0889	.0889-.1143	.1397-.1651	.1905-.2159	.1905-.2159

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

SPEED & FEED INFORMATION

SERIES: TM

BACK TO SERIES 

MATERIAL	STARTING SFM	CUTTING DIAMETER								
		1/8"	3/16"	1/4"	5/16"	3/8"	1/2"	5/8"	3/4"	1"
CHIP PER TOOTH										
STAINLESS STEELS	ISO-M									
Precipitation 13-8, 15-5, 17-4PH	175	0.0050	0.0010	0.0015	0.0021	0.0025	0.0030	0.0035	0.0040	0.0045
Austenitic & Martensitic 303, 316, 321, 304, 410, 416, 422, 430	250-350	0.0005	0.0010	0.0015	0.0020	0.0030	0.0035	0.0040	0.0045	0.0050
HIGH TEMP ALLOYS	ISO-S									
Nickel Base Inconel, Hastelloy, Monel	80-130	0.0003	0.0005	0.0008	0.0010	0.0015	0.0020	0.0025	0.0030	0.0035
STEELS	ISO-P									
Medium Carbon Steel 1045, 4140, 4340, 52100, <46HrC	250	0.0003	0.0005	0.0008	0.0009	0.0010	0.0015	0.0020	0.0025	0.0030
Medium Carbon Steel 1030, 4130, 40140, 25-35HrC	300	0.0005	0.0010	0.0015	0.0020	0.0030	0.0035	0.0040	0.0045	0.0050
Low Carbon Steel 1018, 12L-14, <25 HrC	500	0.0005	0.0010	0.0015	0.0020	0.0030	0.0035	0.0040	0.0045	0.0050
CAST IRONS	ISO-K									
Ductile Iron Ductile Cast Iron	300	0.0006	0.0007	0.0010	0.0015	0.0020	0.0025	0.0030	0.0035	0.0040
Cast Iron Cast Iron	350-500	0.0005	0.0006	0.0009	0.0010	0.0015	0.0020	0.0025	0.0030	0.0035
TITANIUM	ISO-S									
Titanium Alloys 6AL-4V	200-250	0.0003	0.0005	0.0008	0.0010	0.0015	0.0020	0.0025	0.0030	0.0035
ALUMINUM	ISO-N									
T-6061, T7075	1000	0.0005	0.0010	0.0015	0.0020	0.0030	0.0035	0.0040	0.0045	0.0050
BRASS	ISO-N									
Free Machining	800	0.0005	0.0010	0.0015	0.0020	0.0030	0.0035	0.0040	0.0045	0.0050

MATERIAL		M/MIN		CUTTING DIAMETER - METRIC							
			3.5mm	5mm	6.5mm	8mm	9.5mm	13mm	16mm	19mm	24mm
			CHIP PER TOOTH								
STAINLESS STEELS		ISO-M									
Precipitation	53	0.01mm	0.03mm	0.04mm	0.05mm	0.06mm	0.08mm	0.09mm	0.10mm	0.11mm	
Austenitic & Martensitic	76-107	0.01mm	0.03mm	0.04mm	0.05mm	0.08mm	0.09mm	0.10mm	0.11mm	0.13mm	
303, 316, 321, 304, 410, 416, 422, 430											
HIGH TEMP ALLOYS		ISO-S									
Nickel Base											
Inconel, Hastelloy, Monel	24-40	0.01mm	0.01mm	0.02mm	0.03mm	0.04mm	0.05mm	0.06mm	0.08mm	0.09mm	
STEELS		ISO-P									
Medium Carbon Steel	76	0.01mm	0.01mm	0.02mm	0.02mm	0.03mm	0.04mm	0.05mm	0.06mm	0.08mm	
1045, 4140, 4340, 52100, <46HrC											
Medium Carbon Steel	90	0.01mm	0.03mm	0.04mm	0.05mm	0.08mm	0.09mm	0.10mm	0.11mm	0.13mm	
1030, 4130, 40140, 25-35HrC											
Low Carbon Steel	152	0.01mm	0.03mm	0.04mm	0.05mm	0.08mm	0.09mm	0.10mm	0.11mm	0.13mm	
1018, 12L-14, <25 HrC											
CAST IRONS		ISO-K									
Ductile Iron	90	0.02mm	0.02mm	0.03mm	0.04mm	0.05mm	0.06mm	0.08mm	0.09mm	0.10mm	
Ductile Cast Iron											
Cast Iron	107-152	0.01mm	0.02mm	0.02mm	0.03mm	0.04mm	0.05mm	0.06mm	0.08mm	0.09mm	
Cast Iron											
TITANIUM		ISO-S									
Titanium Alloys	60-76	0.01mm	0.01mm	0.02mm	0.03mm	0.04mm	0.05mm	0.06mm	0.08mm	0.09mm	
6AL-4V											
ALUMINUM		ISO-N									
T-6061, T7075	305	0.01mm	0.03mm	0.04mm	0.05mm	0.08mm	0.09mm	0.10mm	0.11mm	0.13mm	
BRASS		ISO-N									
Free Machining	244	0.01mm	0.03mm	0.04mm	0.05mm	0.08mm	0.09mm	0.10mm	0.11mm	0.13mm	

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

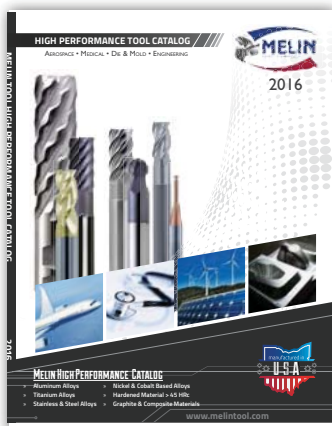
SERIES NAME	DESCRIPTION	STARTING PAGE
AA	2 Flute, 38° Helix Cobalt End Mills	43
ALMG	2 Flute, 35° for light duty CNC Machines	40
AMG-__-DIA	2 Flute, CVD Diamond Coating	106
AMG-__-DLC	2 Flute, DLC Amorphous Diamond	110
AXMG45	2 Flute, 45° End Mill	28
CCAC	Multi Flute, Cobalt Aerocut Roughing End Mill	75
CCMG-__-DIA	4 Flute, CVD Diamond Coating	107
CCMG-__-DLC	4 Flute, DLC Amorphous Diamond	112
CCMG45	6 Flute, 45° Profiling End Mill	105
CDR	2 Flute, 140° Pt Carbide Drill Coolant Hole	121
CRFMG	Multi Flute, Rougher Finisher	99
CRMG	Multi Flute, Fine Profile Carbide Roughing End Mill	98
CRMGD	Multi FL, Composite Router	108
ELMG	3 Flute, 35° for light duty CNC Machines	41
EMG-__-DLC	3 Flute, DLC Amorphous Diamond	111
EMG35	3 Flute, 35° End Mill for Stainless Steel	72
EMG60	3 FL, 60° general machining application in Stainless Steels	97
ERFPM	3 FL, Powdered Metal Rougher for Aggressive Machining	42
EXMG	3 Flute, 37° End Mill	23
FRMG	Multi FL, Fiberglass Routers	109
GMG	5 Flute, 45° for Stainless Steel/Nickel Base Alloys	73
GVHMG	5 Flute, Variable FL for general machining applications	96
GXMG5	5 Flute, 45° for Trochoidal Toolpathing	37
HMG	2 Flute, Ball Nose for Hard Milling in Die & Mold Application	104
HMG1-__-SF-B	2 Flute, Ball Nose for Z-Axis Machining- Rib Cutting	102
HMG1-__-SF-R	2 Flute, Corner Rad for Multi Axis Machining - Rib Cutting	100
HVMG2	2 Flute, 30° for High Velocity Machining	15
HVMG3	3 Flute, 37° for High Velocity Machining	18
HVRMG3	3 Flute, Rougher for High Velocity Machining	21
HXMG2	2 Flute, High Feed Carbide End Mills	118
HXMG4	4 Flute, High Feed Carbide End Mills	119
HXMG4-__-HM	4 Flute, High Feed Carbide End Mills (Hard Material)	120
MDR	2 Flute, 140° Pt Carbide Drill without Coolant hole	126
TM	Multi Flute, Single Form Thread	135
TM-__-H/S	Multi Flute, 60° Straight/Helical Flute, UN Thread	130
TM-__-NPT-__	Multi Flute, NPT Thread , Straight & Helical FL	133
TM-__-NPTF-__	Multi Flute, NPTF Thread , Straight & Helical FL	134
VBMG_ - __-270	Multi Flute, 270° Spherical Ball End Mill	116
VBMG_ - __-300	Multi Flute, 300° Spherical Ball End Mill	117
VBMG2	2 Flute, 220° Spherical Ball End Mill	114
VBMG4	4 Flute, 220° Spherical Ball End Mill	115
VHMG	4 Flute, Variable FL for general machining applications	94
VXMG10	10 Flute, Variable FL for Ultra Fine-Finishing Applications	70
VXMG3T	3 Flute - Variable FL, HP Roughing & Finishing Applications	46
VXMG4	4 Flute, Variable FL for High Performance roughing applications	78
VXMG4T	4 Flute - Variable FL, High Performance Roughing Applications	48
VXMG5	5 Flute, Variable FL for High Performance roughing applications	86
VXMG5T	5 Flute - Variable FL, High Performance Roughing Applications	59
VXMG6T	6 Flute - Variable FL, Roughing & Finishing Applications	65
VXMG7	7 Flute, Variable FL for semi roughing & finishing Applications	90
VXMG7-nACRo	7 Flute - Variable FL, Light to Med Finishing Applications-nACRo	66
VXMG9	9 Flute, Variable FL for optimum fine finish profiling applications	92
VXMG9-nACRo	9 Flute - Variable FL, Fine Finishing Applications-nACRo	68

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DECIMAL EQUIVALENT CHART

SIZE	DECIMAL	SIZE	DECIMAL	SIZE	DECIMAL	SIZE	DECIMAL	SIZE	DECIMAL
97	.0059	54	.0550	25	.1495	6.7mm	.2638	7/16"	.4375
96	.0063	1.4mm	.0551	3.8mm	.1496	17/64"	.2656	11.5mm	.4528
95	.0067	1.45mm	.0571	24	.1520	6.75mm	.2657	29/64"	.4531
94	.0071	1.5mm	.0591	3.9mm	.1535	H	.2660	15/32"	.4688
93	.0075	53	.0595	23	.1540	6.8mm	.2677	12mm	.4724
92	.0079	1.55m	.0610	5/32"	.1562	6.9mm	.2717	31/64"	.4844
.2mm	.0079	1/16"	.0625	22	.1570	I	.2720	12.5mm	.4921
91	.0083	1.6mm	.0630	4mm	.1575	7mm	.2756	1/2"	.5000
90	.0087	52	.0635	21	.1590	J	.2770	13mm	.5118
.22mm	.0087	1.65mm	.0650	20	.1610	7.1mm	.2795	33/64"	.5156
89	.0091	1.7mm	.0669	4.1mm	.1614	K	.2810	17/32"	.5312
88	.0095	51	.0670	4.2mm	.1654	9/32"	.2812	13.5mm	.5315
.25mm	.0098	1.75mm	.0689	19	.1660	7.2mm	.2835	35/64"	.5469
87	.0100	50	.0700	4.25mm	.1673	7.25mm	.2854	14mm	.5512
86	.0105	1.8mm	.0709	4.3mm	.1693	7.3mm	.2874	9/16"	.5625
85	.0110	1.85mm	.0728	18	.1695	L	.2900	14.5mm	.5709
.28mm	.0110	49	.0730	11/64"	.1719	7.4mm	.2913	37/64"	.5781
84	.0115	1.9mm	.0748	17	.1730	M	.2950	15mm	.5906
.3mm	.0118	48	.0760	4.4mm	.1732	7.5mm	.2953	19/32"	.5938
83	.0120	1.95mm	.0768	16	.1770	19/64"	.2969	39/64"	.6094
82	.0125	5/64"	.0781	4.5mm	.1772	7.6mm	.2992	15.5mm	.6102
.32mm	.0126	47	.0785	15	.1800	N	.3020	5/8"	.6250
81	.0130	2mm	.0787	4.6mm	.1811	7.7mm	.3031	16mm	.6299
80	.0135	2.05mm	.0807	14	.1820	7.75mm	.3051	41/64"	.6406
.35mm	.0138	46	.0810	13	.1850	7.8mm	.3071	16.5mm	.6496
79	.0145	45	.0820	4.7mm	.1850	7.9mm	.3110	21/32"	.6562
1/64"	.0156	2.1mm	.0827	4.75mm	.1870	5/16"	.3125	17mm	.6693
.4mm	.0157	2.15mm	.0846	3/16"	.1875	8mm	.3150	43/64"	.6719
78	.0160	44	.0860	4.8mm	.1890	O	.3160	11/16"	.6875
.45mm	.0177	2.2mm	.0866	12	.1890	8.1mm	.3189	17.5mm	.6890
77	.0180	2.25mm	.0886	11	.1910	8.2mm	.3228	45/64"	.7031
.5mm	.0197	43	.0890	4.9mm	.1929	P	.3230	18mm	.7087
76	.0200	2.3mm	.0906	10	.1935	8.25mm	.3248	23/32"	.7188
75	.0210	2.35mm	.0925	9	.1960	8.3mm	.3268	18.5mm	.7283
.55mm	.0217	42	.0935	5mm	.1969	21/64"	.3281	47/64"	.7344
74	.0225	3/32"	.0938	8	.1990	8.4mm	.3307	19mm	.7480
.6mm	.0236	2.4mm	.0945	5.1mm	.2008	Q	.3320	3/4"	.7500
73	.0240	41	.0960	7	.2010	8.5mm	.3346	49/64"	.7656
72	.0250	2.45mm	.0965	13/64"	.2031	8.6mm	.3386	19.5mm	.7677
.65mm	.0256	40	.0980	6	.2040	R	.3390	25/32"	.7812
71	.0260	2.5mm	.0984	5.2mm	.2047	8.7mm	.3425	20mm	.7874
.7mm	.0276	39	.0995	5	.2055	11/32"	.3438	51/64"	.7969
70	.0280	38	.1015	5.25mm	.2067	8.75mm	.3445	20.5mm	.8071
.69	.0292	2.6mm	.1024	5.3mm	.2087	8.8mm	.3465	13/16"	.8125
.75mm	.0295	37	.1040	4	.2090	S	.3480	21mm	.8268
68	.0310	2.7mm	.1063	5.4mm	.2126	8.9mm	.3504	53/64"	.8281
1/32"	.0312	36	.1065	3	.2130	9mm	.3543	27/32"	.8438
.8mm	.0315	2.75mm	.1083	5.5mm	.2165	T	.3580	21.5mm	.8465
67	.0320	7/64"	.1094	7/32"	.2188	9.1mm	.3583	55/64"	.8594
66	.0330	35	.1100	5.6mm	.2205	23/64"	.3594	22mm	.8661
.85mm	.0335	2.8mm	.1102	2	.2210	9.2mm	.3622	7/8"	.8750
65	.0350	34	.1110	5.7mm	.2244	9.25mm	.3642	22.5mm	.8858
.9mm	.0354	33	.1130	5.75mm	.2264	9.3mm	.3661	57/64"	.8906
64	.0360	2.9mm	.1142	1	.2280	U	.3680	23mm	.9055
63	.0370	32	.1160	5.8mm	.2283	9.4mm	.3701	29/32"	.9062
.95mm	.0374	3mm	.1181	5.9mm	.2323	9.5mm	.3740	59/64"	.9219
62	.0380	31	.1200	A	.2340	3/8"	.3750	23.5mm	.9252
61	.0390	3.1mm	.1220	15/64"	.2344	V	.3770	15/16"	.9375
1mm	.0394	1/8"	.1250	6mm	.2362	9.6mm	.3780	24mm	.9449
60	.0400	3.2mm	.1260	B	.2380	9.7mm	.3819	61/64"	.9531
59	.0410	3.25mm	.1280	6.1mm	.2402	9.75mm	.3839	24.5mm	.9646
1.05mm	.0413	30	.1285	C	.2420	9.8mm	.3858	31/32"	.9688
58	.0420	3.3mm	.1299	6.2mm	.2441	W	.3860	25mm	.9843
57	.0430	3.4mm	.1339	D	.2460	9.9mm	.3898	63/64"	.9844
1.1mm	.0433	29	.1360	6.25mm	.2461	25/64"	.3906	1"	1.0000
1.15mm	.0453	3.5mm	.1378	6.3mm	.2480	10mm	.3937		
56	.0465	28	.1405	E	.2500	X	.3970		
3/64"	.0469	9/64"	.1406	1/4"	.2500	Y	.4040		
1.2mm	.0472	3.6mm	.1417	6.4mm	.2520	13/32"	.4062		
1.25mm	.0492	27	.1440	6.5mm	.2559	Z	.4130		
1.3mm	.0512	3.7mm	.1457	F	.2570	10.5mm	.4134		
55	.0520	26	.1470	6.6mm	.2598	27/64"	.4219		
1.35mm	.0531	3.75mm	.1476	G	.2610	11mm	.4331		

