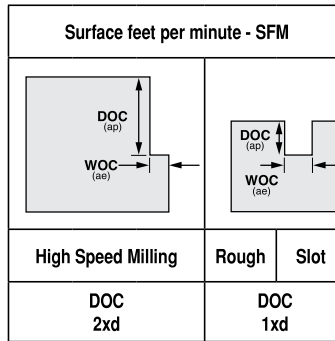
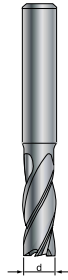


Feeds & Speeds for SELECT MILL HPC end mills

***Large cutting depths and/or less than ideal machining conditions will require a reduction in both Surface Feet Per Minute and Inches Per Revolution ***



$$RPM = \frac{SFM}{d_1} \times 3.82$$

$$IPM = \text{No. of teeth} \times IPT \times RPM$$

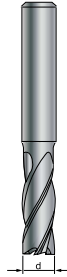
For finishing use WOC (ae) .01 up to .1xd, use SFM from .25xd column, do not increase IPT from table values

Feed Rate Inch per Tooth - IPT							
d1 End Mill Diameter							
1/8 3.17mm	1/4 6.35mm	5/16 7.94mm	3/8 9.52mm	1/2 12.70mm	5/8 15.87mm	3/4 19.05mm	1 25.40mm
Multiply IPT x this factor based on WOC							

Material	Hardness	High Speed Milling					Rough		Slot					
		WOC .05xd	WOC .1xd	WOC .25xd	WOC .4 to .9xd	WOC 1xd	WOC 1xd	WOC 1xd	WOC 1xd					
Structural + free-cutting steels, unalloyed heat-treatable + case hardened steels A283, 1151, 1215, L10, 10Lxx, 11Lxx, 12Lxx, 41Lxx, 51Lxx, 86Lxx, 86Lxx, 10xx	up to 28 HRc	1050	950	800	550	500	.0006	.0011	.0014	.0020	.0026	.0034	.0038	.0051
Free-cutting steels, unalloyed case hardened steels, nitriding steels 1151, 1215, L10, 10Lxx, 11Lxx, 12Lxx, 41Lxx, 51Lxx, 86Lxx, 86Lxx, 10xx, 11xx	28 to 38 HRc	945	855	720	495	450	.0005	.0010	.0013	.0018	.0024	.0030	.0035	.0048
Alloyed heat-treatable, tool and high speed steels 13xx, 2340, 31xx, 32xx, 33xx, 34xx, 40xx, 41xx, 43xx, 4640, 50xx, 51xx, 61xx, 71xx, 86xx, 87xx, 92xx, 98xx, 98xx, Ax, Ox, Dx, Hxx, Lx, Wx, Mx, Tx	28 to 44 HRc	735	665	560	385	350	.0005	.0009	.0012	.0016	.0021	.0026	.0032	.0044
Hardened Steels Carbon and Alloy Steels, Tool & Die Steels	Up to 54 HRc	420	380	320	220	200	.0004	.0008	.0009	.0013	.0017	.0020	.0026	.0034
	54 to 60 HRc	--	--	--	--	--	--	--	--	--	--	--	--	--
Stainless steel 303, 410, 420F, 430, 430F, 416	--	715	645	545	375	340	.0005	.0009	.0012	.0016	.0021	.0026	.0032	.0044
Stainless steel 304, 304L, 420, 17-4PH, 17-7PH, 15-5PH, 13-8PH	--	440	400	335	230	210	.0004	.0009	.0011	.0014	.0020	.0023	.0029	.0038
Stainless steel 310, 316, 316B, 316L, 317, Duplex	--	370	335	280	195	175	.0004	.0008	.0009	.0013	.0017	.0020	.0026	.0034
Titanium Alloys 6Al-4V, 5Al-2.5 Sn, 6Al-2Sn-4Zr-6Mo, 3Al-8V-6Cr4Mo-4Zr, 10V-2Fe-3Al, 13V-11Cr-3Al	up to 42 HRc	355	320	270	185	170	.0003	.0006	.0008	.0010	.0014	.0017	.0020	.0027
High-Temperature Alloys Inconel, Nimonic, Monel, Hastelloy, Waspalloy, A286, Rene 41, Udimet, Stellite	up to 42 HRc	180	160	135	95	85	.0003	.0005	.0007	.0008	.0011	.0013	.0016	.0020
Cast iron, grey cast iron, spheroidal graphite and malleable cast iron 0.6010 EN-GL100 (GG10), 0.6020 EN-GJL-200 (GG20), 0.7050 EN-GJS-500-7 (GGG50), 0.8535 EN-GJMW-350-4 (GTW35)	up to 240 HB 30	945	855	720	495	450	.0006	.0012	.0015	.0020	.0028	.0033	.0042	.0054
Cast iron, grey cast iron, spheroidal graphite and malleable cast iron 0.6025 EN-GL250 (GG25), 0.6035 EN-GJL-350 (GG35), 0.7070 EN-GJS-700-2 (GGG70), 0.8170 EN-GJMB-700-2 (GTS70)	over 240 HB 30	810	730	615	425	385	.0005	.0011	.0014	.0018	.0024	.0030	.0035	.0048
Aluminum, Al-wrought alloys, Al-alloys 2024, 6061, 7075, 1050, 6351, 5005, 2017, 7075	up to 3% Si	--	--	--	--	--	--	--	--	--	--	--	--	--
Aluminium-cast alloys 3.2131 G-AISI5Cu1, 3.2153 G-AISI7Cu3, 3.2573 G-AISI9, 3.2581 G-AISI12, 3.2583 G-AISI12Cu, - G-AISI12CuNiMg	over 3% Si	--	--	--	--	--	--	--	--	--	--	--	--	--
Magnesium-alloys MgMn2, G-MgAl8Zn1, G-MgAl6Zn3	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Non-ferrous metals (copper, short- or long-chipping brass or bronze)	up to 28 HRc	--	--	--	--	--	--	--	--	--	--	--	--	--

Feeds & Speeds for SELECT MILL Fine tooth roughing end mills

***Large cutting depths and/or less than ideal machining conditions will require a reduction in both Surface Feet Per Minute and Inches Per Revolution ***



$$RPM = \frac{SFM}{d_1} \times 3.82$$

$$IPM = \text{No. of teeth} \times IPT \times RPM$$

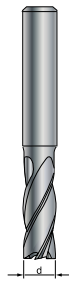
For finishing use WOC (ae) .01 up to .1xd, use SFM from .25xd column, do not increase IPT from table values

Material	Hardness	SFM
Structural + free-cutting steels, unalloyed heat-treatable + case hardened steels A283, 1151, 1215, L10, 10Lxx, 11Lxx, 12Lxx, 41Lxx, 51Lxx, 86Lxx, 86Lxx, 10xx	up to 28 HRc	--
Free-cutting steels, unalloyed case hardened steels, nitriding steels 1151, 1215, L10, 10Lxx, 11Lxx, 12Lxx, 41Lxx, 51Lxx, 86Lxx, 86Lxx, 10xx, 11xx	28 to 38 HRc	--
Alloyed heat-treatable, tool and high speed steels 13xx, 2340, 31xx, 32xx, 33xx, 34xx, 40xx, 41xx, 43xx, 4640, 50xx, 51xx, 61xx, 71xx, 86xx, 87xx, 92xx, 98xx, 98xx, Ax, Ox, Dx, Hxx, Lx, Wx, Mx, Tx	28 to 44 HRc	250
Hardened Steels Carbon and Alloy Steels, Tool & Die Steels	Up to 54 HRc	140
	54 to 60 HRc	70
Stainless steel 303, 410, 420F, 430, 430F, 416	--	--
Stainless steel 304, 304L, 420, 17-4PH, 17-7PH, 15-5PH, 13-8PH	--	--
Stainless steel 310, 316, 316B, 316L, 317, Duplex	--	--
Titanium Alloys 6Al-4V, 5Al-2.5 Sn, 6Al-2Sn-4Zr-6Mo, 3Al-8V-6Cr4Mo-4Zr, 10V-2Fe-3Al, 13V-11Cr-3Al	up to 42 HRc	--
High-Temperature Alloys Inconel, Nimonic, Monel, Hastelloy, Waspalloy, A286, Rene 41, Udimet, Stellite	up to 42 HRc	--
Cast iron, grey cast iron, spheroidal graphite and malleable cast iron 0.6010 EN-GL100 (GG10), 0.6020 EN-GJL-200 (GG20), 0.7050 EN-GJS-500-7 (GGG50), 0.8535 EN-GJMW-350-4 (GTW35)	up to 240 HB 30	280
Cast iron, grey cast iron, spheroidal graphite and malleable cast iron 0.6025 EN-GL250 (GG25), 0.6035 EN-GJL-350 (GG35), 0.7070 EN-GJS-700-2 (GGG70), 0.8170 EN-GJMB-700-2 (GTS70)	over 240 HB 30	250
Aluminum, Al-wrought alloys, Al-alloys 2024, 6061, 7075, 1050, 6351, 5005, 2017, 7075	up to 3% Si	--
Aluminium-cast alloys 3.2131 G-AISI5Cu1, 3.2153 G-AISI7Cu3, 3.2573 G-AISI9, 3.2581 G-AISI12, 3.2583 G-AISI12Cu, - G-AISI12CuNiMg	over 3% Si	--
Magnesium-alloys MgMn2, G-MgAl8Zn1, G-MgAl6Zn3	--	--
Non-ferrous metals (copper, short- or long-chipping brass or bronze)	up to 28 HRc	--

Feed Rate Inch per Tooth - IPT							
d1 End Mill Diameter							
1/8 3.17mm	1/4 6.35mm	5/16 7.94mm	3/8 9.52mm	1/2 12.70mm	5/8 15.87mm	3/4 19.05mm	1 25.40mm
--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--
.0003	.0005	.0007	.0009	.0012	.0014	.0020	.0024
.0002	.0004	.0005	.0007	.0009	.0010	.0013	.0017
.0001	.0003	.0005	.0006	.0008	.0009	.0011	.0014
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--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--
.0004	.0009	.0011	.0014	.0020	.0023	.0029	.0037
.0004	.0009	.0010	.0014	.0018	.0023	.0026	.0037
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Feeds & Speeds for SELECT MILL Aluminum end mills

***Large cutting depths and/or less than ideal machining conditions will require a reduction in both Surface Feet Per Minute and Inches Per Revolution ***



Surface feet per minute - SFM				
High Speed Milling			Rough	Slot
DOC 2xd			DOC 1xd	
WOC .05xd	WOC .1xd	WOC .25xd	WOC .4 to .9xd	WOC 1xd

$$RPM = \frac{SFM}{d_1} \times 3.82$$

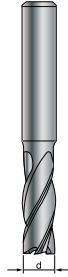
$$IPM = \text{No. of teeth} \times IPT \times RPM$$

For finishing use WOC (ae) .01 up to .1xd, use SFM from .25xd column, do not increase IPT from table values

Material	Hardness	Feed Rate Inch per Tooth - IPT												
		d1 End Mill Diameter												
		1/8 3.17mm	1/4 6.35mm	5/16 7.94mm	3/8 9.52mm	1/2 12.70mm	5/8 15.87mm	3/4 19.05mm	1 25.40mm					
		Multiply IPT x this factor based on WOC												
Structural + free-cutting steels, unalloyed heat-treatable + case hardened steels	--	--	--	--	--	--	--	--	--					
Hardened Steels	--	--	--	--	--	--	--	--	--					
Stainless steel	--	--	--	--	--	--	--	--	--					
Titanium Alloys	--	--	--	--	--	--	--	--	--					
Cast iron, grey cast iron, spheroidal graphite and malleable cast iron	--	--	--	--	--	--	--	--	--					
Aluminum, Al-wrought alloys, Al-alloys 2024, 6061, 7075, 1050, 6351, 5005, 2017, 7075	up to 3% Si	1755	1585	1335	920	835	.0005	.0011	.0014	.0018	.0024	.0030	.0035	.0048
Aluminium-cast alloys 3.2131 G-AISI5Cu1, 3.2153 G-AISI7Cu3, 3.2573 G-AISI9, 3.2581 G-AISI12, 3.2583 G-AISI12Cu, - G-AISI12CuNiMg	over 3% Si	1050	950	800	550	500	.0005	.0009	.0012	.0016	.0021	.0026	.0032	.0044
Magnesium-alloys MgMn2, G-MgAl8Zn1, G-MgAl6Zn3	—	885	810	680	470	425	.0004	.0009	.0011	.0014	.0020	.0023	.0029	.0037
Non-ferrous metals (copper, short- or long-chipping brass or bronze)	up to 28 HRc	1155	1045	880	605	550	.0005	.0009	.0012	.0016	.0021	.0026	.0032	.0044

Feeds & Speeds for SELECT MILL General purpose end mills

***Large cutting depths and/or less than ideal machining conditions will require a reduction in both Surface Feet Per Minute and Inches Per Revolution ***



$$RPM = \frac{SFM}{d_1} \times 3.82$$

$$IPM = \text{No. of teeth} \times IPT \times RPM$$

For finishing use WOC (ae) .01 up to .1xd, use SFM from .25xd column, do not increase IPT from table values

Material	Hardness	SFM
Structural + free-cutting steels, unalloyed heat-treatable + case hardened steels A283, 1151, 1215, L10, 10Lxx, 11Lxx, 12Lxx, 41Lxx, 51Lxx, 86Lxx, 86Lxx, 10xx	up to 28 HRc	340
Free-cutting steels, unalloyed case hardened steels, nitriding steels 1151, 1215, L10, 10Lxx, 11Lxx, 12Lxx, 41Lxx, 51Lxx, 86Lxx, 86Lxx, 10xx, 11xx	28 to 38 HRc	300
Alloyed heat-treatable, tool and high speed steels 13xx, 2340, 31xx, 32xx, 33xx, 34xx, 40xx, 41xx, 43xx, 4640, 50xx, 51xx, 61xx, 71xx, 86xx, 87xx, 92xx, 98xx, 98xx, Ax, Ox, Dx, Hxx, Lx, Wx, Mx, Tx	28 to 44 HRc	225
Hardened Steels Carbon and Alloy Steels, Tool & Die Steels	Up to 54 HRc	100
	54 to 60 HRc	--
Stainless steel 303, 410, 420F, 430, 430F, 416	--	220
Stainless steel 304, 304L, 420, 17-4PH, 17-7PH, 15-5PH, 13-8PH	--	150
Stainless steel 310, 316, 316B, 316L, 317, Duplex	--	130
Titanium Alloys 6Al-4V, 5Al-2.5 Sn, 6Al-2Sn-4Zr-6Mo, 3Al-8V-6Cr4Mo-4Zr, 10V-2Fe-3Al, 13V-11Cr-3Al	up to 42 HRc	110
High-Temperature Alloys Inconel, Nimonic, Monel, Hastelloy, Waspalloy, A286, Rene 41, Udimet, Stellite	up to 42 HRc	70
Cast iron, grey cast iron, spheroidal graphite and malleable cast iron 0.6010 EN-GL100 (GG10), 0.6020 EN-GJL-200 (GG20), 0.7050 EN-GJS-500-7 (GGG50), 0.8535 EN-GJMW-350-4 (GTW35)	up to 240 HB 30	310
Cast iron, grey cast iron, spheroidal graphite and malleable cast iron 0.6025 EN-GL250 (GG25), 0.6035 EN-GJL-350 (GG35), 0.7070 EN-GJS-700-2 (GGG70), 0.8170 EN-GJMB-700-2 (GTS70)	over 240 HB 30	265
Aluminum, Al-wrought alloys, Al-alloys 2024, 6061, 7075, 1050, 6351, 5005, 2017, 7075	up to 3% Si	835
Aluminium-cast alloys 3.2131 G-AISI5Cu1, 3.2153 G-AISI7Cu3, 3.2573 G-AISI9, 3.2581 G-AISI12, 3.2583 G-AISI12Cu, - G-AISI12CuNiMg	over 3% Si	500
Magnesium-alloys MgMn2, G-MgAl8Zn1, G-MgAl6Zn3	--	800
Non-ferrous metals (copper, short- or long-chipping brass or bronze)	up to 28 HRc	330

Feed Rate Inch per Tooth - IPT							
d1 End Mill Diameter							
1/8 3.17mm	1/4 6.35mm	5/16 7.94mm	3/8 9.52mm	1/2 12.70mm	5/8 15.87mm	3/4 19.05mm	1 25.40mm
.0004	.0009	.0011	.0014	.0018	.0023	.0026	.0038
.0004	.0009	.0011	.0014	.0018	.0023	.0026	.0038
.0004	.0008	.0009	.0013	.0017	.0020	.0026	.0034
.0003	.0004	.0006	.0008	.0010	.0014	.0016	.0020
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.0003	.0006	.0008	.0009	.0013	.0017	.0020	.0027
.0003	.0005	.0006	.0009	.0011	.0014	.0016	.0024
.0002	.0004	.0006	.0008	.0010	.0014	.0016	.0020
.0002	.0003	.0004	.0006	.0008	.0010	.0013	.0017
.0002	.0003	.0004	.0006	.0008	.0010	.0013	.0017
.0004	.0008	.0010	.0013	.0017	.0020	.0026	.0034
.0003	.0007	.0009	.0010	.0014	.0017	.0022	.0027
.0007	.0013	.0017	.0020	.0028	.0033	.0042	.0054
.0006	.0011	.0014	.0018	.0024	.0030	.0035	.0048
.0006	.0011	.0014	.0018	.0024	.0030	.0035	.0048
.0004	.0009	.0011	.0014	.0020	.0023	.0029	.0041