



**Maximum Metal Removal
SERIOUS SAVINGS**

**POW • R • PATH
IP7 Series**

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Buy 10 get 10% off the net price**

All IPT7 & IPC7 Catalog Items Included

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Power. Precision. Performance.

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POW • R • PATH **IP7 Series**

All IPT7 & IPC7 Catalog Items Included

7-Flutes for advanced HEM machining

Versatile for use in a wide range of materials

Superior tool life with AlCrNX coating

CMS option creates more manageable chips

Fractional or Metric offering available



Contact your local distributor or visit imcousa.com for more information.

**** 5 Piece Minimum Per Item Number Required For Savings ****



Instant speed & feed recommendations, 24/7.
Scan the QR code or visit imcousa.com/ToolBot.



Power. Precision. Performance.

POW•R•PATH IPT7

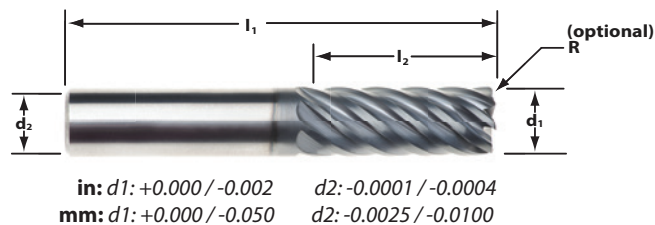


For high-efficiency machining in materials from low carbon steels to high-temp alloys.

- 7-flute
- AICrNX
- Corner radius for HEM in a wide range of materials

The IPT7 is the most versatile POW•R•PATH end mill. It's the "go-to" tool for advanced machining techniques. Engineered specifically for HEM tool paths, the IPT7's unique design runs up to 4.5 x the tool diameter deep at elevated feed rates to maximize metal removal.

NOTE: Not recommended for use with ER collets.



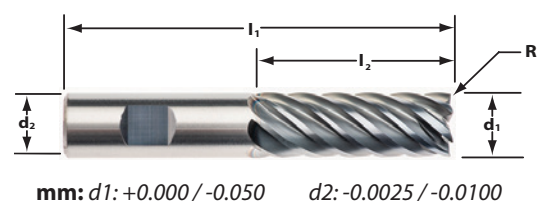
FRACTIONAL / in

Cutter Dia d1	Shank Dia d2	Max Axial Depth xD	Length of Cut I2	Overall Length I1	Order Code SQ	Order Code by Corner Radius						
						.015 CR	.030 CR	.060 CR	.090 CR	.125 CR	.187 CR	.250 CR
3/16	3/16	2	3/8	2	0340036	0340037	0340038	-	-	-	-	-
		3	9/16	2	0340039	0340040	0340041	-	-	-	-	-
		4	3/4	2-1/2	0340042	0340043	0340044	-	-	-	-	-
1/4	1/4	2	1/2	2	0340045	0340046	0340047	0340048	-	-	-	-
		3	3/4	2-1/2	0340049	0340050	0340051	0340052	-	-	-	-
		4	1	3	0340053	0340054	0340055	0340056	-	-	-	-
3/8	3/8	2	3/4	2-1/2	0340057	0340058	0340059	0340060	0340061	-	-	-
		2.5	15/16	2-1/2	0340062	0340063	0340064	0340065	0340066	-	-	-
		3	1-1/8	3	0340067	0340068	0340069	0340070	0340071	-	-	-
		4	1-1/2	3-1/2	0340072	0340073	0340074	0340075	-	-	-	-
1/2	1/2	2	1	3	0340076	-	0340077	0340078	0340079	0340080	-	-
		2.5	1-1/4	3-1/4	0339969	-	0339970	0339971	0339972	0339973	-	-
		3	1-1/2	3-1/2	0340086	-	0340087	0340088	0340089	0340090	-	-
		3.5	1-3/4	4	0339974	-	0339975	0339976	0339977	0339978	-	-
		4	2	4	0340096	-	0340097	0340098	0340099	0340100	-	-
		4.5	2-1/4	4	0340101	-	0340102	0340103	0340104	0340105	-	-
5/8	5/8	2	1-1/4	3-1/2	0340106	-	0340107	0340108	0340109	0340110	0340111	-
		2.5	1-9/16	4	0339979	-	0339980	0339981	0339982	0339983	0339984	-
		3	1-7/8	4	0340118	-	0340119	0340120	0340121	0340122	0340123	-
		3.5	2-3/16	4-1/2	0339985	-	0339986	0339987	-	0339988	-	-
		4	2-1/2	5	0340128	-	0340129	0340130	-	0340131	-	-
3/4	3/4	2	1-1/2	4	0340132	-	0340133	0340134	-	0340135	0340136	0340137
		2.5	1-7/8	4-1/2	0339989	-	0339990	0339991	0339992	0339993	0339994	0339995
		3	2-1/4	5	0340145	-	0340146	0340147	0340148	0340149	0340150	0340151
		3.5	2-5/8	5	0340152	-	0340153	0340154	0340155	0340156	-	-
		4	3	6	0340157	-	0340158	0340159	-	0340160	-	-
1	1	2	2	5	0339996	-	0339997	0339998	0339999	0340000	0340001	0340002
		2.5	2-1/2	5-1/2	0340003	-	0340004	0340005	0340006	0340007	0340008	0340009
		3	3	6	0340175	-	0340176	0340177	-	0340178	-	-
		3.5	3-1/2	6-1/2	0340010	-	0340011	0340012	-	0340013	-	-
		4	4	7	0340183	-	0340184	0340185	-	0340186	-	-

METRIC

Cutter Dia d1	Shank Dia d2	Max Axial Depth xD	Length of Cut l2	Overall Length l1	Order Code SQ	Order Code by Corner Radius				
						0.5 CR	1.0 CR	1.5 CR	2.0 CR	3.0 CR
6	6	2	12	57	0340230	0340231	-	-	-	-
		3	18	63	0340232	0340233	-	-	-	-
		4	24	75	0340234	0340235	-	-	-	-
8	8	2	16	58	0340556	0340557	-	-	-	-
		3	24	63	0340238	0340239	-	-	-	-
		4	32	75	0340240	0340241	-	-	-	-
10	10	2	20	66	0340242	0340243	0340244	-	-	-
		2.5	25	72	0340245	0340246	0340247	-	-	-
		3	30	75	0340248	0340249	0340250	-	-	-
		4	40	88	0340251	0340252	0340253	-	-	-
12	12	2	24	75	0340558	-	0340559	0340560	0340561	0340562
		2.5	30	83	0340259	-	0340260	0340261	0340262	0340263
		3	36	88	0340563	-	0340564	0340566	0340567	0340568
		3.5	42	93	0340569	-	0340570	0340572	0340573	0340574
		4	48	100	0340274	-	0340275	0340276	0340277	0340278
16	16	2	32	92	0340575	-	0340576	0340578	0340579	0340580
		2.5	40	100	0340581	-	0340582	0340584	0340585	0340586
		3	48	110	0340587	-	0340588	0340590	0340591	0340592
		3.5	56	110	0340294	-	0340295	0340296	0340297	0340298
		4	64	125	0340299	-	0340300	0340301	0340302	0340303
20	20	2	40	104	0340304	-	0340305	0340306	0340307	0340308
		2.5	50	115	0340593	-	0340594	0340596	0340597	0340598
		3	60	125	0340314	-	0340315	0340316	0340317	0340318
		3.5	70	135	0340599	-	0340600	0340602	0340603	0340604
		4	80	150	0340324	-	0340325	0340326	0340327	0340328
25	25	2	50	120	0340329	-	0340330	0340331	0340332	0340333
		2.5	63	135	0340014	-	0340031	0340033	0340034	0340187
		3	75	150	0340339	-	0340340	0340341	0340342	0340343
		3.5	88	165	0340188	-	0340189	0340370	0340371	0340372

D = Tool diameter

IPT7_w/WELDON

METRIC

Cutter Dia d1	Shank Dia d2	Max Axial Depth xD	Length of Cut l2	Overall Length l1	Order Code by Corner Radius		
					1.0 CR	1.5 CR	3.0 CR
12	12	3	36	88	0853437	-	0853438
		3.5	42	93	0853439	-	0853440
		4	48	100	0853441	-	0853445
16	16	3	48	110	-	0853450	0853451
		3.5	56	110	-	0853453	0853454
		4	64	125	-	0853455	0853457
20	20	3	60	125	-	0853458	0853459
		3.5	70	135	-	0853461	0853462
		4	80	150	-	0853464	0853465

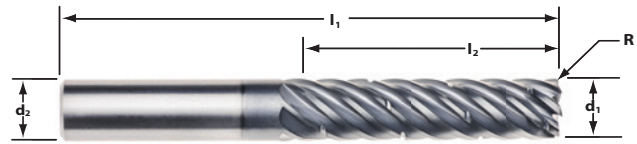
Scan to calculate speeds and feed rates with **Toolbot**



For high-efficiency machining in materials from low carbon steels to hi-temp alloys.

The IPC7 end mill adds the benefits of the unique Chip Management System to the versatility of the seven-flute design. The CMS breaks up long, stringy chips, eliminating chip packing and recutting, and allowing deep, free cutting tool movement in a variety of materials.

Seven flutes provide higher cutting-edge engagement for critical finish quality. The AlCrNX coating protects cutting edges against heat failure and deflects heat from the cutting zone.



in: d1: +0.000 / -0.002 d2: -0.0001 / -0.0004
mm: d1: +0.000 / -0.050 d2: -0.0025 / -0.0100

FRACTIONAL / in

Cutter Dia d1	Shank Dia d2	Max Axial Depth xD	Length of Cut L2	Overall Length L1	Order Code by Corner Radius	
					.030 CR	.060 CR
3/8	3/8	3	1-1/8	3	0340190	-
		4	1-1/2	3-1/2	0340191	-
1/2	1/2	2.5	1-1/4	3-1/4	0340015	0340016
		3	1-1/2	3-1/2	0340194	0340195
		3.5	1-3/4	4	0340017	0340018
		4	2	4	0340198	0340199
5/8	5/8	2	1-1/4	3-1/2	0340200	0340201
		2.5	1-9/16	4	0340019	0340020
		3	1-7/8	4	0340204	0340205
		3.5	2-3/16	4-1/2	0340021	0340022
		4	2-1/2	5	0340208	0340209
		2	1-1/2	4	0340210	0340211
3/4	3/4	2.5	1-7/8	4-1/2	0340023	0340024
		3	2-1/4	5	0340214	0340215
		3.5	2-5/8	5	0340216	0340217
		4	3	6	0340218	0340219
		2	2	5	0340025	0340027
1	1	2.5	2-1/2	5-1/2	0340028	0340029
		3	3	6	0340224	0340225
		3.5	3-1/2	6-1/2	0340030	0340035
		4	4	7	0340228	0340229

METRIC

Cutter Dia d1	Shank Dia d2	Max Axial Depth xD	Length of Cut L2	Overall Length L1	Order Code 1.0 CR
10	10	3	30	75	0340350
		4	40	88	0340351
12	12	2.5	30	83	0340352
		3	36	88	0340565
		3.5	42	93	0340571
		4	48	100	0340355
16	16	2	32	92	0340577
		2.5	40	100	0340583
		3	48	110	0340589
		3.5	56	110	0340359
		4	64	125	0340360
		2	40	104	0340361
20	20	2.5	50	115	0340595
		3	60	125	0340363
		3.5	70	135	0340601
		4	80	150	0340365
25	25	2	50	120	0340366
		2.5	63	135	0340032
		3	75	150	0340368
		3.5	88	165	0340349



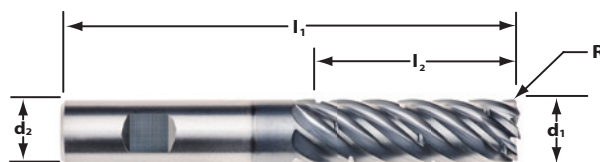
Scan to calculate speeds and feed rates with **Toolbot**

IPC7_w/WELDON

For high-efficiency machining in materials ranging from low carbon steels to hi-temp alloys.

This model adds the benefits of the Chip Management System to the seven-flute design. The CMS breaks up long, stringy chips, eliminating chip packing and recutting, and allowing deep, free cutting tool movement in a variety of materials.

Order with flat for Weldon-style tool holders.



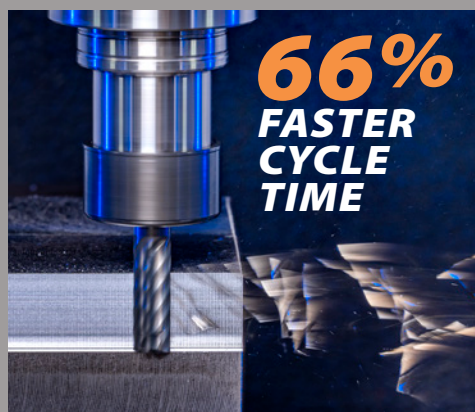
mm: d1: +0.000 / -0.050 d2: -0.0025 / -0.0100

METRIC

Cutter Dia d1	Shank Dia d2	Max Axial Depth xD	Length of Cut L2	Overall Length L1	Order Code 1.0 CR
12	12	3	36	88	0853466
		3.5	42	93	0853468
		4	48	100	0853469
16	16	3	48	110	0853472
		3.5	56	110	0853486
		4	64	125	0853489
20	20	3	60	125	0853490
		3.5	70	135	0853498
		4	80	150	0853500

D = Tool diameter

CASE STUDY | POW•R•PATH IPT7



In this comparison machining in 4140 (30 HRC) Carbon steel, the **POW•R•PATH IPT7 mill with HEM tool paths cut machining time 66%** vs. a high-performance Brand X 4-flute end mill running traditional paths.

That's three parts with IMCO's IPT7 tool and just one with the Brand X 4-flute.

	4-Flute Mill	IPT7 Mill
Roughing:		
Tool dia.	½"	½"
Speed	2674 rpm (350 sfm)	3438 rpm (450 sfm)
Feed	32 ipm (.003 ipt)	154 ipm (.0064 ipt)
Axial DOC	.500"	1.500" (deeper cut)
Radial DOC	.250"	.040" (light step-over)
Slotting:		
Tool dia.	½"	½"
Speed	2292 rpm (300 sfm)	3438 rpm (450 sfm)
Feed	22 ipm (.0024 ipt)	154 ipm (.0064 ipt)
Axial DOC	.500"	1.500" (deeper cut)
Radial DOC	.500"	.040" (light step-over)
Cycle Time	18.5 min.	6.5 min.

POW•R•PATH IPT7/IPC7 SERIES | Application Guide – Speed & Feed (inch)

ISO Code	Work Material	Type of Cut	Axial DOC	Radial DOC	No. of Flutes	Speed (SFM)	Feed (Inches per Tooth)						
							3/16	1/4	3/8	1/2	5/8	3/4	1
K	Gray ASTM-A48 Class 20, 25, 30, 35 & 40	Peripheral - HEM	≤ 3 x D	.1 x D	7	400	.0027	.0036	.0054	.0072	.0090	.0108	.0144
		Peripheral - HEM	> 3 x D - 4 x D	.08 x D	7	400	.0024	.0032	.0049	.0065	.0081	.0097	.0130
		Peripheral - HEM	> 4 x D - 5 x D	.08 x D	7	390	.0022	.0029	.0043	.0058	.0072	.0086	.0115
		Finish	3 x D	.015 x D	7	450	.0010	.0013	.0020	.0026	.0033	.0039	.0052
	Cast iron malleable	Peripheral - HEM	≤ 3 x D	.08 x D	7	390	.0022	.0029	.0044	.0058	.0073	.0087	.0116
		Peripheral - HEM	> 3 - 4 x D	.08 x D	7	390	.0020	.0026	.0039	.0052	.0065	.0078	.0104
		Peripheral - HEM	> 4 - 5 x D	.08 x D	7	375	.0017	.0023	.0035	.0046	.0058	.0070	.0093
		Finish	3 x D	.015 x D	7	350	.0008	.0011	.0016	.0021	.0026	.0032	.0042
P	Low carbon steels ≤ 38 Rc 1018, 1020, 12L14, 5120, 8620	Peripheral - HEM	≤ 3 x D	.08 x D	7	485	.0028	.0038	.0056	.0075	.0094	.0113	.0150
		Peripheral - HEM	> 3 - 4 x D	.08 x D	7	485	.0025	.0034	.0051	.0068	.0084	.0101	.0135
		Peripheral - HEM	> 4 - 5 x D	.08 x D	7	465	.0023	.0030	.0045	.0060	.0075	.0090	.0120
		Finish	3 x D	.015 x D	7	420	.0011	.0014	.0021	.0028	.0035	.0042	.0056
	Medium carbon steels ≤ 48 HRc 1045, 4140, 4340, 5140	Peripheral - HEM	≤ 3 x D	.08 x D	7	450	.0027	.0036	.0053	.0071	.0089	.0107	.0142
		Peripheral - HEM	> 3 - 4 x D	.08 x D	7	450	.0024	.0032	.0048	.0064	.0080	.0096	.0128
		Peripheral - HEM	> 4 - 5 x D	.08 x D	7	425	.0021	.0028	.0043	.0057	.0071	.0085	.0114
		Finish	3 x D	.015 x D	7	390	.0009	.0013	.0019	.0025	.0031	.0038	.0050
	Tool and die steels ≤ 48 Rc A2, D2, O1, S7, P20, H13	Peripheral - HEM	≤ 3 x D	.08 x D	7	420	.0024	.0032	.0048	.0064	.0080	.0096	.0128
		Peripheral - HEM	> 3 - 4 x D	.08 x D	7	420	.0022	.0029	.0043	.0058	.0072	.0086	.0115
		Peripheral - HEM	> 4 - 5 x D	.08 x D	7	395	.0019	.0026	.0038	.0051	.0064	.0077	.0102
		Finish	3 x D	.015 x D	7	365	.0008	.0011	.0016	.0021	.0026	.0032	.0042
M	Martensitic & ferritic stainless steels 410, 416, 440	Peripheral - HEM	≤ 3 x D	.08 x D	7	450	.0028	.0038	.0056	.0075	.0094	.0113	.0150
		Peripheral - HEM	> 3 - 4 x D	.08 x D	7	450	.0025	.0034	.0051	.0068	.0084	.0101	.0135
		Peripheral - HEM	> 4 - 5 x D	.08 x D	7	425	.0023	.0030	.0045	.0060	.0075	.0090	.0120
		Finish	3 x D	.015 x D	7	390	.0009	.0013	.0019	.0025	.0031	.0038	.0050
	Austenitic stainless steels, fFeNi alloys 303, 304, 316, Invar, Kovar	Peripheral - HEM	≤ 3 x D	.08 x D	7	450	.0024	.0032	.0048	.0064	.0080	.0096	.0128
		Peripheral - HEM	> 3 - 4 x D	.08 x D	7	440	.0022	.0029	.0043	.0058	.0072	.0086	.0115
		Peripheral - HEM	> 4 - 5 x D	.07 x D	7	425	.0019	.0026	.0038	.0051	.0064	.0077	.0102
		Finish	3 x D	.015 x D	7	390	.0009	.0012	.0018	.0024	.0030	.0036	.0048
	Precipitation hardening stainless steels 17-4, 15-5	Peripheral - HEM	≤ 3 x D	.08 x D	7	440	.0023	.0031	.0047	.0062	.0078	.0093	.0124
		Peripheral - HEM	> 3 - 4 x D	.08 x D	7	440	.0021	.0028	.0042	.0056	.0070	.0084	.0112
		Peripheral - HEM	> 4 - 5 x D	.07 x D	7	415	.0019	.0025	.0037	.0050	.0062	.0074	.0099
		Finish	3 x D	.015 x D	7	380	.0008	.0010	.0015	.0020	.0025	.0030	.0040
S	Titanium alloys 6Al-4V, 6-2-4	Peripheral - HEM	≤ 3 x D	.1 x D	7	405	.0015	.0021	.0031	.0041	.0051	.0062	.0082
		Peripheral - HEM	> 3 - 4 x D	.08 x D	7	405	.0014	.0018	.0028	.0037	.0046	.0055	.0074
		Peripheral - HEM	> 4 - 5 x D	.08 x D	7	390	.0012	.0016	.0025	.0033	.0041	.0049	.0066
		Finish	3 x D	.015 x D	7	350	.0006	.0008	.0012	.0016	.0020	.0024	.0032
	Difficult-to-machine titanium alloys 10-2-3 Precipitation Hardening Stainless Steel M 13-8	Peripheral - HEM	≤ 2.5 x D	.08 x D	7	335	.0015	.0020	.0030	.0040	.0050	.0060	.0080
		Peripheral - HEM	> 2.5 - 3.5 x D	.07 x D	7	325	.0014	.0018	.0027	.0036	.0045	.0054	.0072
		Peripheral - HEM	> 3.5 - 4 x D	.06 x D	7	305	.0012	.0016	.0024	.0032	.0040	.0048	.0064
		Finish	3 x D	.01 x D	7	290	.0005	.0007	.0011	.0014	.0018	.0021	.0028
	Hastalloy, Waspalloy	Peripheral - HEM	≤ 1.5 x D	.08 x D	7	100	.0035	.0047	.0071	.0094	.0118	.0141	.0188
		Peripheral - HEM	> 1.5 - 2.5 x D	.08 x D	7	95	.0032	.0042	.0063	.0085	.0106	.0127	.0169
		Peripheral - HEM	> 2.5 - 3.5 x D	.06 x D	7	85	.0028	.0038	.0056	.0075	.0094	.0113	.0150
		Finish	2 x D	.01 x D	7	90	.0019	.0025	.0038	.0050	.0063	.0075	.0100
	Inconel 718, Rene 88	Peripheral - HEM	≤ 1.5 x D	.07 x D	7	95	.0035	.0047	.0070	.0093	.0116	.0140	.0186
		Peripheral - HEM	> 1.5 - 2.5 x D	.06 x D	7	90	.0031	.0042	.0063	.0084	.0105	.0126	.0167
		Peripheral - HEM	> 2.5 - 3 x D	.06 x D	7	85	.0028	.0037	.0056	.0074	.0093	.0112	.0149
		Finish	2 x D	.01 x D	7	85	.0018	.0024	.0036	.0048	.0060	.0072	.0096

D = Tool diameter HEM = High-efficiency machining (chip thinning calculations have already been applied to HEM parameters)

≈ Approximately equals
 ≤ Less than or equal to
 ≥ Greater than or equal to
 × Multiply
 < Less than
 > Greater than
 = Equals

POW•R•PATH IPT7/IPC7 SERIES | Application Guide – Speed & Feed (metric)

ISO Code	Work Material	Type of Cut	Axial DOC	Radial DOC	No. of Flutes	Speed (M/min)	6.0	8.0	Feed (MM per Tooth)				
									10.0	12.0	16.0	20.0	25.0
K	Gray ASTM-A48 Class 20, 25, 30, 35 & 40	Peripheral - HEM	≤ 3 x D	.1 x D	7	122	.0864	.1152	.1434	.1728	.2298	.2868	.3456
		Peripheral - HEM	> 3 - 4 x D	.08 x D	7	122	.0778	.1037	.1291	.1555	.2068	.2581	.3110
		Peripheral - HEM	> 4 - 5 x D	.08 x D	7	119	.0691	.0922	.1147	.1382	.1838	.2295	.2765
		Finish	3 x D	.015 x D	7	137	.0312	.0416	.0518	.0624	.0830	.1036	.1248
	Cast iron Malleable	Peripheral - HEM	≤ 3 x D	.08 x D	7	119	.0696	.0928	.1155	.1392	.1851	.2311	.2784
		Peripheral - HEM	> 3 - 4 x D	.08 x D	7	119	.0626	.0835	.1040	.1253	.1666	.2079	.2505
		Peripheral - HEM	> 4 - 5 x D	.08 x D	7	114	.0557	.0742	.0924	.1114	.1481	.1848	.2227
		Finish	3 x D	.015 x D	7	107	.0252	.0336	.0418	.0504	.0670	.0837	.1008
P	Low carbon steels ≤ 38 Rc 1018, 1020, 12L14, 5120, 8620	Peripheral - HEM	≤ 3 x D	.08 x D	7	148	.0900	.1200	.1494	.1800	.2394	.2988	.3600
		Peripheral - HEM	> 3 - 4 x D	.08 x D	7	148	.0810	.1080	.1344	.1620	.2154	.2689	.3240
		Peripheral - HEM	> 4 - 5 x D	.08 x D	7	142	.0720	.0960	.1195	.1440	.1915	.2390	.2880
		Finish	3 x D	.015 x D	7	128	.0336	.0448	.0558	.0672	.0894	.1115	.1344
	Medium carbon steels ≤ 48 HRC 1045, 4140, 4340, 5140	Peripheral - HEM	≤ 3 x D	.08 x D	7	137	.0852	.1136	.1414	.1704	.2266	.2828	.3408
		Peripheral - HEM	> 3 - 4 x D	.08 x D	7	137	.0767	.1022	.1273	.1533	.2040	.2546	.3067
		Peripheral - HEM	> 4 - 5 x D	.08 x D	7	130	.0682	.0909	.1131	.1363	.1813	.2263	.2726
		Finish	3 x D	.015 x D	7	119	.0300	.0400	.0498	.0600	.0798	.0996	.1200
	Tool and die steels ≤ 48 Rc A2, D2, O1, S7, P20, H13	Peripheral - HEM	≤ 3 x D	.08 x D	7	128	.0768	.1024	.1275	.1536	.2043	.2550	.3072
		Peripheral - HEM	> 3 - 4 x D	.08 x D	7	128	.0691	.0922	.1147	.1382	.1838	.2295	.2765
		Peripheral - HEM	> 4 - 5 x D	.08 x D	7	120	.0614	.0819	.1020	.1229	.1634	.2040	.2457
		Finish	3 x D	.015 x D	7	111	.0252	.0336	.0418	.0504	.0670	.0837	.1008
M	Martensitic & ferritic stainless steels 410, 416, 440	Peripheral - HEM	≤ 3 x D	.08 x D	7	137	.0900	.1200	.1494	.1800	.2394	.2988	.3600
		Peripheral - HEM	> 3 - 4 x D	.08 x D	7	137	.0810	.1080	.1344	.1620	.2154	.2689	.3240
		Peripheral - HEM	> 4 - 5 x D	.08 x D	7	130	.0720	.0960	.1195	.1440	.1915	.2390	.2880
		Finish	3 x D	.015 x D	7	119	.0300	.0400	.0498	.0600	.0798	.0996	.1200
	Austenitic stainless steels, FeNi alloys 303, 304, 316, Invar, Kovar	Peripheral - HEM	≤ 3 x D	.08 x D	7	137	.0768	.1024	.1275	.1536	.2043	.2550	.3072
		Peripheral - HEM	> 3 - 4 x D	.08 x D	7	134	.0691	.0922	.1147	.1382	.1838	.2295	.2765
		Peripheral - HEM	> 4 - 5 x D	.07 x D	7	130	.0614	.0819	.1020	.1229	.1634	.2040	.2457
		Finish	3 x D	.015 x D	7	119	.0288	.0384	.0478	.0576	.0766	.0956	.1152
	Precipitation hardening stainless steels 17-4, 15-5	Peripheral - HEM	≤ 3 x D	.08 x D	7	134	.0744	.0992	.1235	.1488	.1979	.2470	.2976
		Peripheral - HEM	> 3 - 4 x D	.08 x D	7	134	.0670	.0893	.1111	.1339	.1781	.2223	.2678
		Peripheral - HEM	> 4 - 5 x D	.07 x D	7	126	.0595	.0794	.0988	.1190	.1583	.1976	.2381
		Finish	3 x D	.015 x D	7	116	.0240	.0320	.0398	.0480	.0638	.0797	.0960
S	Titanium alloys 6Al-4V, 6-2-4	Peripheral - HEM	≤ 3 x D	.1 x D	7	123	.0492	.0656	.0817	.0984	.1309	.1633	.1968
		Peripheral - HEM	> 3 - 4 x D	.08 x D	7	123	.0443	.0590	.0735	.0886	.1178	.1470	.1771
		Peripheral - HEM	> 4 - 5 x D	.08 x D	7	119	.0394	.0525	.0653	.0787	.1047	.1307	.1574
		Finish	3 x D	.015 x D	7	107	.0192	.0256	.0319	.0384	.0511	.0637	.0768
	Difficult-to-machine titanium alloys 10-2-3 Precipitation hardening stainless steel M 13-8	Peripheral - HEM	≤ 2.5 x D	.08 x D	7	102	.0480	.0640	.0797	.0960	.1277	.1593	.1920
		Peripheral - HEM	> 2.5 - 3.5 x D	.07 x D	7	99	.0432	.0576	.0717	.0864	.1149	.1434	.1728
		Peripheral - HEM	> 3.5 - 4 x D	.06 x D	7	93	.0384	.0512	.0637	.0768	.1021	.1275	.1536
		Finish	3 x D	.01 x D	7	88	.0168	.0224	.0279	.0336	.0447	.0558	.0672
	Hastalloy, Waspalloy	Peripheral - HEM	≤ 1.5 x D	.08 x D	7	30	.1128	.1504	.1872	.2256	.3000	.3745	.4512
		Peripheral - HEM	> 1.5 - 2.5 x D	.08 x D	7	29	.1015	.1353	.1685	.2030	.2700	.3370	.4060
		Peripheral - HEM	> 2.5 - 3.5 x D	.06 x D	7	26	.0902	.1203	.1498	.1805	.2400	.2996	.3609
		Finish	2 x D	.01 x D	7	27	.0600	.0800	.0996	.1200	.1596	.1992	.2400
	Inconel 718, Rene 88	Peripheral - HEM	≤ 1.5 x D	.07 x D	7	29	.1116	.1488	.1852	.2232	.2968	.3705	.4464
		Peripheral - HEM	> 1.5 - 2.5 x D	.06 x D	7	27	.1004	.1339	.1667	.2009	.2671	.3334	.4017
		Peripheral - HEM	> 2.5 - 3 x D	.06 x D	7	26	.0893	.1190	.1482	.1785	.2375	.2964	.3571
		Finish	2 x D	.01 x D	7	26	.0576	.0768	.0956	.1152	.1532	.1912	.2304

D = Tool diameter

HEM = High-efficiency machining (chip thinning calculations have already been applied to HEM parameters shown)

Common Machining Formulas

$$\text{rpm} = \frac{\text{sfm} \times 3.82}{D}$$

$$\text{sfm} = \text{rpm} \times D \times .262$$

$$\text{ipm} = \text{rpm} \times \text{ipt} \times Z$$

$$\text{mrr} = \text{RDOC} \times \text{ADOC} \times \text{ipm}$$

$$\text{rpm} = \frac{\text{m/min} \times 318.3}{D}$$

$$\text{m/min} = \text{rpm} \times D \times .00314$$

$$\text{mmrpm} = \text{rpm} \times \text{mmpt} \times Z$$

$$\text{mrr} = \text{RDOC} \times \text{ADOC} \times \text{mmrpm}$$



Scan to calculate speeds and feed rates with **Toolbot**