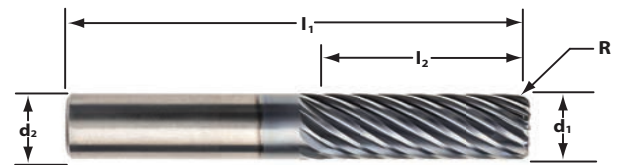


IPT11 POW•R•PATH



For high-efficiency machining (HEM) in materials ranging from low carbon steels to hi-temp alloys. Built for results with 11 cutting edges to yield incredible feed rates. Engineered specifically for HEM tool paths, the IPT11 has a very thick core for extra stability when machining materials up to 3.5 x the tool diameter deep.



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

Note that the IPT11 is not designed for light-duty machines and should only be run in machines with adequate spindle torque and horsepower.

Cutter Dia d1	Shank Dia d2	Max Axial Depth xD	Length of Cut I2	Overall Length I1	Order Code by Corner Radius		
					.030 CR	.060 CR	.125 CR
1/2	1/2	2	1	3	0340615	0340616	-
		2.5	1-1/4	3-1/4	0340617	0340618	-
		3	1-1/2	3-1/2	0340619	0340620	-
		3.5	1-3/4	4	0340621	0340622	-
5/8	5/8	2	1-1/4	3-1/2	0340623	0340624	-
		2.5	1-9/16	4	0340625	0340626	-
		3	1-7/8	4	0340627	0340628	-
		3.5	2-3/16	4-1/2	0340629	0340630	-
3/4	3/4	2	1-1/2	4	0340631	0340632	0340633
		2.5	1-7/8	4-1/2	0340634	0340635	0340636
		3	2-1/4	5	0340637	0340638	0340639
		3.5	2-5/8	5	0340640	0340641	0340642
1	1	2	2	5	0340643	0340644	0340645
		2.5	2-1/2	5-1/2	0340646	0340647	0340648
		3	3	6	0340649	0340650	0340651
		3.5	3-1/2	6-1/2	0340652	0340653	0340654
1-1/4	1-1/4	2	2-1/2	5-1/2	0340655	0340656	0340657
		2.5	3-1/8	6-1/2	0340658	0340659	0340660

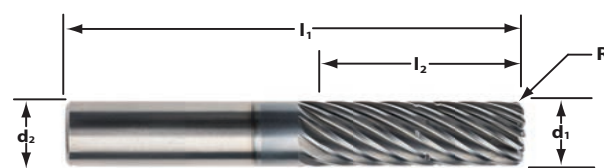
Cutter Dia d1	Shank Dia d2	Max Axial Depth xD	Length of Cut I2	Overall Length I1	Order Code by Corner Radius		
					1.0 CR	1.5 CR	3.0 CR
12	12	2	24	75	0340854	0340855	-
		2.5	30	83	0340856	0340857	-
		3	36	88	0340858	0340859	-
		3.5	42	93	0340860	0340861	-
16	16	2	32	92	0340862	0340863	-
		2.5	40	100	0340864	0340865	-
		3	48	110	0340866	0340867	-
		3.5	56	110	0340868	0340869	-
20	20	2	40	104	0340870	0340871	0340872
		2.5	50	115	0340873	0340874	0340875
		3	60	125	0340876	0340877	0340878
		3.5	70	135	0340879	0340880	0340881

D = Tool Diameter

IPC11 POW•R•PATH



For high-efficiency machining (HEM) in materials ranging from low carbon steels to hi-temp alloys. Adds the benefits of the unique **Chip Management System (CMS)** to the versatility of the IPT11 design. Breaks up long, stringy chips, which eliminates recutting chips and chip packing, and allows for deep, free cutting tool movement in a variety of materials. The results are great chip control and very high metal removal rates.



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

Note that the IPT11 is not designed for light-duty machines and should only be run in machines with adequate spindle torque and horsepower.



Cutter Dia d1	Shank Dia d2	Max Axial Depth xD	Length of Cut I2	Overall Length I1	Order Code by Corner Radius		
					.030 CR	.060 CR	.125 CR
1/2	1/2	3	1-1/2	3-1/2	0340661	0340662	-
		3.5	1-3/4	4	0340663	0340664	-
5/8	5/8	2.5	1-9/16	4	0340665	0340666	-
		3	1-7/8	4	0340667	0340668	-
		3.5	2-3/16	4-1/2	0340669	0340670	-
3/4	3/4	2	1-1/2	4	0340671	0340672	0340673
		2.5	1-7/8	4-1/2	0340674	0340675	0340676
		3	2-1/4	5	0340677	0340678	0340679
		3.5	2-5/8	5	0340680	0340681	0340682
1	1	2	2	5	0340683	0340684	0340685
		2.5	2-1/2	5-1/2	0340686	0340687	0340688
		3	3	6	0340689	0340690	0340691
		3.5	3-1/2	6-1/2	0340692	0340693	0340694
1-1/4	1-1/4	2	2-1/2	5-1/2	0340695	0340696	0340697
		2.5	3-1/8	6-1/2	0340698	0340699	0340700

Cutter Dia d1	Shank Dia d2	Max Axial Depth xD	Length of Cut I2	Overall Length I1	Order Code by Corner Radius		
					1.0 CR	1.5 CR	3.0 CR
12	12	3	36	88	0340882	0340883	-
		3.5	42	93	0340884	0340885	-
16	16	2.5	40	100	0340886	0340887	-
		3	48	110	0340888	0340889	-
		3.5	56	110	0340890	0340891	-
20	20	2	40	104	0340892	0340893	0340894
		2.5	50	115	0340895	0340896	0340897
		3	60	125	0340898	0340899	0340900
		3.5	70	135	0340901	0340902	0340903

D = Tool Diameter

IPT11/IPC11 Application Guide – Speed & Feed (inch)

ISO Code	Work Material	Type of Cut	Axial DOC	Radial DOC	No. of Flutes	Speed (SFM)	1/2	5/8	3/4	1	1-1/4
	Gray ASTM-A48 Class 20, 25, 30, 35 & 40	Peripheral - HEM	≤ 2 x D	.08 x D	11	365	.0053	.0066	.0080	.0106	.0133
		Peripheral - HEM	> 2 - 3 x D	.07 x D	11	365	.0046	.0058	.0069	.0092	.0115
		Peripheral - HEM	> 3 - 3.5 x D	.07 x D	11	350	.0040	.0050	.0060	.0080	.0100
		Peripheral - HEM	> 3.5 - 4 x D	.065 x D	11	350	.0034	.0043	.0051	.0068	.0085
		Finish	3 x D	.01 x D	11	370	.0022	.0028	.0033	.0044	.0055
	Cast Iron Malleable	Peripheral - HEM	≤ 2 x D	.07 x D	11	375	.0063	.0079	.0095	.0126	.0158
		Peripheral - HEM	> 2 - 3 x D	.07 x D	11	375	.0056	.0070	.0084	.0112	.0140
		Peripheral - HEM	> 3 - 3.5 x D	.07 x D	11	360	.0048	.0060	.0072	.0096	.0120
		Peripheral - HEM	> 3.5 - 4 x D	.07 x D	11	360	.0040	.0050	.0060	.0080	.0100
		Finish	3 x D	.01 x D	11	335	.0023	.0029	.0035	.0046	.0058
	Low Carbon Steels ≤ 38 Rc 1018, 1020, 12L14, 5120, 8620	Peripheral - HEM	≤ 2 x D	.07 x D	11	550	.0055	.0069	.0083	.0110	.0138
		Peripheral - HEM	> 2 - 3 x D	.07 x D	11	530	.0048	.0060	.0072	.0096	.0120
		Peripheral - HEM	> 3 - 3.5 x D	.07 x D	11	515	.0042	.0053	.0063	.0084	.0105
		Peripheral - HEM	> 3.5 - 4 x D	.07 x D	11	505	.0036	.0045	.0054	.0072	.0090
		Finish	3 x D	.01 x D	11	475	.0020	.0025	.0030	.0040	.0050
	Medium Carbon Steels ≤ 48 HRC 1045, 4140, 4340, 5140	Peripheral - HEM	≤ 2 x D	.07 x D	11	530	.0054	.0068	.0081	.0108	.0135
		Peripheral - HEM	> 2 - 3 x D	.07 x D	11	515	.0047	.0059	.0071	.0094	.0118
		Peripheral - HEM	> 3 - 3.5 x D	.07 x D	11	500	.0041	.0051	.0062	.0082	.0103
		Peripheral - HEM	> 3.5 - 4 x D	.07 x D	11	490	.0035	.0044	.0053	.0070	.0088
		Finish	3 x D	.01 x D	11	455	.0019	.0024	.0029	.0038	.0048
	Tool and Die Steels ≤ 48 Rc A2, D2, O1, S7, P20, H13	Peripheral - HEM	≤ 2 x D	.06 x D	11	445	.0063	.0079	.0095	.0126	.0158
		Peripheral - HEM	> 2 - 3 x D	.06 x D	11	430	.0055	.0069	.0083	.0110	.0138
		Peripheral - HEM	> 3 - 3.5 x D	.06 x D	11	415	.0048	.0060	.0072	.0096	.0120
		Peripheral - HEM	> 3.5 - 4 x D	.06 x D	11	410	.0041	.0051	.0062	.0082	.0103
		Finish	3 x D	.01 x D	11	385	.0020	.0025	.0030	.0040	.0050
	Martensitic & Ferritic Stainless Steels 410, 416, 440	Peripheral - HEM	≤ 2 x D	.06 x D	11	450	.0068	.0085	.0102	.0136	.0170
		Peripheral - HEM	> 2 - 3 x D	.06 x D	11	450	.0060	.0075	.0090	.0120	.0150
		Peripheral - HEM	> 3 - 3.5 x D	.06 x D	11	425	.0054	.0068	.0081	.0108	.0135
		Peripheral - HEM	> 3.5 - 4 x D	.06 x D	11	425	.0044	.0055	.0066	.0088	.0110
		Finish	3 x D	.01 x D	11	390	.0023	.0029	.0035	.0046	.0058
	Austenitic Stainless Steels, FeNi Alloys 303, 304, 316, Invar, Kovar	Peripheral - HEM	≤ 2 x D	.06 x D	11	445	.0067	.0084	.0101	.0134	.0168
		Peripheral - HEM	> 2 - 3 x D	.06 x D	11	430	.0059	.0074	.0089	.0118	.0148
		Peripheral - HEM	> 3 - 3.5 x D	.06 x D	11	415	.0052	.0065	.0078	.0104	.0130
		Peripheral - HEM	> 3.5 - 4 x D	.06 x D	11	410	.0043	.0054	.0065	.0086	.0108
		Finish	3 x D	.01 x D	11	385	.0025	.0031	.0038	.0050	.0063
	Precipitation Hardening Stainless Steels 17-4, 15-5	Peripheral - HEM	≤ 2 x D	.06 x D	11	435	.0068	.0085	.0102	.0136	.0170
		Peripheral - HEM	> 2 - 3 x D	.06 x D	11	420	.0060	.0075	.0090	.0120	.0150
		Peripheral - HEM	> 3 - 3.5 x D	.06 x D	11	405	.0052	.0065	.0078	.0104	.0130
		Peripheral - HEM	> 3.5 - 4 x D	.06 x D	11	400	.0043	.0054	.0065	.0086	.0108
		Finish	3 x D	.01 x D	11	375	.0022	.0028	.0033	.0044	.0055
	Titanium Alloys 6Al-4V, 6-2-4	Peripheral - HEM	≤ 2 x D	.06 x D	11	425	.0060	.0075	.0090	.0120	.0150
		Peripheral - HEM	> 2 - 3 x D	.06 x D	11	415	.0043	.0054	.0065	.0086	.0108
		Peripheral - HEM	> 3 - 3.5 x D	.06 x D	11	395	.0042	.0053	.0063	.0084	.0105
		Peripheral - HEM	> 3.5 - 4 x D	.06 x D	11	395	.0039	.0049	.0059	.0078	.0098
		Finish	3 x D	.015 x D	11	370	.0023	.0029	.0035	.0046	.0058
	Difficult-to-Machine Titanium Alloys 10-2-3	Peripheral - HEM	≤ 2 x D	.06 x D	11	350	.0059	.0074	.0089	.0118	.0148
		Peripheral - HEM	> 2 - 3 x D	.06 x D	11	330	.0042	.0053	.0063	.0084	.0105
		Peripheral - HEM	> 3 - 3.5 x D	.055 x D	11	315	.0041	.0051	.0062	.0082	.0103
		Peripheral - HEM	> 3.5 - 4 x D	.05 x D	11	310	.0038	.0048	.0057	.0076	.0095
		Finish	3 x D	.01 x D	11	300	.0020	.0025	.0030	.0040	.0050
	Precipitation Hardening Stainless Steel  13-8	Peripheral - HEM	≤ 2 x D	.07 x D	11	105	.0090	.0113	.0135	.0180	.0225
		Peripheral - HEM	> 2 - 3 x D	.065 x D	11	100	.0081	.0101	.0122	.0162	.0203
		Peripheral - HEM	> 3 - 3.5 x D	.055 x D	11	90	.0072	.0090	.0108	.0144	.0180
		Peripheral - HEM	> 3.5 - 4 x D	.055 x D	11	90	.0065	.0081	.0097	.0130	.0162
		Finish	3 x D	.01 x D	11	90	.0047	.0059	.0071	.0094	.0118
	Hastalloy, Waspalloy	Peripheral - HEM	≤ 2 x D	.065 x D	11	100	.0062	.0078	.0093	.0124	.0155
		Peripheral - HEM	> 2 - 3 x D	.06 x D	11	95	.0060	.0075	.0090	.0120	.0150
		Peripheral - HEM	> 3 - 3.5 x D	.05 x D	11	95	.0060	.0075	.0090	.0120	.0150
		Peripheral - HEM	> 3.5 - 4 x D	.05 x D	11	95	.0052	.0065	.0078	.0104	.0130
		Finish	3 x D	.01 x D	11	90	.0032	.0040	.0048	.0064	.0080
	Inconel 718, Rene 88	Peripheral - HEM	≤ 2 x D	.065 x D	11	100	.0062	.0078	.0093	.0124	.0155
		Peripheral - HEM	> 2 - 3 x D	.06 x D	11	95	.0060	.0075	.0090	.0120	.0150
		Peripheral - HEM	> 3 - 3.5 x D	.05 x D	11	95	.0060	.0075	.0090	.0120	.0150
		Peripheral - HEM	> 3.5 - 4 x D	.05 x D	11	95	.0052	.0065	.0078	.0104	.0130
		Finish	3 x D	.01 x D	11	90	.0032	.0040	.0048	.0064	.0080

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

≈ Approximately Equals < Less Than
 ≤ Less Than or Equal To > Greater Than
 ≥ Greater Than or Equal To = Equals
 x Multiply

IPT11/IPC11 Application Guide – Speed & Feed (metric)

ISO Code	Work Material	Type of Cut	Axial DOC	Radial DOC	No. of Flutes	Speed (M/min)	12.0	16.0	20.0
	Gray ASTM-A48 Class 20, 25, 30, 35 & 40	Peripheral - HEM	≤ 2 x D	.08 x D	11	111	.1272	.1692	.2111
		Peripheral - HEM	> 2 - 3 x D	.07 x D	11	111	.1104	.1468	.1832
		Peripheral - HEM	> 3 - 3.5 x D	.07 x D	11	107	.0960	.1277	.1593
		Peripheral - HEM	> 3.5 - 4 x D	.065 x D	11	107	.0816	.1085	.1354
		Finish	3 x D	.01 x D	11	113	.0528	.0702	.0876
	Cast Iron Malleable	Peripheral - HEM	≤ 2 x D	.07 x D	11	114	.1512	.2011	.2510
		Peripheral - HEM	> 2 - 3 x D	.07 x D	11	114	.1344	.1787	.2231
		Peripheral - HEM	> 3 - 3.5 x D	.07 x D	11	110	.1152	.1532	.1912
		Peripheral - HEM	> 3.5 - 4 x D	.07 x D	11	110	.0960	.1277	.1593
		Finish	3 x D	.01 x D	11	102	.0552	.0734	.0916
	Low Carbon Steels ≤ 38 Rc 1018, 1020, 12L14, 5120, 8620	Peripheral - HEM	≤ 2 x D	.07 x D	11	168	.1320	.1755	.2191
		Peripheral - HEM	> 2 - 3 x D	.07 x D	11	162	.1152	.1532	.1912
		Peripheral - HEM	> 3 - 3.5 x D	.07 x D	11	157	.1008	.1341	.1673
		Peripheral - HEM	> 3.5 - 4 x D	.07 x D	11	154	.0864	.1149	.1434
		Finish	3 x D	.01 x D	11	145	.0480	.0638	.0797
	Medium Carbon Steels ≤ 48 HRC 1045, 4140, 4340, 5140	Peripheral - HEM	≤ 2 x D	.07 x D	11	162	.1296	.1724	.2151
		Peripheral - HEM	> 2 - 3 x D	.07 x D	11	157	.1128	.1500	.1872
		Peripheral - HEM	> 3 - 3.5 x D	.07 x D	11	152	.0984	.1309	.1633
		Peripheral - HEM	> 3.5 - 4 x D	.07 x D	11	149	.0840	.1117	.1394
		Finish	3 x D	.01 x D	11	139	.0456	.0606	.0757
	Tool and Die Steels ≤ 48 Rc A2, D2, O1, S7, P20, H13	Peripheral - HEM	≤ 2 x D	.06 x D	11	136	.1512	.2011	.2510
		Peripheral - HEM	> 2 - 3 x D	.06 x D	11	131	.1320	.1755	.2191
		Peripheral - HEM	> 3 - 3.5 x D	.06 x D	11	126	.1152	.1532	.1912
		Peripheral - HEM	> 3.5 - 4 x D	.06 x D	11	125	.0984	.1309	.1633
		Finish	3 x D	.01 x D	11	117	.0480	.0638	.0797
	Martensitic & Ferritic Stainless Steels 410, 416, 440	Peripheral - HEM	≤ 2 x D	.06 x D	11	137	.1608	.2138	.2669
		Peripheral - HEM	> 2 - 3 x D	.06 x D	11	137	.1416	.1883	.2350
		Peripheral - HEM	> 3 - 3.5 x D	.06 x D	11	130	.1248	.1660	.2072
		Peripheral - HEM	> 3.5 - 4 x D	.06 x D	11	130	.1032	.1372	.1713
		Finish	3 x D	.01 x D	11	119	.0600	.0798	.0996
	Austenitic Stainless Steels, FeNi Alloys 303, 304, 316, Invar, Kovar	Peripheral - HEM	≤ 2 x D	.06 x D	11	136	.1632	.2170	.2709
		Peripheral - HEM	> 2 - 3 x D	.06 x D	11	131	.1440	.1915	.2390
		Peripheral - HEM	> 3 - 3.5 x D	.06 x D	11	126	.1296	.1724	.2151
		Peripheral - HEM	> 3.5 - 4 x D	.06 x D	11	125	.1056	.1404	.1753
		Finish	3 x D	.01 x D	11	117	.0552	.0734	.0916
	Precipitation Hardening Stainless Steels 17-4, 15-5	Peripheral - HEM	≤ 2 x D	.06 x D	11	133	.1632	.2170	.2709
		Peripheral - HEM	> 2 - 3 x D	.06 x D	11	128	.1440	.1915	.2390
		Peripheral - HEM	> 3 - 3.5 x D	.06 x D	11	123	.1248	.1660	.2072
		Peripheral - HEM	> 3.5 - 4 x D	.06 x D	11	122	.1032	.1372	.1713
		Finish	3 x D	.01 x D	11	114	.0528	.0702	.0876
	Titanium Alloys 6Al-4V, 6-2-4	Peripheral - HEM	≤ 2 x D	.06 x D	11	130	.1440	.1915	.2390
		Peripheral - HEM	> 2 - 3 x D	.06 x D	11	126	.1032	.1372	.1713
		Peripheral - HEM	> 3 - 3.5 x D	.06 x D	11	120	.1008	.1341	.1673
		Peripheral - HEM	> 3.5 - 4 x D	.06 x D	11	120	.0936	.1245	.1554
		Finish	3 x D	.015 x D	11	113	.0552	.0734	.0916
	Difficult-to-Machine Titanium Alloys 10-2-3	Peripheral - HEM	≤ 2 x D	0.06 x D	11	107	.1416	.1883	.2350
		Peripheral - HEM	> 2 - 3 x D	0.06 x D	11	101	.1008	.1341	.1673
		Peripheral - HEM	> 3 - 3.5 x D	0.055 x D	11	96	.0984	.1309	.1633
		Peripheral - HEM	> 3.5 - 4 x D	0.05 x D	11	94	.0912	.1213	.1514
		Finish	3 x D	.01 x D	11	91	.0480	.0638	.0797
	Precipitation Hardening Stainless Steel  13-8	Peripheral - HEM	≤ 2 x D	.07 x D	11	32	.2160	.2873	.3585
		Peripheral - HEM	> 2 - 3 x D	.065 x D	11	30	.1944	.2585	.3227
		Peripheral - HEM	> 3 - 3.5 x D	.055 x D	11	27	.1728	.2298	.2868
		Peripheral - HEM	> 3.5 - 4 x D	.055 x D	11	27	.1555	.2068	.2581
		Finish	3 x D	.01 x D	11	27	.1128	.1500	.1872
	Hastalloy, Waspalloy	Peripheral - HEM	≤ 2 x D	.07 x D	11	32	.2160	.2873	.3585
		Peripheral - HEM	> 2 - 3 x D	.065 x D	11	30	.1944	.2585	.3227
		Peripheral - HEM	> 3 - 3.5 x D	.055 x D	11	27	.1728	.2298	.2868
		Peripheral - HEM	> 3.5 - 4 x D	.055 x D	11	27	.1555	.2068	.2581
		Finish	3 x D	.01 x D	11	27	.1128	.1500	.1872
	Inconel 718, Rene 88	Peripheral - HEM	≤ 2 x D	.065 x D	11	30	.1488	.1979	.2470
		Peripheral - HEM	> 2 - 3 x D	.06 x D	11	29	.1440	.1915	.2390
		Peripheral - HEM	> 3 - 3.5 x D	.05 x D	11	29	.1440	.1915	.2390
		Peripheral - HEM	> 3.5 - 4 x D	.05 x D	11	29	.1248	.1660	.2072
		Finish	3 x D	.01 x D	11	27	.0768	.1021	.1275

D = Tool Diameter

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

Information on tips and adjustments can be found in our Technical Resources section beginning on page 134.