

## Aqua V Mill - 4 Flute

### Features

- Variable helix, variable index to reduce vibrations and chatter
- Excellent at HSM/HEM
- Versatile across a range of materials
- Available in Square End, Corner Radius
- Aqua Mill Nano-layer Coating for high heat and wear resistance

### Work Materials

- Cast Iron
- Carbon Steel
- Alloy Steel
- Tool Steel
- 300/400 Series SS
- PH SS
- Titanium
- High Temp Alloys

### Performance

For High Performance Machining of a Range of Materials



## Aqua V Mill - 5 Flute

### Features

- Variable helix, variable index to reduce vibrations and chatter
- Excellent at HSM/HEM
- 5 Flute Design for faster feed rates and better surface finishes
- Available in Square End, Corner Radius and Ball End
- Aqua Mill Nano-layer Coating for high heat and wear resistance

### Work Materials

- Cast Iron
- Carbon Steel
- Alloy Steel
- Tool Steel
- 300/400 Series SS
- PH SS
- Titanium
- High Temp Alloys

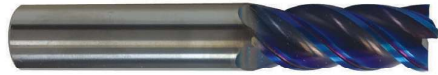
### Performance

For High Performance Machining of a Range of Materials



# HIGH PERFORMANCE END MILLS

## Aqua V Mill - 4 Flute



List No. 9701

Fractional Sizes

(Unit) : mm

EDP	Cutting Diameter	Length of Cut	Overall Length	Flutes
41000138	1/8	0.3750	1.5	4
41000139	3/16	0.4375	2.0	4
41000140	1/4	0.5000	2.5	4
41000141	5/16	0.8125	2.5	4
41000142	3/8	0.8750	2.5	4
41000143	3/8	1.1250	3.0	4
41000144	1/2	1.0000	3.0	4
41000145	1/2	1.2500	3.25	4
41000146	5/8	1.2500	3.5	4
41000147	3/4	1.5000	4.0	4

List No. 9702

Metric sizes

(Unit) : mm

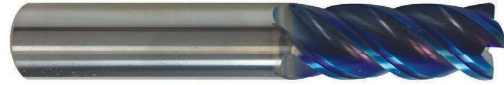
EDP	Cutting Diameter	Length of Cut	Overall Length	Flutes
41000001	3	8	57	4
41000002	4	11	57	4
41000003	5	11	57	4
41000004	6	13	57	4
41000005	8	19	70	4
41000006	10	22	70	4
41000007	12	26	75	4
41000008	16	32	90	4
41000009	18	38	100	4
41000010	20	45	100	4

1 per tube

WARNING: Cancer - [www.P65Warnings.ca.gov](http://www.P65Warnings.ca.gov)

# HIGH PERFORMANCE END MILLS

## Aqua V Mill - 4 Flute Corner Radius



List No. 9703 Fractional sizes

EDP	Cutting Diameter	Length of Cut	Overall Length	0.015 CR	0.030 CR	0.060 CR	.120 CR	Flutes
41000181	1/8	0.3750	1.50	X				4
41000182	3/16	0.4375	2.00		X			4
41000183	1/4	0.5000	2.50		X			4
41000184	5/16	0.8125	2.50		X			4
41000185	3/8	0.8750	2.50		X			4
41000186	1/2	1.0000	3.00		X			4
41000187	1/2	1.2500	3.25		X			4
41000189	1/2	1.0000	3.00			X		4
41000190	1/2	1.0000	3.00				X	4
41000191	5/8	1.2500	3.50		X			4
41000192	5/8	1.2500	3.50			X		4
41000193	5/8	1.2500	3.50				X	4
41000194	3/4	1.5000	4.00		X			4
41000195	3/4	1.5000	4.00			X		4
41000196	3/4	1.5000	4.00				X	4

List No. 9704 Metric Sizes

(Unit) : mm

EDP	Cutting Diameter	Length of Cut	Overall Length	0.3 CR	0.5 CR	1.0 CR	2.0 CR	Flutes
41000021	3	8	57	X				4
41000022	4	11	57	X				4
41000023	5	11	57		X			4
41000024	6	13	57		X			4
41000025	8	19	70		X			4
41000026	8	19	70			X		4
41000027	10	22	80		X			4
41000028	10	22	80			X		4
41000029	12	26	90		X			4
41000030	12	26	90			X		4
41000031	12	26	90				X	4
41000032	16	32	90			X		4
41000033	16	32	90				X	4
41000034	18	38	100			X		4
41000035	18	38	100				X	4
41000036	20	45	100				X	4

1 per tube

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# HIGH PERFORMANCE END MILLS

## Aqua V Mill - 5 Flute



List No. 9705 Fractional Sizes

EDP	Cutting Diameter	Length of Cut	Overall Length	Flutes
41000148	1/8	0.2500	1.50	5
41000149	1/8	0.5000	1.50	5
41000150	1/8	0.7500	2.50	5
41000151	3/16	0.3125	2.00	5
41000152	3/16	0.5625	2.00	5
41000153	3/16	0.7500	2.50	5
41000154	1/4	0.3750	2.00	5
41000155	1/4	0.7500	2.50	5
41000156	1/4	1.1250	3.00	5
41000157	5/16	0.4375	2.00	5
41000158	5/16	0.8125	2.50	5
41000159	5/16	1.2500	3.00	5
41000160	5/16	2.1250	4.00	5
41000161	3/8	0.5000	2.00	5
41000162	3/8	1.0000	2.50	5
41000163	3/8	1.2500	3.00	5
41000164	3/8	1.6250	4.00	5

EDP	Cutting Diameter	Length of Cut	Overall Length	Flutes
41000165	3/8	2.5000	6.00	5
41000166	1/2	0.6250	2.50	5
41000167	1/2	1.0000	3.00	5
41000168	1/2	1.2500	3.00	5
41000169	1/2	1.6250	4.00	5
41000170	1/2	2.1250	4.00	5
41000171	1/2	3.2500	6.00	5
41000172	5/8	0.7500	3.00	5
41000173	5/8	1.6250	3.50	5
41000174	5/8	2.1250	4.00	5
41000175	5/8	2.6250	5.00	5
41000176	5/8	3.2500	6.00	5
41000177	3/4	1.0000	3.00	5
41000178	3/4	1.6250	4.00	5
41000179	3/4	2.3750	5.00	5
41000180	3/4	3.2500	6.00	5

List No. 9706 Metric Sizes (Unit) : mm

EDP	Cutting Diameter	Length of Cut	Overall Length	Flutes
41000011	3	8	57	5
41000012	4	11	57	5
41000013	5	11	57	5
41000014	6	13	57	5
41000015	8	19	70	5
41000016	10	22	70	5
41000017	12	26	75	5
41000018	16	32	90	5
41000019	18	38	100	5
41000020	20	45	100	5

1 per tube

**WARNING:** Cancer - [www.P65Warnings.ca.gov](http://www.P65Warnings.ca.gov)

# HIGH PERFORMANCE END MILLS

## Aqua V Mill - 5 Flute Corner Radius



List No. 9707 Fractional sizes

EDP	Cutting Dia.	Length of Cut	Overall Length	0.015 CR	0.030 CR	0.060 CR	0.120 CR	Flutes	EDP	Cutting Dia.	Length of Cut	Overall Length	0.015 CR	0.030 CR	0.060 CR	0.120 CR	Flutes
41000197	1/8	0.2500	1.50	X				5	41000221	1/2	0.6250	2.50			X		5
41000198	1/8	0.5000	1.50	X				5	41000222	1/2	0.6250	2.50				X	5
41000199	1/8	0.7500	2.50	X				5	41000223	1/2	1.0000	3.00		X			5
41000200	3/16	0.3125	2.00		X			5	41000224	1/2	1.0000	3.00			X		5
41000201	3/16	0.5625	2.00		X			5	41000225	1/2	1.0000	3.00				X	5
41000202	3/16	0.7500	2.50		X			5	41000226	1/2	1.2500	3.00		X			5
41000203	1/4	0.3750	2.00			X		5	41000227	1/2	1.6250	4.00		X			5
41000204	1/4	0.7500	2.50			X		5	41000228	1/2	2.1250	4.00		X			5
41000205	1/4	1.1250	3.00			X		5	41000229	1/2	3.2500	6.00		X			5
41000206	5/16	0.4375	2.00		X			5	41000230	5/8	0.7500	3.00		X			5
41000207	5/16	0.4375	2.00			X		5	41000231	5/8	0.7500	3.00			X		5
41000208	5/16	0.8125	2.50		X			5	41000232	5/8	1.6250	3.50		X			5
41000209	5/16	0.8125	2.50			X		5	41000233	5/8	1.6250	3.50			X		5
41000210	5/16	1.2500	3.00		X			5	41000234	5/8	1.6250	3.50				X	5
41000211	5/16	2.1250	4.00		X			5	41000235	5/8	2.1250	4.00		X			5
41000212	3/8	0.5000	2.00		X			5	41000236	5/8	2.6250	5.00		X			5
41000213	3/8	0.5000	2.00			X		5	41000237	5/8	3.2500	6.00		X			5
41000214	3/8	1.0000	2.50		X			5	41000238	3/4	1.0000	3.00		X			5
41000215	3/8	1.0000	2.50			X		5	41000239	3/4	1.0000	3.00			X		5
41000216	3/8	1.0000	2.50				X	5	41000240	3/4	1.0000	3.00				X	5
41000217	3/8	1.2500	3.00			X		5	41000241	3/4	1.6250	4.00		X			5
41000218	3/8	1.6250	4.00			X		5	41000242	3/4	1.6250	4.00			X		5
41000219	3/8	2.5000	6.00			X		5	41000243	3/4	1.6250	4.00				X	5
41000220	1/2	0.6250	2.50		X			5	41000244	3/4	2.3750	5.00		X			5
									41000245	3/4	3.2500	6.00		X			5

List No. 9708 Metric sizes (Unit) : mm

EDP	Cutting Dia.	Length of Cut	Overall Length	0.3 CR	0.5 CR	1.0 CR	2.0 CR	Flutes
41000037	3	8	57	X				5
41000038	4	11	57	X				5
41000039	5	11	57		X			5
41000040	6	13	57		X			5
41000041	8	19	70		X			5
41000042	8	19	70			X		5
41000043	10	22	80		X			5
41000044	10	22	80			X		5
41000045	12	26	90		X			5
41000046	12	26	90			X		5
41000047	12	26	90				X	5
41000048	16	32	90			X		5
41000049	16	32	90				X	5
41000050	18	38	100			X		5
41000051	18	38	100				X	5
41000052	20	45	100				X	5

1 per tube

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# HIGH PERFORMANCE END MILLS

## Aqua V Mill - 5 Flute Ball Nose



List No. 9709 Fractional Sizes

EDP	Cutting Diameter	Length of Cut	Overall Length	Flutes
41000246	1/8	0.2500	1.5	5
41000247	1/8	0.5000	1.5	5
41000248	1/8	0.7500	2.5	5
41000249	3/16	0.3125	2.0	5
41000250	3/16	0.5625	2.0	5
41000251	3/16	0.7500	2.5	5
41000252	1/4	0.3750	2.0	5
41000253	1/4	0.7500	2.5	5
41000254	1/4	1.1250	3.0	5
41000255	5/16	0.4375	2.0	5
41000256	5/16	0.8125	2.5	5
41000257	5/16	1.2500	3.0	5
41000258	3/8	0.5000	2.0	5
41000259	3/8	1.0000	2.5	5
41000260	3/8	1.2500	3.0	5

EDP	Cutting Diameter	Length of Cut	Overall Length	Flutes
41000261	3/8	1.6250	3.5	5
41000262	3/8	1.6250	6.0	5
41000263	1/2	0.6250	2.5	5
41000264	1/2	1.0000	3.0	5
41000265	1/2	1.2500	3.0	5
41000266	1/2	1.6250	4.0	5
41000267	1/2	1.6250	6.0	5
41000268	5/8	0.7500	3.0	5
41000269	5/8	1.6250	3.5	5
41000270	5/8	2.1250	4.0	5
41000271	5/8	2.1250	6.0	5
41000272	3/4	1.0000	3.0	5
41000273	3/4	1.6250	4.0	5
41000274	3/4	2.3750	5.0	5
41000275	3/4	2.3750	6.0	5

List No. 9710 Metric Sizes (Unit) : mm

EDP	Cutting Diameter	Length of Cut	Overall Length	Flutes
41000053	3	8	57	5
41000054	4	11	57	5
41000055	5	11	57	5
41000056	6	13	57	5
41000057	8	19	70	5
41000058	10	22	90	5
41000059	12	26	90	5
41000060	16	32	100	5
41000061	18	38	100	5
41000062	20	45	100	5

1 per tube

WARNING: Cancer - www.P65Warnings.ca.gov





# HIGH PERFORMANCE END MILLS

## Standard Milling Conditions

### Aqua V Mill 4 Flute Slotting

List No. 9701, 9702, 9703, 9704

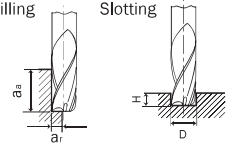
Work Material	Cast Irons						Carbon Steels 1018/1020			Medium Alloy Steels 4130/4140			Tool Steels <40 HRC			Stainless Steels 400 Series			Stainless Steels 300 Series			Stainless Steels PH			Titanium Alloys			High Temp Alloys Inconel, Haynes, etc.		
Milling Conditions	325-375 SFM						330-380 SFM			290-340 SFM			290-340 SFM			290-340 SFM			240-290 SFM			220-270 SFM			140-190 SFM			50-75 SFM		
Mill Diam.	RPM	IPT	IPM	RPM	IPT	IPM	RPM	IPT	IPM	RPM	IPT	IPM	RPM	IPT	IPM	RPM	IPT	IPM	RPM	IPT	IPM	RPM	IPT	IPM	RPM	IPT	IPM	RPM	IPT	IPM
3	12100	0.0005	26.1	12300	0.0006	31.7	11000	0.0006	24.9	11000	0.0006	24.9	11000	0.0006	24.9	9400	0.0006	24.2	8750	0.0005	17.6	6150	0.0005	12.4	2450	0.0005	4.8			
1/8	11450	0.0006	26.1	11600	0.0007	31.6	10400	0.0006	25.0	10400	0.0006	25.0	10400	0.0006	25.0	8850	0.0007	24.1	8250	0.0005	17.5	5800	0.0005	12.3	2300	0.0005	4.8			
4	9100	0.0007	26.0	9200	0.0008	31.2	8250	0.0008	24.9	8250	0.0008	24.9	8250	0.0008	24.9	7050	0.0008	23.9	6550	0.0007	17.3	4600	0.0007	12.1	1800	0.0007	4.7			
3/16	7650	0.0008	25.9	7750	0.0010	31.2	6900	0.0009	24.8	6900	0.0009	24.8	6900	0.0009	24.8	5900	0.0010	23.7	5500	0.0008	17.2	3900	0.0008	12.2	1550	0.0008	4.9			
5	7300	0.0009	25.9	7400	0.0011	31.2	6600	0.0009	25.0	6600	0.0009	25.0	6600	0.0009	25.0	5600	0.0011	23.6	5250	0.0008	17.2	3700	0.0008	12.1	1450	0.0008	4.8			
6	6050	0.0011	25.6	6150	0.0013	31.0	5500	0.0011	24.9	5500	0.0011	24.9	5500	0.0011	24.9	4700	0.0013	23.7	4350	0.0010	17.0	3100	0.0010	12.1	1200	0.0010	4.7			
1/4	5750	0.0011	25.8	5800	0.0013	30.9	5200	0.0012	25.0	5200	0.0012	25.0	5200	0.0012	25.0	4450	0.0013	23.7	4150	0.0010	17.1	2900	0.0010	11.9	1150	0.0010	4.8			
5/16	4600	0.0014	25.7	4650	0.0017	30.8	4150	0.0015	24.9	4150	0.0015	24.9	4150	0.0015	24.9	3550	0.0017	23.5	3300	0.0013	16.9	2300	0.0013	11.8	950	0.0013	5.0			
8	4550	0.0014	25.6	4600	0.0017	30.7	4100	0.0015	24.8	4100	0.0015	24.8	4100	0.0015	24.8	3500	0.0017	23.4	3300	0.0013	17.0	2300	0.0013	11.9	900	0.0013	4.7			
3/8	3800	0.0017	25.4	3850	0.0020	30.5	3450	0.0018	24.8	3450	0.0018	24.8	3450	0.0018	24.8	2950	0.0020	23.4	2750	0.0015	16.8	1950	0.0015	11.9	750	0.0016	4.7			
10	3650	0.0018	25.6	3700	0.0021	30.7	3300	0.0019	24.9	3300	0.0019	24.9	3300	0.0019	24.9	2800	0.0021	23.3	2600	0.0016	16.7	1850	0.0016	11.9	730	0.0016	4.8			
7/16	3300	0.0019	25.7	3300	0.0023	30.4	3000	0.0021	25.2	3000	0.0021	25.2	3000	0.0021	25.2	2550	0.0023	23.5	2350	0.0018	16.7	1650	0.0018	11.7	650	0.0018	4.8			
12	3050	0.0021	25.6	3100	0.0025	30.8	2750	0.0023	24.9	2750	0.0023	24.9	2750	0.0023	24.9	2350	0.0025	23.4	2200	0.0019	16.9	1550	0.0019	11.9	600	0.0020	4.7			
1/2	2850	0.0022	25.3	2900	0.0026	30.5	2600	0.0024	25.0	2600	0.0024	25.0	2600	0.0024	25.0	2200	0.0026	23.1	2050	0.0020	16.6	1450	0.0020	11.8	570	0.0021	4.8			
9/16	2550	0.0025	25.4	2600	0.0030	30.7	2300	0.0027	24.8	2300	0.0027	24.8	2300	0.0027	24.8	2000	0.0030	23.6	1850	0.0023	16.9	1300	0.0023	11.9	510	0.0024	4.8			
5/8	2300	0.0028	25.5	2300	0.0033	30.2	2100	0.0030	25.2	2100	0.0030	25.2	2100	0.0030	25.2	1800	0.0033	23.6	1650	0.0025	16.7	1150	0.0025	11.6	460	0.0026	4.8			
16	2300	0.0028	25.7	2300	0.0033	30.4	2050	0.0030	24.8	2050	0.0030	24.8	2050	0.0030	24.8	1750	0.0033	23.1	1650	0.0025	16.8	1150	0.0025	11.7	455	0.0026	4.8			
3/4	1900	0.0033	25.2	1950	0.0039	30.7	1750	0.0036	25.2	1750	0.0036	25.2	1750	0.0036	25.2	1500	0.0039	23.6	1400	0.0030	17.0	1000	0.0030	12.1	380	0.0031	4.8			
20	1800	0.0035	25.1	1850	0.0041	30.5	1650	0.0038	24.9	1650	0.0038	24.9	1650	0.0038	24.9	1400	0.0041	23.1	1300	0.0032	16.5	900	0.0032	11.4	365	0.0033	4.8			
Depth of Cut	a <sub>a</sub>	0.5D												0.25D																
	a <sub>r</sub>	1.0D																												

For entry, it is recommended to use slotting conditions.  
 Adjust milling condition when unusual vibration or sound occurs.  
 When using long reach tools, decrease width of cut and feed rate by 50%.

D: Dia. of Mill

Side Milling

Slotting





# HIGH PERFORMANCE END MILLS

## Standard Milling Conditions

### Aqua V Mill 5 Flute

List No. 9705, 9706, 9707, 9708, 9709, 9710

### Roughing

Work Material	Cast Irons			Carbon Steels 1018/1020			Medium Alloy Steels 4130/4140			Tool Steels <40 HRC			Stainless Steels 400 Series			Stainless Steels 300 Series			Stainless Steels PH			Titanium Alloys			High Temp Alloys Inconel, Haynes, etc.		
	440-1000 SFM			470-1000 SFM			410-680 SFM			410-680 SFM			410-680 SFM			360-590 SFM			330-540 SFM			200-250 SFM			75-100 SFM		
Mill Diam.	RPM	IPT	IPM	RPM	IPT	IPM	RPM	IPT	IPM	RPM	IPT	IPM	RPM	IPT	IPM	RPM	IPT	IPM	RPM	IPT	IPM	RPM	IPT	IPM	RPM	IPT	IPM
3	32300	0.0009	137.3	32300	0.0009	137.3	22000	0.0007	75.1	22000	0.0006	70.8	22000	0.0006	70.8	19000	0.0007	66.1	17400	0.0006	48.7	8100	0.0006	22.8	3250	0.0006	10.5
1/8	30600	0.0009	141.4	30600	0.0009	141.4	20800	0.0007	74.9	20800	0.0007	70.7	20800	0.0007	70.7	18000	0.0007	66.2	16500	0.0006	48.6	7650	0.0006	22.7	3050	0.0007	10.4
4	24300	0.0011	133.5	24300	0.0011	133.5	16500	0.0009	74.3	16500	0.0008	70.1	16500	0.0008	70.1	14300	0.0009	66.3	13100	0.0007	47.4	6050	0.0007	22.7	2500	0.0009	10.8
3/16	20400	0.0013	128.4	20400	0.0013	128.4	13900	0.0011	73.5	13900	0.0010	69.9	13900	0.0010	69.9	12000	0.0011	66.2	11000	0.0009	46.8	5100	0.0009	22.7	2050	0.0010	10.5
5	19400	0.0013	127.0	19400	0.0013	127.0	13200	0.0011	73.1	13200	0.0011	69.6	13200	0.0011	69.6	11400	0.0012	66.1	10500	0.0009	44.6	4850	0.0010	23.0	1950	0.0011	10.5
6	16200	0.0015	123.1	16200	0.0015	123.1	11000	0.0013	72.6	11000	0.0013	69.3	11000	0.0013	69.3	9550	0.0014	66.4	8700	0.0011	45.8	4050	0.0011	22.7	1600	0.0013	10.3
1/4	15300	0.0016	121.9	15300	0.0016	121.9	10400	0.0014	72.5	10400	0.0013	69.3	10400	0.0013	69.3	9000	0.0015	66.2	8250	0.0012	49.5	3800	0.0012	22.6	1550	0.0014	10.5
5/16	12200	0.0019	117.6	12200	0.0019	117.6	8300	0.0017	71.9	8300	0.0017	68.8	8300	0.0017	68.8	7200	0.0018	66.2	6600	0.0014	45.2	3050	0.0015	22.7	1200	0.0017	10.2
8	12100	0.0019	117.5	12100	0.0019	117.5	8250	0.0017	72.0	8250	0.0017	68.9	8250	0.0017	68.9	7150	0.0018	65.8	6550	0.0014	45.2	3050	0.0015	22.8	1200	0.0017	10.3
3/8	10200	0.0023	115.4	10200	0.0023	115.4	6950	0.0021	71.9	6950	0.0020	69.0	6950	0.0020	69.0	6000	0.0022	66.2	5500	0.0016	44.8	2550	0.0018	22.7	1000	0.0020	10.2
10	9700	0.0024	114.6	9700	0.0024	114.6	6600	0.0022	71.6	6600	0.0021	68.7	6600	0.0021	68.7	5700	0.0023	66.1	5250	0.0017	44.6	2400	0.0019	22.5	1000	0.0021	10.7
7/16	8750	0.0026	113.7	8750	0.0026	113.7	5950	0.0024	71.6	5950	0.0023	68.7	5950	0.0023	68.7	5150	0.0026	66.3	4700	0.0019	44.4	2200	0.0021	22.9	900	0.0024	10.7
12	8100	0.0028	112.8	8100	0.0028	112.8	5500	0.0026	71.4	5500	0.0025	68.6	5500	0.0025	68.6	4750	0.0028	66.1	4400	0.0020	44.8	2000	0.0022	22.4	800	0.0026	10.2
1/2	7650	0.0029	112.2	7650	0.0029	112.2	5200	0.0027	71.4	5200	0.0026	68.6	5200	0.0026	68.6	4500	0.0029	66.2	4100	0.0022	44.1	1900	0.0022	20.7	750	0.0027	10.2
9/16	6800	0.0033	111.1	6800	0.0033	111.1	4600	0.0031	70.9	4600	0.0030	68.2	4600	0.0030	68.2	4000	0.0033	66.2	3650	0.0024	44.0	1700	0.0024	20.8	700	0.0030	10.7
5/8	6100	0.0036	109.9	6100	0.0036	109.9	4150	0.0034	71.0	4150	0.0033	68.3	4150	0.0033	68.3	3600	0.0037	66.2	3300	0.0027	44.1	1500	0.0027	20.4	600	0.0034	10.2
16	6100	0.0036	110.7	6100	0.0036	110.7	4150	0.0034	71.5	4150	0.0033	68.8	4150	0.0033	68.8	3550	0.0037	65.3	3300	0.0027	44.4	1500	0.0027	20.6	600	0.0034	10.2
3/4	5100	0.0043	108.4	5100	0.0043	108.4	3450	0.0041	70.6	3450	0.0039	68.0	3450	0.0039	68.0	3000	0.0044	66.2	2750	0.0032	43.9	1300	0.0033	21.2	500	0.0041	10.2
20	4850	0.0045	108.4	4850	0.0045	108.4	3300	0.0043	70.9	3300	0.0041	68.3	3300	0.0041	68.3	2850	0.0046	65.6	2600	0.0033	43.5	1200	0.0034	20.6	500	0.0043	10.7
Depth of Cut	a <sub>s</sub>	1,5D																									
	a <sub>r</sub>	0,3D																				0,25D					

### Roughing - LOW SPEED (Use if RPM from High Speed Chart is > Max Machine RPM)

Work Material	Cast Irons			Carbon Steels 1018/1020			Medium Alloy Steels 4130/4140			Tool Steels <40 HRC			Stainless Steels 400 Series			Stainless Steels 300 Series			Stainless Steels PH			Titanium Alloys			High Temp Alloys Inconel, Haynes, etc.		
	440-500 SFM			470-510 SFM			410-450 SFM			410-450 SFM			410-450 SFM			360-390 SFM			330-360 SFM			200-250 SFM			75-100 SFM		
Mill Diam.	RPM	IPT	IPM	RPM	IPT	IPM	RPM	IPT	IPM	RPM	IPT	IPM	RPM	IPT	IPM	RPM	IPT	IPM	RPM	IPT	IPM	RPM	IPT	IPM	RPM	IPT	IPM
3	16200	0.0009	68.9	16500	0.0009	70.1	14500	0.0007	49.5	14500	0.0006	46.7	14500	0.0006	46.7	12500	0.0007	43.5	11500	0.0006	32.2	8100	0.0006	22.8	3250	0.0006	10.5
1/8	15300	0.0009	70.7	15500	0.0009	71.6	13750	0.0007	49.5	13750	0.0007	46.7	13750	0.0007	46.7	11900	0.0007	43.8	11000	0.0006	32.4	7650	0.0006	22.7	3050	0.0007	10.4
4	12100	0.0011	66.5	12500	0.0011	68.7	11000	0.0009	49.5	11000	0.0008	46.7	11000	0.0008	46.7	9450	0.0009	43.8	8700	0.0007	31.5	6050	0.0007	22.7	2500	0.0009	10.8
3/16	10200	0.0013	64.2	10400	0.0013	65.5	9200	0.0011	48.6	9200	0.0010	46.3	9200	0.0010	46.3	7950	0.0011	43.9	7300	0.0009	31.0	5100	0.0009	22.7	2050	0.0010	10.5
5	9700	0.0013	63.5	9900	0.0013	64.8	8700	0.0011	48.2	8700	0.0011	45.9	8700	0.0011	45.9	7600	0.0012	44.1	7000	0.0009	29.8	4850	0.0010	23.0	1950	0.0011	10.5
6	8100	0.0015	61.6	8250	0.0015	62.7	7300	0.0013	48.2	7300	0.0013	46.0	7300	0.0013	46.0	6300	0.0014	43.8	5800	0.0011	30.5	4050	0.0011	22.7	1600	0.0013	10.3
1/4	7650	0.0016	61.0	7800	0.0016	62.2	6900	0.0014	48.1	6900	0.0013	46.0	6900	0.0013	46.0	6000	0.0015	44.2	5500	0.0012	33.0	3800	0.0012	22.6	1550	0.0014	10.5
Depth of Cut	a <sub>s</sub>	1,5D																									
	a <sub>r</sub>	0,3D																				0,25D					

\*For Finishing Feeds/Speeds, see page 19

# HIGH PERFORMANCE END MILLS

## Standard Milling Conditions

### Aqua V Mill 5 Flute Finish

List No. 9705, 9706, 9707, 9708, 9709, 9710

Work Material	Cast Irons			Carbon Steels 1018/1020			Medium Alloy Steels 4130/4140			Tool Steels <40 HRC			Stainless Steels 400 Series			Stainless Steels 300 Series			Stainless Steels PH			Titanium Alloys			High Temp Alloys Inconel, Haynes, etc.			
	Milling Conditions			800-900 SFM			700-800 SFM			700-800 SFM			700-800 SFM			650-700 SFM			650-700 SFM			250-300 SFM			75-120 SFM			
Mill Diam.	RPM	IPT	IPM	RPM	IPT	IPM	RPM	IPT	IPM	RPM	IPT	IPM	RPM	IPT	IPM	RPM	IPT	IPM	RPM	IPT	IPM	RPM	IPT	IPM	RPM	IPT	IPM	
3	26250	0.0003	51.0	29100	0.0004	68.3	26250	0.0004	55.2	26250	0.0003	51.0	26250	0.0003	51.0	24300	0.0004	51.1	21750	0.0003	37.4	14550	0.0003	25.0	5850	0.0003	11.5	
1/8	24750	0.0003	50.8	27450	0.0004	68.1	24750	0.0004	55.0	24750	0.0003	50.8	24750	0.0003	50.8	22950	0.0004	51.0	20700	0.0003	37.5	13800	0.0003	25.0	5475	0.0003	11.4	
4	19650	0.0004	50.6	21750	0.0005	67.5	19650	0.0005	54.9	19650	0.0004	50.6	19650	0.0004	50.6	18150	0.0005	50.7	16350	0.0004	37.0	10950	0.0004	24.8	4350	0.0004	11.4	
3/16	16500	0.0005	50.4	18300	0.0006	67.3	16500	0.0006	54.8	16500	0.0005	50.4	16500	0.0005	50.4	15300	0.0006	50.9	13800	0.0004	37.0	9150	0.0004	24.5	3675	0.0005	11.5	
5	15750	0.0005	50.5	17400	0.0006	67.2	15750	0.0006	55.0	15750	0.0005	50.5	15750	0.0005	50.5	14550	0.0006	50.8	13125	0.0005	36.9	8700	0.0005	24.5	3525	0.0005	11.5	
6	13050	0.0006	50.0	14550	0.0008	67.1	13050	0.0007	54.6	13050	0.0006	50.0	13050	0.0006	50.0	12150	0.0007	50.8	10950	0.0006	36.7	7275	0.0006	24.4	2925	0.0007	11.5	
1/4	12375	0.0007	50.2	13800	0.0008	67.3	12375	0.0007	54.7	12375	0.0007	50.2	12375	0.0007	50.2	11475	0.0007	50.8	10350	0.0006	36.7	6900	0.0006	24.5	2775	0.0007	11.5	
5/16	9900	0.0008	50.0	10950	0.0010	66.6	9900	0.0009	54.7	9900	0.0008	50.0	9900	0.0008	50.0	9150	0.0009	50.5	8250	0.0007	36.4	5550	0.0007	24.5	2175	0.0009	11.3	
8	9750	0.0008	49.7	10950	0.0010	67.1	9825	0.0009	54.7	9825	0.0008	50.0	9825	0.0008	50.0	9075	0.0009	50.5	8175	0.0007	36.4	5475	0.0007	24.4	2175	0.0009	11.4	
3/8	8250	0.0010	49.9	9150	0.0012	66.6	8250	0.0011	54.6	8250	0.0010	49.9	8250	0.0010	49.9	9000	0.0011	59.6	6900	0.0009	36.4	4575	0.0009	24.2	1800	0.0010	11.2	
10	7875	0.0011	50.0	8700	0.0013	66.5	7875	0.0012	54.8	7875	0.0011	50.0	7875	0.0011	50.0	7275	0.0012	50.6	6525	0.0009	36.1	4350	0.0009	24.1	1725	0.0011	11.3	
7/16	7050	0.0012	49.7	7800	0.0014	66.1	7050	0.0013	54.5	7050	0.0012	49.7	7050	0.0012	49.7	6525	0.0013	50.4	5850	0.0010	36.0	3900	0.0010	24.0	1575	0.0012	11.4	
12	6525	0.0013	49.7	7275	0.0015	66.6	6525	0.0014	54.4	6525	0.0013	49.7	6525	0.0013	49.7	6075	0.0014	50.7	5475	0.0011	36.3	3600	0.0011	23.9	1454	0.0013	11.4	
1/2	6150	0.0013	49.5	6900	0.0016	66.8	6150	0.0015	54.3	6150	0.0013	49.5	6150	0.0013	49.5	5700	0.0015	50.3	5100	0.0012	35.8	3450	0.0012	24.2	1380	0.0014	11.4	
9/16	5475	0.0015	49.6	6150	0.0018	66.9	5475	0.0017	54.3	5475	0.0015	49.6	5475	0.0015	49.6	5100	0.0017	50.6	4575	0.0013	36.1	3075	0.0013	24.2	1230	0.0016	11.5	
5/8	4950	0.0017	49.8	5475	0.0020	66.1	4950	0.0018	54.6	4950	0.0017	49.8	4950	0.0017	49.8	4575	0.0018	50.4	4125	0.0015	36.4	2775	0.0015	24.3	1095	0.0017	11.3	
16	4950	0.0017	50.2	3975	0.0020	48.4	4950	0.0019	55.0	4950	0.0017	50.2	4950	0.0017	50.2	4575	0.0019	50.8	4125	0.0015	36.4	2700	0.0015	23.8	1095	0.0017	11.4	
3/4	4125	0.0020	49.7	4575	0.0024	66.2	4125	0.0022	54.5	4125	0.0020	49.7	4125	0.0020	49.7	3825	0.0022	50.6	3450	0.0017	36.2	2325	0.0017	24.4	915	0.0021	11.4	
20	3900	0.0021	49.3	4350	0.0025	66.1	3900	0.0023	54.1	3900	0.0021	49.3	3900	0.0021	49.3	3675	0.0023	51.0	3300	0.0018	36.3	2175	0.0018	23.9	870	0.0022	11.3	
Depth of Cut	a <sub>s</sub>	1.5D																										
	a <sub>r</sub>	0.010" - 0.015"																					0.010"					

### Finish - LOW SPEED (Use if RPM from High Speed Chart is > Max Machine RPM)

Work Material	Cast Irons			Carbon Steels 1018/1020			Medium Alloy Steels 4130/4140			Tool Steels <40 HRC			Stainless Steels 400 Series			Stainless Steels 300 Series			Stainless Steels PH			Titanium Alloys			High Temp Alloys Inconel, Haynes, etc.			
	Milling Conditions			470-510 SFM			410-450 SFM			410-450 SFM			410-450 SFM			360-390 SFM			330-360 SFM			200-250 SFM			75-100 SFM			
Mill Diam.	RPM	IPT	IPM	RPM	IPT	IPM	RPM	IPT	IPM	RPM	IPT	IPM	RPM	IPT	IPM	RPM	IPT	IPM	RPM	IPT	IPM	RPM	IPT	IPM	RPM	IPT	IPM	
3	17500	0.0003	28.3	19400	0.0004	38.0	17500	0.0004	30.7	17500	0.0003	28.3	17500	0.0003	28.3	16200	0.0004	28.4	14500	0.0003	20.8	9700	0.0003	13.9	3900	0.0003	6.4	
1/8	16500	0.0003	28.2	18300	0.0004	37.8	16500	0.0004	30.6	16500	0.0003	28.2	16500	0.0003	28.2	15300	0.0004	28.4	13800	0.0003	20.9	9200	0.0003	13.9	3650	0.0003	6.3	
4	13100	0.0004	28.1	14500	0.0005	37.5	13100	0.0005	30.5	13100	0.0004	28.1	13100	0.0004	28.1	12100	0.0005	28.2	10900	0.0004	20.6	7300	0.0004	13.8	2900	0.0004	6.3	
3/16	11000	0.0005	28.0	12200	0.0006	37.4	11000	0.0006	30.5	11000	0.0005	28.0	11000	0.0005	28.0	10200	0.0006	28.3	9200	0.0004	20.5	6100	0.0004	13.6	2450	0.0005	6.4	
5	10500	0.0005	28.0	11600	0.0006	37.3	10500	0.0006	30.5	10500	0.0005	28.0	10500	0.0005	28.0	9700	0.0006	28.2	8750	0.0005	20.5	5800	0.0005	13.6	2350	0.0005	6.4	
6	8700	0.0006	27.8	9700	0.0008	37.3	8700	0.0007	30.3	8700	0.0006	27.8	8700	0.0006	27.8	8100	0.0007	28.2	7300	0.0006	20.4	4850	0.0006	13.6	1950	0.0007	6.4	
1/4	8250	0.0007	27.9	9200	0.0008	37.4	8250	0.0007	30.4	8250	0.0007	27.9	8250	0.0007	27.9	7650	0.0007	28.2	6900	0.0006	20.4	4600	0.0006	13.6	1850	0.0007	6.4	
Depth of Cut	a <sub>s</sub>	1.5D																										
	a <sub>r</sub>	0.010" - 0.015"																					0.010"					

For slotting, it is recommended to use Aqua V 4 Flute.  
 For entry, it is recommended to use cutting conditions 50% RPM and 50% IPT.  
 Adjust milling condition when unusual vibration or sound occurs.  
 When using long reach tools, decrease width of cut and feed rate by 50%.

D: Dia. of Mill

Side Milling

Slotting

