

MULTI-MILL[®] High Performance Variable Helix End Mills

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cutting tool technologies

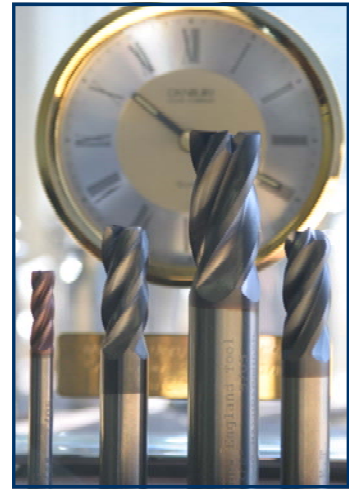
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New Solid Carbide High Performance Features Include:

- *Reduce Cycle Time - one tool for roughing, finishing, slot and profile cuts
- *Increased Metal Removal Rates due to Heavier Chip Loads
- *Ideal for Stainless, Cast Iron, Carbon Steels, Titanium, Inconel and High Temp Alloys
- *New High Performance AlTiN coating
- *Ideal for Wet or Dry Machining
- *Achieve superior surface finishes at high feed rates



Save Time...Save Money!



Four Flute - Corner Radius

Cutter Dia	Shank Dia	Flute Length	Overall Length	Corner Radius	No Flat	Weldon Flat
					Item #	Item #
1/8	1/8	1/4	1-1/2	.008-.010	NCM1010	-
1/8	1/8	1/2	2	.008-.010	NCM4102	-
3/16	3/16	1/4	2	.008-.010	NCM1012	-
3/16	3/16	9/16	2	.008-.010	NCM4104	-
1/4	1/4	3/8	2	.015-.020	NCM1016	-
1/4	1/4	3/4	2-1/2	.015-.020	NCM4108	-
5/16	5/16	7/16	2	.015-.020	NCM1020	-
5/16	5/16	13/16	2-1/2	.015-.020	NCM4112	-
3/8	3/8	1/2	2	.015-.020	NCM1024	-
3/8	3/8	1	2-1/2	.015-.020	NCM4116	NCM4116W
3/8	3/8	2	4	.015-.020	NCM4117	NCM4117W
3/8	3/8	3	6	.015-.020	NCM4175	NCM4175W
7/16	7/16	9/16	2-1/2	.015-.020	NCM1028	-
7/16	7/16	1	2-3/4	.015-.020	NCM4118	NCM4118W
1/2	1/2	5/8	2-1/2	.030-.035	NCM1032	-
1/2	1/2	1	3	.030-.035	NCM4120	NCM4120W
1/2	1/2	1-1/4	3	.030-.035	NCM4122	NCM4122W
1/2	1/2	2	4	.030-.035	NCM4123	NCM4123W
1/2	1/2	3	6	.030-.035	NCM4124	NCM4124W
5/8	5/8	3/4	3	.030-.035	NCM1034	-
5/8	5/8	1-5/8	3-1/2	.030-.035	NCM4129	NCM4129W
5/8	5/8	3	6	.030-.035	NCM4130	NCM4130W
3/4	3/4	3/4	3	.030-.035	NCM1036	-
3/4	3/4	7/8	3	.030-.035	NCM1037	-
3/4	3/4	1-5/8	4	.030-.035	NCM4135	NCM4135W
3/4	3/4	3	6	.030-.035	NCM4136	NCM4136W
3/4	3/4	4	7	.030-.035	NCM4137	NCM4137W
1	1	1-1/4	3	.030-.035	NCM1040	-
1	1	1-1/2	4	.030-.035	NCM1041	-
1	1	2	4	.030-.035	NCM4143	NCM4143W
1	1	2-1/2	5	.030-.035	NCM4146	NCM4146W
1	1	3	6	.030-.035	NCM4144	NCM4144W
1	1	4	7	.030-.035	NCM4145	NCM4145W

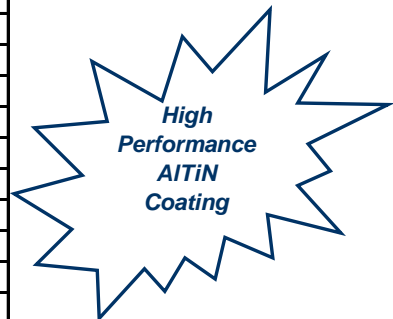
NEW

NEW

NEW

See Page 2 for square end tools

Maximize your tool life by using end mills with corner radius whenever possible.



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Four Flute				Square End		Ball Nose
				No Flat Item #	Weldon Flat Item #	No Flat Item #
Cutter Dia	Shank Dia	Flute Length	Overall Length			
1/8	1/8	1/2	2	NCM4010	-	NCM6010
3/16	3/16	9/16	2	NCM4012	-	NCM6012
1/4	1/4	3/4	2-1/2	NCM4016	-	NCM6016
5/16	5/16	13/16	2-1/2	NCM4020	-	NCM6020
3/8	3/8	1	2-1/2	NCM4024	NCM4024W	NCM6024
7/16	7/16	1	2-3/4	NCM4028	NCM4028W	NCM6028
1/2	1/2	1	3	NCM4030	NCM4030W	-
1/2	1/2	1-1/4	3	NCM4032	NCM4032W	NCM6032
5/8	5/8	1-5/8	3-1/2	NCM4034	NCM4034W	NCM6034
3/4	3/4	1-5/8	4	NCM4036	NCM4036W	NCM6036
1	1	2	4	NCM4040	NCM4040W	NCM6040
1	1	2-1/2	5	NCM4041	NCM4041W	-



Use stub length end mills for maximum tool strength and rigidity.

Use when the depth of cut is less than the tool diameter.

Maximize your tool life by using end mills with corner radius whenever possible.



Speed & Feed Recommendations - 4 FLUTE

Materials	Low Alloy Steels		Stainless Steels		Titanium Alloys		High Temp Alloys	
	Ductile Steels Cast Irons		High Strength Steels Medium Alloys Copper		Stainless Steels High Alloy Steels			
Diameter	speed sfm	feed ipt	speed sfm	feed ipt	speed sfm	feed ipt	speed sfm	feed ipt
1/8	500-600	.0010	300-325	.0008	270-300	.0007	80-110	.0005
3/16	500-600	.0012	300-325	.0010	270-300	.0010	80-110	.0006
1/4	500-600	.0019	300-325	.0015	270-300	.0015	80-110	.0010
5/16	500-600	.0025	300-325	.0019	270-300	.0017	80-100	.0011
3/8	500-600	.0031	300-325	.0024	270-300	.0018	80-110	.0013
7/16	500-600	.0034	300-325	.0030	270-300	.0020	80-110	.0015
1/2	500-600	.0036	300-325	.0031	270-300	.0027	80-110	.0017
5/8	500-600	.0040	300-325	.0036	270-300	.0030	80-110	.0020
3/4	500-600	.0042	300-325	.0038	270-300	.0036	80-110	.0025
1	500-600	.0055	300-325	.0040	270-300	.0040	80-110	.0030

Speed & Feed Recommendations - 5 FLUTE

Materials	Low Alloy Steels		Stainless Steels		Titanium Alloys		High Temp Alloys	
	Ductile Steels Cast Irons		High Strength Steels Medium Alloys Copper		Stainless Steels High Alloy Steels			
Diameter	speed sfm	feed ipt	speed sfm	feed ipt	speed sfm	feed ipt	speed sfm	feed ipt
1/8	800-850	.0010	600-625	.0008	550-570	.0007	200-225	.0005
3/16	800-850	.0012	600-625	.0010	550-570	.0010	200-225	.0006
1/4	800-850	.0019	600-625	.0015	550-570	.0015	200-225	.0010
5/16	800-850	.0025	600-625	.0019	550-570	.0017	200-225	.0011
3/8	800-850	.0031	600-625	.0024	550-570	.0018	200-225	.0013
7/16	800-850	.0034	600-625	.0030	550-570	.0020	200-225	.0015
1/2	800-850	.0036	600-625	.0031	550-570	.0027	200-225	.0017
5/8	800-850	.0040	600-625	.0036	550-570	.0030	200-225	.0020
3/4	800-850	.0042	600-625	.0038	550-570	.0036	200-225	.0025
1	800-850	.0055	600-625	.0040	550-570	.0040	200-225	.0030

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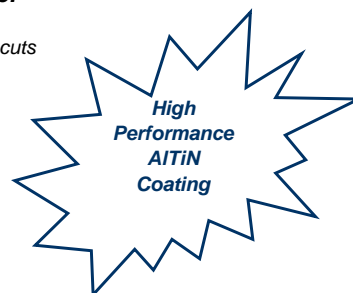
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Five Flute

Cutter Dia	Shank Dia	Flute Length	Overall Length	Corner Radius	Corner Radius		Square End	
					No Flat Item #	Weldon Flat Item #	No Flat Item #	Weldon Flat Item #
1/4	1/4	3/8	2	.015-.020	NCM4550	-	NCM4502	-
1/4	1/4	5/8	2-1/2	.015-.020	NCM4552	-	NCM4505	-
1/4	1/4	3/4	2-1/2	.015-.020	-	-	NCM4506	-
1/4	1/4	1-1/4	3	.015-.020	NCM4554	-	-	-
1/4	1/4	5/8	4	.015-.020	NCM4556	-	-	-
5/16	5/16	13/16	2-1/2	.015-.020	NCM4558	-	NCM4508	-
3/8	3/8	1/2	2	.015-.020	NCM4560	NCM4560W	NCM4511	NCM4511W
3/8	3/8	1	2-1/2	.015-.020	NCM4562	NCM4562W	NCM4514	NCM4514W
3/8	3/8	1-1/4	3	.015-.020	NCM4564	NCM4564W	-	-
3/8	3/8	7/8	4	.015-.020	NCM4566	NCM4566W	-	-
3/8	3/8	2	4				NCM4515	NCM4515W
7/16	7/16	1	2-3/4	.015-.020	NCM4568	NCM4568W	NCM4517	NCM4517W
1/2	1/2	5/8	2-1/2	.025-.030	NCM4570	NCM4570W	NCM4520	NCM4520W
1/2	1/2	1	3	.025-.030	NCM4572	NCM4572W	NCM4523	NCM4523W
1/2	1/2	1-1/4	3	.025-.030	NCM4574	NCM4574W	NCM4524	NCM4524W
1/2	1/2	2	4	.025-.030	NCM4576	NCM4576W	NCM4525	NCM4525W
1/2	1/2	1	6	.025-.030	NCM4578	NCM4578W	-	-
5/8	5/8	3/4	3	.030-.035	NCM4580	NCM4580W	NCM4526	NCM4526
5/8	5/8	1-1/4	3-1/2	.030-.035	NCM4582	NCM4582W	NCM4529	NCM4529W
5/8	5/8	1-5/8	3-1/2				NCM4530	NCM4530W
5/8	5/8	2-1/4	5	.030-.035	NCM4584	NCM4584W	-	-
5/8	5/8	1-1/4	6	.030-.035	NCM4586	NCM4586W	-	-
3/4	3/4	7/8	3	.030-.035	NCM4588	NCM4588W	NCM4532	NCM4532W
3/4	3/4	1-1/2	4	.030-.035	NCM4590	NCM4590W	NCM4535	NCM4535W
3/4	3/4	1-5/8	4				NCM4536	NCM4536W
3/4	3/4	2-1/4	5	.030-.035	NCM4592	NCM4592W	-	-
3/4	3/4	1-1/2	6	.030-.035	NCM4594	NCM4594W	-	-
3/4	3/4	4	7				NCM4537	NCM4537W
1	1	1-1/2	4	.030-.035	NCM4596	NCM4596W	NCM4538	NCM4538W
1	1	2-1/2	5	.030-.035	NCM4598	NCM4598W	NCM4539	NCM4539W
1	1	3	6				NCM4540	NCM4540W
1	1	4	7				NCM4541	NCM4541W



Metric

Cutter Dia	Shank Dia	Flute Length	Overall Length	Corner Radius	Four Flute		Five Flute	
					No Flat Item #	Weldon Flat Item #	No Flat Item #	Weldon Flat Item #
3mm	6mm	8mm	57mm	0.25 - 0.38	NCM4402	-	-	-
4mm	6mm	11mm	57mm	0.25 - 0.38	NCM4406	-	-	-
5mm	6mm	13mm	57mm	0.25 - 0.38	NCM4410	-	-	-
6mm	6mm	13mm	57mm	0.38 - 0.51	NCM4414	-	NCM4914	-
8mm	8mm	19mm	63mm	0.38 - 0.51	NCM4418	-	NCM4918	-
10mm	10mm	22mm	72mm	0.38 - 0.51	NCM4422	NCM4422W	NCM4922	NCM4922W
12mm	12mm	26mm	83mm	0.64 - 0.76	NCM4426	NCM4426W	NCM4926	NCM4926W
14mm	14mm	26mm	83mm	0.64 - 0.76	NCM4430	NCM4430W	NCM4930	NCM4930W
16mm	16mm	32mm	92mm	0.76 - 0.89	NCM4434	NCM4434W	NCM4934	NCM4934W
18mm	18mm	32mm	92mm	0.76 - 0.89	NCM4438	NCM4438W	NCM4938	NCM4938W
20mm	20mm	38mm	100mm	0.76 - 0.89	NCM4442	NCM4442W	NCM4942	NCM4942W