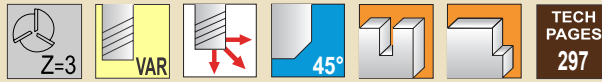


Series ARC

.1575" - .3750"
(4.000mm - 9.525mm)



TOLERANCES	
d_1	+0.000" - .002" (+.000 - .050mm)
d_2	h6
d_3	+0.000" - .005" (+.000 - .127mm)

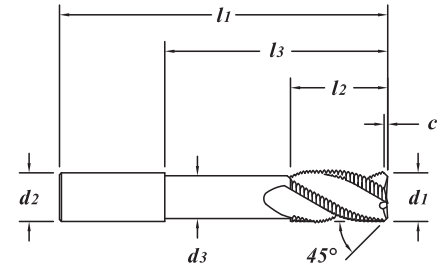
Recommended for aluminum and non-ferrous materials

Aluminum Knuckle Rougher / Ripper

Bright Finish

- Solid submicron grain carbide end mill - center cutting
- Wave knuckle design to break up chips
- Each flute has individual helix angle to break up harmonics
- Reduces tool pressure requiring less machine power
- Designed for roughing Aluminum Alloys

Ideal for use in extruded Aluminum



MATERIAL HARDNESS (Rc)

70
35
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EDP#	d_1 † Diameter		d_2 Shank Diameter	l_1 Overall Length	l_2 Flute Length	c Chamfer Length	l_3 Reach Length	d_3 Neck Diameter
	Decimal	Metric						
46219	.1575	4.000	6.0	50	8	0.30	-	-
46222	.1575	4.000	6.0	50	12	0.30	-	-
46225	.1575	4.000	6.0	65	10	0.30	30	3.2
46228	.1575	4.000	6.0	75	15	0.30	40	3.2
46231	.1875	3/16"	4.763	2"	5/16"	.015"	-	-
46234	.1875	3/16"	4.763	2"	9/16"	.015"	-	-
46237	.1875	3/16"	4.763	3"	1"	.015"	-	-
46240	.1875	3/16"	4.763	3"	1/2"	.015"	1-1/2"	.160"
46243	.2362	6.000	6.0	50	12	0.50	-	-
46246	.2362	6.000	6.0	65	19	0.50	-	-
46249	.2362	6.000	6.0	100	20	0.50	60	5.2
46252	.2500	1/4"	6.350	1/4"	2"	3/8"	.020"	-
46255	.2500	1/4"	6.350	1/4"	2-1/2"	3/4"	.020"	-
46258	.2500	1/4"	6.350	1/4"	4"	1-1/2"	.020"	-
46261	.2500	1/4"	6.350	1/4"	4"	1"	.020"	2"
46264	.3125	5/16"	7.938	5/16"	2"	7/16"	.020"	-
46267	.3125	5/16"	7.938	5/16"	2-1/2"	13/16"	.020"	-
46270	.3125	5/16"	7.938	5/16"	4"	1-1/2"	.020"	-
46273	.3125	5/16"	7.938	5/16"	4"	1"	.020"	2"
46276	.3150	8.000	8.0	50	12	0.50	-	-
46279	.3150	8.000	8.0	65	22	0.50	-	-
46282	.3150	8.000	8.0	100	40	0.50	-	-
46285	.3150	8.000	8.0	100	20	0.50	60	7.2
46288	.3150	8.000	8.0	150	40	0.50	100	7.2
46291	.3750	3/8"	9.525	3/8"	2"	1/2"	.025"	-
46294	.3750	3/8"	9.525	3/8"	2-1/2"	7/8"	.025"	-
46297	.3750	3/8"	9.525	3/8"	3"	1-1/4"	.025"	-
46300	.3750	3/8"	9.525	3/8"	4"	1-5/8"	.025"	-
46303	.3750	3/8"	9.525	3/8"	4"	1"	.025"	2"
46306	.3750	3/8"	9.525	3/8"	6"	1-1/2"	.025"	4"

EDP#	$d1$ † Diameter		$d2$ Shank Diameter	$l1$ Overall Length	$l2$ Flute Length	c Chamfer Length	$l3$ Reach Length	$d3$ Neck Diameter	
	Decimal	Metric							
46309	.3937	10.000	10.0	50	16	0.50	-	-	
46312	.3937	10.000	10.0	70	22	0.50	-	-	
46315	.3937	10.000	10.0	100	40	0.50	-	-	
46318	.3937	10.000	10.0	100	20	0.50	60	9.2	
46321	.3937	10.000	10.0	150	40	0.50	100	9.2	
46324	.4724	12.000	12.0	65	19	0.80	-	-	
46327	.4724	12.000	12.0	75	32	0.80	-	-	
46330	.4724	12.000	12.0	100	50	0.80	-	-	
46333	.4724	12.000	12.0	100	25	0.80	60	11.2	
46336	.4724	12.000	12.0	150	40	0.80	100	11.2	
46339	.5000	1/2"	12.700	1/2"	2-1/2"	5/8"	.030"	-	-
46342	.5000	1/2"	12.700	1/2"	3"	1-1/4"	.030"	-	-
46345	.5000	1/2"	12.700	1/2"	4"	2"	.030"	-	-
46348	.5000	1/2"	12.700	1/2"	4"	1"	.030"	2"	.470"
46351	.5000	1/2"	12.700	1/2"	6"	1-1/2"	.030"	4"	.470"
46354	.6250	5/8"	15.875	5/8"	3"	3/4"	.035"	-	-
46357	.6250	5/8"	15.875	5/8"	3-1/2"	1-1/4"	.035"	-	-
46360	.6250	5/8"	15.875	5/8"	4"	1-5/8"	.035"	-	-
46363	.6250	5/8"	15.875	5/8"	4"	1"	.035"	2"	.595"
46366	.6250	5/8"	15.875	5/8"	6"	1-1/2"	.035"	3"	.595"
46369	.6250	5/8"	15.875	5/8"	6"	1-1/2"	.035"	4"	.595"
46372	.6299	16.000	16.0	75	19	1.00	-	-	
46375	.6299	16.000	16.0	88	32	1.00	-	-	
46378	.6299	16.000	16.0	100	50	1.00	-	-	
46381	.6299	16.000	16.0	100	20	1.00	50	15.2	
46384	.6299	16.000	16.0	150	40	1.00	100	15.2	
46387	.7500	3/4"	19.050	3/4"	4"	1-5/8"	.040"	-	-
46390	.7500	3/4"	19.050	3/4"	5"	2-1/4"	.040"	-	-
46393	.7500	3/4"	19.050	3/4"	4"	7/8"	.040"	2"	.720"
46396	.7500	3/4"	19.050	3/4"	6"	1-1/2"	.040"	3"	.720"
46399	.7500	3/4"	19.050	3/4"	6"	1-1/2"	.040"	4"	.720"
46402	.7874	20.000	20.0	100	22	1.00	-	-	
46405	.7874	20.000	20.0	100	40	1.00	-	-	
46408	.7874	20.000	20.0	100	30	1.00	50	19.2	
46411	.7874	20.000	20.0	150	40	1.00	100	19.2	
46414	1.000	1"	25.400	1"	4"	1-1/2"	.040"	-	-
46417	1.000	1"	25.400	1"	5"	2"	.040"	-	-
46420	1.000	1"	25.400	1"	6"	2"	.040"	3-1/2"	.970"
46423	1.000	1"	25.400	1"	7"	2"	.040"	4-1/2"	.970"

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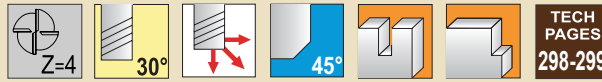
MATERIAL HARDNESS (Rc)

35

0

Series VHM

.1575" - .3543"
(4.000mm - 9.000mm)

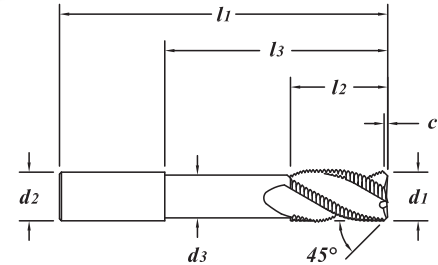
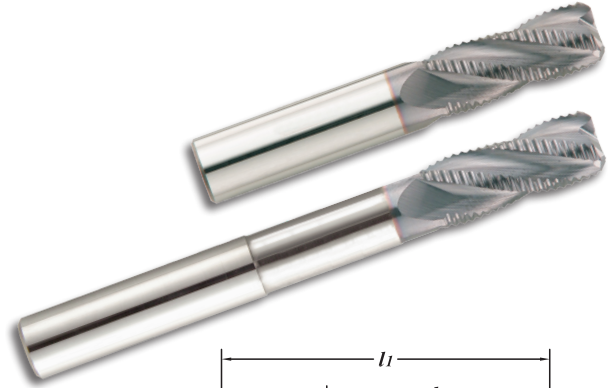


TOLERANCES	
d_1	+0.000" - .002" (+.000 - .050mm)
d_2	h6
d_3	+0.000" - .005" (+.000 - .127mm)

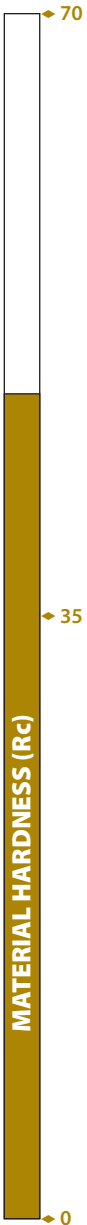
Recommended for stainless steel, inconel, pH materials, cold rolled steel, titanium, cast iron and tool steels under 40Rc

Staggered Flute Knuckle Rougher / Ripper
AlTiN Coating

- Solid submicron grain carbide end mill - center cutting
- State-of-the-art rougher using VRX technology
- Reduces tool pressure for more aggressive machining
- Recommended for pocket milling
- Variable flute geometry



EDP#	d_1 † Diameter		d_2 Shank Diameter	l_1 Overall Length	l_2 Flute Length	c Chamfer Length	l_3 Reach Length	d_3 Neck Diameter
	Decimal	Metric						
49450	.1575	4.000	6.0	50	8	0.30	-	-
49455	.1575	4.000	6.0	50	12	0.30	-	-
49460	.1575	4.000	6.0	65	10	0.30	30	3.4
49465	.1575	4.000	6.0	75	15	0.30	40	3.4
49470	.1875	3/16"	4.763	3/16"	2"	5/16"	.015"	-
49475	.1875	3/16"	4.763	3/16"	2"	9/16"	.015"	-
49480	.1875	3/16"	4.763	3/16"	3"	1"	.015"	-
49485	.1875	3/16"	4.763	3/16"	3"	1/2"	.015"	1-1/2"
49490	.2362	6.000	6.0	50	12	0.50	-	-
49500	.2362	6.000	6.0	65	19	0.50	-	-
49505	.2362	6.000	6.0	100	15	0.50	40	5.4
49510	.2362	6.000	6.0	100	20	0.50	60	5.4
49520	.2500	1/4"	6.350	1/4"	2"	3/8"	.020"	-
49540	.2500	1/4"	6.350	1/4"	2-1/2"	3/4"	.020"	-
49543	.2500	1/4"	6.350	1/4"	4"	1-1/2"	.020"	-
49547	.2500	1/4"	6.350	1/4"	4"	1"	.020"	2"
49550	.2756	7.000	8.0	50	12	0.50	-	-
49555	.2756	7.000	8.0	65	22	0.50	-	-
49570	.2812	9/32"	7.142	5/16"	2"	7/16"	.020"	-
49575	.2812	9/32"	7.142	5/16"	2-1/2"	13/16"	.020"	-
49580	.3125	5/16"	7.938	5/16"	2"	7/16"	.020"	-
49600	.3125	5/16"	7.938	5/16"	2-1/2"	13/16"	.020"	-
49603	.3125	5/16"	7.938	5/16"	4"	1-1/2"	.020"	-
49605	.3125	5/16"	7.938	5/16"	4"	1"	.020"	2"
49610	.3150	8.000	8.0	50	12	0.50	-	-
49620	.3150	8.000	8.0	65	22	0.50	-	-
49622	.3150	8.000	8.0	100	40	0.50	-	-
49623	.3150	8.000	8.0	100	20	0.50	60	7.4
49624	.3150	8.000	8.0	150	40	0.50	100	7.4
49625	.3438	11/32"	8.733	3/8"	2"	1/2"	.025"	-
49630	.3438	11/32"	8.733	3/8"	2-1/2"	7/8"	.025"	-
49635	.3543	9.000	10.0	50	14	0.50	-	-
49637	.3543	9.000	10.0	65	22	0.50	-	-



EDP#	$d1$ † Diameter		$d2$ Shank Diameter	$l1$ Overall Length	$l2$ Flute Length	c Chamfer Length	$l3$ Reach Length	$d3$ Neck Diameter	
	Decimal	Metric							
49640	.3750	3/8"	9.525	3/8"	2"	1/2"	.025"	-	-
49660	.3750	3/8"	9.525	3/8"	2-1/2"	7/8"	.025"	-	-
49662	.3750	3/8"	9.525	3/8"	3"	1-1/4"	.025"	-	-
49664	.3750	3/8"	9.525	3/8"	4"	1-5/8"	.025"	-	-
49667	.3750	3/8"	9.525	3/8"	4"	1"	.025"	2"	.355"
49670	.3937		10.000	10.0	50	16	0.50	-	-
49680	.3937		10.000	10.0	70	22	0.50	-	-
49682	.3937		10.000	10.0	100	40	0.50	-	-
49684	.3937		10.000	10.0	100	20	0.50	40	9.4
49686	.3937		10.000	10.0	100	30	0.50	60	9.4
49690	.4375	7/16"	11.113	7/16"	2-1/2"	5/8"	.025"	-	-
49700	.4375	7/16"	11.113	7/16"	2-3/4"	1"	.025"	-	-
49710	.4724		12.000	12.0	65	19	0.80	-	-
49720	.4724		12.000	12.0	75	32	0.80	-	-
49725	.4724		12.000	12.0	100	50	0.80	-	-
49730	.4724		12.000	12.0	100	25	0.80	60	11.4
49735	.4724		12.000	12.0	150	40	0.80	100	11.4
* 49740	.5000	1/2"	12.700	1/2"	2-1/2"	5/8"	.030"	-	-
* 49760	.5000	1/2"	12.700	1/2"	3"	1-1/4"	.030"	-	-
* 49761	.5000	1/2"	12.700	1/2"	4"	2"	.030"	-	-
* 49762	.5000	1/2"	12.700	1/2"	4"	1"	.030"	2"	.480"
* 49764	.5000	1/2"	12.700	1/2"	6"	1-1/2"	.030"	4"	.480"
* 49765	.5512		14.000	14.0	75	19	0.80	-	-
* 49770	.5512		14.000	14.0	88	32	0.80	-	-
* 49780	.6250	5/8"	15.875	5/8"	3"	3/4"	.035"	-	-
* 49800	.6250	5/8"	15.875	5/8"	3-1/2"	1-1/4"	.035"	-	-
* 49820	.6250	5/8"	15.875	5/8"	4"	1-5/8"	.035"	-	-
* 49824	.6250	5/8"	15.875	5/8"	4"	1"	.035"	2"	.605"
* 49826	.6250	5/8"	15.875	5/8"	6"	1-1/2"	.035"	3"	.605"
* 49828	.6250	5/8"	15.875	5/8"	6"	1-1/2"	.035"	4"	.605"
* 49830	.6299		16.000	16.0	75	19	1.00	-	-
* 49840	.6299		16.000	16.0	88	32	1.00	-	-
* 49842	.6299		16.000	16.0	100	50	1.00	-	-
* 49843	.6299		16.000	16.0	100	20	1.00	50	15.4
* 49844	.6299		16.000	16.0	150	40	1.00	100	15.4
* 49850	.7087		18.000	18.0	100	38	1.00	-	-
* 49860	.7500	3/4"	19.050	3/4"	3"	7/8"	.040"	-	-
* 49880	.7500	3/4"	19.050	3/4"	4"	1-5/8"	.040"	-	-
* 49882	.7500	3/4"	19.050	3/4"	5"	2-1/4"	.040"	-	-
* 49886	.7500	3/4"	19.050	3/4"	6"	1-1/2"	.040"	3"	.730"
* 49887	.7500	3/4"	19.050	3/4"	6"	1-1/2"	.040"	4"	.730"
* 49890	.7874		20.000	20.0	75	22	1.00	-	-
* 49900	.7874		20.000	20.0	100	38	1.00	-	-
* 49902	.7874		20.000	20.0	100	30	1.00	50	19.4
* 49904	.7874		20.000	20.0	150	40	1.00	100	19.4
* 49915	.9843		25.000	25.0	100	25	1.00	-	-
* 49920	.9843		25.000	25.0	100	38	1.00	-	-
* 49925	1.000	1"	25.400	1"	4"	1"	.040"	-	-
* 49930	1.000	1"	25.400	1"	4"	1-1/2"	.040"	-	-
* 49940	1.000	1"	25.400	1"	5"	2"	.040"	-	-

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MATERIAL HARDNESS (Rc)

* - Tools with weldon flats