

TOLERANCES

$d1$	$+0.000" -0.001" (+0.000 -0.025\text{mm})$
$d2$	$h6$

TECH
PAGES
288

Series 242M, 842M

HIGH
PERFORMANCE
END MILLS

Recommended for aluminum and titanium

Square End

Solid submicron grain carbide end mill - center cutting

High performance machining

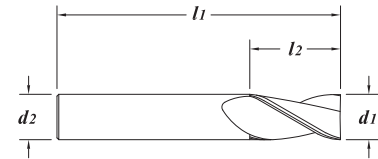
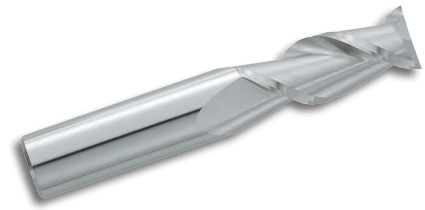
Rigid work holding, machine stability and part integrity are critical!

Excellent choice for slotting

Polished cylindrical O.D. margin reduces chatter

Sharp corners (Can be modified with a corner radius)

Designed for spindles between 3,000-8,000 RPM, 1% diameter for chip load



EDP#	$d1$ †		$d2$	$l1$	$l2$	1-11	12-24	25-49	50-100
	Decimal	Diameter Metric							
08910	.1181	3.000	3.0	38	8	12.09	11.56	11.04	10.51
08920	.1181	3.000	3.0	50	12	14.57	13.94	13.30	12.67
85160	.1250	1/8"	3.175	1/8"	1-1/2"	11.35	10.86	10.36	9.87
85170	.1250	1/8"	3.175	1/8"	2"	13.67	13.08	12.48	11.89
08950	.1575	4.000	6.0	50	8	19.65	18.80	17.94	17.09
08960	.1575	4.000	6.0	50	12	19.65	18.80	17.94	17.09
85180	.1875	3/16"	4.763	3/16"	2"	14.17	13.55	12.94	12.32
85190	.1875	3/16"	4.763	3/16"	2"	14.17	13.55	12.94	12.32
08990	.1969	5.000	6.0	50	10	18.50	17.70	16.89	16.09
09000	.1969	5.000	6.0	65	15	20.57	19.68	18.78	17.89
09010	.2362	6.000	6.0	50	12	15.76	15.07	14.39	13.70
09020	.2362	6.000	6.0	65	25	16.93	16.19	15.46	14.72
09030	.2362	6.000	6.0	100	50	30.68	29.35	28.01	26.68
85200	.2500	1/4"	6.350	1/4"	2"	14.93	14.28	13.63	12.98
85220	.2500	1/4"	6.350	1/4"	2-1/2"	16.13	15.43	14.73	14.03
85240	.2500	1/4"	6.350	1/4"	4"	29.14	27.87	26.61	25.34
85300	.3125	5/16"	7.938	5/16"	3"	34.06	32.58	31.10	29.62
09240	.3150	8.000	8.0	65	20	23.76	22.73	21.69	20.66
09040	.3150	8.000	8.0	75	30	35.89	34.33	32.77	31.21
09050	.3150	8.000	8.0	100	50	40.03	38.29	36.55	34.81
85400	.3750	3/8"	9.525	3/8"	2"	25.22	24.12	23.03	21.93
85420	.3750	3/8"	9.525	3/8"	2-1/2"	28.18	26.95	25.73	24.50
85440	.3750	3/8"	9.525	3/8"	4"	42.10	40.27	38.44	36.61
09060	.3937	10.000	10.0	50	16	29.35	28.07	26.80	25.52
09070	.3937	10.000	10.0	70	25	34.30	32.81	31.32	29.83
09080	.3937	10.000	10.0	100	50	53.65	51.32	48.98	46.65
09090	.4724	12.000	12.0	65	20	43.84	41.93	40.03	38.12
09100	.4724	12.000	12.0	75	32	47.40	45.34	43.28	41.22
09110	.4724	12.000	12.0	100	50	65.30	62.46	59.62	56.78
85500	.5000	1/2"	12.700	1/2"	2-1/2"	41.40	39.60	37.80	36.00
85520	.5000	1/2"	12.700	1/2"	3"	45.14	43.18	41.21	39.25
85540	.5000	1/2"	12.700	1/2"	4"	61.61	58.93	56.25	53.57
85600	.6250	5/8"	15.875	5/8"	3-1/2"	87.04	83.26	79.47	75.69
85620	.6250	5/8"	15.875	5/8"	6"	126.98	121.46	115.94	110.42
09120	.6299	16.000	16.0	88	40	91.39	87.42	83.44	79.47
09130	.6299	16.000	16.0	150	75	126.98	121.46	115.94	110.42
09140	.7087	18.000	18.0	100	45	134.02	128.19	122.37	116.54
85700	.7500	3/4"	19.050	3/4"	4"	127.63	122.08	116.53	110.98
85720	.7500	3/4"	19.050	3/4"	6"	202.29	193.49	184.70	175.90
09350	.7874	20.000	20.0	100	38	170.38	162.98	155.57	148.16
09150	.7874	20.000	20.0	150	75	213.10	203.83	194.57	185.30
09160	.9843	25.000	25.0	100	45	197.94	189.33	180.73	172.12
09170	.9843	25.000	25.0	150	75	328.37	314.09	299.82	285.54
85800	1.000	1"	25.400	1"	4"	190.90	182.60	174.30	166.00
85820	1.000	1"	25.400	1"	6"	343.91	328.96	314.00	299.05

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MATERIAL HARDNESS (Rc)

35

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Series 253MA, 853MA

.1181" - .5512"
(3.000mm - 14.000mm)



TECH
PAGES
286-287

TOLERANCES

$d1$	$+0.000" - .002" (+.000 - .050mm)$
$d2$	$h6$

Recommended for stainless steel

Square End

AlTiN Coating

Solid submicron grain carbide end mill - center cutting

High performance machining

Rigid work holding, machine stability and part integrity are critical!

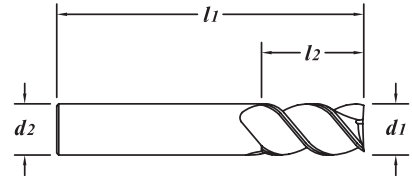
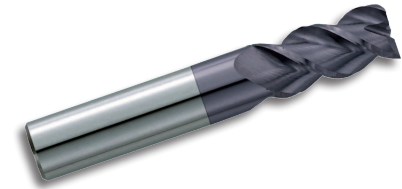
Dry or semi-dry machining

Slots stainless steel at an axial depth of 25% of diameter

Sharp corners (Can be modified with a corner radius)

Bright Finish - page 182

TiCN Coated - page 184



EDP#	$d1$ †		$d2$	$l1$	$l2$	1-11	12-24	25-49	50-100
	Decimal	Diameter Metric							
10347	.1181	3.000	3.0	38	8	14.81	14.17	13.52	12.88
10357	.1181	3.000	3.0	50	12	17.85	17.07	16.30	15.52
86137	.1250 1/8"	3.175	1/8"	1-1/2"	1/4"	14.06	13.45	12.84	12.23
86147	.1250 1/8"	3.175	1/8"	2"	1/2"	16.96	16.23	15.49	14.75
10387	.1575	4.000	6.0	50	8	23.93	22.89	21.85	20.81
10397	.1575	4.000	6.0	50	12	23.93	22.89	21.85	20.81
86157	.1875 3/16"	4.763	3/16"	2"	5/16"	16.08	15.38	14.68	13.98
86167	.1875 3/16"	4.763	3/16"	2"	9/16"	16.08	15.38	14.68	13.98
86187	.1875 3/16"	4.763	3/16"	3"	1"	28.04	26.82	25.60	24.38
10407	.1969	5.000	5.0	50	8	19.06	18.23	17.40	16.57
10417	.1969	5.000	5.0	50	14	19.06	18.23	17.40	16.57
10507	.1969	5.000	6.0	50	8	23.44	22.42	21.40	20.38
10517	.1969	5.000	6.0	65	16	25.60	24.49	23.37	22.26
10017	.2362	6.000	6.0	50	12	19.93	19.06	18.20	17.33
10027	.2362	6.000	6.0	65	19	22.46	21.48	20.51	19.53
10037	.2362	6.000	6.0	75	32	34.63	33.12	31.62	30.11
86207	.2500 1/4"	6.350	1/4"	2"	1/2"	19.12	18.29	17.46	16.63
86227	.2500 1/4"	6.350	1/4"	2-1/2"	3/4"	21.69	20.75	19.80	18.86
86247	.2500 1/4"	6.350	1/4"	3"	1-1/4"	33.15	31.71	30.27	28.83
86267	.3125 5/16"	7.938	5/16"	2"	7/16"	26.43	25.28	24.13	22.98
86277	.3125 5/16"	7.938	5/16"	2-1/2"	13/16"	30.92	29.58	28.23	26.89
86287	.3125 5/16"	7.938	5/16"	4"	1-1/4"	48.58	46.46	44.35	42.24
10427	.3150	8.000	8.0	50	11	27.52	26.32	25.13	23.93
10047	.3150	8.000	8.0	65	20	32.05	30.66	29.26	27.87
10057	.3150	8.000	8.0	75	32	44.18	42.26	40.34	38.42
86307	.3750 3/8"	9.525	3/8"	2"	1/2"	31.22	29.87	28.51	27.15
86327	.3750 3/8"	9.525	3/8"	2-1/2"	1"	36.49	34.90	33.32	31.73
86347	.3750 3/8"	9.525	3/8"	3-1/2"	1-1/2"	52.66	50.37	48.08	45.79
10067	.3937	10.000	10.0	50	12	36.14	34.57	33.00	31.43
10077	.3937	10.000	10.0	75	25	51.05	48.83	46.61	44.39
10087	.3937	10.000	10.0	88	38	64.63	61.82	59.01	56.20
86367	.4375 7/16"	11.113	7/16"	2-1/2"	9/16"	43.87	41.97	40.06	38.15
86377	.4375 7/16"	11.113	7/16"	2-3/4"	1"	43.87	41.97	40.06	38.15
86387	.4375 7/16"	11.113	7/16"	4"	2"	70.15	67.10	64.05	61.00
10097	.4724	12.000	12.0	65	16	53.27	50.95	48.64	46.32
10107	.4724	12.000	12.0	75	26	56.83	54.36	51.89	49.42
10117	.4724	12.000	12.0	100	50	77.57	74.20	70.82	67.45
86407	.5000 1/2"	12.700	1/2"	2-1/2"	5/8"	51.08	48.86	46.64	44.42
86427	.5000 1/2"	12.700	1/2"	3"	1"	54.58	52.21	49.83	47.46
86447	.5000 1/2"	12.700	1/2"	4"	2"	73.85	70.64	67.43	64.22
10437	.5512	14.000	14.0	65	16	79.55	76.09	72.63	69.17
10447	.5512	14.000	14.0	75	25	85.17	81.47	77.76	74.06
10457	.5512	14.000	14.0	100	50	103.37	98.88	94.38	89.89

MATERIAL HARDNESS (Rc)

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35

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EDP#	$d1$ † Diameter			$d2$ Shank Diameter	$l1$ Overall Length	$l2$ Flute Length	1-11	12-24	25-49	50-100
	Decimal		Metric							
86467	.5625	9/16"	14.288	9/16"	3"	7/8"	85.41	81.70	77.98	74.27
86477	.5625	9/16"	14.288	9/16"	3-1/2"	1-1/4"	90.76	86.81	82.87	78.92
86507	.6250	5/8"	15.875	5/8"	3"	7/8"	90.56	86.63	82.69	78.75
86527	.6250	5/8"	15.875	5/8"	3-1/2"	1-1/4"	100.71	96.33	91.95	87.57
86547	.6250	5/8"	15.875	5/8"	6"	2-1/2"	147.28	140.88	134.47	128.07
10137	.6299		16.000	16.0	88	32	60.81	58.17	55.52	52.88
10147	.6299		16.000	16.0	150	65	147.28	140.88	134.47	128.07
10167	.7087		18.000	18.0	100	38	150.12	143.59	137.07	130.54
86607	.7500	3/4"	19.050	3/4"	3-1/2"	1"	143.75	137.50	131.25	125.00
86627	.7500	3/4"	19.050	3/4"	4"	1-1/2"	143.75	137.50	131.25	125.00
86647	.7500	3/4"	19.050	3/4"	6"	3"	225.79	215.97	206.16	196.34
10187	.7874		20.000	20.0	100	38	194.21	185.77	177.32	168.88
10197	.7874		20.000	20.0	150	75	243.62	233.02	222.43	211.84
86697	1.000	1"	25.400	1"	4"	1-1/8"	214.75	205.41	196.08	186.74
86727	1.000	1"	25.400	1"	4"	2"	214.75	205.41	196.08	186.74
86747	1.000	1"	25.400	1"	6"	3-1/4"	374.44	358.16	341.88	325.60

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35

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MATERIAL HARDNESS (Rc)

Series 253M, 853M

.1181" - .5512"
(3.000mm - 14.000mm)



TOLERANCES

d_1	$+0.000" - .002" (+.000 - .050mm)$
d_2	$h6$

Recommended for aluminum and stainless steel

Square End

Bright Finish

Solid submicron grain carbide end mill - center cutting

High performance machining

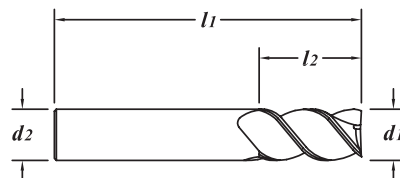
Rigid work holding, machine stability and part integrity are critical!

Slots aluminum at an axial depth of 25% of diameter

Sharp corners (Can be modified with a corner radius)

AlTiN Coating - page 180

TiCN Coated - page 184



EDP#	d_1 † Diameter		d_2 Shank Diameter	l_1 Overall Length	l_2 Flute Length	1-11	12-24	25-49	50-100
	Decimal	Metric							
10340	.1181	3.000	3.0	38	8	12.09	11.56	11.04	10.51
10350	.1181	3.000	3.0	50	12	14.57	13.94	13.30	12.67
86130	.1250	1/8"	3.175	1-1/2"	1/4"	11.35	10.86	10.36	9.87
86140	.1250	1/8"	3.175	1/8"	1/2"	13.67	13.08	12.48	11.89
10380	.1575	4.000	6.0	50	8	19.65	18.80	17.94	17.09
10390	.1575	4.000	6.0	50	12	19.65	18.80	17.94	17.09
86150	.1875	3/16"	4.763	3/16"	2"	13.37	12.79	12.21	11.63
86160	.1875	3/16"	4.763	3/16"	2"	13.37	12.79	12.21	11.63
86180	.1875	3/16"	4.763	3/16"	3"	23.84	22.80	21.77	20.73
10400	.1969	5.000	5.0	50	8	14.86	14.21	13.57	12.92
10410	.1969	5.000	5.0	50	14	14.86	14.21	13.57	12.92
10010	.2362	6.000	6.0	50	12	15.76	15.07	14.39	13.70
10020	.2362	6.000	6.0	65	19	16.93	16.19	15.46	14.72
10030	.2362	6.000	6.0	75	32	29.06	27.80	26.53	25.27
86200	.2500	1/4"	6.350	1/4"	1/2"	14.93	14.28	13.63	12.98
86220	.2500	1/4"	6.350	1/4"	2-1/2"	16.13	15.43	14.73	14.03
86240	.2500	1/4"	6.350	1/4"	3"	27.62	26.42	25.22	24.02
86260	.3125	5/16"	7.938	5/16"	2"	20.41	19.53	18.64	17.75
86270	.3125	5/16"	7.938	5/16"	2-1/2"	22.63	21.65	20.66	19.68
86280	.3125	5/16"	7.938	5/16"	4"	38.01	36.36	34.70	33.05
10420	.3150	8.000	8.0	50	11	21.53	20.59	19.66	18.72
10040	.3150	8.000	8.0	65	20	23.76	22.73	21.69	20.66
10050	.3150	8.000	8.0	75	32	35.89	34.33	32.77	31.21
86300	.3750	3/8"	9.525	3/8"	1/2"	25.22	24.12	23.03	21.93
86320	.3750	3/8"	9.525	3/8"	2-1/2"	28.18	26.95	25.73	24.50
86340	.3750	3/8"	9.525	3/8"	3-1/2"	42.10	40.27	38.44	36.61
10060	.3937	10.000	10.0	50	12	29.35	28.07	26.80	25.52
10070	.3937	10.000	10.0	75	25	41.61	39.80	37.99	36.18
10080	.3937	10.000	10.0	88	38	52.41	50.13	47.85	45.57
86360	.4375	7/16"	11.113	7/16"	2-1/2"	34.40	32.90	31.41	29.91
86370	.4375	7/16"	11.113	7/16"	2-3/4"	34.40	32.90	31.41	29.91
86380	.4375	7/16"	11.113	7/16"	4"	57.93	55.41	52.89	50.37
10090	.4724	12.000	12.0	65	16	43.84	41.93	40.03	38.12
10100	.4724	12.000	12.0	75	26	47.40	45.34	43.28	41.22
10110	.4724	12.000	12.0	100	50	65.30	62.46	59.62	56.78
86400	.5000	1/2"	12.700	1/2"	2-1/2"	41.63	39.82	38.01	36.20
86420	.5000	1/2"	12.700	1/2"	3"	45.14	43.18	41.21	39.25
86440	.5000	1/2"	12.700	1/2"	4"	61.61	58.93	56.25	53.57
10430	.5512	14.000	14.0	65	16	68.57	65.59	62.61	59.63
10440	.5512	14.000	14.0	75	25	74.19	70.96	67.74	64.51
10450	.5512	14.000	14.0	100	50	89.70	85.80	81.90	78.00

MATERIAL HARDNESS (Rc)

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EDP#	$d1^{\dagger}$		$d2$ Shank Diameter	$l1$ Overall Length	$l2$ Flute Length	1-11	12-24	25-49	50-100
	Decimal	Diameter Metric							
86460	.5625	9/16"	14.288	9/16"	3"	7/8"	74.45	71.21	67.98
86470	.5625	9/16"	14.288	9/16"	3-1/2"	1-1/4"	77.08	73.73	70.38
86480	.5625	9/16"	14.288	9/16"	6"	2-1/2"	116.96	111.87	106.79
86500	.6250	5/8"	15.875	5/8"	3"	7/8"	79.60	76.14	72.68
86520	.6250	5/8"	15.875	5/8"	3-1/2"	1-1/4"	87.04	83.26	79.47
86540	.6250	5/8"	15.875	5/8"	6"	2-1/2"	126.98	121.46	115.94
10120	.6299		16.000	16.0	75	20	83.78	80.14	76.49
10130	.6299		16.000	16.0	88	32	91.39	87.42	83.44
10140	.6299		16.000	16.0	150	65	126.98	121.46	115.94
10160	.7087		18.000	18.0	100	38	134.00	128.17	122.35
10170	.7087		18.000	18.0	150	75	190.90	182.60	174.30
86600	.7500	3/4"	19.050	3/4"	3-1/2"	1"	127.63	122.08	116.53
86620	.7500	3/4"	19.050	3/4"	4"	1-1/2"	127.63	122.08	116.53
86640	.7500	3/4"	19.050	3/4"	6"	3"	202.29	193.49	184.70
10460	.7874		20.000	20.0	75	22	155.25	148.50	141.75
10180	.7874		20.000	20.0	100	38	170.38	162.98	155.57
10190	.7874		20.000	20.0	150	75	213.10	203.83	194.57
10480	.9843		25.000	25.0	100	50	197.94	189.33	180.73
10490	.9843		25.000	25.0	150	82	328.37	314.09	299.82
86690	1.000	1"	25.400	1"	4"	1-1/8"	190.90	182.60	174.30
86720	1.000	1"	25.400	1"	4"	2"	190.90	182.60	174.30
86740	1.000	1"	25.400	1"	6"	3-1/4"	343.91	328.96	314.00

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35

MATERIAL HARDNESS (Rc)

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TOLERANCES

$d1$	$+0.000" - .002" (+.000 - .050\text{mm})$
$d2$	$h6$

Recommended for aluminum and 303 stainless steel

Square End

TiCN Coated

Solid submicron grain carbide end mill - center cutting

High performance machining

Rigid work holding, machine stability and part integrity are critical!

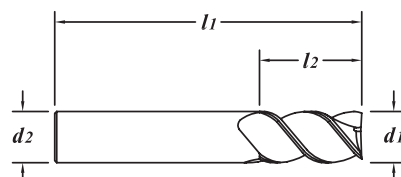
Improved abrasion resistance and lubricity

Slots aluminum and stainless steel at an axial depth of 25% of diameter

Sharp corners (Can be modified with a corner radius)

AlTiN Coating - page 180

Bright Finish - page 182



EDP#	$d1$ †			$d2$ Shank Diameter	$l1$ Overall Length	$l2$ Flute Length	1-11	12-24	25-49	50-100
	Decimal	Diameter	Metric							
86154	.1875	3/16"	4.763	3/16"	2"	5/16"	15.76	15.07	14.39	13.70
86164	.1875	3/16"	4.763	3/16"	2"	9/16"	15.76	15.07	14.39	13.70
86184	.1875	3/16"	4.763	3/16"	3"	1"	27.16	25.98	24.80	23.62
86204	.2500	1/4"	6.350	1/4"	2"	1/2"	18.27	17.48	16.68	15.89
86224	.2500	1/4"	6.350	1/4"	2-1/2"	3/4"	20.95	20.04	19.13	18.22
86244	.2500	1/4"	6.350	1/4"	3"	1-1/4"	32.42	31.01	29.60	28.19
86264	.3125	5/16"	7.938	5/16"	2"	7/16"	25.63	24.52	23.40	22.29
86274	.3125	5/16"	7.938	5/16"	2-1/2"	13/16"	29.06	27.80	26.53	25.27
86284	.3125	5/16"	7.938	5/16"	4"	1-1/4"	46.02	44.02	42.02	40.02
86304	.3750	3/8"	9.525	3/8"	2"	1/2"	30.44	29.12	27.79	26.47
86324	.3750	3/8"	9.525	3/8"	2-1/2"	1"	33.40	31.94	30.49	29.04
86344	.3750	3/8"	9.525	3/8"	3-1/2"	1-1/2"	50.07	47.89	45.72	43.54
86364	.4375	7/16"	11.113	7/16"	2-1/2"	9/16"	42.14	40.30	38.47	36.64
86374	.4375	7/16"	11.113	7/16"	2-3/4"	1"	42.14	40.30	38.47	36.64
86384	.4375	7/16"	11.113	7/16"	4"	2"	67.56	64.63	61.69	58.75
86404	.5000	1/2"	12.700	1/2"	2-1/2"	5/8"	49.36	47.21	45.07	42.92
86424	.5000	1/2"	12.700	1/2"	3"	1"	52.85	50.56	48.26	45.96
86444	.5000	1/2"	12.700	1/2"	4"	2"	71.27	68.17	65.07	61.97
86464	.5625	9/16	14.288	9/16"	3"	7/8"	84.84	81.15	77.46	73.77
86474	.5625	9/16	14.288	9/16"	3-1/2"	1-1/4"	89.13	85.25	81.38	77.50
86484	.5625	9/16	14.288	9/16"	6"	2-1/2"	133.83	128.01	122.19	116.37
86504	.6250	5/8"	15.875	5/8"	3"	7/8"	89.98	86.06	82.15	78.24
86524	.6250	5/8"	15.875	5/8"	3-1/2"	1-1/4"	99.06	94.75	90.45	86.14
86544	.6250	5/8"	15.875	5/8"	6"	2-1/2"	143.85	137.60	131.34	125.09
86604	.7500	3/4"	19.050	3/4"	3-1/2"	1"	141.40	135.26	129.11	122.96
86624	.7500	3/4"	19.050	3/4"	4"	1-1/2"	141.40	135.26	129.11	122.96
86644	.7500	3/4"	19.050	3/4"	6"	3"	221.55	211.92	202.28	192.65
86694	1.000	1"	25.400	1"	4"	1-1/8"	211.62	202.42	193.22	184.02
86724	1.000	1"	25.400	1"	4"	2"	211.62	202.42	193.22	184.02
86744	1.000	1"	25.400	1"	6"	3-1/4"	371.15	355.01	338.88	322.74

TOLERANCES

$d1$	$+0.000" -0.002" (+.000 -0.050\text{mm})$
$d2$	$h6$

Series 263M, 263MC, 263MA, 863MA


Recommended for steels, stainless steel, high-temperature alloys

Square End

Bright Finish, TiCN, or AlTiN Coating

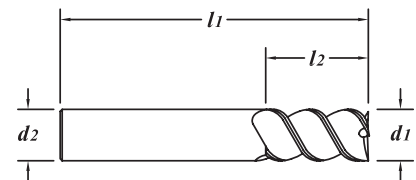
Solid submicron grain carbide end mill - center cutting

High performance profiling

Rigid work holding, machine stability and part integrity are critical!

Modified end gash - will not cut square corner

Can be modified with a corner radius



(263M) BRIGHT EDP#	(263MC) TiCN EDP#	(263MA/863MA) AlTiN EDP#	$d1$ † Diameter		$d2$ Shank Diameter	$l1$ Overall Length	$l2$ Flute Length	1-11	12-24	25-49	50-100
			Decimal	Metric							
23010	-	-	.2500	1/4"	6.350	1/4"	2-1/2"	3/4"	16.13	15.43	14.03
23020	-	-	.3125	5/16"	7.938	5/16"	2-1/2"	7/8"	22.63	21.65	19.68
23030	-	-	.3750	3/8"	9.525	3/8"	2-1/2"	7/8"	28.18	26.95	24.50
23040	-	-	.4375	7/16"	11.113	7/16"	2-3/4"	1"	34.40	32.90	29.91
23050	-	-	.5000	1/2"	12.700	1/2"	3"	1"	45.14	43.18	39.25
23060	-	-	.6250	5/8"	15.875	5/8"	3-1/2"	1-1/4"	87.04	83.26	75.69
23070	-	-	.7500	3/4"	19.050	3/4"	4"	1-1/2"	127.63	122.08	110.98
23080	-	-	1.000	1"	25.400	1"	4"	1-1/2"	190.90	182.60	166.00
-	23014	-	.2500	1/4"	6.350	1/4"	2-1/2"	3/4"	20.95	20.04	18.22
-	23024	-	.3125	5/16"	7.938	5/16"	2-1/2"	7/8"	29.06	27.80	25.27
-	23034	-	.3750	3/8"	9.525	3/8"	2-1/2"	7/8"	34.63	33.12	30.11
-	23044	-	.4375	7/16"	11.113	7/16"	2-3/4"	1"	42.14	40.30	36.64
-	23054	-	.5000	1/2"	12.700	1/2"	3"	1"	52.85	50.56	45.96
-	23064	-	.6250	5/8"	15.875	5/8"	3-1/2"	1-1/4"	99.06	94.75	86.14
-	23074	-	.7500	3/4"	19.050	3/4"	4"	1-1/2"	141.40	135.26	122.96
-	23084	-	1.000	1"	25.400	1"	4"	1-1/2"	211.62	202.42	184.02
-	-	23517	.2362		6.000	6.0	65	13	22.46	21.48	19.53
-	-	23017	.2500	1/4"	6.350	1/4"	2-1/2"	3/4"	21.69	20.75	18.86
-	-	23027	.3125	5/16"	7.938	5/16"	2-1/2"	7/8"	30.92	29.58	26.89
-	-	23527	.3150		8.000	8.0	65	19	32.05	30.66	27.87
-	-	23037	.3750	3/8"	9.525	3/8"	2-1/2"	7/8"	36.49	34.90	31.73
-	-	23537	.3937		10.000	10.0	70	22	43.76	41.86	38.05
-	-	23047	.4375	7/16"	11.113	7/16"	2-3/4"	1"	43.87	41.97	38.15
-	-	23547	.4724		12.000	12.0	75	26	56.83	54.36	49.42
-	-	23057	.5000	1/2"	12.700	1/2"	3"	1"	54.58	52.21	47.46
-	-	23067	.6250	5/8"	15.875	5/8"	3-1/2"	1-1/4"	100.71	96.33	87.57
-	-	23557	.6299		16.000	16.0	88	32	105.05	100.49	91.35
-	-	23077	.7500	3/4"	19.050	3/4"	4"	1-1/2"	143.75	137.50	125.00
-	-	23087	1.000	1"	25.400	1"	4"	1-1/2"	214.75	205.41	186.74

HIGH PERFORMANCE
END MILLS

70

35

MATERIAL HARDNESS (Rc)

0

Series 255MA, 855MA

.1181" - .4724"
(3.000mm - 12.000mm)



TOLERANCES

$d1$	$+0.000" - .002" (+.000 - .050mm)$
$d2$	$h6$

Recommended for steels, stainless steel, and exotics

Square End

AlTiN Coating

Solid submicron grain carbide end mill - center cutting

High performance milling

Rigid work holding, machine stability and part integrity are critical!

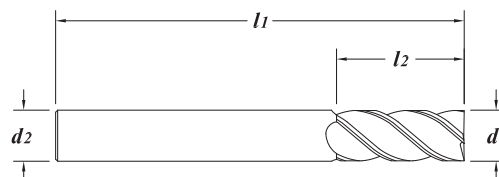
Dry or semi-dry machining

Improved finishes in titanium

Heavy core, Sharp corners

Bright Finish - page 188

TiCN Coated - page 190



EDP#	$d1$ † Diameter		$d2$ Shank Diameter	$l1$ Overall Length	$l2$ Flute Length	1-11	12-24	25-49	50-100
	Decimal	Metric							
40047	.1181	3.000	3.0	38	8	14.81	14.17	13.52	12.88
40057	.1181	3.000	3.0	50	12	17.85	17.07	16.30	15.52
52087	.1250	1/8"	3.175	1-1/2"	1/4"	14.06	13.45	12.84	12.23
52097	.1250	1/8"	3.175	2"	1/2"	16.96	16.23	15.49	14.75
40087	.1575	4.000	6.0	50	8	23.93	22.89	21.85	20.81
40097	.1575	4.000	6.0	50	12	23.93	22.89	21.85	20.81
52107	.1875	3/16"	4.763	2"	5/16"	16.08	15.38	14.68	13.98
52127	.1875	3/16"	4.763	2"	9/16"	16.08	15.38	14.68	13.98
40107	.1969	5.000	5.0	50	8	19.06	18.23	17.40	16.57
40127	.1969	5.000	5.0	50	14	19.06	18.23	17.40	16.57
40117	.1969	5.000	6.0	50	8	23.44	22.42	21.40	20.38
40137	.1969	5.000	6.0	65	16	25.60	24.49	23.37	22.26
40207	.2362	6.000	6.0	50	10	19.93	19.06	18.20	17.33
40227	.2362	6.000	6.0	65	20	22.46	21.48	20.51	19.53
40247	.2362	6.000	6.0	100	32	37.18	35.56	33.95	32.33
52207	.2500	1/4"	6.350	1/4"	3/8"	19.12	18.29	17.46	16.63
52227	.2500	1/4"	6.350	1/4"	2-1/2"	21.69	20.75	19.80	18.86
52237	.2500	1/4"	6.350	1/4"	3"	33.15	31.71	30.27	28.83
52247	.2500	1/4"	6.350	1/4"	4"	35.65	34.10	32.55	31.00
52307	.3125	5/16"	7.938	5/16"	2"	26.43	25.28	24.13	22.98
52327	.3125	5/16"	7.938	5/16"	2-1/2"	30.92	29.58	28.23	26.89
52347	.3125	5/16"	7.938	5/16"	4"	48.58	46.46	44.35	42.24
40307	.3150	8.000	8.0	50	11	27.52	26.32	25.13	23.93
40327	.3150	8.000	8.0	65	21	32.05	30.66	29.26	27.87
40347	.3150	8.000	8.0	100	32	50.58	48.38	46.18	43.98
40367	.3543	9.000	10.0	65	22	49.50	47.34	45.19	43.04
52407	.3750	3/8"	9.525	3/8"	2"	31.22	29.87	28.51	27.15
52427	.3750	3/8"	9.525	3/8"	2-1/2"	36.49	34.90	33.32	31.73
52437	.3750	3/8"	9.525	3/8"	3"	46.58	44.55	42.53	40.50
52447	.3750	3/8"	9.525	3/8"	3-1/2"	52.66	50.37	48.08	45.79
40407	.3937	10.000	10.0	50	12	36.14	34.57	33.00	31.43
40427	.3937	10.000	10.0	70	22	43.76	41.86	39.95	38.05
40447	.3937	10.000	10.0	88	38	64.63	61.82	59.01	56.20
52507	.4375	7/16"	11.113	7/16"	2-1/2"	43.87	41.97	40.06	38.15
52527	.4375	7/16"	11.113	7/16"	2-3/4"	43.87	41.97	40.06	38.15
52547	.4375	7/16"	11.113	7/16"	4"	70.15	67.10	64.05	61.00
40507	.4724	12.000	12.0	65	16	53.27	50.95	48.64	46.32
40527	.4724	12.000	12.0	75	32	56.83	54.36	51.89	49.42
40547	.4724	12.000	12.0	100	50	77.57	74.20	70.82	67.45

MATERIAL HARDNESS (Rc)

70

35

0

EDP#	d_1 †		d_2 Shank Diameter	l_1 Overall Length	l_2 Flute Length	1-11	12-24	25-49	50-100
	Decimal	Diameter Metric							
52607	.5000	1/2"	12.700	1/2"	2-1/2"	5/8"	51.08	48.86	46.64
52627	.5000	1/2"	12.700	1/2"	3"	1-1/4"	54.58	52.21	49.83
52647	.5000	1/2"	12.700	1/2"	4"	2"	73.85	70.64	67.43
52707	.6250	5/8"	15.875	5/8"	3"	3/4"	90.56	86.63	82.69
52727	.6250	5/8"	15.875	5/8"	3-1/2"	1-5/8"	100.71	96.33	91.95
52747	.6250	5/8"	15.875	5/8"	6"	2-1/2"	147.28	140.88	134.47
40607	.6299		16.000	16.0	75	20	94.73	90.61	86.49
40627	.6299		16.000	16.0	88	41	105.05	100.49	95.92
40647	.6299		16.000	16.0	150	63	147.28	140.88	134.47
52807	.7500	3/4"	19.050	3/4"	3"	7/8"	127.59	122.05	116.50
52827	.7500	3/4"	19.050	3/4"	4"	1-5/8"	143.75	137.50	131.25
52837	.7500	3/4"	19.050	3/4"	5"	2"	192.94	184.55	176.16
52847	.7500	3/4"	19.050	3/4"	6"	3-1/4"	225.79	215.97	206.16
40727	.7874		20.000	20.0	100	41	194.21	185.77	177.32
40747	.7874		20.000	20.0	150	82	243.62	233.02	222.43
40787	.9843		25.000	25.0	100	28	221.79	212.15	202.50
40827	.9843		25.000	25.0	100	50	221.79	212.15	202.50
40847	.9843		25.000	25.0	150	82	358.89	343.29	327.68
52897	1.000	1"	25.400	1"	4"	1-1/8"	214.75	205.41	196.08
52927	1.000	1"	25.400	1"	4"	2"	214.75	205.41	196.08
52947	1.000	1"	25.400	1"	6"	3-1/4"	374.44	358.16	341.88



End Mill Manufacturing

70

35

MATERIAL HARDNESS (Rc)

0

Series 255M, 855M

.1181" - .5000"
(3.000mm - 12.700mm)



TOLERANCES

d_1	+0.000" - .002" (+.000 - .050mm)
d_2	h6

Recommended for steels, stainless steel, and exotics

Square End

Bright Finish

Solid submicron grain carbide end mill - center cutting

High performance milling

Rigid work holding, machine stability and part integrity are critical!

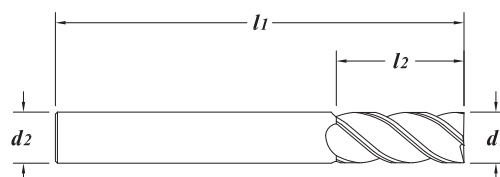
Improved finishes in titanium

Heavy core

Sharp corners

AlTiN Coating - page 186

TiCN Coated - page 190



EDP#	d_1 † Diameter		d_2 Shank Diameter	l_1 Overall Length	l_2 Flute Length	1-11	12-24	25-49	50-100	
	Decimal	Metric								
40040	.1181		3.000	3.0	38	8	12.09	11.56	11.04	10.51
40050	.1181		3.000	3.0	50	12	14.57	13.94	13.30	12.67
52080	.1250	1/8"	3.175	1/8"	1-1/2"	1/4"	11.35	10.86	10.36	9.87
52090	.1250	1/8"	3.175	1/8"	2"	1/2"	13.67	13.08	12.48	11.89
40080	.1575		4.000	6.0	50	8	19.65	18.80	17.94	17.09
40090	.1575		4.000	6.0	50	12	19.65	18.80	17.94	17.09
52100	.1875	3/16"	4.763	3/16"	2"	5/16"	13.37	12.79	12.21	11.63
52120	.1875	3/16"	4.763	3/16"	2"	9/16"	13.37	12.79	12.21	11.63
40100	.1969		5.000	5.0	50	8	14.86	14.21	13.57	12.92
40120	.1969		5.000	5.0	50	14	14.86	14.21	13.57	12.92
40200	.2362		6.000	6.0	50	10	15.76	15.07	14.39	13.70
40220	.2362		6.000	6.0	65	20	16.93	16.19	15.46	14.72
40240	.2362		6.000	6.0	100	32	30.68	29.35	28.01	26.68
52200	.2500	1/4"	6.350	1/4"	2"	3/8"	14.93	14.28	13.63	12.98
52220	.2500	1/4"	6.350	1/4"	2-1/2"	3/4"	16.13	15.43	14.73	14.03
52240	.2500	1/4"	6.350	1/4"	4"	1-1/4"	29.14	27.87	26.61	25.34
52300	.3125	5/16"	7.938	5/16"	2"	7/16"	20.41	19.53	18.64	17.75
52320	.3125	5/16"	7.938	5/16"	2-1/2"	13/16"	22.63	21.65	20.66	19.68
52340	.3125	5/16"	7.938	5/16"	4"	1-1/4"	38.01	36.36	34.70	33.05
40320	.3150		8.000	8.0	65	21	23.76	22.73	21.69	20.66
40340	.3150		8.000	8.0	100	32	40.03	38.29	36.55	34.81
52400	.3750	3/8"	9.525	3/8"	2"	1/2"	25.22	24.12	23.03	21.93
52420	.3750	3/8"	9.525	3/8"	2-1/2"	7/8"	28.18	26.95	25.73	24.50
52440	.3750	3/8"	9.525	3/8"	3-1/2"	1-1/2"	42.10	40.27	38.44	36.61
40420	.3937		10.000	10.0	70	22	34.30	32.81	31.32	29.83
40440	.3937		10.000	10.0	88	38	52.41	50.13	47.85	45.57
52500	.4375	7/16"	11.113	7/16"	2-1/2"	9/16"	34.40	32.90	31.41	29.91
52520	.4375	7/16"	11.113	7/16"	2-3/4"	1"	34.40	32.90	31.41	29.91
52540	.4375	7/16"	11.113	7/16"	4"	2"	57.93	55.41	52.89	50.37
40520	.4724		12.000	12.0	75	32	47.40	45.34	43.28	41.22
40540	.4724		12.000	12.0	100	50	65.30	62.46	59.62	56.78
52600	.5000	1/2"	12.700	1/2"	2-1/2"	5/8"	41.63	39.82	38.01	36.20
52620	.5000	1/2"	12.700	1/2"	3"	1-1/4"	45.14	43.18	41.21	39.25
52640	.5000	1/2"	12.700	1/2"	4"	2"	61.61	58.93	56.25	53.57

EDP#	$d1$ † Diameter			$d2$ Shank Diameter	$l1$ Overall Length	$l2$ Flute Length	1-11	12-24	25-49	50-100
	Decimal		Metric							
52700	.6250	5/8"	15.875	5/8"	3"	3/4"	79.60	76.14	72.68	69.22
52720	.6250	5/8"	15.875	5/8"	3-1/2"	1-5/8"	87.04	83.26	79.47	75.69
52740	.6250	5/8"	15.875	5/8"	6"	2-1/2"	126.98	121.46	115.94	110.42
40600	.6299		16.000	16.0	75	20	83.78	80.14	76.49	72.85
40620	.6299		16.000	16.0	88	41	91.39	87.42	83.44	79.47
40640	.6299		16.000	16.0	150	63	126.98	121.46	115.94	110.42
52800	.7500	3/4"	19.050	3/4"	3"	7/8"	114.47	109.49	104.52	99.54
52820	.7500	3/4"	19.050	3/4"	4"	1-5/8"	127.63	122.08	116.53	110.98
52830	.7500	3/4"	19.050	3/4"	5"	2"	172.76	165.25	157.74	150.23
52840	.7500	3/4"	19.050	3/4"	6"	3-1/4"	202.29	193.49	184.70	175.90
40700	.7874		20.000	20.0	75	22	155.25	148.50	141.75	135.00
40720	.7874		20.000	20.0	100	41	170.38	162.98	155.57	148.16
40740	.7874		20.000	20.0	150	82	213.10	203.83	194.57	185.30
40780	.9843		25.000	25.0	100	28	197.94	189.33	180.73	172.12
40820	.9843		25.000	25.0	100	50	197.94	189.33	180.73	172.12
40840	.9843		25.000	25.0	150	82	328.37	314.09	299.82	285.54
52890	1.000	1"	25.400	1"	4"	1-1/8"	190.90	182.60	174.30	166.00
52920	1.000	1"	25.400	1"	4"	2"	190.90	182.60	174.30	166.00
52940	1.000	1"	25.400	1"	6"	3-1/4"	343.91	328.96	314.00	299.05



70

35

0

MATERIAL HARDNESS (Rc)

Series 255MC

.1875" - 1.000"
(4.763mm - 25.400mm)



TOLERANCES

d_1	$+0.000" - .002" (+.000 - .050\text{mm})$
d_2	$h6$

Recommended for steels, stainless steel, and exotics

Square End

TiCN Coated

Solid submicron grain carbide end mill - center cutting

High performance milling

Rigid work holding, machine stability and part integrity are critical!

Improved abrasion resistance and lubricity

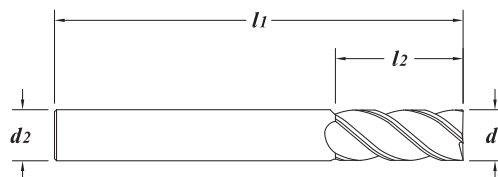
Improved finishes in titanium

Heavy core

Sharp corners

AlTiN Coating - page 186

Bright Finish - page 188



EDP#	d_1 † Diameter		d_2 Shank Diameter	l_1 Overall Length	l_2 Flute Length	1-11	12-24	25-49	50-100
	Decimal	Metric							
52104	.1875	3/16"	4.763	3/16"	2"	5/16"	15.76	15.07	14.39
52124	.1875	3/16"	4.763	3/16"	2"	9/16"	15.76	15.07	14.39
52204	.2500	1/4"	6.350	1/4"	2"	3/8"	18.27	17.48	16.68
52224	.2500	1/4"	6.350	1/4"	2-1/2"	3/4"	20.95	20.04	19.13
52244	.2500	1/4"	6.350	1/4"	4"	1-1/4"	34.35	32.86	31.36
52304	.3125	5/16"	7.938	5/16"	2"	7/16"	25.63	24.52	23.40
52324	.3125	5/16"	7.938	5/16"	2-1/2"	13/16"	29.06	27.80	26.53
52344	.3125	5/16"	7.938	5/16"	4"	1-1/4"	46.02	44.02	42.02
52404	.3750	3/8"	9.525	3/8"	2"	1/2"	30.44	29.12	27.79
52424	.3750	3/8"	9.525	3/8"	2-1/2"	7/8"	34.63	33.12	31.62
52444	.3750	3/8"	9.525	3/8"	3-1/2"	1-1/2"	50.07	47.89	45.72
52504	.4375	7/16"	11.113	7/16"	2-1/2"	9/16"	42.14	40.30	38.47
52524	.4375	7/16"	11.113	7/16"	2-3/4"	1"	42.14	40.30	38.47
52544	.4375	7/16"	11.113	7/16"	4"	2"	67.56	64.63	61.69
52604	.5000	1/2"	12.700	1/2"	2-1/2"	5/8"	49.36	47.21	45.07
52624	.5000	1/2"	12.700	1/2"	3"	1-1/4"	52.85	50.56	48.26
52644	.5000	1/2"	12.700	1/2"	4"	2"	71.27	68.17	65.07
52704	.6250	5/8"	15.875	5/8"	3"	3/4"	89.98	86.06	82.15
52724	.6250	5/8"	15.875	5/8"	3-1/2"	1-5/8"	99.06	94.75	90.45
52744	.6250	5/8"	15.875	5/8"	6"	2-1/2"	143.85	137.60	131.34
52804	.7500	3/4"	19.050	3/4"	3"	7/8"	127.25	121.72	116.18
52824	.7500	3/4"	19.050	3/4"	4"	1-5/8"	141.40	135.26	129.11
52844	.7500	3/4"	19.050	3/4"	6"	3-1/4"	221.55	211.92	202.28
52894	1.000	1"	25.400	1"	4"	1-1/8"	211.62	202.42	193.22
52924	1.000	1"	25.400	1"	4"	2"	211.62	202.42	193.22
52944	1.000	1"	25.400	1"	6"	3-1/4"	371.15	355.01	338.88
									322.74

TOLERANCES

d_1	$+0.000" - .002" (+.000 - .050\text{mm})$
d_2	$h6$
r	$+0.001" - .001" (+.025 - .025\text{mm})$



TECH
PAGES
286-287

Series 255RA, 855RA

.1181" - .3125"
(3.000mm - 7.938mm)

Recommended for steels, stainless steel, and exotics

Corner Radius

AlTiN Coating

Solid submicron grain carbide end mill - center cutting

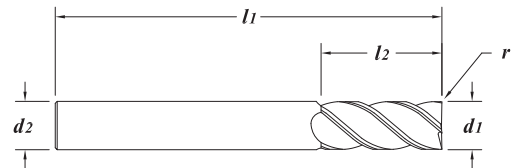
High performance milling

Rigid work holding, machine stability and part integrity are critical!

Dry or semi-dry machining

Improved finishes in titanium

Heavy core



EDP#	d_1 †		d_2	l_1	l_2	r					
	Diameter										
	Decimal	Metric	Shank Diameter	Overall Length	Flute Length	Corner Radius	1-11	12-24	25-49	50-100	
83527	.1181	3.000	3.0	38	8	0.20	16.17	15.47	14.76	14.06	
83537	.1181	3.000	3.0	38	8	0.50	16.17	15.47	14.76	14.06	
83547	.1181	3.000	3.0	50	12	0.20	19.38	18.54	17.69	16.85	
83550	.1181	3.000	3.0	50	12	0.30	19.38	18.54	17.69	16.85	
83557	.1181	3.000	3.0	50	12	0.50	19.38	18.54	17.69	16.85	
83567	.1250	1/8"	3.175	1/8"	1-1/2"	1/4"	.010"	15.36	14.70	14.03	13.36
83577	.1250	1/8"	3.175	1/8"	1-1/2"	1/4"	.020"	15.36	14.70	14.03	13.36
83587	.1250	1/8"	3.175	1/8"	2"	1/2"	.010"	18.88	18.06	17.24	16.42
83597	.1250	1/8"	3.175	1/8"	2"	1/2"	.020"	18.88	18.06	17.24	16.42
83600	.1250	1/8"	3.175	1/8"	2"	1/2"	.030"	18.88	18.06	17.24	16.42
83607	.1575	4.000	6.0	50	8	0.30	26.07	24.94	23.80	22.67	
83617	.1575	4.000	6.0	50	8	0.50	26.07	24.94	23.80	22.67	
83627	.1575	4.000	6.0	50	12	0.30	26.07	24.94	23.80	22.67	
83637	.1575	4.000	6.0	50	12	0.50	26.07	24.94	23.80	22.67	
83647	.1875	3/16"	4.763	3/16"	2"	5/16"	.010"	19.32	18.48	17.64	16.80
83657	.1875	3/16"	4.763	3/16"	2"	5/16"	.020"	19.32	18.48	17.64	16.80
83667	.1875	3/16"	4.763	3/16"	2"	9/16"	.010"	19.32	18.48	17.64	16.80
83677	.1875	3/16"	4.763	3/16"	2"	9/16"	.020"	19.32	18.48	17.64	16.80
83680	.1875	3/16"	4.763	3/16"	2"	9/16"	.030"	19.32	18.48	17.64	16.80
83707	.1969	5.000	6.0	65	15	0.30	28.43	27.19	25.96	24.72	
83717	.1969	5.000	6.0	65	15	0.50	28.43	27.19	25.96	24.72	
83767	.2362	6.000	6.0	50	12	0.30	24.53	23.46	22.40	21.33	
83777	.2362	6.000	6.0	50	12	0.50	24.53	23.46	22.40	21.33	
83780	.2362	6.000	6.0	65	19	0.20	27.54	26.35	25.15	23.95	
83787	.2362	6.000	6.0	65	19	0.30	27.54	26.35	25.15	23.95	
83797	.2362	6.000	6.0	65	19	0.50	27.54	26.35	25.15	23.95	
83807	.2362	6.000	6.0	65	19	1.00	27.54	26.35	25.15	23.95	
83827	.2500	1/4"	6.350	1/4"	2"	3/8"	.015"	23.61	22.58	21.56	20.53
83837	.2500	1/4"	6.350	1/4"	2"	3/8"	.030"	23.61	22.58	21.56	20.53
83845	.2500	1/4"	6.350	1/4"	2-1/2"	3/4"	.010"	26.54	25.39	24.23	23.08
83847	.2500	1/4"	6.350	1/4"	2-1/2"	3/4"	.015"	26.54	25.39	24.23	23.08
83857	.2500	1/4"	6.350	1/4"	2-1/2"	3/4"	.030"	26.54	25.39	24.23	23.08
83877	.2500	1/4"	6.350	1/4"	2-1/2"	3/4"	.060"	26.54	25.39	24.23	23.08
83907	.2500	1/4"	6.350	1/4"	3"	1-1/8"	.030"	38.11	36.45	34.80	33.14
83927	.3125	5/16"	7.938	5/16"	2"	7/16"	.020"	32.23	30.83	29.43	28.03
83937	.3125	5/16"	7.938	5/16"	2"	7/16"	.030"	32.23	30.83	29.43	28.03
83940	.3125	5/16"	7.938	5/16"	2-1/2"	13/16"	.010"	35.93	34.36	32.80	31.24
83947	.3125	5/16"	7.938	5/16"	2-1/2"	13/16"	.020"	35.93	34.36	32.80	31.24
83957	.3125	5/16"	7.938	5/16"	2-1/2"	13/16"	.030"	35.93	34.36	32.80	31.24
83977	.3125	5/16"	7.938	5/16"	2-1/2"	13/16"	.060"	35.93	34.36	32.80	31.24

continued →

Series 255RA, 855RA (continued)

.3150" - 1.000"
(8.000mm - 25.400mm)

EDP#	d_1 †			d_2	l_1	l_2	r	1-11	12-24	25-49	50-100
	Decimal	Diameter	Metric								
83987	.3150		8.000	8.0	50	12	0.50	33.42	31.97	30.51	29.06
83997	.3150		8.000	8.0	50	12	1.00	33.42	31.97	30.51	29.06
84000	.3150		8.000	8.0	65	22	0.30	37.27	35.65	34.03	32.41
84007	.3150		8.000	8.0	65	22	0.50	37.27	35.65	34.03	32.41
84017	.3150		8.000	8.0	65	22	1.00	37.27	35.65	34.03	32.41
84027	.3150		8.000	8.0	65	22	1.50	37.27	35.65	34.03	32.41
84087	.3750	3/8"	9.525	3/8"	2"	1/2"	.020"	38.00	36.34	34.69	33.04
84097	.3750	3/8"	9.525	3/8"	2"	1/2"	.030"	38.00	36.34	34.69	33.04
84100	.3750	3/8"	9.525	3/8"	2-1/2"	7/8"	.010"	41.79	39.97	38.16	36.34
84107	.3750	3/8"	9.525	3/8"	2-1/2"	7/8"	.020"	41.79	39.97	38.16	36.34
84117	.3750	3/8"	9.525	3/8"	2-1/2"	7/8"	.030"	41.79	39.97	38.16	36.34
84137	.3750	3/8"	9.525	3/8"	2-1/2"	7/8"	.060"	41.79	39.97	38.16	36.34
84147	.3750	3/8"	9.525	3/8"	3"	1-1/4"	.030"	54.99	52.60	50.21	47.82
84167	.3937		10.000	10.0	70	22	0.50	50.52	48.32	46.13	43.93
84177	.3937		10.000	10.0	70	22	1.00	50.52	48.32	46.13	43.93
84257	.4724		12.000	12.0	75	32	0.30	73.88	70.66	67.45	64.24
84267	.4724		12.000	12.0	75	32	0.50	73.88	70.66	67.45	64.24
84277	.4724		12.000	12.0	75	32	1.00	73.88	70.66	67.45	64.24
84287	.4724		12.000	12.0	75	32	1.50	73.88	70.66	67.45	64.24
84307	.5000	1/2"	12.700	1/2"	3"	1-1/4"	.010"	70.89	67.80	64.72	61.64
84317	.5000	1/2"	12.700	1/2"	3"	1-1/4"	.020"	70.89	67.80	64.72	61.64
84327	.5000	1/2"	12.700	1/2"	3"	1-1/4"	.030"	70.89	67.80	64.72	61.64
84337	.5000	1/2"	12.700	1/2"	3"	1-1/4"	.060"	70.89	67.80	64.72	61.64
84357	.5000	1/2"	12.700	1/2"	3"	1-1/4"	.120"	70.89	67.80	64.72	61.64
84367	.5000	1/2"	12.700	1/2"	4"	2"	.030"	83.97	80.32	76.67	73.02
84377	.5000	1/2"	12.700	1/2"	4"	2"	.060"	83.97	80.32	76.67	73.02
84397	.5000	1/2"	12.700	1/2"	4"	2"	.120"	83.97	80.32	76.67	73.02
84467	.6250	5/8"	15.875	5/8"	3-1/2"	1-1/4"	.015"	112.73	107.83	102.93	98.03
84487	.6250	5/8"	15.875	5/8"	3-1/2"	1-1/4"	.030"	112.73	107.83	102.93	98.03
84497	.6250	5/8"	15.875	5/8"	3-1/2"	1-1/4"	.060"	112.73	107.83	102.93	98.03
84507	.6250	5/8"	15.875	5/8"	3-1/2"	1-1/4"	.120"	112.73	107.83	102.93	98.03
84567	.6299		16.000	16.0	88	32	1.00	117.55	112.44	107.33	102.22
84577	.6299		16.000	16.0	88	32	2.00	117.55	112.44	107.33	102.22
84587	.6299		16.000	16.0	150	65	1.00	175.55	167.92	160.28	152.65
84597	.6299		16.000	16.0	150	65	2.00	175.55	167.92	160.28	152.65
84667	.7500	3/4"	19.050	3/4"	4"	1-1/2"	.015"	161.33	154.32	147.30	140.29
84687	.7500	3/4"	19.050	3/4"	4"	1-1/2"	.030"	161.33	154.32	147.30	140.29
84697	.7500	3/4"	19.050	3/4"	4"	1-1/2"	.060"	161.33	154.32	147.30	140.29
84700	.7500	3/4"	19.050	3/4"	4"	1-1/2"	.120"	161.33	154.32	147.30	140.29
84707	.7500	3/4"	19.050	3/4"	5"	2"	.030"	223.38	213.66	203.95	194.24
84717	.7500	3/4"	19.050	3/4"	5"	2"	.060"	223.38	213.66	203.95	194.24
84747	.7500	3/4"	19.050	3/4"	5"	2"	.120"	223.38	213.66	203.95	194.24
84757	.7500	3/4"	19.050	3/4"	5"	2"	.190"	223.38	213.66	203.95	194.24
84767	.7874		20.000	20.0	100	38	1.00	228.31	218.38	208.46	198.53
84777	.7874		20.000	20.0	100	38	3.00	228.31	218.38	208.46	198.53
84887	.9843		25.000	25.0	100	38	1.00	261.27	249.91	238.55	227.19
84897	.9843		25.000	25.0	100	38	3.00	261.27	249.91	238.55	227.19
84957	1.000	1"	25.400	1"	4"	1-1/2"	.015"	274.83	262.88	250.93	238.98
84967	1.000	1"	25.400	1"	4"	1-1/2"	.030"	274.83	262.88	250.93	238.98
84970	1.000	1"	25.400	1"	4"	1-1/2"	.060"	274.83	262.88	250.93	238.98
84977	1.000	1"	25.400	1"	4"	1-1/2"	.120"	274.83	262.88	250.93	238.98
84987	1.000	1"	25.400	1"	5"	2"	.030"	337.97	323.28	308.58	293.89
84990	1.000	1"	25.400	1"	5"	2"	.060"	337.97	323.28	308.58	293.89
84997	1.000	1"	25.400	1"	5"	2"	.120"	337.97	323.28	308.58	293.89
85007	1.000	1"	25.400	1"	5"	2"	.190"	337.97	323.28	308.58	293.89

TOLERANCES

d_1	$+0.000" - .002" (+0.000 - .050\text{mm})$
d_2	$h6$

**NEW
ITEM****Series 246M, 246MC, 246MA, 846M, 846MA**TECH
PAGES
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Recommended for steels

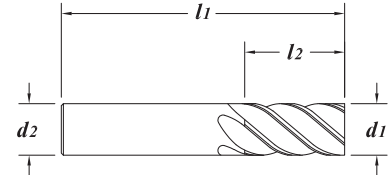
Square End**Bright Finish, TiCN, or AlTiN Coating**

Solid submicron grain carbide end mill - center cutting

High performance finishing in a variety of steels

Rigid work holding, machine stability and part integrity are critical!

Excellent durability



(246M/846M) BRIGHT EDP#	(246MC) TiCN EDP#	(246MA/846MA) AlTiN EDP#	d_1 † Diameter			d_2 Shank Diameter	l_1 Overall Length	l_2 Flute Length	1-11	12-24	25-49	50-100
			Decimal		Metric							
51110	-	-	.1875	3/16"	4.763	3/16"	2"	5/8"	13.37	12.79	12.21	11.63
51510	-	-	.1969		5.000	5.0	50	16	14.86	14.21	13.57	12.92
51520	-	-	.2362		6.000	6.0	65	20	16.93	16.19	15.46	14.72
51150	-	-	.2500	1/4"	6.350	1/4"	2-1/2"	3/4"	16.13	15.43	14.73	14.03
51190	-	-	.3125	5/16"	7.938	5/16"	2-1/2"	7/8"	22.63	21.65	20.66	19.68
51530	-	-	.3150		8.000	8.0	65	22	23.76	22.73	21.69	20.66
51230	-	-	.3750	3/8"	9.525	3/8"	2-1/2"	7/8"	28.18	26.95	25.73	24.50
51540	-	-	.3937		10.000	10.0	70	25	34.30	32.81	31.32	29.83
51270	-	-	.4375	7/16"	11.113	7/16"	2-3/4"	1"	34.40	32.90	31.41	29.91
51310	-	-	.5000	1/2"	12.700	1/2"	3"	1"	45.14	43.18	41.21	39.25
51330	-	-	.6250	5/8"	15.875	5/8"	3-1/2"	1-1/4"	87.04	83.26	79.47	75.69
51560	-	-	.6299		16.000	16.0	88	32	91.39	87.42	83.44	79.47
51350	-	-	.7500	3/4"	19.050	3/4"	4"	1-1/2"	127.63	122.08	116.53	110.98
51370	-	-	1.000	1"	25.400	1"	4"	1-1/2"	190.90	182.60	174.30	166.00
51400	-	-	1.250	1-1/4"	31.750	1-1/4"	4-1/2"	2"	557.35	533.12	508.88	484.65
51430	-	-	1.250	1-1/4"	31.750	1-1/4"	6"	3"	729.58	697.86	666.14	634.42
-	51114	-	.1875	3/16"	4.763	3/16"	2"	5/8"	15.76	15.07	14.39	13.70
-	51154	-	.2500	1/4"	6.350	1/4"	2-1/2"	3/4"	20.95	20.04	19.13	18.22
-	51194	-	.3125	5/16"	7.938	5/16"	2-1/2"	7/8"	29.06	27.80	26.53	25.27
-	51234	-	.3750	3/8"	9.525	3/8"	2-1/2"	7/8"	34.63	33.12	31.62	30.11
-	51274	-	.4375	7/16"	11.113	7/16"	2-3/4"	1"	42.14	40.30	38.47	36.64
-	51314	-	.5000	1/2"	12.700	1/2"	3"	1"	52.85	50.56	48.26	45.96
-	51334	-	.6250	5/8"	15.875	5/8"	3-1/2"	1-1/4"	99.06	94.75	90.45	86.14
-	51354	-	.7500	3/4"	19.050	3/4"	4"	1-1/2"	141.40	135.26	129.11	122.96
-	51374	-	1.000	1"	25.400	1"	4"	1-1/2"	211.58	202.38	193.18	183.98
-	51404	-	1.250	1-1/4"	31.750	1-1/4"	4-1/2"	2"	590.76	565.07	539.39	513.70
-	51434	-	1.250	1-1/4"	31.750	1-1/4"	6"	3"	767.36	734.00	700.63	667.27
-	-	51117	.1875	3/16"	4.763	3/16"	2"	5/8"	16.08	15.38	14.68	13.98
-	-	51517	.1969		5.000	5.0	50	16	19.06	18.23	17.40	16.57
-	-	51597	.1969		5.000	6.0	65	16	25.60	24.49	23.37	22.26
-	-	51527	.2362		6.000	6.0	65	20	22.46	21.48	20.51	19.53
-	-	51157	.2500	1/4"	6.350	1/4"	2-1/2"	3/4"	21.69	20.75	19.80	18.86
-	-	51197	.3125	5/16"	7.938	5/16"	2-1/2"	7/8"	30.92	29.58	28.23	26.89
-	-	51537	.3150		8.000	8.0	65	22	32.05	30.66	29.26	27.87
-	-	51237	.3750	3/8"	9.525	3/8"	2-1/2"	7/8"	36.49	34.90	33.32	31.73
-	-	51547	.3937		10.000	10.0	70	25	43.76	41.86	39.95	38.05
-	-	51277	.4375	7/16"	11.113	7/16"	2-3/4"	1"	43.87	41.97	40.06	38.15
-	-	51557	.4724		12.000	12.0	75	26	56.83	54.36	51.89	49.42
-	-	51317	.5000	1/2"	12.700	1/2"	3"	1"	54.58	52.21	49.83	47.46
-	-	51337	.6250	5/8"	15.875	5/8"	3-1/2"	1-1/4"	100.71	96.33	91.95	87.57
-	-	51567	.6299		16.000	16.0	88	32	105.05	100.49	95.92	91.35
-	-	51357	.7500	3/4"	19.050	3/4"	4"	1-1/2"	143.75	137.50	131.25	125.00
-	-	51577	.7874		20.000	20.0	100	38	194.21	185.77	177.32	168.88
-	-	51587	.9843		25.000	25.0	100	38	221.79	212.15	202.50	192.86
-	-	51377	1.000	1"	25.400	1"	4"	1-1/2"	214.75	205.41	196.08	186.74
-	-	51407	1.250	1-1/4"	31.750	1-1/4"	4-1/2"	2"	596.45	570.52	544.58	518.65
-	-	51437	1.250	1-1/4"	31.750	1-1/4"	6"	3"	768.68	735.26	701.84	668.42

NEW

70

35

MATERIAL HARDNESS (Rc)

0

$d1$	$+0.000" - .002" (+.000 - .050\text{mm})$
$d2$	$h6$



TECH
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Recommended for inconel, tool steels, hardened die mold >40Rc

Square End

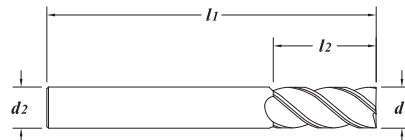
BALINIT® Durana Coating

Solid submicron grain carbide end mill - center cutting

High performance tool for use in high Rockwell and difficult to machine materials

Corner Radius - page 195

Ball End - page 196



EDP#	$d1$ † Diameter		$d2$ Shank Diameter	$l1$ Overall Length	$l2$ Flute Length	Number of Flutes	1-11	12-24	25-49	50-100
	Decimal	Metric								
21200	.1181	3.000	3.0	38	12	4	15.63	14.95	14.27	13.59
21230	.1250	1/8"	3.175	1/8"	1-1/2"	4	14.86	14.21	13.57	12.92
21260	.1575	4.000	6.0	50	12	4	25.25	24.16	23.06	21.96
21290	.1875	3/16"	4.763	3/16"	2"	4	18.66	17.85	17.04	16.23
21320	.1969	5.000	6.0	65	15	4	27.67	26.47	25.26	24.06
21350	.2362	6.000	6.0	65	19	4	26.83	25.66	24.50	23.33
21380	.2500	1/4"	6.350	1/4"	2-1/2"	4	25.85	24.73	23.60	22.48
21410	.2756	7.000	8.0	65	22	5	40.50	38.74	36.98	35.22
21440	.3125	5/16"	7.938	5/16"	2-1/2"	5	35.10	33.57	32.05	30.52
21470	.3150	8.000	8.0	65	22	5	36.89	35.29	33.68	32.08
21500	.3543	9.000	10.0	65	22	5	54.20	51.84	49.49	47.13
21530	.3750	3/8"	9.525	3/8"	2-1/2"	5	40.69	38.92	37.15	35.38
21560	.3937	10.000	10.0	70	22	5	49.11	46.97	44.84	42.70
21620	.4724	12.000	12.0	75	32	5	72.00	68.87	65.74	62.61
21660	.5000	1/2"	12.700	1/2"	3"	5	68.46	65.48	62.51	59.53
21710	.6250	5/8"	15.875	5/8"	3-1/2"	5	108.70	103.97	99.25	94.52
21740	.6299	16.000	16.0	88	32	5	114.31	109.34	104.37	99.40
21800	.7500	3/4"	19.050	3/4"	4"	5	155.69	148.92	142.15	135.38
21830	.7874	20.000	20.0	100	38	5	220.09	210.52	200.95	191.38
21890	.9843	25.000	25.0	100	38	5	275.17	263.21	251.24	239.28
21920	1.000	1"	25.400	1"	4"	5	266.05	254.49	242.92	231.35

70

35

MATERIAL HARDNESS (Rc)

0

TOLERANCES

d_1	$+0.000" -0.002" (+.000mm -.050mm)$
d_2	$h6$
r	$+0.001" -0.001" (+.025 -.025mm)$

HIGH ROCKWELL END MILLS

Series 545RA

TECH
PAGES
308-309

Recommended for inconel, tool steels, hardened die mold >40Rc

Corner Radius

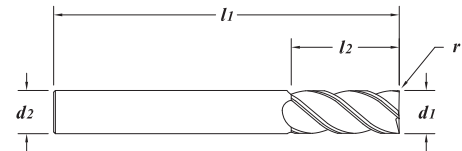
BALINIT® Durana Coating

Solid submicron grain carbide end mill - center cutting

High performance tool for use in high Rockwell and difficult to machine materials

Square End - page 194

Ball End - page 196

HIGH
PERFORMANCE
END MILLS

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35

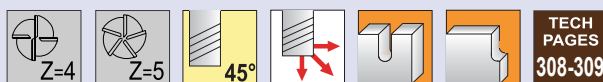
MATERIAL HARDNESS (Rc)

0

EDP#	d_1 † Diameter		d_2 Shank Diameter	l_1 Overall Length	l_2 Flute Length	r Corner Radius	Number of Flutes	1-11	12-24	25-49	50-100
	Decimal	Metric									
21202	.1181	3.000	3.0	38	12	0.20	4	17.07	16.32	15.58	14.84
21212	.1181	3.000	3.0	38	12	0.50	4	17.07	16.32	15.58	14.84
21232	.1250	1/8"	3.175	1/8"	1-1/2"	1/2"	.010"	4	16.22	15.51	14.81
21242	.1250	1/8"	3.175	1/8"	1-1/2"	1/2"	.020"	4	16.22	15.51	14.81
21262	.1575	4.000	6.0	50	12	0.30	4	27.52	26.32	25.13	23.93
21292	.1875	3/16"	4.763	3/16"	2"	9/16"	.010"	4	20.38	19.49	18.61
21302	.1875	3/16"	4.763	3/16"	2"	9/16"	.020"	4	20.38	19.49	18.61
21322	.1969	5.000	6.0	65	15	0.30	4	30.02	28.71	27.41	26.10
21342	.2362	6.000	6.0	65	19	0.20	4	29.07	27.81	26.54	25.28
21352	.2362	6.000	6.0	65	19	0.50	4	29.07	27.81	26.54	25.28
21372	.2500	1/4"	6.350	1/4"	2-1/2"	3/4"	.010"	4	28.01	26.80	25.58
21382	.2500	1/4"	6.350	1/4"	2-1/2"	3/4"	.015"	4	28.01	26.80	25.58
21392	.2500	1/4"	6.350	1/4"	2-1/2"	3/4"	.030"	4	28.01	26.80	25.58
21412	.2756	7.000	8.0	65	22	0.50	5	43.93	42.02	40.11	38.20
21432	.3125	5/16"	7.938	5/16"	2-1/2"	13/16"	.010"	5	37.93	36.28	34.63
21442	.3125	5/16"	7.938	5/16"	2-1/2"	13/16"	.015"	5	37.93	36.28	34.63
21452	.3125	5/16"	7.938	5/16"	2-1/2"	13/16"	.030"	5	37.93	36.28	34.63
21462	.3150	8.000	8.0	65	22	0.20	5	39.93	38.19	36.46	34.72
21472	.3150	8.000	8.0	65	22	0.50	5	39.93	38.19	36.46	34.72
21502	.3543	9.000	10.0	65	22	0.50	5	59.00	56.43	53.87	51.30
21522	.3750	3/8"	9.525	3/8"	2-1/2"	7/8"	.010"	5	44.14	42.22	40.30
21532	.3750	3/8"	9.525	3/8"	2-1/2"	7/8"	.015"	5	44.14	42.22	40.30
21542	.3750	3/8"	9.525	3/8"	2-1/2"	7/8"	.030"	5	44.14	42.22	40.30
21552	.3937	10.000	10.0	70	22	0.20	5	53.31	51.00	48.68	46.36
21562	.3937	10.000	10.0	70	22	0.50	5	53.31	51.00	48.68	46.36
21612	.4724	12.000	12.0	75	32	0.50	5	78.76	75.34	71.91	68.49
21622	.4724	12.000	12.0	75	32	1.00	5	78.76	75.34	71.91	68.49
21642	.5000	1/2"	12.700	1/2"	3"	1-1/4"	.010"	5	74.82	71.57	68.31
21652	.5000	1/2"	12.700	1/2"	3"	1-1/4"	.015"	5	74.82	71.57	68.31
21662	.5000	1/2"	12.700	1/2"	3"	1-1/4"	.030"	5	74.82	71.57	68.31
21672	.5000	1/2"	12.700	1/2"	3"	1-1/4"	.060"	5	74.82	71.57	68.31
21692	.6250	5/8"	15.875	5/8"	3-1/2"	1-1/4"	.010"	5	119.00	113.83	108.65
21702	.6250	5/8"	15.875	5/8"	3-1/2"	1-1/4"	.015"	5	119.00	113.83	108.65
21712	.6250	5/8"	15.875	5/8"	3-1/2"	1-1/4"	.030"	5	119.00	113.83	108.65
21722	.6250	5/8"	15.875	5/8"	3-1/2"	1-1/4"	.060"	5	119.00	113.83	108.65
21732	.6299	16.000	16.0	88	32	0.50	5	125.27	119.82	114.38	108.93
21742	.6299	16.000	16.0	88	32	1.00	5	125.27	119.82	114.38	108.93
21772	.7087	18.000	18.0	100	38	0.50	5	178.78	171.01	163.23	155.46
21802	.7500	3/4"	19.050	3/4"	4"	1-1/2"	.015"	5	171.07	163.64	156.20
21812	.7500	3/4"	19.050	3/4"	4"	1-1/2"	.030"	5	171.07	163.64	156.20
21822	.7500	3/4"	19.050	3/4"	4"	1-1/2"	.060"	5	171.07	163.64	156.20
21832	.7874	20.000	20.0	100	38	0.50	5	241.86	231.34	220.83	210.31
21922	1.000	1"	25.400	1"	4"	1-1/2"	.015"	5	292.38	279.66	266.95
21932	1.000	1"	25.400	1"	4"	1-1/2"	.030"	5	292.38	279.66	266.95
21942	1.000	1"	25.400	1"	4"	1-1/2"	.060"	5	292.38	279.66	266.95

Series 545BA

HIGH ROCKWELL END MILLS



TOLERANCES

d_1	$+0.000^{\circ} - .002^{\circ} (+.000 - .050\text{mm})$
d_2	$h6$
ball radius	$+0.000^{\circ} - .001^{\circ} (+.000 - .025\text{mm})$

TECH
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Recommended for inconel, tool steels, hardened die mold >40Rc

Ball End

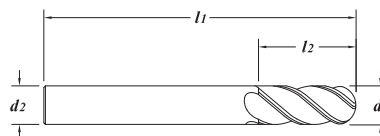
BALINIT® Durana Coating

Solid submicron grain carbide end mill - center cutting

High performance tool for use in high Rockwell and difficult to machine materials

Square End - page 194

Corner Radius - page 195



EDP#	$d_1^{\dagger}$		d_2	l_1	l_2	Number of Flutes	1-11	12-24	25-49	50-100
	Decimal	Diameter	Metric	Shank Diameter	Overall Length	Flute Length				
21204	.1181		3.000	3.0	38	12	4	17.07	16.32	15.58
21234	.1250	1/8"	3.175	1/8"	1-1/2"	1/2"	4	16.22	15.51	14.81
21264	.1575		4.000	6.0	50	12	4	27.52	26.32	25.13
21294	.1875	3/16"	4.763	3/16"	2"	9/16"	4	20.38	19.49	18.61
21324	.1969		5.000	6.0	65	15	4	30.02	28.71	27.41
21354	.2362		6.000	6.0	65	19	4	29.07	27.81	26.54
21384	.2500	1/4"	6.353	1/4"	2-1/2"	3/4"	4	28.01	26.80	25.58
21414	.2756		7.000	8.0	65	22	5	43.93	42.02	40.11
21444	.3125	5/16"	7.938	5/16"	2-1/2"	13/16"	5	37.93	36.28	34.63
21474	.3150		8.000	8.0	65	22	5	39.93	38.19	36.46
21504	.3543		9.000	10.0	65	22	5	59.00	56.43	53.87
21534	.3750	3/8"	9.525	3/8"	2-1/2"	7/8"	5	44.14	42.22	40.30
21564	.3937		10.000	10.0	70	22	5	53.31	51.00	48.68
21624	.4724		12.000	12.0	75	32	5	78.76	75.34	71.91
21664	.5000	1/2"	12.700	1/2"	3"	1-1/4"	5	74.82	71.57	68.31
21714	.6250	5/8"	15.875	5/8"	3-1/2"	1-1/4"	5	119.00	113.83	108.65
21744	.6299		16.000	16.0	88	32	5	125.27	119.82	114.38
21774	.7087		18.000	18.0	100	38	5	178.78	171.01	163.23
21804	.7500	3/4"	19.050	3/4"	4"	1-1/2"	5	171.07	163.64	156.20
21924	1.000	1"	25.400	1"	4"	1-1/2"	5	292.38	279.66	266.95

TOLERANCES	
d_1	$+0.000" -0.002" (+.000mm -.050mm)$
d_2	$h6$
r	$+0.001" -.001" (+.025 -.025mm)$

HIGH FEED END MILLS

Series H-45



Recommended for die mold applications

Corner Radius

BALINIT® Durana Coating

Solid submicron grain carbide end mill - center cutting

For light axial / radial depths of cut

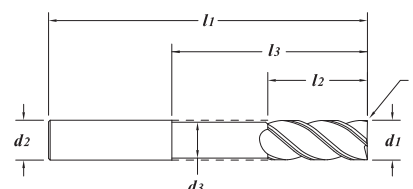
Rigid work holding, machine stability and part integrity are critical!

Recommended for high Rockwell materials

Modified reach lengths available within 48 hours

* - tool has 3° per side blend angle to shank

* - tool has reduced diameter shank



EDP#	d_1 † Diameter		d_2 Shank Diameter	l_1 Overall Length	l_2 Flute Length	r Corner Radius	l_3 Reach Length	d_3 Neck Diameter	1-11	12-24	25-49	50-100
	Decimal	Metric										
48300	.1181	3.000	6.0	65	3	0.75	15.0	2.80	38.63	36.95	35.27	33.59
48305	.1250	3.175	1/8"	3"	1/8"	.015"	-	-	29.19	27.92	26.65	25.38
48310	.1250	3.175	1/8"	3"	1/8"	.030"	-	-	29.19	27.92	26.65	25.38
48315	.1250	3.175	3/16"	2-1/2"	1/8"	.010"	3/4"	.115"	34.29	32.80	31.31	29.82
48320	.1250	3.175	3/16"	2-1/2"	1/8"	.015"	3/4"	.115"	34.29	32.80	31.31	29.82
48325	.1250	3.175	3/16"	2-1/2"	1/8"	.020"	3/4"	.115"	34.29	32.80	31.31	29.82
* 48330	.1250	3.175	3/16"	3"	1/8"	.030"	*	-	31.29	29.93	28.57	27.21
48335	.1575	4.000	6.0	65	4	1.00	20.0	3.70	37.09	35.48	33.86	32.25
48340	.1875	4.763	3/16"	3"	3/16"	.015"	-	-	33.66	32.20	30.73	29.27
48345	.1875	4.763	3/16"	3"	3/16"	.030"	-	-	33.66	32.20	30.73	29.27
48350	.1875	4.763	3/16"	3"	3/16"	.060"	-	-	33.66	32.20	30.73	29.27
48355	.1875	4.763	1/4"	2-1/2"	3/16"	.020"	7/8"	.175"	36.02	34.45	32.89	31.32
48360	.1875	4.763	1/4"	2-1/2"	3/16"	.030"	7/8"	.175"	36.02	34.45	32.89	31.32
48365	.1875	4.763	1/4"	2-1/2"	3/16"	.060"	7/8"	.175"	36.02	34.45	32.89	31.32
48370	.1875	4.763	1/4"	4"	3/16"	.020"	1-1/2"	.175"	52.07	49.81	47.54	45.28
48375	.1875	4.763	1/4"	4"	3/16"	.030"	1-1/2"	.175"	52.07	49.81	47.54	45.28
* 48380	.1875	4.763	1/4"	4"	3/16"	.030"	*	-	52.07	49.81	47.54	45.28
* 48385	.1969	5.000	6.0	100	5	1.20	* 10.0	4.90	53.98	51.63	49.29	46.94
48390	.2362	6.000	6.0	100	6	1.50	30.0	5.70	51.20	48.97	46.75	44.52
48395	.2500	6.350	1/4"	3"	1/4"	.015"	-	-	38.89	37.20	35.51	33.82
48400	.2500	6.350	1/4"	3"	1/4"	.030"	-	-	38.89	37.20	35.51	33.82
48405	.2500	6.350	1/4"	3"	1/4"	.060"	-	-	38.89	37.20	35.51	33.82
* 48410	.2756	7.000	6.0	100	7	1.50	*	-	81.01	77.48	73.96	70.44
48415	.3125	7.938	5/16"	2-1/2"	5/16"	.020"	-	-	35.93	34.36	32.80	31.24
48420	.3125	7.938	5/16"	3"	5/16"	.078"	1-5/8"	.300"	57.34	54.85	52.35	49.86
48425	.3125	7.938	5/16"	3"	5/16"	.094"	1-5/8"	.300"	57.34	54.85	52.35	49.86
48430	.3150	8.000	8.0	75	8	2.00	-	-	51.62	49.38	47.13	44.89
48435	.3150	8.000	8.0	100	8	2.00	40.0	7.70	66.95	64.04	61.13	58.22
48440	.3750	9.525	3/8"	3"	3/8"	.015"	-	-	54.53	52.16	49.79	47.42
48445	.3750	9.525	3/8"	3"	3/8"	.030"	-	-	54.53	52.16	49.79	47.42
48450	.3750	9.525	3/8"	3"	3/8"	.060"	-	-	54.53	52.16	49.79	47.42
48455	.3750	9.525	3/8"	3"	3/8"	.094"	2.00"	.365"	62.32	59.61	56.90	54.19
48460	.3750	9.525	3/8"	4"	3/8"	.030"	2-1/2"	.365"	69.37	66.35	63.34	60.32
48465	.3750	9.525	3/8"	4"	3/8"	.094"	2-1/2"	.365"	69.37	66.35	63.34	60.32
48470	.3937	10.000	10.0	100	10	2.00	50.0	9.70	85.64	81.92	78.19	74.47
48475	.4724	12.000	12.0	100	12	3.00	60.0	11.70	95.12	90.98	86.85	82.71
48480	.5000	12.700	1/2"	3"	1/2"	.015"	-	-	70.89	67.80	64.72	61.64
48485	.5000	12.700	1/2"	3"	1/2"	.030"	-	-	70.89	67.80	64.72	61.64
48490	.5000	12.700	1/2"	3"	1/2"	.060"	-	-	70.89	67.80	64.72	61.64
48495	.5000	12.700	1/2"	3"	1/2"	.125"	-	-	70.89	67.80	64.72	61.64
48500	.5000	12.700	1/2"	4"	1/2"	.125"	-	-	83.97	80.32	76.67	73.02

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MATERIAL HARDNESS (Rc)

HIGH PERFORMANCE
END MILLS



TOLERANCES

d_1	+0.000" - .001" (+.000 - .025mm)
d_2	h6
ball radius	+0.0000" - .0005" (+.0000 - .0127mm)

Recommended for die mold applications

Die Mold Cutter - Ball End

BALINIT® Durana Coating

Solid submicron grain carbide end mill - center cutting

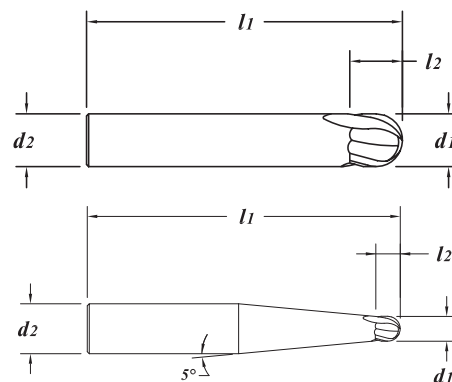
High performance machining in the die mold industry

Rigid work holding, machine stability and part integrity are critical!

≤5mm (.1969") diameter have 5° per side taper to shank

Recommended for high Rockwell materials

Can be modified with a neck in 48 hours



EDP#	d_1 † Diameter		d_2 Shank Diameter	l_1 Overall Length	l_2 Flute Length	1-11	12-24	25-49	50-100
	Decimal	Metric							
14210	.0312	1/32"	0.792	1/4"	3"	1/32"	60.36	57.74	52.49
15210	.0394		1.000	6.0	75	1	60.36	57.74	52.49
15220	.0591		1.500	6.0	75	1.5	60.36	57.74	52.49
14220	.0625	1/16"	1.588	1/4"	3"	1/16"	60.36	57.74	52.49
15230	.0787		2.000	6.0	75	2	60.36	57.74	52.49
14230	.0938	3/32"	2.383	1/4"	3"	3/32"	60.36	57.74	52.49
15240	.1181		3.000	6.0	75	3	58.98	56.42	53.85
14240	.1250	1/8"	3.175	1/4"	3"	1/8"	58.98	56.42	53.85
15250	.1575		4.000	6.0	75	4	58.12	55.59	53.07
14250	.1875	3/16"	4.763	1/4"	3"	3/16"	58.12	55.59	53.07
15260	.1969		5.000	6.0	75	5	58.12	55.59	53.07
15270	.2362		6.000	6.0	75	6	56.91	54.44	51.96
14260	.2500	1/4"	6.350	1/4"	3"	1/4"	56.91	54.44	51.96
14270	.3125	5/16"	7.938	5/16"	4"	5/16"	69.70	66.67	63.64
15280	.3150		8.000	8.0	100	8	69.70	66.67	63.64
14280	.3750	3/8"	9.525	3/8"	4"	3/8"	77.12	73.77	70.41
15290	.3937		10.000	10.0	100	10	83.43	79.81	76.18
15300	.4724		12.000	12.0	100	12	101.05	96.66	92.26
14290	.5000	1/2"	12.700	1/2"	4"	1/2"	112.53	107.64	102.74

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MATERIAL HARDNESS (Rc)

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TOLERANCES

$d1$	$+0.000" - .002" (+.000 - .050\text{mm})$
$d2$	$h6$



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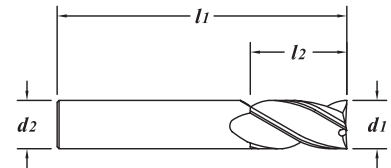
Series 210D

HIGH
PERFORMANCE
END MILLS

Recommended for graphite, fiber-reinforced plastics, carbon fiber

Square End Diamond Coating

Solid grade C-2 carbide end mill - center cutting
Crystalline diamond coating



EDP#	$d1$ †		$d2$	$l1$	$l2$	1-11	12-24	25-49	50-100
	Decimal	Diameter Metric							
10018	.0312	1/32"	0.792	1/8"	1-1/2"	3/32"	73.26	70.07	66.89
46018	.0394		1.000	3.0	38	4	77.11	73.76	70.40
10028	.0469	3/64"	1.191	1/8"	1-1/2"	1/8"	73.26	70.07	66.89
46028	.0591		1.500	3.0	38	6	77.11	73.76	70.40
10038	.0625	1/16"	1.588	1/8"	1-1/2"	1/4"	70.92	67.84	64.75
46038	.0787		2.000	3.0	38	8	74.67	71.42	68.18
10058	.0938	3/32"	2.383	1/8"	1-1/2"	3/8"	69.67	66.64	63.61
46058	.1181		3.000	3.0	38	12	69.30	66.29	63.27
10078	.1250	1/8"	3.175	1/8"	1-1/2"	1/2"	65.81	62.95	60.09
46078	.1575		4.000	4.0	50	14	110.73	105.92	101.10
10118	.1875	3/16"	4.763	3/16"	2"	5/8"	105.20	100.63	96.05
46098	.1969		5.000	5.0	50	16	127.64	122.09	116.54
46108	.2362		6.000	6.0	65	20	130.17	124.51	118.85
10158	.2500	1/4"	6.350	1/4"	2-1/2"	3/4"	123.66	118.28	112.91
10198	.3125	5/16"	7.938	5/16"	2-1/2"	7/8"	147.95	141.52	135.08
46128	.3150		8.000	8.0	65	20	174.64	167.05	159.45
10238	.3750	3/8"	9.525	3/8"	2-1/2"	7/8"	165.78	158.58	151.37
46148	.3937		10.000	10.0	70	25	193.42	185.01	176.60
46168	.4724		12.000	12.0	75	25	212.04	202.82	193.60
10318	.5000	1/2"	12.700	1/2"	3"	1"	201.43	192.68	183.92
13338	.6250	5/8"	15.875	5/8"	3-1/2"	1-1/4"	291.12	278.47	265.81
46188	.6299		16.000	16.0	88	32	354.48	339.06	323.65
13358	.7500	3/4"	19.050	3/4"	4"	1-1/2"	550.79	526.85	502.90
13378	1.000	1"	25.400	1"	4"	1-1/2"	865.35	827.73	790.10

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MATERIAL HARDNESS (Rc)

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Series 210RD



TOLERANCES

d_1	+0.000" - .002" (+0.000 - .050mm)
d_2	h6
r	+0.001" - .001" (+0.025 - .025mm)

Recommended for graphite, fiber-reinforced plastics, carbon fiber

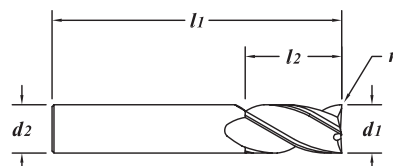
Corner Radius

Diamond Coating

Solid grade C-2 carbide end mill - center cutting

Crystalline diamond coating

For stronger corners and part radius



MATERIAL HARDNESS (Rc)

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EDP#	d_1 † Diameter		d_2 Shank Diameter	l_1 Overall Length	l_2 Flute Length	r Corner Radius	1-11	12-24	25-49	50-100
	Decimal	Metric								
24118	.1181	3.000	3.0	38	12	0.50	96.00	91.83	87.65	83.48
80018	.1250	3.175	1/8"	1-1/2"	1/2"	.015"	91.20	87.23	83.27	79.30
80028	.1250	3.175	1/8"	1-1/2"	1/2"	.020"	91.20	87.23	83.27	79.30
24148	.1575	4.000	4.0	50	14	0.30	138.72	132.69	126.66	120.63
24158	.1575	4.000	4.0	50	14	0.50	138.72	132.69	126.66	120.63
80058	.1875	4.763	3/16"	2"	5/8"	.015"	131.80	126.07	120.34	114.61
80068	.1875	4.763	3/16"	2"	5/8"	.020"	131.80	126.07	120.34	114.61
24178	.2362	6.000	6.0	65	20	0.50	148.03	141.59	135.16	128.72
24208	.2362	6.000	6.0	65	20	1.50	148.03	141.59	135.16	128.72
80108	.2500	6.350	1/4"	2-1/2"	3/4"	.015"	140.63	134.52	128.40	122.29
80118	.2500	6.350	1/4"	2-1/2"	3/4"	.020"	140.63	134.52	128.40	122.29
80128	.2500	6.350	1/4"	2-1/2"	3/4"	.030"	140.63	134.52	128.40	122.29
24248	.3150	8.000	8.0	65	20	1.00	185.64	177.57	169.50	161.43
80248	.3750	9.525	3/8"	2-1/2"	7/8"	.020"	176.88	169.19	161.50	153.81
80258	.3750	9.525	3/8"	2-1/2"	7/8"	.030"	176.88	169.19	161.50	153.81
24318	.3937	10.000	10.0	70	25	1.00	206.21	197.24	188.28	179.31
24378	.4724	12.000	12.0	75	25	0.50	226.75	216.89	207.03	197.17
24398	.4724	12.000	12.0	75	25	1.00	226.75	216.89	207.03	197.17
80328	.5000	12.700	1/2"	3"	1"	.030"	215.41	206.04	196.68	187.31
80348	.5000	12.700	1/2"	3"	1"	.060"	215.41	206.04	196.68	187.31

TOLERANCES

d_1	$+0.000" -0.002" (+0.000 -0.050\text{mm})$
d_2	$h6$
ball radius	$+0.000" -0.001" (+0.000 -0.025\text{mm})$



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Series 310D

HIGH PERFORMANCE
END MILLS

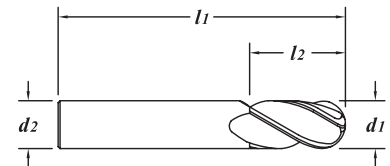
Recommended for graphite, fiber-reinforced plastics, carbon fiber

Ball End

Diamond Coating

Solid grade C-2 carbide end mill - center cutting

Crystalline diamond coating



EDP#	d_1 †		d_2	l_1	l_2	1-11	12-24	25-49	50-100
	Decimal	Diameter Metric							
15018	.0312	1/32"	0.792	1/8"	1-1/2"	3/32"	99.04	94.73	90.43
48018	.0394		1.000	3.0	38	4	104.26	99.73	95.19
15028	.0469	3/64"	1.191	1/8"	1-1/2"	1/8"	99.04	94.73	90.43
48028	.0591		1.500	3.0	38	6	104.26	99.73	95.19
15038	.0625	1/16"	1.588	1/8"	1-1/2"	1/4"	96.72	92.51	88.31
48038	.0787		2.000	3.0	38	8	101.79	97.36	92.94
15058	.0938	3/32"	2.383	1/8"	1-1/2"	3/8"	95.04	90.90	86.77
48058	.1181		3.000	3.0	38	12	96.00	91.83	87.65
15078	.1250	1/8"	3.175	1/8"	1-1/2"	1/2"	91.20	87.23	83.27
48078	.1575		4.000	4.0	50	14	138.72	132.69	126.66
15118	.1875	3/16"	4.763	3/16"	2"	5/8"	131.80	126.07	120.34
48098	.1969		5.000	5.0	50	16	144.96	138.66	132.35
48108	.2362		6.000	6.0	65	20	148.03	141.59	135.16
15158	.2500	1/4"	6.350	1/4"	2-1/2"	3/4"	140.63	134.52	128.40
15198	.3125	5/16"	7.938	5/16"	2-1/2"	7/8"	158.40	151.51	144.63
48128	.3150		8.000	8.0	65	20	185.64	177.57	169.50
15238	.3750	3/8"	9.525	3/8"	2-1/2"	7/8"	176.88	169.19	161.50
48168	.4724		12.000	12.0	75	25	226.75	216.89	207.03
15318	.5000	1/2"	12.700	1/2"	3"	1"	215.41	206.04	196.68

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MATERIAL HARDNESS (Rc)

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TOLERANCES

d_1	$+0.000" - .002" (+.000 - .050\text{mm})$
d_2	$h6$

Recommended for graphite, fiber-reinforced plastics, carbon fiber

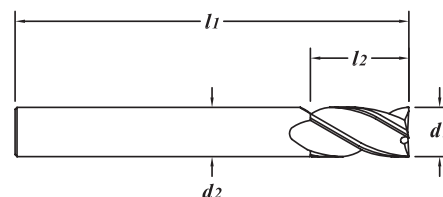
Extra Length - Square End

Diamond Coating

Solid grade C-2 carbide end mill - center cutting

Crystalline diamond coating

Can be modified with a neck in 48 hours



EDP#	d_1 † Diameter		d_2 Shank Diameter	l_1 Overall Length	l_2 Flute Length	1-11	12-24	25-49	50-100
	Decimal	Metric							
94028	.1181	3.000	3.0	75	20	106.18	101.56	96.95	92.33
38038	.1250	1/8"	3.175	1/8"	3"	100.88	96.49	92.11	87.72
94068	.1575	4.000	4.0	75	25	142.07	135.89	129.72	123.54
38048	.1875	3/16"	4.763	3/16"	4"	134.95	129.09	123.22	117.35
38058	.2500	1/4"	6.350	1/4"	3"	144.60	138.31	132.03	125.74
38068	.2500	1/4"	6.350	1/4"	4"	150.17	143.64	137.11	130.58
38078	.2500	1/4"	6.350	1/4"	6"	171.87	164.40	156.92	149.45
38098	.3125	5/16"	7.938	5/16"	4"	176.05	168.40	160.74	153.09
94168	.3150	8.000	8.0	100	25	210.58	201.42	192.27	183.11
38128	.3750	3/8"	9.525	3/8"	4"	196.05	187.53	179.00	170.48
38138	.3750	3/8"	9.525	3/8"	6"	216.67	207.25	197.83	188.41
94208	.3937	10.000	10.0	100	25	235.09	224.87	214.65	204.43
94248	.4724	12.000	12.0	100	25	259.60	248.31	237.03	225.74
38168	.5000	1/2"	12.700	1/2"	4"	246.64	235.92	225.19	214.47
38178	.5000	1/2"	12.700	1/2"	4"	246.64	235.92	225.19	214.47

MATERIAL HARDNESS (Rc)

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TOLERANCES

d_1	$+0.000" - .002" (+.000 - .050\text{mm})$
d_2	$h6$
ball radius	$+0.000" - .001" (+.000 - .025\text{mm})$



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Series 710D

HIGH PERFORMANCE
END MILLS

Recommended for graphite, fiber-reinforced plastics, carbon fiber

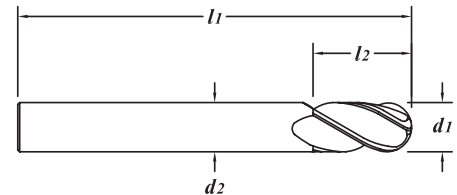
Extra Length - Ball End

Diamond Coating

Solid grade C-2 carbide end mill - center cutting

Crystalline diamond coating

Can be modified with a neck in 48 hours



EDP#	d_1 †		d_2	l_1	l_2	1-11	12-24	25-49	50-100
	Decimal	Diameter Metric							
99028	.1181	3.000	3.0	75	20	129.69	124.05	118.41	112.77
40038	.1250	1/8"	3.175	1/8"	3"	123.21	117.85	112.50	107.14
99068	.1575	4.000	4.0	75	25	161.36	154.34	147.33	140.31
40048	.1875	3/16"	4.763	3/16"	4"	153.28	146.62	139.95	133.29
99108	.2362	6.000	6.0	100	25	177.34	169.63	161.92	154.21
99128	.2362	6.000	6.0	150	38	196.91	188.35	179.79	171.23
40058	.2500	1/4"	6.350	1/4"	3"	162.92	155.84	148.75	141.67
40068	.2500	1/4"	6.350	1/4"	4"	168.50	161.17	153.85	146.52
40078	.2500	1/4"	6.350	1/4"	6"	187.07	178.94	170.80	162.67
40098	.3125	5/16"	7.938	5/16"	4"	194.37	185.92	177.47	169.02
99168	.3150	8.000	8.0	100	25	226.55	216.70	206.85	197.00
40128	.3750	3/8"	9.525	3/8"	4"	214.38	205.06	195.74	186.42
40138	.3750	3/8"	9.525	3/8"	6"	226.83	216.96	207.10	197.24
99208	.3937	10.000	10.0	100	25	251.08	240.16	229.25	218.33
40168	.5000	1/2"	12.700	1/2"	4"	261.84	250.46	239.07	227.69
40178	.5000	1/2"	12.700	1/2"	2"	261.84	250.46	239.07	227.69

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MATERIAL HARDNESS (Rc)

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