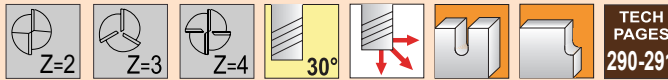


Series 320MA, 323MA, 330MA, 920MA, 923MA, 930MA

.0312" - .3150"
(0.792mm - 8.000mm)



TOLERANCES	
d_1	+0.00" - .002" (+.000 - .050mm)
d_2	h6
ball radius	+0.00" - .001" (+.000 - .025mm)

TECH
PAGES
290-291

Standard Length - Ball End

TiAlN Coating

Solid submicron grain carbide end mill - center cutting

Dry or semi-dry machining

Extremely versatile

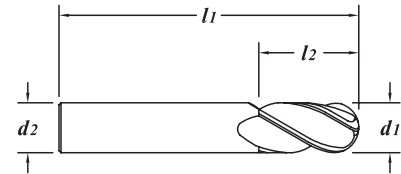
Bright Finish - page 240

TiN Coating - page 242

TiCN Coating - page 243

Stub Length - page 227

Extended length - page 262



(320MA/920MA) 2 Flute EDP#	(323MA/923MA) 3 Flute EDP#	(330MA/930MA) 4 Flute EDP#	d_1 †		d_2 Shank Diameter	l_1 Overall Length	l_2 Flute Length	LIST PRICE	
			Decimal	Metric					
16017	17017	18017	.0312	1/32"	0.792	1/8"	1-1/2"	3/32"	15.99
47017	38017	48017	.0394		1.000	3.0	38	4	16.68
16027	17027	18027	.0469	3/64"	1.191	1/8"	1-1/2"	1/8"	15.99
47027	38027	48027	.0591		1.500	3.0	38	6	16.68
16037	17037	18037	.0625	1/16"	1.588	1/8"	1-1/2"	1/4"	15.25
16047	17047	18047	.0781	5/64"	1.984	1/8"	1-1/2"	1/4"	15.25
47037	38037	48037	.0787		2.000	3.0	38	8	15.88
16057	17057	18057	.0938	3/32"	2.383	1/8"	1-1/2"	3/8"	14.69
47047	38047	48047	.0984		2.500	3.0	38	12	15.30
16067	17067	18067	.1094	7/64"	2.779	1/8"	1-1/2"	3/8"	14.69
47057	38057	48057	.1181		3.000	3.0	38	12	14.13
16077	17077	18077	.1250	1/8"	3.175	1/8"	1-1/2"	1/2"	13.57
47067	38067	48067	.1378		3.500	4.0	50	12	19.54
16087	17087	18087	.1406	9/64"	3.571	3/16"	2"	9/16"	18.74
16097	17097	18097	.1562	5/32"	3.967	3/16"	2"	9/16"	18.74
47077	38077	48077	.1575		4.000	4.0	50	14	17.80
16107	17107	18107	.1719	11/64"	4.366	3/16"	2"	9/16"	18.74
47087	38087	48087	.1772		4.500	5.0	50	14	23.17
16117	17117	18117	.1875	3/16"	4.763	3/16"	2"	5/8"	17.07
97077	98077	99077	.1969		5.000	5.0	50	16	21.61
47097	38097	48097	.1969		5.000	5.0	65	16	23.75
16127	17127	18127	.2031	13/64"	5.159	1/4"	2-1/2"	5/8"	24.08
16137	17137	18137	.2188	7/32"	5.558	1/4"	2-1/2"	5/8"	24.08
16147	17147	18147	.2344	15/64"	5.954	1/4"	2-1/2"	3/4"	24.08
47107	38107	48107	.2362		6.000	6.0	65	19	24.21
16157	17157	18157	.2500	1/4"	6.350	1/4"	2-1/2"	3/4"	23.28
16167	17167	18167	.2656	17/64"	6.746	5/16"	2-1/2"	7/8"	36.11
47117	38117	48117	.2756		7.000	7.0	65	22	32.19
16177	17177	18177	.2812	9/32"	7.142	5/16"	2-1/2"	7/8"	36.11
16187	17187	18187	.2969	19/64"	7.541	5/16"	2-1/2"	7/8"	36.11
16197	17197	18197	.3125	5/16"	7.938	5/16"	2-1/2"	7/8"	31.56
47127	38127	48127	.3150		8.000	8.0	65	22	32.74

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MATERIAL HARDNESS (Rc)

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Series 320MA, 323MA, 330MA, 920MA, 923MA, 930MA (continued)

.3281" - 1.000"
(8.334mm - 25.400mm)

GENERAL PURPOSE
END MILLS

(320MA/920MA) 2 Flute EDP#	(323MA/923MA) 3 Flute EDP#	(330MA/930MA) 4 Flute EDP#	d_1 † Diameter		d_2 Shank Diameter	l_1 Overall Length	l_2 Flute Length	LIST PRICE	
			Decimal	Metric					
16207	17207	18207	.3281	21/64"	8.334	3/8"	2-1/2"	7/8"	41.68
16217	17217	18217	.3438	11/32"	8.733	3/8"	2-1/2"	7/8"	41.68
47137	38137	48137	.3543		9.000	9.0	65	22	38.27
16227	17227	18227	.3594	23/64"	9.129	3/8"	2-1/2"	7/8"	41.68
16237	17237	18237	.3750	3/8"	9.525	3/8"	2-1/2"	7/8"	36.85
16247	17247	18247	.3906	25/64"	9.921	7/16"	2-3/4"	7/8"	50.52
47147	38147	48147	.3937		10.000	10.0	70	25	44.49
16257	17257	18257	.4062	13/32"	10.317	7/16"	2-3/4"	7/8"	50.52
16267	-	18267	.4219	27/64"	10.716	7/16"	2-3/4"	7/8"	50.52
47157	38157	48157	.4331		11.000	11.0	75	25	46.36
16277	17277	18277	.4375	7/16"	11.113	7/16"	2-3/4"	1"	44.56
16287	17287	18287	.4531	29/64"	11.509	1/2"	3"	1"	68.54
16297	17297	18297	.4688	15/32"	11.908	1/2"	3"	1"	68.54
47167	38167	48167	.4724		12.000	12.0	75	25	65.52
16307	17307	18307	.4844	31/64"	12.304	1/2"	3"	1"	68.54
16317	17317	18317	.5000	1/2"	12.700	1/2"	3"	1"	62.86
47177	38177	48177	.5512		14.000	14.0	88	32	95.32
16327	17327	18327	.5625	9/16"	14.288	9/16"	3-1/2"	1-1/4"	91.41
16337	17337	18337	.6250	5/8"	15.875	5/8"	3-1/2"	1-1/4"	100.07
47187	38187	48187	.6299		16.000	16.0	88	38	104.42
16347	17347	18347	.6875	11/16"	17.463	3/4"	4"	1-1/2"	160.32
47197	38197	48197	.7087		18.000	18.0	100	38	149.92
16357	17357	18357	.7500	3/4"	19.050	3/4"	4"	1-1/2"	143.51
47207	38207	48207	.7874		20.000	20.0	100	38	203.11
47217	38217	48217	.8661		22.000	22.0	100	38	223.11
-	17367	18367	.8750	7/8"	22.225	7/8"	4"	1-1/2"	228.02
47227	38227	48227	.9843		25.000	25.0	100	38	232.78
16377	17377	18377	1.000	1"	25.400	1"	4"	1-1/2"	245.01

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MATERIAL HARDNESS (Rc)