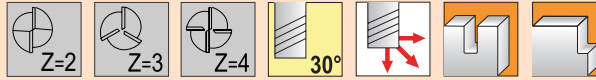


Series 220R, 223R, 230R, 820R, 823R, 830R

.0625" - .3125"
(1.588mm - 7.938mm)



TECH
PAGES
282-283

TOLERANCES	
d1	+0.000" - .002" (+.000 - .050mm)
d2	h6
r	+0.001" - .001" (+.025 - .025mm)

Standard Length - Corner Radius

Solid submicron grain carbide end mill - center cutting

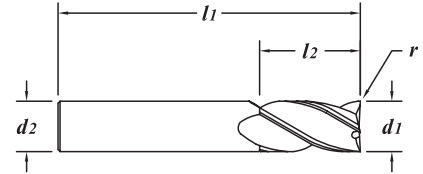
For stronger corners and part radius

Extremely versatile

TiAlN Coating - page 225

Stub Length - page 210

Extended Length - page 241



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MATERIAL HARDNESS (Rc)

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(220R/820R) 2 Flute EDP#	(223R/823R) 3 Flute EDP#	(230R/830R) 4 Flute EDP#	d1 †		d2 Shank Diameter	l1 Overall Length	l2 Flute Length	r Corner Radius	1-11	12-24	25-49	50-100	
			Decimal	Metric									
79580	36100	80580	.0625	1/16"	1.588	1/8"	1-1/2"	1/4"	.010"	13.40	12.82	12.23	11.65
79590	36102	80590	.0625	1/16"	1.588	1/8"	1-1/2"	1/4"	.015"	13.40	12.82	12.23	11.65
79600	36104	80600	.0938	3/32"	2.383	1/8"	1-1/2"	3/8"	.010"	12.81	12.25	11.70	11.14
79610	36106	80610	.0938	3/32"	2.383	1/8"	1-1/2"	3/8"	.015"	12.81	12.25	11.70	11.14
79620	36108	80620	.0938	3/32"	2.383	1/8"	1-1/2"	3/8"	.020"	12.81	12.25	11.70	11.14
36500	36110	24070	.1181		3.000	3.0	38	12	0.20	12.22	11.69	11.16	10.63
36502	36112	24080	.1181		3.000	3.0	38	12	0.50	12.22	11.69	11.16	10.63
79000	36114	80000	.1250	1/8"	3.175	1/8"	1-1/2"	1/2"	.010"	11.63	11.12	10.62	10.11
79010	36116	80010	.1250	1/8"	3.175	1/8"	1-1/2"	1/2"	.015"	11.63	11.12	10.62	10.11
79020	36118	80020	.1250	1/8"	3.175	1/8"	1-1/2"	1/2"	.020"	11.63	11.12	10.62	10.11
79030	36120	80030	.1250	1/8"	3.175	1/8"	1-1/2"	1/2"	.030"	11.63	11.12	10.62	10.11
-	-	80035	.1250	1/8"	3.175	1/8"	1-1/2"	1/2"	.040"	11.63	11.12	10.62	10.11
36504	36122	24090	.1575		4.000	4.0	50	14	0.30	16.09	15.39	14.69	13.99
36506	36124	24100	.1575		4.000	4.0	50	14	0.50	16.09	15.39	14.69	13.99
79040	36126	80040	.1875	3/16"	4.763	3/16"	2"	5/8"	.010"	15.32	14.65	13.99	13.32
79050	36128	80050	.1875	3/16"	4.763	3/16"	2"	5/8"	.015"	15.32	14.65	13.99	13.32
79060	36130	80060	.1875	3/16"	4.763	3/16"	2"	5/8"	.020"	15.32	14.65	13.99	13.32
79070	36132	80070	.1875	3/16"	4.763	3/16"	2"	5/8"	.030"	15.32	14.65	13.99	13.32
36508	36134	24110	.1969		5.000	5.0	65	16	0.30	19.50	18.66	17.81	16.96
36510	36136	24120	.1969		5.000	5.0	65	16	0.50	19.50	18.66	17.81	16.96
36512	36138	24170	.2362		6.000	6.0	65	19	0.50	20.00	19.13	18.26	17.39
36514	36140	24180	.2362		6.000	6.0	65	19	0.80	20.00	19.13	18.26	17.39
36516	36142	24190	.2362		6.000	6.0	65	19	1.00	20.00	19.13	18.26	17.39
36518	36144	24200	.2362		6.000	6.0	65	19	1.50	20.00	19.13	18.26	17.39
36520	36146	24210	.2362		6.000	6.0	65	19	2.00	20.00	19.13	18.26	17.39
36522	36148	80090	.2500	1/4"	6.350	1/4"	2-1/2"	3/4"	.010"	19.03	18.21	17.38	16.55
79100	36150	80100	.2500	1/4"	6.350	1/4"	2-1/2"	3/4"	.015"	19.03	18.21	17.38	16.55
79110	36152	80110	.2500	1/4"	6.350	1/4"	2-1/2"	3/4"	.020"	19.03	18.21	17.38	16.55
79120	36154	80120	.2500	1/4"	6.350	1/4"	2-1/2"	3/4"	.030"	19.03	18.21	17.38	16.55
79130	36156	80130	.2500	1/4"	6.350	1/4"	2-1/2"	3/4"	.045"	19.03	18.21	17.38	16.55
79140	36158	80140	.2500	1/4"	6.350	1/4"	2-1/2"	3/4"	.060"	19.03	18.21	17.38	16.55
79160	36160	80160	.3125	5/16"	7.938	5/16"	2-1/2"	7/8"	.015"	24.94	23.86	22.77	21.69
79170	36162	80170	.3125	5/16"	7.938	5/16"	2-1/2"	7/8"	.020"	24.94	23.86	22.77	21.69
79180	36164	80180	.3125	5/16"	7.938	5/16"	2-1/2"	7/8"	.030"	24.94	23.86	22.77	21.69
79190	36166	80190	.3125	5/16"	7.938	5/16"	2-1/2"	7/8"	.045"	24.94	23.86	22.77	21.69
79200	36168	80200	.3125	5/16"	7.938	5/16"	2-1/2"	7/8"	.060"	24.94	23.86	22.77	21.69

Series 220R, 223R, 230R, 820R, 823R, 830R (continued)

.3150" - .6250"
(8.000mm - 15.875mm)

GENERAL PURPOSE
END MILLS

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MATERIAL HARDNESS (Rc)

(220R/820R) 2 Flute EDP#	(223R/823R) 3 Flute EDP#	(230R/830R) 4 Flute EDP#	$d1$ † Diameter		$d2$ Shank Diameter	$l1$ Overall Length	$l2$ Flute Length	r Corner Radius	1-11	12-24	25-49	50-100	
			Decimal	Metric									
36524	36170	24220	.3150	8.000	8.0	65	22	0.50	26.25	25.11	23.97	22.83	
36526	36172	24230	.3150	8.000	8.0	65	22	0.80	26.25	25.11	23.97	22.83	
36528	36174	24240	.3150	8.000	8.0	65	22	1.00	26.25	25.11	23.97	22.83	
36530	36176	24250	.3150	8.000	8.0	65	22	1.50	26.25	25.11	23.97	22.83	
36532	36178	24260	.3150	8.000	8.0	65	22	2.00	26.25	25.11	23.97	22.83	
36534	36180	24270	.3150	8.000	8.0	65	22	2.50	26.25	25.11	23.97	22.83	
36536	36182	24280	.3150	8.000	8.0	65	22	3.00	26.25	25.11	23.97	22.83	
36538	36184	80220	.3750	3/8"	9.525	3/8"	2-1/2"	7/8"	.010"	30.53	29.21	27.88	26.55
79230	36186	80230	.3750	3/8"	9.525	3/8"	2-1/2"	7/8"	.015"	30.53	29.21	27.88	26.55
79240	36188	80240	.3750	3/8"	9.525	3/8"	2-1/2"	7/8"	.020"	30.53	29.21	27.88	26.55
79250	36190	80250	.3750	3/8"	9.525	3/8"	2-1/2"	7/8"	.030"	30.53	29.21	27.88	26.55
79260	36192	80260	.3750	3/8"	9.525	3/8"	2-1/2"	7/8"	.045"	30.53	29.21	27.88	26.55
79270	36194	80270	.3750	3/8"	9.525	3/8"	2-1/2"	7/8"	.060"	30.53	29.21	27.88	26.55
36540	36196	24290	.3937	10.000	10.0	70	25	0.50	37.48	35.85	34.22	32.59	
36542	36198	24300	.3937	10.000	10.0	70	25	0.80	37.48	35.85	34.22	32.59	
36544	36200	24310	.3937	10.000	10.0	70	25	1.00	37.48	35.85	34.22	32.59	
36546	36202	24320	.3937	10.000	10.0	70	25	1.50	37.48	35.85	34.22	32.59	
36548	36204	24330	.3937	10.000	10.0	70	25	2.00	37.48	35.85	34.22	32.59	
36550	36206	24340	.3937	10.000	10.0	70	25	2.50	37.48	35.85	34.22	32.59	
36552	36208	24350	.3937	10.000	10.0	70	25	3.00	37.48	35.85	34.22	32.59	
36554	36210	24360	.3937	10.000	10.0	70	25	3.20	37.48	35.85	34.22	32.59	
36556	36212	80700	.4375	7/16"	11.113	7/16"	2-3/4"	1"	.010"	37.58	35.95	34.31	32.68
36558	36214	80705	.4375	7/16"	11.113	7/16"	2-3/4"	1"	.015"	37.58	35.95	34.31	32.68
36560	36216	80710	.4375	7/16"	11.113	7/16"	2-3/4"	1"	.020"	37.58	35.95	34.31	32.68
36562	36218	80715	.4375	7/16"	11.113	7/16"	2-3/4"	1"	.030"	37.58	35.95	34.31	32.68
36564	36220	80720	.4375	7/16"	11.113	7/16"	2-3/4"	1"	.045"	37.58	35.95	34.31	32.68
36566	36222	80725	.4375	7/16"	11.113	7/16"	2-3/4"	1"	.060"	37.58	35.95	34.31	32.68
36568	36224	80730	.4375	7/16"	11.113	7/16"	2-3/4"	1"	.090"	37.58	35.95	34.31	32.68
36570	36226	80735	.4375	7/16"	11.113	7/16"	2-3/4"	1"	.125"	37.58	35.95	34.31	32.68
36572	36228	24370	.4724	12.000	12.0	75	25	0.50	59.70	57.10	54.51	51.91	
36574	36230	24380	.4724	12.000	12.0	75	25	0.80	59.70	57.10	54.51	51.91	
36576	36232	24390	.4724	12.000	12.0	75	25	1.00	59.70	57.10	54.51	51.91	
36578	36234	24400	.4724	12.000	12.0	75	25	1.50	59.70	57.10	54.51	51.91	
36580	36236	24410	.4724	12.000	12.0	75	25	2.00	59.70	57.10	54.51	51.91	
36582	36238	24420	.4724	12.000	12.0	75	25	2.50	59.70	57.10	54.51	51.91	
36584	36240	24430	.4724	12.000	12.0	75	25	3.00	59.70	57.10	54.51	51.91	
36586	36242	24440	.4724	12.000	12.0	75	25	3.20	59.70	57.10	54.51	51.91	
36588	36244	80290	.5000	1/2"	12.700	1/2"	3"	1"	.010"	56.83	54.36	51.89	49.42
79300	36246	80300	.5000	1/2"	12.700	1/2"	3"	1"	.015"	56.83	54.36	51.89	49.42
79310	36248	80310	.5000	1/2"	12.700	1/2"	3"	1"	.020"	56.83	54.36	51.89	49.42
79320	36250	80320	.5000	1/2"	12.700	1/2"	3"	1"	.030"	56.83	54.36	51.89	49.42
79330	36252	80330	.5000	1/2"	12.700	1/2"	3"	1"	.045"	56.83	54.36	51.89	49.42
79340	36254	80340	.5000	1/2"	12.700	1/2"	3"	1"	.060"	56.83	54.36	51.89	49.42
79350	36256	80350	.5000	1/2"	12.700	1/2"	3"	1"	.090"	56.83	54.36	51.89	49.42
79360	36258	80360	.5000	1/2"	12.700	1/2"	3"	1"	.125"	56.83	54.36	51.89	49.42
79370	36260	80370	.6250	5/8"	15.875	5/8"	3-1/2"	1-1/4"	.015"	91.92	87.92	83.93	79.93
79380	36262	80380	.6250	5/8"	15.875	5/8"	3-1/2"	1-1/4"	.020"	91.92	87.92	83.93	79.93
79390	36264	80390	.6250	5/8"	15.875	5/8"	3-1/2"	1-1/4"	.030"	91.92	87.92	83.93	79.93
79400	36266	80400	.6250	5/8"	15.875	5/8"	3-1/2"	1-1/4"	.045"	91.92	87.92	83.93	79.93
79410	36268	80410	.6250	5/8"	15.875	5/8"	3-1/2"	1-1/4"	.060"	91.92	87.92	83.93	79.93
79420	36270	80420	.6250	5/8"	15.875	5/8"	3-1/2"	1-1/4"	.090"	91.92	87.92	83.93	79.93

continued →

Series 220R, 223R, 230R, 820R, 823R, 830R (continued)

.6299" - 1.000"
(16.000mm - 25.400mm)

(220R/820R) 2 Flute EDP#	(223R/823R) 3 Flute EDP#	(230R/830R) 4 Flute 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									
36590	36272	24450	.6299	16.000	16.0	88	38	0.50	96.50	92.30	88.11	83.91	
36592	36274	24460	.6299	16.000	16.0	88	38	1.00	96.50	92.30	88.11	83.91	
36594	36276	24470	.6299	16.000	16.0	88	38	2.00	96.50	92.30	88.11	83.91	
36596	36278	24480	.6299	16.000	16.0	88	38	2.50	96.50	92.30	88.11	83.91	
36598	36280	24490	.6299	16.000	16.0	88	38	3.00	96.50	92.30	88.11	83.91	
36600	36282	24500	.6299	16.000	16.0	88	38	4.00	96.50	92.30	88.11	83.91	
36602	36284	24510	.6299	16.000	16.0	88	38	5.00	96.50	92.30	88.11	83.91	
79440	36286	80440	.7500	3/4"	19.050	3/4"	4"	1-1/2"	.015"	135.27	129.39	123.51	117.63
79450	36288	80450	.7500	3/4"	19.050	3/4"	4"	1-1/2"	.020"	135.27	129.39	123.51	117.63
79460	36290	80460	.7500	3/4"	19.050	3/4"	4"	1-1/2"	.030"	135.27	129.39	123.51	117.63
79470	36292	80470	.7500	3/4"	19.050	3/4"	4"	1-1/2"	.045"	135.27	129.39	123.51	117.63
79480	36294	80480	.7500	3/4"	19.050	3/4"	4"	1-1/2"	.060"	135.27	129.39	123.51	117.63
79490	36296	80490	.7500	3/4"	19.050	3/4"	4"	1-1/2"	.090"	135.27	129.39	123.51	117.63
79500	36298	80500	.7500	3/4"	19.050	3/4"	4"	1-1/2"	.125"	135.27	129.39	123.51	117.63
79630	36300	80630	.7500	3/4"	19.050	3/4"	4"	1-1/2"	.250"	135.27	129.39	123.51	117.63
36604	36302	24520	.7874	20.000	20.0	100	38	0.50	190.44	182.16	173.88	165.60	
36606	36304	24530	.7874	20.000	20.0	100	38	1.00	190.44	182.16	173.88	165.60	
36608	36306	24540	.7874	20.000	20.0	100	38	2.00	190.44	182.16	173.88	165.60	
36610	36308	24550	.7874	20.000	20.0	100	38	3.00	190.44	182.16	173.88	165.60	
36612	36310	24560	.7874	20.000	20.0	100	38	5.00	190.44	182.16	173.88	165.60	
79510	36312	80510	1.000	1"	25.400	1"	4"	1-1/2"	.015"	234.65	224.44	214.24	204.04
79520	36314	80520	1.000	1"	25.400	1"	4"	1-1/2"	.020"	234.65	224.44	214.24	204.04
79530	36316	80530	1.000	1"	25.400	1"	4"	1-1/2"	.030"	234.65	224.44	214.24	204.04
79540	36318	80540	1.000	1"	25.400	1"	4"	1-1/2"	.045"	234.65	224.44	214.24	204.04
79550	36320	80550	1.000	1"	25.400	1"	4"	1-1/2"	.060"	234.65	224.44	214.24	204.04
79560	36322	80560	1.000	1"	25.400	1"	4"	1-1/2"	.090"	234.65	224.44	214.24	204.04
79570	36324	80570	1.000	1"	25.400	1"	4"	1-1/2"	.125"	234.65	224.44	214.24	204.04
79640	36326	80640	1.000	1"	25.400	1"	4"	1-1/2"	.250"	234.65	224.44	214.24	204.04

