

.1562" - .2500"
(3.967mm - 6.350mm)



TECH
PAGES
288-290

TOLERANCES

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

Recommended for aluminum

Variable Helix End Mill

Bright Finish

Solid submicron grain carbide end mill - center cutting

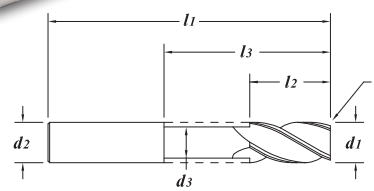
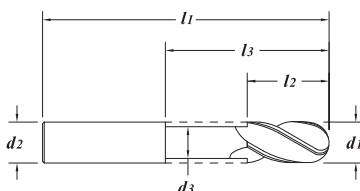
Engineered for High Efficiency Milling of Aluminum

Proprietary geometry with polished flutes breaks up harmonics

Improved end geometry provides superior floor finishes and increased plunge rates

Capable of running up to 40,000 RPM - reduces vibration and balance issues

Chip splitters and necks can be added within 48 hours



EDP#	$d1$ †		$d2$	$l1$	$l2$	r	$l3$	$d3$	1-11	12-24	25-49	50-100
	Decimal	Diameter	Metric	Shank Diameter	Overall Length	Flute Length	Corner Radius	Reach Length	Neck Diameter			
NEW 06996	.1562	5/32"	3.967	3/16"	2"	1/2"	-	-	-	19.24	18.40	17.57
NEW 06997	.1562	5/32"	3.967	3/16"	2"	1/2"	.010"	-	-	21.62	20.68	19.74
NEW 06998	.1562	5/32"	3.967	3/16"	2"	1/2"	.020"	-	-	21.62	20.68	19.74
NEW 06999	.1562	5/32"	3.967	3/16"	2"	1/2"	.030"	-	-	21.62	20.68	19.74
07000	.1575		4.000	6.0	50	12	-	16	3.80	26.47	25.32	24.17
07001	.1575		4.000	6.0	50	12	0.20	16	3.80	30.18	28.86	27.55
07002	.1575		4.000	6.0	50	12	0.50	16	3.80	30.18	28.86	27.55
07003	.1575		4.000	6.0	50	12	1.00	16	3.80	30.18	28.86	27.55
07004	.1875	3/16"	4.763	3/16"	2"	1/2"	-	5/8"	.179"	19.17	18.34	17.50
07005	.1875	3/16"	4.763	3/16"	2"	1/2"	.015"	5/8"	.179"	21.60	20.66	19.72
07006	.1875	3/16"	4.763	3/16"	2"	1/2"	.030"	5/8"	.179"	21.60	20.66	19.72
07007	.1875	3/16"	4.763	3/16"	2"	1/2"	.060"	5/8"	.179"	21.60	20.66	19.72
07008	.1875	3/16"	4.763	3/16"	2"	1/2"	BALL	5/8"	.179"	21.60	20.66	19.72
NEW 07231	.1875	3/16"	4.763	3/16"	2-1/2"	3/4"	-	-	-	22.16	21.20	20.23
07009	.1969		5.000	6.0	65	16	-	26	4.70	26.88	25.71	24.54
07010	.1969		5.000	6.0	65	16	0.20	26	4.70	32.06	30.67	29.27
07011	.1969		5.000	6.0	65	16	0.50	26	4.70	32.06	30.67	29.27
07012	.1969		5.000	6.0	65	16	1.00	26	4.70	32.06	30.67	29.27
07013	.2362		6.000	6.0	65	19	-	26	5.70	25.79	24.67	23.55
07014	.2362		6.000	6.0	65	19	0.20	26	5.70	30.74	29.40	28.07
07015	.2362		6.000	6.0	65	19	0.50	26	5.70	30.74	29.40	28.07
07016	.2362		6.000	6.0	65	19	1.00	26	5.70	30.74	29.40	28.07
07017	.2362		6.000	6.0	65	19	1.50	26	5.70	30.74	29.40	28.07
07018	.2362		6.000	6.0	65	19	2.00	26	5.70	30.74	29.40	28.07
07019	.2362		6.000	6.0	65	19	BALL	26	5.70	30.74	29.40	28.07
NEW 07228	.2500	1/4"	6.350	1/4"	2"	3/8"	-	-	-	18.48	17.68	16.87
NEW 07229	.2500	1/4"	6.350	1/4"	2"	1/2"	-	-	-	18.48	17.68	16.87
07020	.2500	1/4"	6.350	1/4"	2-1/2"	3/4"	-	-	-	19.45	18.60	17.76
07021	.2500	1/4"	6.350	1/4"	2-1/2"	3/4"	.015"	-	-	24.15	23.10	22.05
07022	.2500	1/4"	6.350	1/4"	2-1/2"	3/4"	.030"	-	-	24.15	23.10	22.05
07023	.2500	1/4"	6.350	1/4"	2-1/2"	3/4"	.060"	-	-	24.15	23.10	22.05
07024	.2500	1/4"	6.350	1/4"	2-1/2"	3/4"	.090"	-	-	24.15	23.10	22.05
07025	.2500	1/4"	6.350	1/4"	2-1/2"	3/4"	BALL	-	-	24.15	23.10	22.05
07026	.2500	1/4"	6.350	1/4"	3"	1"	-	-	-	33.28	31.83	30.39
07027	.2500	1/4"	6.350	1/4"	3"	1"	.030"	-	-	39.11	37.41	35.71
07028	.2500	1/4"	6.350	1/4"	3"	1"	.060"	-	-	39.11	37.41	35.71

EDP#	$d1$ † Diameter			$d2$ Shank Diameter	$l1$ Overall Length	$l2$ Flute Length	r Corner Radius	$l3$ Reach Length	$d3$ Neck Diameter	1-11	12-24	25-49	50-100
	Decimal	1/4"	Metric										
07029	.2500	1/4"	6.350	1/4"	3"	3/8"	-	1-1/8"	.235"	38.66	36.98	35.30	33.62
07030	.2500	1/4"	6.350	1/4"	3"	3/8"	.015"	1-1/8"	.235"	44.49	42.56	40.62	38.69
07031	.2500	1/4"	6.350	1/4"	3"	3/8"	.030"	1-1/8"	.235"	44.49	42.56	40.62	38.69
07032	.2500	1/4"	6.350	1/4"	3"	3/8"	.060"	1-1/8"	.235"	44.49	42.56	40.62	38.69
07033	.3150		8.000	8.0	65	19	-	26	7.40	34.49	32.99	31.49	29.99
07034	.3150		8.000	8.0	65	19	0.20	26	7.40	38.99	37.29	35.60	33.90
07035	.3150		8.000	8.0	65	19	0.50	26	7.40	38.99	37.29	35.60	33.90
07036	.3150		8.000	8.0	65	19	1.00	26	7.40	38.99	37.29	35.60	33.90
07037	.3150		8.000	8.0	65	19	1.50	26	7.40	38.99	37.29	35.60	33.90
07084	.4724		12.000	12.0	88	26	3.00	38	11.40	98.46	94.18	89.90	85.62
07085	.4724		12.000	12.0	88	26	4.00	38	11.40	98.46	94.18	89.90	85.62
07086	.4724		12.000	12.0	88	26	BALL	38	11.40	98.46	94.18	89.90	85.62
07041	.3750	3/8"	9.525	3/8"	2-1/2"	1"	-	-	-	33.68	32.22	30.75	29.29
07042	.3750	3/8"	9.525	3/8"	2-1/2"	1"	.010"	-	-	38.32	36.65	34.99	33.32
07043	.3750	3/8"	9.525	3/8"	2-1/2"	1"	.015"	-	-	38.32	36.65	34.99	33.32
07044	.3750	3/8"	9.525	3/8"	2-1/2"	1"	.020"	-	-	38.32	36.65	34.99	33.32
07045	.3750	3/8"	9.525	3/8"	2-1/2"	1"	.030"	-	-	38.32	36.65	34.99	33.32
07046	.3750	3/8"	9.525	3/8"	2-1/2"	1"	.060"	-	-	38.32	36.65	34.99	33.32
07047	.3750	3/8"	9.525	3/8"	2-1/2"	1"	.090"	-	-	38.32	36.65	34.99	33.32
07048	.3750	3/8"	9.525	3/8"	2-1/2"	1"	.120"	-	-	38.32	36.65	34.99	33.32
07049	.3750	3/8"	9.525	3/8"	2-1/2"	1"	BALL	-	-	38.32	36.65	34.99	33.32
07050	.3750	3/8"	9.525	3/8"	3"	1-1/4"	-	-	-	46.39	44.37	42.36	40.34
07051	.3750	3/8"	9.525	3/8"	3"	1-1/4"	.015"	-	-	52.38	50.11	47.83	45.55
07052	.3750	3/8"	9.525	3/8"	3"	1-1/4"	.030"	-	-	52.38	50.11	47.83	45.55
07053	.3750	3/8"	9.525	3/8"	3"	1-1/4"	.060"	-	-	52.38	50.11	47.83	45.55
07054	.3750	3/8"	9.525	3/8"	3"	1-1/4"	.120"	-	-	52.38	50.11	47.83	45.55
07055	.3750	3/8"	9.525	3/8"	3"	1/2"	-	1-1/8"	.355"	51.77	49.52	47.27	45.02
07056	.3750	3/8"	9.525	3/8"	3"	1/2"	.015"	1-1/8"	.355"	57.76	55.25	52.74	50.23
07057	.3750	3/8"	9.525	3/8"	3"	1/2"	.030"	1-1/8"	.355"	57.76	55.25	52.74	50.23
07058	.3750	3/8"	9.525	3/8"	3"	1/2"	.060"	1-1/8"	.355"	57.76	55.25	52.74	50.23
07059	.3750	3/8"	9.525	3/8"	3"	1/2"	.090"	1-1/8"	.355"	57.76	55.25	52.74	50.23
07060	.3750	3/8"	9.525	3/8"	3"	1/2"	.120"	1-1/8"	.355"	57.76	55.25	52.74	50.23
07061	.3750	3/8"	9.525	3/8"	4"	1/2"	-	2-1/8"	.355"	62.47	59.75	57.04	54.32
07062	.3750	3/8"	9.525	3/8"	4"	1/2"	.015"	2-1/8"	.355"	71.20	68.10	65.01	61.91
07063	.3750	3/8"	9.525	3/8"	4"	1/2"	.020"	2-1/8"	.355"	71.20	68.10	65.01	61.91
07064	.3750	3/8"	9.525	3/8"	4"	1/2"	.030"	2-1/8"	.355"	71.20	68.10	65.01	61.91
07065	.3750	3/8"	9.525	3/8"	4"	1/2"	.060"	2-1/8"	.355"	71.20	68.10	65.01	61.91
07066	.3750	3/8"	9.525	3/8"	4"	1/2"	.090"	2-1/8"	.355"	71.20	68.10	65.01	61.91
07067	.3750	3/8"	9.525	3/8"	4"	1/2"	.120"	2-1/8"	.355"	71.20	68.10	65.01	61.91
07068	.3937		10.000	10.0	70	22	-	30	9.40	56.49	54.03	51.58	49.12
07069	.3937		10.000	10.0	70	22	0.20	30	9.40	64.87	62.05	59.23	56.41
07070	.3937		10.000	10.0	70	22	0.50	30	9.40	64.87	62.05	59.23	56.41
07071	.3937		10.000	10.0	70	22	1.00	30	9.40	64.87	62.05	59.23	56.41
07072	.3937		10.000	10.0	70	22	1.50	30	9.40	64.87	62.05	59.23	56.41
07073	.3937		10.000	10.0	70	22	2.00	30	9.40	64.87	62.05	59.23	56.41
07074	.3937		10.000	10.0	70	22	3.00	30	9.40	64.87	62.05	59.23	56.41
07075	.3937		10.000	10.0	70	22	BALL	30	9.40	64.87	62.05	59.23	56.41
07076	.3937		10.000	10.0	100	40	-	-	-	65.50	62.66	59.81	56.96
07077	.3937		10.000	10.0	100	22	-	55	9.40	76.82	73.48	70.14	66.80
07078	.4724		12.000	12.0	88	26	-	38	11.40	83.40	79.77	76.15	72.52
07079	.4724		12.000	12.0	88	26	0.20	38	11.40	98.46	94.18	89.90	85.62
07212	.4724		12.000	12.0	88	26	0.50	38	11.40	98.46	94.18	89.90	85.62
07081	.4724		12.000	12.0	88	26	1.00	38	11.40	98.46	94.18	89.90	85.62
07082	.4724		12.000	12.0	88	26	1.50	38	11.40	98.46	94.18	89.90	85.62

70

MATERIAL HARDNESS (Rc)

35

0

continued →

Series A3 (continued)

.4724" - .6250"
(12.000mm - 15.875mm)

EDP#	$d1$ † Diameter		$d2$ Shank Diameter	$l1$ Overall Length	$l2$ Flute Length	r Corner Radius	$l3$ Reach Length	$d3$ Neck Diameter	1-11	12-24	25-49	50-100
	Decimal	Metric										
07083	.4724	12.000	12.0	88	26	2.00	38	11.40	98.46	94.18	89.90	85.62
07084	.4724	12.000	12.0	88	26	3.00	38	11.40	98.46	94.18	89.90	85.62
07085	.4724	12.000	12.0	88	26	4.00	38	11.40	98.46	94.18	89.90	85.62
07086	.4724	12.000	12.0	88	26	BALL	38	11.40	98.46	94.18	89.90	85.62
07213	.4724	12.000	12.0	88	36	-	-	-	77.34	73.98	70.61	67.25
07088	.4724	12.000	12.0	88	36	0.20	-	-	92.97	88.92	84.88	80.84
07089	.4724	12.000	12.0	88	36	0.50	-	-	92.97	88.92	84.88	80.84
07090	.4724	12.000	12.0	88	36	1.00	-	-	92.97	88.92	84.88	80.84
07091	.4724	12.000	12.0	88	36	1.50	-	-	92.97	88.92	84.88	80.84
07092	.4724	12.000	12.0	88	36	2.00	-	-	92.97	88.92	84.88	80.84
07093	.4724	12.000	12.0	88	36	3.00	-	-	92.97	88.92	84.88	80.84
07094	.4724	12.000	12.0	88	36	4.00	-	-	92.97	88.92	84.88	80.84
07095	.4724	12.000	12.0	88	36	BALL	-	-	92.97	88.92	84.88	80.84
07215	.5000	12.700	1/2"	3"	1"	-	-	-	55.26	52.86	50.45	48.05
07216	.5000	12.700	1/2"	3"	1"	.030"	-	-	72.55	69.40	66.24	63.09
07217	.5000	12.700	1/2"	3"	1"	BALL	-	-	72.55	69.40	66.24	63.09
07096	.5000	12.700	1/2"	3"	1-1/4"	-	-	-	55.26	52.86	50.45	48.05
07097	.5000	12.700	1/2"	3"	1-1/4"	.010"	-	-	72.55	69.40	66.24	63.09
07098	.5000	12.700	1/2"	3"	1-1/4"	.015"	-	-	72.55	69.40	66.24	63.09
07099	.5000	12.700	1/2"	3"	1-1/4"	.020"	-	-	72.55	69.40	66.24	63.09
07100	.5000	12.700	1/2"	3"	1-1/4"	.030"	-	-	72.55	69.40	66.24	63.09
07101	.5000	12.700	1/2"	3"	1-1/4"	.060"	-	-	72.55	69.40	66.24	63.09
07102	.5000	12.700	1/2"	3"	1-1/4"	.090"	-	-	72.55	69.40	66.24	63.09
07103	.5000	12.700	1/2"	3"	1-1/4"	.120"	-	-	72.55	69.40	66.24	63.09
07218	.5000	12.700	1/2"	3"	1-1/4"	.125"	-	-	72.55	69.40	66.24	63.09
07104	.5000	12.700	1/2"	3"	1-1/4"	.190"	-	-	72.55	69.40	66.24	63.09
07105	.5000	12.700	1/2"	3"	1-1/4"	BALL	-	-	72.55	69.40	66.24	63.09
07219	.5000	12.700	1/2"	3"	1/2"	.030"	1-1/2"	.470"	77.94	74.55	71.16	67.77
07220	.5000	12.700	1/2"	3"	1/2"	.090"	1-1/2"	.470"	77.94	74.55	71.16	67.77
NEW 07230	.5000	12.700	1/2"	3-1/2"	1-1/2"	-	-	-	72.55	69.40	66.24	63.09
07221	.5000	12.700	1/2"	4"	1-5/8"	-	-	-	74.88	71.62	68.37	65.11
07222	.5000	12.700	1/2"	4"	1-5/8"	.030"	-	-	84.31	80.64	76.98	73.31
07223	.5000	12.700	1/2"	4"	1-5/8"	BALL	-	-	84.31	80.64	76.98	73.31
07106	.5000	12.700	1/2"	4"	2-1/16"	-	-	-	74.88	71.62	68.37	65.11
07107	.5000	12.700	1/2"	4"	2-1/16"	.015"	-	-	84.31	80.64	76.98	73.31
07108	.5000	12.700	1/2"	4"	2-1/16"	.030"	-	-	84.31	80.64	76.98	73.31
07109	.5000	12.700	1/2"	4"	2-1/16"	.060"	-	-	84.31	80.64	76.98	73.31
07110	.5000	12.700	1/2"	4"	2-1/16"	.120"	-	-	84.31	80.64	76.98	73.31
07224	.5000	12.700	1/2"	4"	1/2"	.090"	2"	.470"	95.60	91.44	87.29	83.13
07225	.5000	12.700	1/2"	4"	1/2"	.190"	2"	.470"	95.60	91.44	87.29	83.13
07111	.5000	12.700	1/2"	4"	5/8"	-	2-1/4"	.475"	86.18	82.43	78.69	74.94
07112	.5000	12.700	1/2"	4"	5/8"	.015"	2-1/4"	.475"	95.60	91.44	87.29	83.13
07113	.5000	12.700	1/2"	4"	5/8"	.030"	2-1/4"	.475"	95.60	91.44	87.29	83.13
07114	.5000	12.700	1/2"	4"	5/8"	.060"	2-1/4"	.475"	95.60	91.44	87.29	83.13
07115	.5000	12.700	1/2"	4"	5/8"	BALL	2-1/4"	.475"	95.60	91.44	87.29	83.13
07116	.6250	15.875	5/8"	4"	1-5/8"	-	-	-	118.96	113.78	108.61	103.44
07214	.6250	15.875	5/8"	4"	1-5/8"	.030"	-	-	130.38	124.71	119.04	113.37
07118	.6250	15.875	5/8"	4"	1-5/8"	.060"	-	-	130.38	124.71	119.04	113.37
07119	.6250	15.875	5/8"	4"	1-5/8"	.090"	-	-	130.38	124.71	119.04	113.37
07120	.6250	15.875	5/8"	4"	1-5/8"	.120"	-	-	130.38	124.71	119.04	113.37
07121	.6250	15.875	5/8"	4"	3/4"	-	2-3/8"	.590"	129.72	124.08	118.44	112.80
07122	.6250	15.875	5/8"	4"	3/4"	.030"	2-3/8"	.590"	141.14	135.00	128.87	122.73
07123	.6250	15.875	5/8"	4"	3/4"	.060"	2-3/8"	.590"	141.14	135.00	128.87	122.73
07124	.6250	15.875	5/8"	4"	3/4"	.120"	2-3/8"	.590"	141.14	135.00	128.87	122.73
07125	.6250	15.875	5/8"	4"	3/4"	.190"	2-3/8"	.590"	141.14	135.00	128.87	122.73

EDP#	$d1$ † Diameter		$d2$ Shank Diameter	$l1$ Overall Length	$l2$ Flute Length	r Corner Radius	$l3$ Reach Length	$d3$ Neck Diameter	1-11	12-24	25-49	50-100
	Decimal	Metric										
07126	.6299	16.000	16.0	100	24	-	50	15.40	131.93	126.19	120.46	114.72
07127	.6299	16.000	16.0	100	24	0.50	50	15.40	144.00	137.74	131.48	125.22
07128	.6299	16.000	16.0	100	24	1.00	50	15.40	144.00	137.74	131.48	125.22
07129	.6299	16.000	16.0	100	24	1.50	50	15.40	144.00	137.74	131.48	125.22
07130	.6299	16.000	16.0	100	24	3.00	50	15.40	144.00	137.74	131.48	125.22
NEW 07131	.6299	16.000	16.0	100	24	6.00	50	15.40	144.00	137.74	131.48	125.22
07132	.6299	16.000	16.0	100	32	-	50	15.40	131.93	126.19	120.46	114.72
07133	.6299	16.000	16.0	100	32	0.50	50	15.40	144.00	137.74	131.48	125.22
07134	.6299	16.000	16.0	100	32	1.00	50	15.40	144.00	137.74	131.48	125.22
07135	.6299	16.000	16.0	100	32	1.50	50	15.40	144.00	137.74	131.48	125.22
07136	.6299	16.000	16.0	100	32	3.00	50	15.40	144.00	137.74	131.48	125.22
07137	.6299	16.000	16.0	100	32	6.00	50	15.40	144.00	137.74	131.48	125.22
07138	.7500	3/4"	19.050	3/4"	4"	1-3/4"	-	-	153.73	147.05	140.36	133.68
07139	.7500	3/4"	19.050	3/4"	4"	1-3/4"	.015"	-	171.15	163.71	156.27	148.83
07140	.7500	3/4"	19.050	3/4"	4"	1-3/4"	.030"	-	171.15	163.71	156.27	148.83
07141	.7500	3/4"	19.050	3/4"	4"	1-3/4"	.060"	-	171.15	163.71	156.27	148.83
07142	.7500	3/4"	19.050	3/4"	4"	1-3/4"	.078"	-	171.15	163.71	156.27	148.83
07143	.7500	3/4"	19.050	3/4"	4"	1-3/4"	.094"	-	171.15	163.71	156.27	148.83
07144	.7500	3/4"	19.050	3/4"	4"	1-3/4"	.120"	-	171.15	163.71	156.27	148.83
07145	.7500	3/4"	19.050	3/4"	4"	1-3/4"	.156"	-	171.15	163.71	156.27	148.83
07146	.7500	3/4"	19.050	3/4"	4"	1-3/4"	.190"	-	171.15	163.71	156.27	148.83
07147	.7500	3/4"	19.050	3/4"	4"	1-3/4"	.250"	-	171.15	163.71	156.27	148.83
07148	.7500	3/4"	19.050	3/4"	4"	1-3/4"	BALL	-	171.15	163.71	156.27	148.83
07149	.7500	3/4"	19.050	3/4"	4"	1"	-	2"	159.11	152.20	145.28	138.36
07150	.7500	3/4"	19.050	3/4"	4"	1"	.030"	2"	176.54	168.86	161.19	153.51
07151	.7500	3/4"	19.050	3/4"	4"	1"	.060"	2"	176.54	168.86	161.19	153.51
07152	.7500	3/4"	19.050	3/4"	4"	1"	.090"	2"	176.54	168.86	161.19	153.51
07153	.7500	3/4"	19.050	3/4"	4"	1"	.120"	2"	176.54	168.86	161.19	153.51
07154	.7500	3/4"	19.050	3/4"	4"	1"	.125"	2"	176.54	168.86	161.19	153.51
07155	.7500	3/4"	19.050	3/4"	4"	1"	.160"	2"	176.54	168.86	161.19	153.51
07156	.7500	3/4"	19.050	3/4"	4"	1"	.190"	2"	176.54	168.86	161.19	153.51
07157	.7500	3/4"	19.050	3/4"	5"	2-1/4"	-	-	204.76	195.86	186.95	178.05
07158	.7500	3/4"	19.050	3/4"	5"	2-1/4"	.030"	-	237.72	227.38	217.05	206.71
07159	.7500	3/4"	19.050	3/4"	5"	2-1/4"	.060"	-	237.72	227.38	217.05	206.71
07160	.7500	3/4"	19.050	3/4"	5"	2-1/4"	.120"	-	237.72	227.38	217.05	206.71
07161	.7500	3/4"	19.050	3/4"	5"	2-1/4"	.125"	-	237.72	227.38	217.05	206.71
07162	.7500	3/4"	19.050	3/4"	5"	2-1/4"	.190"	-	237.72	227.38	217.05	206.71
07163	.7500	3/4"	19.050	3/4"	5"	2-1/4"	.250"	-	237.72	227.38	217.05	206.71
07226	.7500	3/4"	19.050	3/4"	6"	3-1/4"	-	-	208.14	199.09	190.04	180.99
07164	.7500	3/4"	19.050	3/4"	6"	1"	-	3-3/8"	221.43	211.81	202.18	192.55
07165	.7500	3/4"	19.050	3/4"	6"	1"	.030"	3-3/8"	257.04	245.86	234.69	223.51
07166	.7500	3/4"	19.050	3/4"	6"	1"	.060"	3-3/8"	257.04	245.86	234.69	223.51
07167	.7500	3/4"	19.050	3/4"	6"	1"	.090"	3-3/8"	257.04	245.86	234.69	223.51
07168	.7500	3/4"	19.050	3/4"	6"	1"	.125"	3-3/8"	257.04	245.86	234.69	223.51
07169	.7500	3/4"	19.050	3/4"	6"	1"	.250"	3-3/8"	257.04	245.86	234.69	223.51
07170	.7500	3/4"	19.050	3/4"	6"	1"	BALL	3-3/8"	257.04	245.86	234.69	223.51

70

MATERIAL HARDNESS (Rc)

35

0

continued →

Series A3 (continued)

.7874" - 1.000"
(20.000mm - 25.400mm)

EDP#	$d1$ † Diameter		$d2$ Shank Diameter	$l1$ Overall Length	$l2$ Flute Length	r Corner Radius	$l3$ Reach Length	$d3$ Neck Diameter	1-11	12-24	25-49	50-100
	Decimal	Metric										
07171	.7874	20.000	20.0	100	30	-	50	19.4	211.11	201.93	192.75	183.57
07172	.7874	20.000	20.0	100	30	0.50	50	19.4	246.50	235.79	225.07	214.35
07173	.7874	20.000	20.0	100	30	1.00	50	19.4	246.50	235.79	225.07	214.35
07174	.7874	20.000	20.0	100	30	1.50	50	19.4	246.50	235.79	225.07	214.35
07175	.7874	20.000	20.0	100	30	3.00	50	19.4	246.50	235.79	225.07	214.35
07177	.7874	20.000	20.0	100	30	5.00	50	19.4	246.50	235.79	225.07	214.35
07178	.7874	20.000	20.0	100	30	6.00	50	19.4	246.50	235.79	225.07	214.35
07179	.7874	20.000	20.0	100	30	8.00	50	19.4	246.50	235.79	225.07	214.35
07180	.7874	20.000	20.0	150	30	-	100	19.40	264.83	253.32	241.80	230.29
07181	.7874	20.000	20.0	150	30	0.50	100	19.40	328.35	314.07	299.80	285.52
07182	.7874	20.000	20.0	150	30	1.00	100	19.40	328.35	314.07	299.80	285.52
07183	.7874	20.000	20.0	150	30	1.50	100	19.40	328.35	314.07	299.80	285.52
NEW 07184	.7874	20.000	20.0	150	30	3.00	100	19.40	328.35	314.07	299.80	285.52
07185	.7874	20.000	20.0	150	30	4.00	100	19.40	328.35	314.07	299.80	285.52
07186	.7874	20.000	20.0	150	30	5.00	100	19.40	328.35	314.07	299.80	285.52
07187	.7874	20.000	20.0	150	30	6.00	100	19.40	328.35	314.07	299.80	285.52
NEW 07188	.7874	20.000	20.0	150	30	8.00	100	19.40	328.35	314.07	299.80	285.52
NEW 07189	1.000	25.400	1"	4"	1-1/4"	-	2"	.950"	235.57	225.32	215.08	204.84
07190	1.000	25.400	1"	4"	1-1/4"	.060"	2"	.950"	301.55	288.44	275.33	262.22
07191	1.000	25.400	1"	4-1/2"	1-1/4"	-	2-1/2"	.950"	267.19	255.57	243.96	232.34
07192	1.000	25.400	1"	4-1/2"	1-1/4"	.030"	2-1/2"	.950"	340.45	325.64	310.84	296.04
07193	1.000	25.400	1"	4-1/2"	1-1/4"	.060"	2-1/2"	.950"	340.45	325.64	310.84	296.04
07194	1.000	25.400	1"	4-1/2"	1-1/4"	.120"	2-1/2"	.950"	340.45	325.64	310.84	296.04
07196	1.000	25.400	1"	5"	1"	-	2-5/8"	.950"	294.29	281.49	268.70	255.90
07197	1.000	25.400	1"	5"	1"	.030"	2-5/8"	.950"	375.05	358.74	342.44	326.13
07198	1.000	25.400	1"	5"	1"	.060"	2-5/8"	.950"	375.05	358.74	342.44	326.13
07199	1.000	25.400	1"	5"	1"	.125"	2-5/8"	.950"	375.05	358.74	342.44	326.13
07200	1.000	25.400	1"	5"	1"	.250"	2-5/8"	.950"	375.05	358.74	342.44	326.13
07201	1.000	25.400	1"	5"	1"	BALL	2-5/8"	.950"	375.05	358.74	342.44	326.13
07202	1.000	25.400	1"	5"	2-1/4"	-	-	-	283.52	271.19	258.87	246.54
07203	1.000	25.400	1"	5"	2-1/4"	.030"	-	-	364.29	348.45	332.61	316.77
07204	1.000	25.400	1"	5"	2-1/4"	.060"	-	-	364.29	348.45	332.61	316.77
07205	1.000	25.400	1"	5"	2-1/4"	.120"	-	-	364.29	348.45	332.61	316.77
07206	1.000	25.400	1"	5"	2-1/4"	.250"	-	-	364.29	348.45	332.61	316.77
07207	1.000	25.400	1"	6"	3-1/4"	-	-	-	352.59	337.26	321.93	306.60
07208	1.000	25.400	1"	6"	3-1/4"	.030"	-	-	413.16	395.20	377.23	359.27
07209	1.000	25.400	1"	6"	3-1/4"	.060"	-	-	413.16	395.20	377.23	359.27
07210	1.000	25.400	1"	6"	3-1/4"	.120"	-	-	413.16	395.20	377.23	359.27
NEW 07211	1.000	25.400	1"	6"	3-1/4"	.250"	-	-	413.16	395.20	377.23	359.27

MATERIAL HARDNESS (Rc)

70

35

0

TOLERANCES

$d1$	$+0.000^{\circ} - .001^{\circ} (+.000 - .025\text{mm})$
$d2$	$h6$

HIGH EFFICIENCY MILLING

Series 142M



TECH
PAGES
289

Recommended for aluminum

HSAL End Mill - Square End

BALINIT® MAYURA Coating

Solid submicron grain carbide end mill - center cutting

Engineered for High Efficiency Milling

Specific coating engineered to repel aluminum

Engineered to run at 750-2500 SFM (225-750 M/Min.)

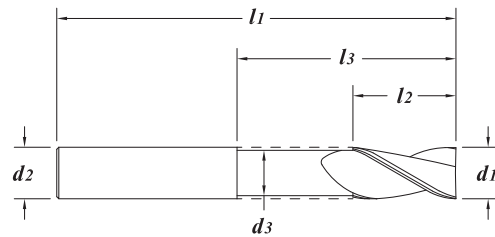
For high speed machining of aluminum

High velocity - high metal removal rate (for spindles 10,000 RPM and above)

Need to use properly balanced holders

Holds perpendicularity

Flats can be added within 48 hours



EDP#	$d1$ † Diameter		$d2$ Shank Diameter	$l1$ Overall Length	$l2$ Flute Length	$l3$ Reach Length	$d3$ Neck Diameter	1-11	12-24	25-49	50-100
	Decimal	Metric									
41222	.1575	4.000	6.0	50	12	-	-	26.97	25.80	24.62	23.45
41232	.1575	4.000	6.0	65	6	20	3.7	33.76	32.30	30.83	29.36
41282	.1875 3/16"	4.763	3/16"	2"	9/16"	-	-	20.33	19.45	18.56	17.68
41342	.1969	5.000	6.0	65	16	-	-	27.83	26.62	25.41	24.20
41352	.1969	5.000	6.0	75	8	20	4.7	47.32	45.27	43.21	41.15
41402	.2362	6.000	6.0	65	19	-	-	26.94	25.77	24.60	23.43
41412	.2362	6.000	6.0	75	10	25	5.7	45.80	43.81	41.82	39.83
41462	.2500 1/4"	6.350	1/4"	2-1/2"	3/4"	-	-	25.60	24.49	23.37	22.26
41542	.2756	7.000	8.0	65	19	-	-	41.32	39.52	37.73	35.93
41602	.3125 5/16"	7.938	5/16"	2-1/2"	3/4"	-	-	35.56	34.01	32.47	30.92
41662	.3150	8.000	8.0	65	19	-	-	37.43	35.81	34.18	32.55
41672	.3150	8.000	8.0	75	12	25	7.4	56.49	54.03	51.58	49.12
41722	.3750 3/8"	9.525	3/8"	2-1/2"	7/8"	-	-	41.77	39.95	38.14	36.32
41802	.3937	10.000	10.0	70	24	-	-	62.85	60.12	57.38	54.65
41812	.3937	10.000	10.0	75	12	30	9.4	69.60	66.57	63.55	60.52
41822	.3937	10.000	10.0	100	12	35	9.4	83.79	80.15	76.50	72.86
41882	.4724	12.000	12.0	75	32	-	-	70.30	67.24	64.19	61.13
41892	.4724	12.000	12.0	75	16	30	11.4	75.67	72.38	69.09	65.80
41902	.4724	12.000	12.0	100	16	35	11.4	103.24	98.75	94.26	89.77
41912	.4724	12.000	12.0	100	16	40	11.4	103.24	98.75	94.26	89.77
41942	.5000 1/2"	12.700	1/2"	3"	1-1/4"	-	-	66.79	63.89	60.98	58.08
42022	.6250 5/8"	15.875	5/8"	4"	1-5/8"	-	-	133.12	127.34	121.55	115.76
42072	.6299	16.000	16.0	75	16	30	15.4	131.86	126.13	120.39	114.66
42082	.6299	16.000	16.0	100	40	-	-	140.12	134.02	127.93	121.84
42092	.6299	16.000	16.0	100	20	40	15.4	145.48	139.15	132.83	126.50
42102	.6299	16.000	16.0	125	20	60	15.4	185.90	177.82	169.73	161.65
42142	.7500 3/4"	19.050	3/4"	4"	1-5/8"	-	-	170.34	162.93	155.53	148.12
42212	.7874	20.000	20.0	100	32	-	-	228.69	218.75	208.80	198.86
42222	.7874	20.000	20.0	100	20	40	19	234.05	223.87	213.70	203.52
42232	.7874	20.000	20.0	125	20	60	19	271.02	259.24	247.45	235.67
42302	1.000 1"	25.400	1"	4"	1-5/8"	-	-	256.00	244.87	233.74	222.61

HIGH PERFORMANCE
END MILLS

MATERIAL HARDNESS (Rc)

70

35

0

Series 142R

.1575" - .4724"
(4.000mm - 12.000mm)

HIGH EFFICIENCY MILLING



TECH
PAGES
289

TOLERANCES

$d1$	$+0.000" - .001" (+0.000 - .025mm)$
$d2$	$h6$
r	$+0.0005" - .0005" (+0.0127 - .0127mm)$

Recommended for aluminum

HSAL End Mill - Corner Radius

BALINIT® MAYURA Coating

Solid submicron grain carbide end mill - center cutting

Engineered for High Efficiency Milling

Specific coating engineered to repel aluminum

Engineered to run at 750-2500 SFM (225-750 M/Min.)

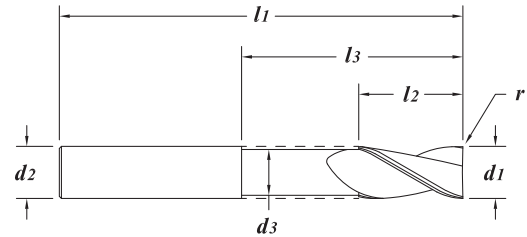
For high speed machining of aluminum

High velocity - high metal removal rate (for spindles 10,000 RPM and above)

Need to use properly balanced holders

Holds perpendicularity

Flats can be added within 48 hours



EDP#	$d1$ † Diameter		$d2$ Shank Diameter	$l1$ Overall Length	$l2$ Flute Length	r Corner Radius	$l3$ Reach Length	$d3$ Neck Diameter	1-11	12-24	25-49	50-100
	Decimal	Metric										
39222	.1575	4.000	6.0	50	12	0.30	-	-	31.57	30.20	28.82	27.45
39232	.1575	4.000	6.0	65	6	0.50	20	3.7	38.59	36.92	35.24	33.56
39242	.1575	4.000	6.0	65	6	1.00	20	3.7	38.59	36.92	35.24	33.56
39282	.1875	3/16"	4.763	3/16"	2"	9/16"	.010"	-	23.40	22.39	21.37	20.35
39342	.1969	5.000	6.0	65	16	0.30	-	-	32.57	31.15	29.74	28.32
39352	.1969	5.000	6.0	75	8	0.50	20	4.7	53.21	50.90	48.58	46.27
39362	.1969	5.000	6.0	75	8	1.00	20	4.7	53.21	50.90	48.58	46.27
39402	.2362	6.000	6.0	65	19	0.30	-	-	31.52	30.15	28.78	27.41
39412	.2362	6.000	6.0	75	10	0.50	25	5.7	51.50	49.26	47.02	44.78
39422	.2362	6.000	6.0	75	10	1.00	25	5.7	51.50	49.26	47.02	44.78
39432	.2362	6.000	6.0	75	10	1.50	25	5.7	51.50	49.26	47.02	44.78
39442	.2362	6.000	6.0	75	10	2.00	25	5.7	51.50	49.26	47.02	44.78
39462	.2500	1/4"	6.350	1/4"	2-1/2"	3/4"	.015"	-	29.95	28.64	27.34	26.04
39602	.3125	5/16"	7.938	5/16"	2-1/2"	3/4"	.015"	-	39.64	37.92	36.19	34.47
39662	.3150	8.000	8.0	65	19	0.50	-	-	41.70	39.89	38.07	36.26
39672	.3150	8.000	8.0	75	12	0.50	25	7.4	63.55	60.79	58.02	55.26
39682	.3150	8.000	8.0	75	12	1.00	25	7.4	63.55	60.79	58.02	55.26
39692	.3150	8.000	8.0	75	12	2.00	25	7.4	63.55	60.79	58.02	55.26
39702	.3150	8.000	8.0	75	12	3.00	25	7.4	63.55	60.79	58.02	55.26
39722	.3750	3/8"	9.525	3/8"	2-1/2"	7/8"	.030"	-	46.18	44.18	42.17	40.16
39802	.3937	10.000	10.0	70	24	0.50	-	-	70.84	67.76	64.68	61.60
39812	.3937	10.000	10.0	100	12	1.00	35	9.4	95.22	91.08	86.94	82.80
39822	.3937	10.000	10.0	100	12	1.50	35	9.4	95.22	91.08	86.94	82.80
39832	.3937	10.000	10.0	100	12	2.00	35	9.4	95.22	91.08	86.94	82.80
39842	.3937	10.000	10.0	100	12	3.00	35	9.4	95.22	91.08	86.94	82.80
39882	.4724	12.000	12.0	75	32	0.50	-	-	87.62	83.81	80.00	76.19
39892	.4724	12.000	12.0	100	16	0.50	40	11.4	112.62	107.72	102.83	97.93
39902	.4724	12.000	12.0	100	16	1.00	40	11.4	112.62	107.72	102.83	97.93
39912	.4724	12.000	12.0	100	16	1.50	40	11.4	112.62	107.72	102.83	97.93
39922	.4724	12.000	12.0	100	16	2.00	40	11.4	112.62	107.72	102.83	97.93
39932	.4724	12.000	12.0	100	16	3.00	40	11.4	112.62	107.72	102.83	97.93

EDP#	$d1$ † Diameter			$d2$ Shank Diameter	$l1$ Overall Length	$l2$ Flute Length	r Corner Radius	$l3$ Reach Length	$d3$ Neck Diameter	1-11	12-24	25-49	50-100
	Decimal		Metric										
39942	.5000	1/2"	12.700	1/2"	3"	1-1/4"	.030"	-	-	83.24	79.62	76.00	72.38
40022	.6250	5/8"	15.875	5/8"	4"	1-5/8"	.030"	-	-	143.99	137.73	131.47	125.21
40082	.6299		16.000	16.0	100	40	1.00	-	-	151.58	144.99	138.40	131.81
40092	.6299		16.000	16.0	125	20	1.00	60	15.4	205.98	197.02	188.07	179.11
40102	.6299		16.000	16.0	125	20	2.00	60	15.4	205.98	197.02	188.07	179.11
40142	.7500	3/4"	19.050	3/4"	4"	1-5/8"	.030"	-	-	186.88	178.75	170.63	162.50
40182	.7874		20.000	20.0	100	40	1.00	-	-	262.32	250.91	239.51	228.10
40192	.7874		20.000	20.0	150	20	1.00	65	19.0	359.21	343.60	327.98	312.36
40202	.7874		20.000	20.0	150	20	2.00	65	19.0	359.21	343.60	327.98	312.36
40212	.7874		20.000	20.0	150	20	3.00	65	19.0	359.21	343.60	327.98	312.36



70

35

0

MATERIAL HARDNESS (Rc)



TOLERANCES

d_1	$+0.000^{\circ} - .001^{\circ}$ (+.000 - .025mm)
d_2	$h6$
ball radius	$+0.0000^{\circ} - .0005^{\circ}$ (+.0000 - .0127mm)



HSAL End Mill - Ball End

BALINIT® MAYURA Coating

Solid submicron grain carbide end mill - center cutting

Engineered for High Efficiency Milling

Specific coating engineered to repel aluminum

Engineered to run at 750-2500 SFM (225-750 M/Min.)

For high speed machining of aluminum

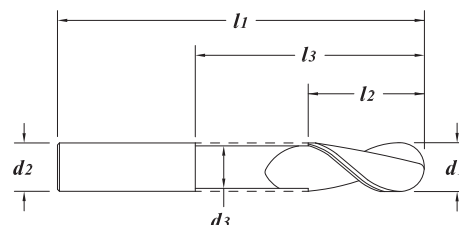
High velocity - high metal removal rate (for spindles 10,000 RPM and above)

Need to use properly balanced holders

Holds perpendicularity

Honed edge on radius for improved finish

Flats can be added within 48 hours



70

35

0

EDP#	d_1 † Diameter		d_2 Shank Diameter	l_1 Overall Length	l_2 Flute Length	l_3 Reach Length	d_3 Neck Diameter	1-11	12-24	25-49	50-100
	Decimal	Metric									
42522	.1575	4.000	6.0	50	12	-	-	31.57	30.20	28.82	27.45
42582	.1875	3/16"	4.763	3/16"	2"	9/16"	-	23.40	22.39	21.37	20.35
42642	.1969	5.000	6.0	65	16	-	-	32.57	31.15	29.74	28.32
42702	.2362	6.000	6.0	65	19	-	-	31.52	30.15	28.78	27.41
42762	.2500	1/4"	6.350	1/4"	2-1/2"	3/4"	-	29.95	28.64	27.34	26.04
42764	.2500	1/4"	6.350	1/4"	4"	3/8"	1-1/8"	.235"	51.89	49.63	47.38
42842	.2756	7.000	8.0	65	19	-	-	45.84	43.85	41.85	39.86
42902	.3125	5/16"	7.938	5/16"	2-1/2"	3/4"	-	39.64	37.92	36.19	34.47
42962	.3150	8.000	8.0	65	19	-	-	41.70	39.89	38.07	36.26
43022	.3750	3/8"	9.525	3/8"	2-1/2"	7/8"	-	46.18	44.18	42.17	40.16
43023	.3750	3/8"	9.525	3/8"	4"	1/2"	1-1/8"	.355"	78.88	75.45	72.02
43102	.3937	10.000	10.0	70	24	-	-	70.84	67.76	64.68	61.60
43182	.4724	12.000	12.0	75	32	-	-	87.62	83.81	80.00	76.19
43242	.5000	1/2"	12.700	1/2"	3"	1-1/4"	-	83.24	79.62	76.00	72.38
43243	.5000	1/2"	12.700	1/2"	4"	5/8"	2-1/4"	.475"	106.98	102.33	97.68
43322	.6250	5/8"	15.875	5/8"	4"	1-5/8"	-	143.99	137.73	131.47	125.21
43382	.6299	16.000	16.0	100	40	-	-	151.58	144.99	138.40	131.81
43442	.7500	3/4"	19.050	3/4"	4"	1-5/8"	-	186.88	178.75	170.63	162.50
43444	.7500	3/4"	19.050	3/4"	5"	1"	3-1/16"	.715"	256.35	245.20	234.06
43482	.7874	20.000	20.0	100	32	-	-	262.32	250.91	239.51	228.10
43542	.9843	25.000	25.0	100	38	-	-	303.53	290.33	277.14	263.94
43602	1.000	1"	25.400	1"	4"	1-5/8"	-	318.70	304.84	290.99	277.13

TOLERANCES	
$d1$	$+0.000" - .001" (+.000 - .025mm)$
$d2$	$h6$

HIGH EFFICIENCY MILLING

Series 143M



.1181" - .3150"
(3.000mm - 8.000mm)

Recommended for aluminum

HSAL End Mill - Square End

BALINIT® MAYURA Coating

Solid submicron grain carbide end mill - center cutting

Engineered for High Efficiency Milling

Specific coating engineered to repel aluminum

Engineered to run at 750-2500 SFM (225-750 M/Min.)

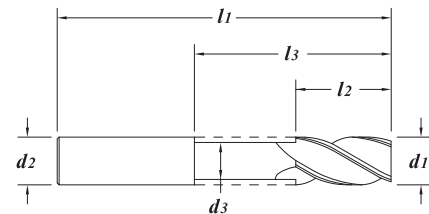
For high speed machining of aluminum

High velocity - high metal removal rate (for 5,000-20,000 RPM spindles)

Need to use properly balanced holders

Holds perpendicularity

Flats can be added within 48 hours



EDP#	$d1$ † Diameter		$d2$ Shank Diameter	$l1$ Overall Length	$l2$ Flute Length	$l3$ Reach Length	$d3$ Neck Diameter	1-11	12-24	25-49	50-100
	Decimal	Metric									
41173	.1181	3.000	3.0	38	6	-	-	20.29	19.40	18.52	17.64
41183	.1181	3.000	3.0	38	12	-	-	20.29	19.40	18.52	17.64
41193	.1250	1/8"	3.175	1/8"	1-1/2"	1/4"	-	19.76	18.90	18.04	17.18
41203	.1250	1/8"	3.175	1/8"	1-1/2"	1/2"	-	19.76	18.90	18.04	17.18
41213	.1575	4.000	6.0	50	8	-	-	26.97	25.80	24.62	23.45
41223	.1575	4.000	6.0	50	12	-	-	26.97	25.80	24.62	23.45
41243	.1575	4.000	6.0	65	6	20	3.7	33.76	32.30	30.83	29.36
41273	.1875	3/16"	4.763	3/16"	2"	5/16"	-	20.33	19.45	18.56	17.68
41283	.1875	3/16"	4.763	3/16"	2"	9/16"	-	20.33	19.45	18.56	17.68
41303	.1875	3/16"	4.763	3/16"	3"	7/32"	3/4"	38.17	36.51	34.85	33.19
41313	.1875	3/16"	4.763	3/16"	3"	1"	-	32.81	31.38	29.96	28.53
41343	.1969	5.000	6.0	65	16	-	-	27.83	26.62	25.41	24.20
41363	.1969	5.000	6.0	75	8	20	4.7	47.32	45.27	43.21	41.15
41403	.2362	6.000	6.0	65	19	-	-	26.94	25.77	24.60	23.43
41423	.2362	6.000	6.0	75	10	25	5.7	45.80	43.81	41.82	39.83
39735	.2500	1/4"	6.350	1/4"	2"	3/8"	-	24.29	23.23	22.18	21.12
39737	.2500	1/4"	6.350	1/4"	2"	1/2"	-	24.29	23.23	22.18	21.12
41453	.2500	1/4"	6.350	1/4"	2-1/2"	3/8"	-	25.60	24.49	23.37	22.26
41463	.2500	1/4"	6.350	1/4"	2-1/2"	3/4"	-	25.60	24.49	23.37	22.26
41473	.2500	1/4"	6.350	1/4"	3"	1"	-	38.81	37.13	35.44	33.75
41475	.2500	1/4"	6.350	1/4"	3"	1-1/4"	-	38.81	37.13	35.44	33.75
41493	.2500	1/4"	6.350	1/4"	4"	3/8"	1-1/8"	46.28	44.26	42.25	40.24
41503	.2500	1/4"	6.350	1/4"	4"	3/8"	2-1/8"	51.65	49.40	47.16	44.91
41511	.2500	1/4"	6.350	1/4"	4"	1-1/2"	-	40.92	39.14	37.36	35.58
41513	.2500	1/4"	6.350	1/4"	4"	1-5/8"	-	40.92	39.14	37.36	35.58
41543	.2756	7.000	8.0	65	19	-	-	41.32	39.52	37.73	35.93
41563	.2756	7.000	8.0	75	12	25	6.4	62.08	59.38	56.68	53.98
41593	.3125	5/16"	7.938	5/16"	2-1/2"	7/16"	-	35.56	34.01	32.47	30.92
41603	.3125	5/16"	7.938	5/16"	2-1/2"	3/4"	-	35.56	34.01	32.47	30.92
41623	.3125	5/16"	7.938	5/16"	4"	7/16"	1-1/8"	60.72	58.08	55.44	52.80
39739	.3150	8.000	8.0	50	12	-	-	33.60	32.14	30.68	29.22
41663	.3150	8.000	8.0	65	19	-	-	37.43	35.81	34.18	32.55
41683	.3150	8.000	8.0	75	12	25	7.4	56.49	54.03	51.58	49.12
41685	.3150	8.000	8.0	75	26	-	-	50.95	48.73	46.52	44.30
41687	.3150	8.000	8.0	75	30	-	-	50.95	48.73	46.52	44.30
41693	.3150	8.000	8.0	100	12	55	7.4	69.26	66.25	63.24	60.23

continued →

Series 143M (continued)

.3750" - .6299"
(9.525mm - 16.000mm)

EDP#	$d1$ †		$d2$	$l1$	$l2$	$l3$	$d3$	1-11	12-24	25-49	50-100
	Decimal	Diameter									
39741	.3750	3/8"	9.525	3/8"	2"	1/2"	-	37.41	35.78	34.16	32.53
41713	.3750	3/8"	9.525	3/8"	2-1/2"	1/2"	-	41.77	39.95	38.14	36.32
39743	.3750	3/8"	9.525	3/8"	2-1/2"	3/4"	-	41.77	39.95	38.14	36.32
41723	.3750	3/8"	9.525	3/8"	2-1/2"	7/8"	-	41.77	39.95	38.14	36.32
41733	.3750	3/8"	9.525	3/8"	3"	1"	-	53.84	51.50	49.16	46.82
41735	.3750	3/8"	9.525	3/8"	3"	1-1/4"	-	53.84	51.50	49.16	46.82
41737	.3750	3/8"	9.525	3/8"	3-1/2"	1-1/2"	-	57.78	55.26	52.75	50.24
41763	.3750	3/8"	9.525	3/8"	4"	1/2"	2-1/8"	.355"	70.59	67.52	64.45
41773	.3750	3/8"	9.525	3/8"	4"	1-5/8"	-	59.86	57.26	54.65	52.05
42363	.3750	3/8"	9.525	3/8"	4"	2"	-	59.86	57.26	54.65	52.05
41783	.3750	3/8"	9.525	3/8"	6"	1/2"	4"	.355"	106.95	102.30	97.65
39745	.3937		10.000	10.0	50	14	-	57.75	55.24	52.73	50.22
41803	.3937		10.000	10.0	70	24	-	62.85	60.12	57.38	54.65
41805	.3937		10.000	10.0	75	30	-	66.18	63.31	60.43	57.55
41843	.3937		10.000	10.0	100	12	35	9.4	83.79	80.15	76.50
41853	.3937		10.000	10.0	100	12	55	9.4	89.15	85.27	81.40
41863	.3937		10.000	10.0	150	12	110	9.4	124.92	119.49	114.06
39747	.4724		12.000	12.0	65	16	-	65.94	63.07	60.21	57.34
39749	.4724		12.000	12.0	75	26	-	70.30	67.24	64.19	61.13
41883	.4724		12.000	12.0	75	32	-	70.30	67.24	64.19	61.13
41893	.4724		12.000	12.0	100	50	-	91.92	87.92	83.93	79.93
41903	.4724		12.000	12.0	100	16	40	11.4	103.24	98.75	94.26
41913	.4724		12.000	12.0	100	16	55	11.4	103.24	98.75	94.26
41923	.4724		12.000	12.0	150	16	110	11.4	157.81	150.95	144.09
39751	.5000	1/2"	12.700	1/2"	2-1/2"	5/8"	-	62.56	59.84	57.12	54.40
39753	.5000	1/2"	12.700	1/2"	2-1/2"	3/4"	-	62.56	59.84	57.12	54.40
41933	.5000	1/2"	12.700	1/2"	3"	5/8"	-	66.79	63.89	60.98	58.08
39755	.5000	1/2"	12.700	1/2"	3"	1"	-	66.79	63.89	60.98	58.08
41943	.5000	1/2"	12.700	1/2"	3"	1-1/4"	-	66.79	63.89	60.98	58.08
41945	.5000	1/2"	12.700	1/2"	3-1/2"	1-1/2"	-	85.26	81.55	77.85	74.14
41963	.5000	1/2"	12.700	1/2"	4"	1-5/8"	-	87.33	83.53	79.74	75.94
41965	.5000	1/2"	12.700	1/2"	4"	1-3/4"	-	87.33	83.53	79.74	75.94
41973	.5000	1/2"	12.700	1/2"	4"	2"	-	87.33	83.53	79.74	75.94
41983	.5000	1/2"	12.700	1/2"	4"	5/8"	2-1/8"	.475"	98.06	93.80	89.53
41993	.5000	1/2"	12.700	1/2"	6"	5/8"	4-1/8"	.475"	149.93	143.41	136.89
42003	.5000	1/2"	12.700	1/2"	6"	3-1/8"	-	128.48	122.89	117.31	111.72
39757	.6250	5/8"	15.875	5/8"	3"	3/4"	-	123.76	118.38	113.00	107.62
42013	.6250	5/8"	15.875	5/8"	3-1/2"	3/4"	-	127.33	121.79	116.26	110.72
39759	.6250	5/8"	15.875	5/8"	3-1/2"	1"	-	127.33	121.79	116.26	110.72
42016	.6250	5/8"	15.875	5/8"	3-1/2"	1-1/4"	-	127.33	121.79	116.26	110.72
42021	.6250	5/8"	15.875	5/8"	4"	1-1/2"	-	133.12	127.34	121.55	115.76
42023	.6250	5/8"	15.875	5/8"	4"	1-5/8"	-	133.12	127.34	121.55	115.76
42025	.6250	5/8"	15.875	5/8"	4"	1-3/4"	-	133.12	127.34	121.55	115.76
42373	.6250	5/8"	15.875	5/8"	4"	2-1/8"	-	133.12	127.34	121.55	115.76
42033	.6250	5/8"	15.875	5/8"	6"	3/4"	2-3/8"	.590"	185.81	177.73	169.65
42043	.6250	5/8"	15.875	5/8"	6"	3/4"	4-3/8"	.590"	196.54	187.99	179.45
42053	.6250	5/8"	15.875	5/8"	6"	3-1/4"	-	175.08	167.46	159.85	152.24
42083	.6299		16.000	16.0	100	40	-	140.12	134.02	127.93	121.84
42103	.6299		16.000	16.0	100	20	40	15.4	145.48	139.15	132.83
42113	.6299		16.000	16.0	125	20	60	15.4	185.90	177.82	169.73
42123	.6299		16.000	16.0	150	20	110	15.4	206.90	197.90	188.91

EDP#	$d1$ †			$d2$ Shank Diameter	$l1$ Overall Length	$l2$ Flute Length	$l3$ Reach Length	$d3$ Neck Diameter	1-11	12-24	25-49	50-100
	Decimal	Diameter	Metric									
42133	.7500	3/4"	19.050	3/4"	4"	1"	-	-	170.34	162.93	155.53	148.12
42136	.7500	3/4"	19.050	3/4"	4"	1-1/4"	-	-	170.34	162.93	155.53	148.12
42141	.7500	3/4"	19.050	3/4"	4"	1-1/2"	-	-	170.34	162.93	155.53	148.12
42143	.7500	3/4"	19.050	3/4"	4"	1-5/8"	-	-	170.34	162.93	155.53	148.12
42145	.7500	3/4"	19.050	3/4"	4"	1-3/4"	-	-	170.34	162.93	155.53	148.12
42153	.7500	3/4"	19.050	3/4"	5"	2-1/4"	-	-	224.92	215.14	205.36	195.58
42155	.7500	3/4"	19.050	3/4"	5"	2-1/2"	-	-	224.92	215.14	205.36	195.58
42163	.7500	3/4"	19.050	3/4"	6"	1"	2-1/2"	.715"	244.67	234.04	223.40	212.76
42173	.7500	3/4"	19.050	3/4"	6"	1"	4-3/8"	.715"	252.25	241.29	230.32	219.35
42193	.7500	3/4"	19.050	3/4"	6"	3-1/4"	-	-	237.16	226.85	216.54	206.23
42203	.7874		20.000	20.0	100	25	-	-	228.69	218.75	208.80	198.86
42213	.7874		20.000	20.0	100	32	-	-	228.69	218.75	208.80	198.86
42223	.7874		20.000	20.0	100	20	40	19.0	234.05	223.87	213.70	203.52
42226	.7874		20.000	20.0	125	20	60	19.0	271.02	259.24	247.45	235.67
42233	.7874		20.000	20.0	150	20	85	19.0	314.05	300.40	286.74	273.09
42236	.7874		20.000	20.0	150	20	110	19.0	319.44	305.55	291.66	277.77
42243	.9843		25.000	25.0	100	38	-	-	263.88	252.41	240.93	229.46
42283	.9843		25.000	25.0	100	25	50	24.0	269.22	257.51	245.81	234.10
42286	.9843		25.000	25.0	125	25	65	24.0	336.50	321.87	307.24	292.61
42291	.9843		25.000	25.0	150	25	90	24.0	422.12	403.77	385.41	367.06
42293	1.000	1"	25.400	1"	4"	1"	-	-	256.00	244.87	233.74	222.61
42303	1.000	1"	25.400	1"	4"	1-5/8"	-	-	256.00	244.87	233.74	222.61
42313	1.000	1"	25.400	1"	5"	2"	-	-	316.02	302.28	288.54	274.80
42343	1.000	1"	25.400	1"	6"	1-1/4"	3-3/8"	.960"	409.45	391.64	373.84	356.04
42353	1.000	1"	25.400	1"	6"	3-1/4"	-	-	393.38	376.28	359.17	342.07

70

MATERIAL HARDNESS (Rc)

35

0



Series 143R

.1181" - .2362"
(3.000mm - 6.000mm)

HIGH EFFICIENCY MILLING



TECH
PAGES
289

TOLERANCES

d1	+0.000" - .001" (+.000 - .025mm)
d2	h6
r	+0.0005" - .0005" (+.0127 - .0127mm)

Recommended for aluminum

HSAL End Mill - Corner Radius

BALINIT® MAYURA Coating

Solid submicron grain carbide end mill - center cutting

Engineered for High Efficiency Milling

Specific coating engineered to repel aluminum

Engineered to run at 750-2500 SFM (225-750 M/Min.)

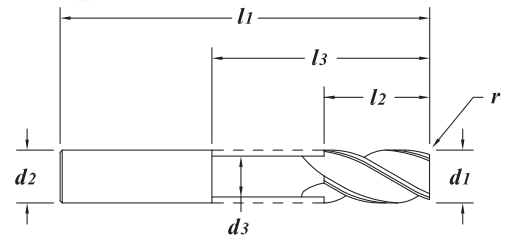
For high speed machining of aluminum

High velocity - high metal removal rate (for 5,000-20,000 RPM spindles)

Need to use properly balanced holders

Holds perpendicularity

Flats can be added within 48 hours



EDP#	d1 † Diameter		d2 Shank Diameter	l1 Overall Length	l2 Flute Length	r Corner Radius	l3 Reach Length	d3 Neck Diameter	1-11	12-24	25-49	50-100
	Decimal	Metric										
39113	.1181	3.000	3.0	38	6	0.20	-	-	23.38	22.36	21.35	20.33
39123	.1181	3.000	3.0	38	6	0.50	-	-	23.38	22.36	21.35	20.33
39133	.1181	3.000	3.0	38	12	0.20	-	-	23.38	22.36	21.35	20.33
39143	.1181	3.000	3.0	38	12	0.50	-	-	23.38	22.36	21.35	20.33
39153	.1250	1/8"	3.175	1/8"	1-1/2"	1/4"	.010"	-	22.69	21.70	20.72	19.73
39163	.1250	1/8"	3.175	1/8"	1-1/2"	1/4"	.020"	-	22.69	21.70	20.72	19.73
39173	.1250	1/8"	3.175	1/8"	1-1/2"	1/2"	.010"	-	22.69	21.70	20.72	19.73
39183	.1250	1/8"	3.175	1/8"	1-1/2"	1/2"	.020"	-	22.69	21.70	20.72	19.73
39193	.1575	4.000	6.0	50	8	0.20	-	-	31.57	30.20	28.82	27.45
39203	.1575	4.000	6.0	50	8	0.50	-	-	31.57	30.20	28.82	27.45
39213	.1575	4.000	6.0	50	12	0.20	-	-	31.57	30.20	28.82	27.45
39223	.1575	4.000	6.0	50	12	0.30	-	-	31.57	30.20	28.82	27.45
39225	.1575	4.000	6.0	50	12	0.50	-	-	31.57	30.20	28.82	27.45
39243	.1575	4.000	6.0	65	6	0.30	20	3.7	38.59	36.92	35.24	33.56
39253	.1575	4.000	6.0	65	6	0.50	20	3.7	38.59	36.92	35.24	33.56
39263	.1575	4.000	6.0	65	6	1.00	20	3.7	38.59	36.92	35.24	33.56
39265	.1875	3/16"	4.763	3/16"	2"	5/16"	.010"	-	23.40	22.39	21.37	20.35
39275	.1875	3/16"	4.763	3/16"	2"	5/16"	.020"	-	23.40	22.39	21.37	20.35
39280	.1875	3/16"	4.763	3/16"	2"	5/16"	.030"	-	23.40	22.39	21.37	20.35
39283	.1875	3/16"	4.763	3/16"	2"	9/16"	.010"	-	23.40	22.39	21.37	20.35
39285	.1875	3/16"	4.763	3/16"	2"	9/16"	.020"	-	23.40	22.39	21.37	20.35
39293	.1875	3/16"	4.763	3/16"	2"	9/16"	.030"	-	23.40	22.39	21.37	20.35
39303	.1875	3/16"	4.763	3/16"	3"	7/32"	.010"	3/4"	42.85	40.99	39.12	37.26
39313	.1875	3/16"	4.763	3/16"	3"	7/32"	.030"	3/4"	42.85	40.99	39.12	37.26
39343	.1969	5.000	6.0	65	16	0.30	-	-	32.57	31.15	29.74	28.32
39363	.1969	5.000	6.0	75	8	0.30	20	4.7	53.21	50.90	48.58	46.27
39373	.1969	5.000	6.0	75	8	0.50	20	4.7	53.21	50.90	48.58	46.27
39383	.1969	5.000	6.0	75	8	1.00	20	4.7	53.21	50.90	48.58	46.27
39403	.2362	6.000	6.0	65	19	0.30	-	-	31.52	30.15	28.78	27.41
39423	.2362	6.000	6.0	75	10	0.30	25	5.7	51.50	49.26	47.02	44.78
39433	.2362	6.000	6.0	75	10	0.50	25	5.7	51.50	49.26	47.02	44.78
39436	.2362	6.000	6.0	75	10	1.00	25	5.7	51.50	49.26	47.02	44.78
39439	.2362	6.000	6.0	75	10	1.50	25	5.7	51.50	49.26	47.02	44.78
39443	.2362	6.000	6.0	75	10	2.00	25	5.7	51.50	49.26	47.02	44.78

EDP#	$d1$ †			$d2$ Shank Diameter	$l1$ Overall Length	$l2$ Flute Length	r Corner Radius	$l3$ Reach Length	$d3$ Neck Diameter	1-11	12-24	25-49	50-100
	Decimal	Diameter	Metric										
39314	.2500	1/4"	6.350	1/4"	2"	1/2"	.010"	-	-	28.42	27.18	25.95	24.71
39316	.2500	1/4"	6.350	1/4"	2"	1/2"	.015"	-	-	28.42	27.18	25.95	24.71
39318	.2500	1/4"	6.350	1/4"	2"	1/2"	.020"	-	-	28.42	27.18	25.95	24.71
39453	.2500	1/4"	6.350	1/4"	2-1/2"	3/4"	.010"	-	-	29.95	28.64	27.34	26.04
39463	.2500	1/4"	6.350	1/4"	2-1/2"	3/4"	.015"	-	-	29.95	28.64	27.34	26.04
39320	.2500	1/4"	6.350	1/4"	2-1/2"	3/4"	.020"	-	-	29.95	28.64	27.34	26.04
39473	.2500	1/4"	6.350	1/4"	2-1/2"	3/4"	.030"	-	-	29.95	28.64	27.34	26.04
39483	.2500	1/4"	6.350	1/4"	3"	1-1/8"	.030"	-	-	45.41	43.44	41.46	39.49
39493	.2500	1/4"	6.350	1/4"	4"	3/8"	.015"	1-1/8"	.235"	51.89	49.63	47.38	45.12
40403	.2500	1/4"	6.350	1/4"	4"	3/8"	.030"	1-1/8"	.235"	51.89	49.63	47.38	45.12
39503	.2500	1/4"	6.350	1/4"	4"	3/8"	.015"	2-1/8"	.235"	57.22	54.74	52.25	49.76
39543	.2756		7.000	8.0	65	19	0.30	-	-	45.84	43.85	41.85	39.86
39563	.2756		7.000	8.0	75	12	0.30	25	6.4	69.84	66.80	63.77	60.73
39322	.3125	5/16"	7.938	5/16"	2"	1/2"	.010"	-	-	36.26	34.68	33.11	31.53
39324	.3125	5/16"	7.938	5/16"	2"	1/2"	.020"	-	-	36.26	34.68	33.11	31.53
39593	.3125	5/16"	7.938	5/16"	2-1/2"	3/4"	.010"	-	-	39.64	37.92	36.19	34.47
39603	.3125	5/16"	7.938	5/16"	2-1/2"	3/4"	.015"	-	-	39.64	37.92	36.19	34.47
39326	.3125	5/16"	7.938	5/16"	2-1/2"	3/4"	.020"	-	-	39.64	37.92	36.19	34.47
39613	.3125	5/16"	7.938	5/16"	2-1/2"	3/4"	.030"	-	-	39.64	37.92	36.19	34.47
39623	.3125	5/16"	7.938	5/16"	4"	7/16"	.015"	1-1/8"	.297"	68.21	65.24	62.28	59.31
39633	.3125	5/16"	7.938	5/16"	4"	7/16"	.030"	1-1/8"	.297"	68.21	65.24	62.28	59.31
39328	.3150		8.000	8.0	50	12	0.50	-	-	37.95	36.30	34.65	33.00
39663	.3150		8.000	8.0	65	19	0.50	-	-	41.70	39.89	38.07	36.26
39683	.3150		8.000	8.0	75	12	0.50	25	7.4	63.55	60.79	58.02	55.26
39688	.3150		8.000	8.0	75	12	1.00	25	7.4	63.55	60.79	58.02	55.26
39693	.3150		8.000	8.0	75	12	2.00	25	7.4	63.55	60.79	58.02	55.26
39698	.3150		8.000	8.0	75	12	3.00	25	7.4	63.55	60.79	58.02	55.26
39330	.3750	3/8"	9.525	3/8"	2"	1/2"	.010"	-	-	42.68	40.82	38.97	37.11
39332	.3750	3/8"	9.525	3/8"	2"	1/2"	.020"	-	-	42.68	40.82	38.97	37.11
39703	.3750	3/8"	9.525	3/8"	2-1/2"	7/8"	.010"	-	-	46.18	44.18	42.17	40.16
39713	.3750	3/8"	9.525	3/8"	2-1/2"	7/8"	.015"	-	-	46.18	44.18	42.17	40.16
39334	.3750	3/8"	9.525	3/8"	2-1/2"	7/8"	.020"	-	-	46.18	44.18	42.17	40.16
39723	.3750	3/8"	9.525	3/8"	2-1/2"	7/8"	.030"	-	-	46.18	44.18	42.17	40.16
39733	.3750	3/8"	9.525	3/8"	2-1/2"	7/8"	.060"	-	-	46.18	44.18	42.17	40.16
39734	.3750	3/8"	9.525	3/8"	2-1/2"	7/8"	.120"	-	-	46.18	44.18	42.17	40.16
39738	.3750	3/8"	9.525	3/8"	3"	1-1/4"	.030"	-	-	59.55	56.96	54.37	51.78
39763	.3750	3/8"	9.525	3/8"	4"	1/2"	.030"	2-1/8"	.355"	78.88	75.45	72.02	68.59
39773	.3750	3/8"	9.525	3/8"	4"	1/2"	.060"	2-1/8"	.355"	78.88	75.45	72.02	68.59
39783	.3750	3/8"	9.525	3/8"	6"	1/2"	.030"	4"	.355"	115.17	110.17	105.16	100.15
39336	.3937		10.000	10.0	50	14	0.50	-	-	64.17	61.38	58.59	55.80
39803	.3937		10.000	10.0	70	24	0.50	-	-	70.84	67.76	64.68	61.60
39843	.3937		10.000	10.0	100	12	0.50	35	9.4	95.22	91.08	86.94	82.80
39848	.3937		10.000	10.0	100	12	1.00	35	9.4	95.22	91.08	86.94	82.80
39853	.3937		10.000	10.0	100	12	1.50	35	9.4	95.22	91.08	86.94	82.80
39863	.3937		10.000	10.0	100	12	2.00	35	9.4	95.22	91.08	86.94	82.80
39873	.3937		10.000	10.0	100	12	3.00	35	9.4	95.22	91.08	86.94	82.80
39344	.4724		12.000	12.0	65	16	0.50	-	-	76.88	73.54	70.19	66.85
39883	.4724		12.000	12.0	75	32	0.50	-	-	87.62	83.81	80.00	76.19
39346	.4724		12.000	12.0	75	32	0.75	-	-	87.62	83.81	80.00	76.19
39348	.4724		12.000	12.0	75	32	1.00	-	-	87.62	83.81	80.00	76.19
39903	.4724		12.000	12.0	100	16	0.50	40	11.4	112.62	107.72	102.83	97.93
39907	.4724		12.000	12.0	100	16	1.00	40	11.4	112.62	107.72	102.83	97.93
39911	.4724		12.000	12.0	100	16	1.50	40	11.4	112.62	107.72	102.83	97.93
39915	.4724		12.000	12.0	100	16	2.00	40	11.4	112.62	107.72	102.83	97.93
39919	.4724		12.000	12.0	100	16	3.00	40	11.4	112.62	107.72	102.83	97.93

70

MATERIAL HARDNESS (RC)

35

0

continued →

Series 143R (continued)

.5000" - 1.000"
(12.700mm - 25.400mm)

EDP#	$d1$ † Diameter		$d2$ Shank Diameter	$l1$ Overall Length	$l2$ Flute Length	r Corner Radius	$l3$ Reach Length	$d3$ Neck Diameter	1-11	12-24	25-49	50-100
	Decimal	Metric										
39353	.5000	12.700	1/2"	2-1/2"	5/8"	.010"	-	-	73.04	69.86	66.69	63.51
39355	.5000	12.700	1/2"	2-1/2"	5/8"	.020"	-	-	73.04	69.86	66.69	63.51
39923	.5000	12.700	1/2"	3"	1-1/4"	.010"	-	-	83.24	79.62	76.00	72.38
39933	.5000	12.700	1/2"	3"	1-1/4"	.015"	-	-	83.24	79.62	76.00	72.38
39356	.5000	12.700	1/2"	3"	1-1/4"	.020"	-	-	83.24	79.62	76.00	72.38
39943	.5000	12.700	1/2"	3"	1-1/4"	.030"	-	-	83.24	79.62	76.00	72.38
39953	.5000	12.700	1/2"	3"	1-1/4"	.060"	-	-	83.24	79.62	76.00	72.38
39963	.5000	12.700	1/2"	3"	1-1/4"	.120"	-	-	83.24	79.62	76.00	72.38
39965	.5000	12.700	1/2"	3"	1-1/4"	.125"	-	-	83.24	79.62	76.00	72.38
39967	.5000	12.700	1/2"	3"	1-1/4"	.190"	-	-	83.24	79.62	76.00	72.38
39972	.5000	12.700	1/2"	4"	1-5/8"	.015"	-	-	96.26	92.07	87.89	83.70
39973	.5000	12.700	1/2"	4"	2"	.010"	-	-	96.26	92.07	87.89	83.70
40413	.5000	12.700	1/2"	4"	2"	.030"	-	-	96.26	92.07	87.89	83.70
40423	.5000	12.700	1/2"	4"	2"	.060"	-	-	96.26	92.07	87.89	83.70
40433	.5000	12.700	1/2"	4"	5/8"	.010"	2-1/8"	.475"	106.98	102.33	97.68	93.03
39983	.5000	12.700	1/2"	4"	5/8"	.030"	2-1/8"	.475"	106.98	102.33	97.68	93.03
40443	.5000	12.700	1/2"	4"	5/8"	.060"	2-1/8"	.475"	106.98	102.33	97.68	93.03
40453	.5000	12.700	1/2"	4"	5/8"	.120"	2-1/8"	.475"	106.98	102.33	97.68	93.03
39993	.5000	12.700	1/2"	6"	5/8"	.030"	4-1/8"	.475"	160.55	153.57	146.59	139.61
39366	.6250	15.875	5/8"	3"	3/4"	.010"	-	-	134.31	128.47	122.63	116.79
39368	.6250	15.875	5/8"	3"	3/4"	.020"	-	-	134.31	128.47	122.63	116.79
39369	.6250	15.875	5/8"	3-1/2"	1-1/4"	.015"	-	-	138.18	132.18	126.17	120.16
39370	.6250	15.875	5/8"	3-1/2"	1-1/4"	.020"	-	-	138.18	132.18	126.17	120.16
40463	.6250	15.875	5/8"	4"	1-5/8"	.015"	-	-	143.99	137.73	131.47	125.21
39372	.6250	15.875	5/8"	4"	1-5/8"	.020"	-	-	143.99	137.73	131.47	125.21
40023	.6250	15.875	5/8"	4"	1-5/8"	.030"	-	-	143.99	137.73	131.47	125.21
40473	.6250	15.875	5/8"	4"	1-5/8"	.060"	-	-	143.99	137.73	131.47	125.21
40483	.6250	15.875	5/8"	4"	1-5/8"	.120"	-	-	143.99	137.73	131.47	125.21
40485	.6250	15.875	5/8"	4"	1-5/8"	.190"	-	-	143.99	137.73	131.47	125.21
40033	.6250	15.875	5/8"	6"	3/4"	.030"	2-3/8"	.590"	205.88	196.93	187.98	179.03
40043	.6250	15.875	5/8"	6"	3/4"	.030"	4-3/8"	.590"	216.64	207.22	197.80	188.38
40083	.6299	16.000	16.0	100	40	1.00	-	-	151.58	144.99	138.40	131.81
40103	.6299	16.000	16.0	100	20	1.00	40	15.4	156.94	150.12	143.29	136.47
40113	.6299	16.000	16.0	125	20	2.00	60	15.4	205.98	197.02	188.07	179.11
40118	.6299	16.000	16.0	125	20	3.00	60	15.4	205.98	197.02	188.07	179.11
40123	.6299	16.000	16.0	125	20	4.00	60	15.4	205.98	197.02	188.07	179.11
39374	.7500	19.050	3/4"	4"	1-1/4"	.020"	-	-	186.88	178.75	170.63	162.50
40133	.7500	19.050	3/4"	4"	1-5/8"	.015"	-	-	186.88	178.75	170.63	162.50
39376	.7500	19.050	3/4"	4"	1-5/8"	.020"	-	-	186.88	178.75	170.63	162.50
40143	.7500	19.050	3/4"	4"	1-5/8"	.030"	-	-	186.88	178.75	170.63	162.50
40153	.7500	19.050	3/4"	4"	1-5/8"	.060"	-	-	186.88	178.75	170.63	162.50
40493	.7500	19.050	3/4"	4"	1-5/8"	.120"	-	-	186.88	178.75	170.63	162.50
40495	.7500	19.050	3/4"	4"	1-5/8"	.190"	-	-	186.88	178.75	170.63	162.50
40497	.7500	19.050	3/4"	4"	1-5/8"	.250"	-	-	186.88	178.75	170.63	162.50
40503	.7500	19.050	3/4"	6"	1"	.015"	2-1/2"	.715"	278.50	266.39	254.28	242.17
40163	.7500	19.050	3/4"	6"	1"	.030"	2-1/2"	.715"	278.50	266.39	254.28	242.17
40513	.7500	19.050	3/4"	6"	1"	.060"	2-1/2"	.715"	278.50	266.39	254.28	242.17
40523	.7500	19.050	3/4"	6"	1"	.120"	2-1/2"	.715"	278.50	266.39	254.28	242.17
40171	.7500	19.050	3/4"	6"	1"	.015"	4"	.715"	286.06	273.63	261.19	248.75
40173	.7500	19.050	3/4"	6"	1"	.030"	4-3/8"	.715"	286.06	273.63	261.19	248.75
40183	.7874	20.000	20.0	100	32	1.00	-	-	262.32	250.91	239.51	228.10
40223	.7874	20.000	20.0	100	20	1.00	40	19.0	267.67	256.04	244.40	232.76
40225	.7874	20.000	20.0	150	20	1.00	65	19.0	359.21	343.60	327.98	312.36
40226	.7874	20.000	20.0	150	20	2.00	65	19.0	359.21	343.60	327.98	312.36
40229	.7874	20.000	20.0	150	20	3.00	65	19.0	359.21	343.60	327.98	312.36
40231	.7874	20.000	20.0	150	20	4.00	65	19.0	359.21	343.60	327.98	312.36
40243	.9843	25.000	25.0	100	38	1.00	-	-	303.53	290.33	277.14	263.94
40293	1.000	25.400	1"	4"	1-5/8"	.030"	-	-	318.70	304.84	290.99	277.13
40303	1.000	25.400	1"	4"	1-5/8"	.060"	-	-	318.70	304.84	290.99	277.13
40313	1.000	25.400	1"	4"	1-5/8"	.120"	-	-	318.70	304.84	290.99	277.13
40343	1.000	25.400	1"	6"	1-1/4"	.030"	3-3/8"	.960"	467.05	446.74	426.44	406.13
40353	1.000	25.400	1"	6"	1-1/4"	.060"	3-3/8"	.960"	467.05	446.74	426.44	406.13
40363	1.000	25.400	1"	6"	1-1/4"	.120"	3-3/8"	.960"	467.05	446.74	426.44	406.13
NEW 40366	1.000	25.400	1"	6"	1-1/4"	.030"	4"	.960"	467.05	446.74	426.44	406.13

CAM Tool Libraries

Download Tool Libraries Now

Mastercam[®]

 AUTODESK[®]
FUSION 360[™]

 GIBBSCAM

 **ToolsUnited**
Search.Download.Source.

 **MachiningCloud**[™]
Smart Manufacturing

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

.2362" - .5000"
(6.000mm - 12.700mm)



Recommended for titanium and steels under 40Rc

Multi-Flute End Mill - Square End

AlCrN Coating

Solid submicron grain carbide end mill - non-center cutting

Multiple flutes for increased feed rates

Odd number of flutes to naturally break up harmonics

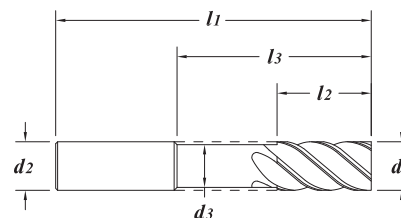
Engineered for High Efficiency Milling

Up to 8% Radial (ap) engagement

Can be used to finish most steels under 40Rc, as well as aluminum

Conventional grind for better finish cutting and less push off when finishing

Regrindable



EDP#	$d1$ † Diameter		$d2$ Shank Diameter	$l1$ Overall Length	$l2$ Flute Length	$l3$ Reach Length	$d3$ Neck Diameter	Number Flutes	1-11	12-24	25-49	50-100
	Decimal	Metric										
98390	.2362	6.000	6.0	50	12	-	-	7	25.67	24.55	23.44	22.32
98392	.2362	6.000	6.0	65	19	-	-	7	28.93	27.68	26.42	25.16
98394	.2362	6.000	6.0	100	38	-	-	7	48.21	46.11	44.02	41.92
98396	.2362	6.000	6.0	100	10	60	5.4	7	51.78	49.53	47.28	45.03
98398	.2500	1/4"	6.350	1/4"	2"	3/8"	-	7	24.62	23.55	22.48	21.41
98400	.2500	1/4"	6.350	1/4"	2-1/2"	3/4"	-	7	27.92	26.71	25.49	24.28
98402	.2500	1/4"	6.350	1/4"	4"	1-1/2"	-	7	46.25	44.24	42.23	40.22
98404	.3125	5/16"	7.938	5/16"	2"	7/16"	-	7	36.56	34.97	33.38	31.79
98406	.3125	5/16"	7.938	5/16"	2-1/2"	13/16"	-	7	39.84	38.10	36.37	34.64
98408	.3125	5/16"	7.938	5/16"	4"	1-1/2"	-	7	63.11	60.37	57.62	54.88
98410	.3150	8.000	8.0	50	12	-	-	7	37.05	35.44	33.83	32.22
98412	.3150	8.000	8.0	65	22	-	-	7	41.27	39.48	37.68	35.89
98414	.3150	8.000	8.0	100	38	-	-	7	65.71	62.85	60.00	57.14
98416	.3150	8.000	8.0	100	12	60	7.4	7	69.29	66.28	63.26	60.25
98418	.3750	3/8"	9.525	3/8"	2"	1/2"	-	7	43.99	42.08	40.16	38.25
98420	.3750	3/8"	9.525	3/8"	2-1/2"	7/8"	-	7	47.00	44.96	42.91	40.87
98422	.3750	3/8"	9.525	3/8"	3"	1-1/4"	-	7	60.51	57.88	55.25	52.62
98424	.3750	3/8"	9.525	3/8"	4"	2"	-	7	67.83	64.88	61.93	58.98
98426	.3937	10.000	10.0	50	16	-	-	7	51.23	49.01	46.78	44.55
98428	.3937	10.000	10.0	70	22	-	-	7	56.37	53.92	51.47	49.02
98430	.3937	10.000	10.0	100	38	-	-	7	85.46	81.74	78.03	74.31
98432	.3937	10.000	10.0	100	50	-	-	7	85.46	81.74	78.03	74.31
98434	.3937	10.000	10.0	100	16	60	9.4	7	89.04	85.17	81.30	77.43
98436	.4724	12.000	12.0	75	26	-	-	9	73.22	70.04	66.85	63.67
98438	.4724	12.000	12.0	75	32	-	-	9	73.22	70.04	66.85	63.67
98440	.4724	12.000	12.0	100	42	-	-	9	100.48	96.11	91.74	87.37
98442	.4724	12.000	12.0	100	52	-	-	9	100.48	96.11	91.74	87.37
98444	.4724	12.000	12.0	150	19	105	11.4	9	141.65	135.49	129.33	123.17
98446	.5000	1/2"	12.700	1/2"	3"	1"	-	9	70.30	67.24	64.19	61.13
98448	.5000	1/2"	12.700	1/2"	3"	1-1/4"	-	9	70.30	67.24	64.19	61.13
98450	.5000	1/2"	12.700	1/2"	4"	5/8"	2-1/8"	9	98.70	94.41	90.12	85.83
98452	.5000	1/2"	12.700	1/2"	4"	1-1/2"	-	9	95.13	90.99	86.86	82.72
98454	.5000	1/2"	12.700	1/2"	4"	2-1/8"	-	9	95.13	90.99	86.86	82.72

EDP#	d_1 † Diameter			d_2 Shank Diameter	l_1 Overall Length	l_2 Flute Length	l_3 Reach Length	d_3 Neck Diameter	Number Flutes	1-11	12-24	25-49	50-100
	Decimal		Metric										
98456	.6250	5/8"	15.875	5/8"	3-1/2"	1-1/4"	-	-	9	144.76	138.47	132.17	125.88
98458	.6250	5/8"	15.875	5/8"	4"	1-5/8"	-	-	9	154.61	147.88	141.16	134.44
98460	.6250	5/8"	15.875	5/8"	6"	3-1/4"	-	-	9	212.73	203.48	194.23	184.98
98464	.6299		16.000	16.0	88	32	-	-	9	151.02	144.45	137.89	131.32
98466	.6299		16.000	16.0	100	42	-	-	9	161.21	154.20	147.19	140.18
98468	.6299		16.000	16.0	150	60	-	-	9	221.82	212.18	202.53	192.89
98470	.6299		16.000	16.0	150	80	-	-	9	221.82	212.18	202.53	192.89
98472	.6299		16.000	16.0	150	22	102	15.4	9	225.40	215.60	205.80	196.00
98474	.7500	3/4"	19.050	3/4"	4"	1-1/2"	-	-	11	214.91	205.57	196.22	186.88
98476	.7500	3/4"	19.050	3/4"	4"	1-5/8"	-	-	11	214.91	205.57	196.22	186.88
98478	.7500	3/4"	19.050	3/4"	5"	2-1/8"	-	-	11	288.48	275.94	263.39	250.85
98480	.7500	3/4"	19.050	3/4"	6"	3-1/4"	-	-	11	337.56	322.88	308.21	293.53
98484	.7874		20.000	20.0	100	26	-	-	11	279.19	267.05	254.91	242.77
98486	.7874		20.000	20.0	100	38	-	-	11	279.19	267.05	254.91	242.77
98488	.7874		20.000	20.0	150	60	-	-	11	351.62	336.34	321.05	305.76
98490	.7874		20.000	20.0	150	80	-	-	11	351.62	336.34	321.05	305.76
98494	1.000	1"	25.400	1"	4"	1-1/2"	-	-	13	296.36	283.47	270.59	257.70
98496	1.000	1"	25.400	1"	5"	2-1/4"	-	-	13	396.68	379.43	362.19	344.94
98498	1.000	1"	25.400	1"	6"	3-1/4"	-	-	13	516.74	494.27	471.81	449.34
98500	1.000	1"	25.400	1"	7"	4-1/4"	-	-	13	694.86	664.65	634.44	604.23

70

35

MATERIAL HARDNESS (Rc)

0

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

.4724"
(12.000mm)



TECH
PAGES
304-305

Recommended for titanium and steels under 40Rc

Multi-Flute End Mill - Corner Radius

AlCrN Coating

Solid submicron grain carbide end mill - non-center cutting

Multiple flutes for increased feed rates

Odd number of flutes to naturally break up harmonics

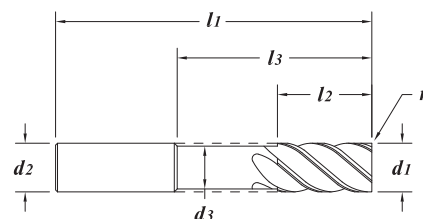
Engineered for High Efficiency Milling

Up to 8% Radial (ap) engagement

Can be used to finish most steels under 40Rc, as well as aluminum

Conventional grind for better finish cutting and less push off when finishing

Regrindable



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	Number Flutes	1-11	12-24	25-49	50-100
	Decimal	Metric											
98504	.4724	12.000	12.0	75	26	0.50	-	-	7	89.04	85.17	81.30	77.43
98508	.4724	12.000	12.0	75	26	1.00	-	-	7	89.04	85.17	81.30	77.43
98516	.4724	12.000	12.0	75	26	4.00	-	-	7	89.04	85.17	81.30	77.43
98518	.4724	12.000	12.0	75	32	0.50	-	-	7	89.04	85.17	81.30	77.43
98522	.4724	12.000	12.0	75	32	1.00	-	-	7	89.04	85.17	81.30	77.43
98524	.4724	12.000	12.0	75	32	1.50	-	-	7	89.04	85.17	81.30	77.43
98528	.4724	12.000	12.0	75	32	3.00	-	-	7	89.04	85.17	81.30	77.43
98532	.4724	12.000	12.0	100	42	0.50	-	-	7	105.48	100.89	96.31	91.72
98538	.4724	12.000	12.0	100	42	1.50	-	-	7	105.48	100.89	96.31	91.72
98544	.4724	12.000	12.0	100	42	4.00	-	-	7	105.48	100.89	96.31	91.72
98546	.4724	12.000	12.0	100	52	0.50	-	-	7	105.48	100.89	96.31	91.72
98550	.4724	12.000	12.0	100	52	1.00	-	-	7	105.48	100.89	96.31	91.72
98552	.4724	12.000	12.0	100	52	1.50	-	-	7	105.48	100.89	96.31	91.72
98556	.4724	12.000	12.0	100	52	3.00	-	-	7	105.48	100.89	96.31	91.72
98560	.4724	12.000	12.0	150	19	0.50	105	11.4	7	146.34	139.98	133.61	127.25
98564	.4724	12.000	12.0	150	19	1.00	105	11.4	7	146.34	139.98	133.61	127.25
98570	.4724	12.000	12.0	150	19	3.00	105	11.4	7	146.34	139.98	133.61	127.25

70

35

0

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	Number Flutes	1-11	12-24	25-49	50-100
	Decimal	Metric											
98574	.5000	12.700	1/2"	3"	1"	.010"	-	-	7	85.42	81.71	77.99	74.28
98576	.5000	12.700	1/2"	3"	1"	.020"	-	-	7	85.42	81.71	77.99	74.28
98578	.5000	12.700	1/2"	3"	1"	.030"	-	-	7	85.42	81.71	77.99	74.28
98580	.5000	12.700	1/2"	3"	1"	.060"	-	-	7	85.42	81.71	77.99	74.28
98582	.5000	12.700	1/2"	3"	1"	.090"	-	-	7	85.42	81.71	77.99	74.28
98584	.5000	12.700	1/2"	3"	1"	.120"	-	-	7	85.42	81.71	77.99	74.28
98586	.5000	12.700	1/2"	3"	1"	.125"	-	-	7	85.42	81.71	77.99	74.28
98588	.5000	12.700	1/2"	3"	1-1/4"	.010"	-	-	7	85.42	81.71	77.99	74.28
98590	.5000	12.700	1/2"	3"	1-1/4"	.020"	-	-	7	85.42	81.71	77.99	74.28
98592	.5000	12.700	1/2"	3"	1-1/4"	.030"	-	-	7	85.42	81.71	77.99	74.28
98594	.5000	12.700	1/2"	3"	1-1/4"	.060"	-	-	7	85.42	81.71	77.99	74.28
98598	.5000	12.700	1/2"	3"	1-1/4"	.120"	-	-	7	85.42	81.71	77.99	74.28
98600	.5000	12.700	1/2"	3"	1-1/4"	.125"	-	-	7	85.42	81.71	77.99	74.28
98602	.5000	12.700	1/2"	4"	5/8"	.010"	2-1/8"	.470"	7	104.52	99.98	95.43	90.89
98604	.5000	12.700	1/2"	4"	5/8"	.020"	2-1/8"	.470"	7	104.52	99.98	95.43	90.89
98606	.5000	12.700	1/2"	4"	5/8"	.030"	2-1/8"	.470"	7	104.52	99.98	95.43	90.89
98608	.5000	12.700	1/2"	4"	5/8"	.060"	2-1/8"	.470"	7	104.52	99.98	95.43	90.89
98610	.5000	12.700	1/2"	4"	5/8"	.120"	2-1/8"	.470"	7	104.52	99.98	95.43	90.89
98612	.5000	12.700	1/2"	4"	5/8"	.125"	2-1/8"	.470"	7	104.52	99.98	95.43	90.89
98614	.5000	12.700	1/2"	4"	1-1/2"	.010"	-	-	7	100.95	96.56	92.17	87.78
98616	.5000	12.700	1/2"	4"	1-1/2"	.020"	-	-	7	100.95	96.56	92.17	87.78
98618	.5000	12.700	1/2"	4"	1-1/2"	.030"	-	-	7	100.95	96.56	92.17	87.78
98620	.5000	12.700	1/2"	4"	1-1/2"	.060"	-	-	7	100.95	96.56	92.17	87.78
98622	.5000	12.700	1/2"	4"	2-1/8"	.010"	-	-	7	100.95	96.56	92.17	87.78
98626	.5000	12.700	1/2"	4"	2-1/8"	.030"	-	-	7	100.95	96.56	92.17	87.78
98628	.5000	12.700	1/2"	4"	2-1/8"	.060"	-	-	7	100.95	96.56	92.17	87.78
98630	.5000	12.700	1/2"	4"	2-1/8"	.120"	-	-	7	100.95	96.56	92.17	87.78
98632	.5000	12.700	1/2"	4"	2-1/8"	.125"	-	-	7	100.95	96.56	92.17	87.78
98634	.6250	15.875	5/8"	3-1/2"	1-1/4"	.010"	-	-	7	151.78	145.18	138.58	131.98
98636	.6250	15.875	5/8"	3-1/2"	1-1/4"	.020"	-	-	7	151.78	145.18	138.58	131.98
98638	.6250	15.875	5/8"	3-1/2"	1-1/4"	.030"	-	-	7	151.78	145.18	138.58	131.98
98640	.6250	15.875	5/8"	3-1/2"	1-1/4"	.060"	-	-	7	151.78	145.18	138.58	131.98
98644	.6250	15.875	5/8"	3-1/2"	1-1/4"	.125"	-	-	7	151.78	145.18	138.58	131.98
98646	.6250	15.875	5/8"	4"	1-5/8"	.010"	-	-	7	164.98	157.81	150.63	143.46
98648	.6250	15.875	5/8"	4"	1-5/8"	.020"	-	-	7	164.98	157.81	150.63	143.46
98652	.6250	15.875	5/8"	4"	1-5/8"	.060"	-	-	7	164.98	157.81	150.63	143.46
98654	.6250	15.875	5/8"	4"	1-5/8"	.120"	-	-	7	164.98	157.81	150.63	143.46
98658	.6250	15.875	5/8"	6"	3-1/4"	.010"	-	-	7	227.11	217.24	207.36	197.49
98660	.6250	15.875	5/8"	6"	3-1/4"	.020"	-	-	7	227.11	217.24	207.36	197.49
98662	.6250	15.875	5/8"	6"	3-1/4"	.030"	-	-	7	227.11	217.24	207.36	197.49
98666	.6250	15.875	5/8"	6"	3-1/4"	.120"	-	-	7	227.11	217.24	207.36	197.49
98672	.6250	15.875	5/8"	6"	3/4"	.020"	4-1/8"	.590"	7	230.71	220.68	210.65	200.62
98674	.6250	15.875	5/8"	6"	3/4"	.030"	4-1/8"	.590"	7	230.71	220.68	210.65	200.62
98678	.6250	15.875	5/8"	6"	3/4"	.120"	4-1/8"	.590"	7	230.71	220.68	210.65	200.62

continued →

Series TMR (continued)

.6299" - .7874"
(16.000mm - 20.000mm)

EDP#	$d1$ † Diameter		$d2$ Shank Diameter	$l1$ Overall Length	$l2$ Flute Length	r Corner Radius	$l3$ Reach Length	$d3$ Neck Diameter	Number Flutes	1-11	12-24	25-49	50-100
	Decimal	Metric											
98680	.6299	16.000	16.0	88	32	0.50	-	-	7	158.38	151.49	144.61	137.72
98690	.6299	16.000	16.0	88	32	3.00	-	-	7	158.38	151.49	144.61	137.72
98696	.6299	16.000	16.0	100	42	0.50	-	-	7	168.42	161.10	153.77	146.45
98700	.6299	16.000	16.0	100	42	1.00	-	-	7	168.42	161.10	153.77	146.45
98704	.6299	16.000	16.0	100	42	2.00	-	-	7	168.42	161.10	153.77	146.45
98706	.6299	16.000	16.0	100	42	3.00	-	-	7	168.42	161.10	153.77	146.45
98708	.6299	16.000	16.0	100	42	4.00	-	-	7	168.42	161.10	153.77	146.45
98710	.6299	16.000	16.0	100	42	5.00	-	-	7	168.42	161.10	153.77	146.45
98712	.6299	16.000	16.0	150	60	0.50	-	-	7	236.19	225.92	215.65	205.38
98716	.6299	16.000	16.0	150	60	1.00	-	-	7	236.19	225.92	215.65	205.38
98720	.6299	16.000	16.0	150	60	2.00	-	-	7	236.19	225.92	215.65	205.38
98722	.6299	16.000	16.0	150	60	3.00	-	-	7	236.19	225.92	215.65	205.38
98724	.6299	16.000	16.0	150	60	4.00	-	-	7	236.19	225.92	215.65	205.38
98726	.6299	16.000	16.0	150	60	5.00	-	-	7	236.19	225.92	215.65	205.38
98732	.6299	16.000	16.0	150	80	1.00	-	-	7	236.19	225.92	215.65	205.38
98738	.6299	16.000	16.0	150	80	3.00	-	-	7	236.19	225.92	215.65	205.38
98744	.6299	16.000	16.0	150	22	0.50	102	15.4	7	239.78	229.35	218.93	208.50
98752	.6299	16.000	16.0	150	22	2.00	102	15.4	7	239.78	229.35	218.93	208.50
98754	.6299	16.000	16.0	150	22	3.00	102	15.4	7	239.78	229.35	218.93	208.50
98764	.7500	3/4"	19.050	3/4"	4"	1-1/2"	.030"	-	9	226.37	216.52	206.68	196.84
98766	.7500	3/4"	19.050	3/4"	4"	1-1/2"	.060"	-	9	226.37	216.52	206.68	196.84
98770	.7500	3/4"	19.050	3/4"	4"	1-1/2"	.190"	-	9	226.37	216.52	206.68	196.84
98772	.7500	3/4"	19.050	3/4"	4"	1-1/2"	.250"	-	9	226.37	216.52	206.68	196.84
98778	.7500	3/4"	19.050	3/4"	4"	1-5/8"	.030"	-	9	226.37	216.52	206.68	196.84
98788	.7500	3/4"	19.050	3/4"	5"	2-1/8"	.010"	-	9	313.98	300.33	286.68	273.03
98794	.7500	3/4"	19.050	3/4"	5"	2-1/8"	.060"	-	9	313.98	300.33	286.68	273.03
98800	.7500	3/4"	19.050	3/4"	5"	2-1/8"	.250"	-	9	313.98	300.33	286.68	273.03
98802	.7500	3/4"	19.050	3/4"	6"	3-1/4"	.010"	-	9	372.96	356.74	340.53	324.31
98804	.7500	3/4"	19.050	3/4"	6"	3-1/4"	.020"	-	9	372.96	356.74	340.53	324.31
98806	.7500	3/4"	19.050	3/4"	6"	3-1/4"	.030"	-	9	372.96	356.74	340.53	324.31
98814	.7500	3/4"	19.050	3/4"	6"	3-1/4"	.250"	-	9	372.96	356.74	340.53	324.31
98816	.7500	3/4"	19.050	3/4"	6"	1"	.010"	4-1/8"	9	376.54	360.17	343.80	327.43
98820	.7500	3/4"	19.050	3/4"	6"	1"	.030"	4-1/8"	9	376.54	360.17	343.80	327.43
98830	.7874	20.000	20.0	100	26	0.50	-	-	9	308.06	294.67	281.27	267.88
98834	.7874	20.000	20.0	100	26	1.00	-	-	9	308.06	294.67	281.27	267.88
98864	.7874	20.000	20.0	100	38	6.00	-	-	9	308.06	294.67	281.27	267.88
98866	.7874	20.000	20.0	150	60	0.50	-	-	9	378.70	362.23	345.77	329.30
98876	.7874	20.000	20.0	150	60	3.00	-	-	9	378.70	362.23	345.77	329.30
98884	.7874	20.000	20.0	150	80	0.50	-	-	9	378.70	362.23	345.77	329.30

EDP#	$d1$ † Diameter		$d2$ Shank Diameter	$l1$ Overall Length	$l2$ Flute Length	r Corner Radius	$l3$ Reach Length	$d3$ Neck Diameter	Number Flutes	1-11	12-24	25-49	50-100	
	Decimal	Metric												
98920	1.000	1"	25.400	1"	4"	1-1/2"	.015"	-	-	11	356.72	341.21	325.70	310.19
98936	1.000	1"	25.400	1"	5"	2-1/4"	.030"	-	-	11	438.92	419.84	400.75	381.67
98942	1.000	1"	25.400	1"	5"	2-1/4"	.120"	-	-	11	438.92	419.84	400.75	381.67
98948	1.000	1"	25.400	1"	6"	3-1/4"	.030"	-	-	11	572.46	547.57	522.68	497.79
98950	1.000	1"	25.400	1"	6"	3-1/4"	.060"	-	-	11	572.46	547.57	522.68	497.79
98958	1.000	1"	25.400	1"	7"	4-1/4"	.030"	-	-	11	750.54	717.90	685.27	652.64



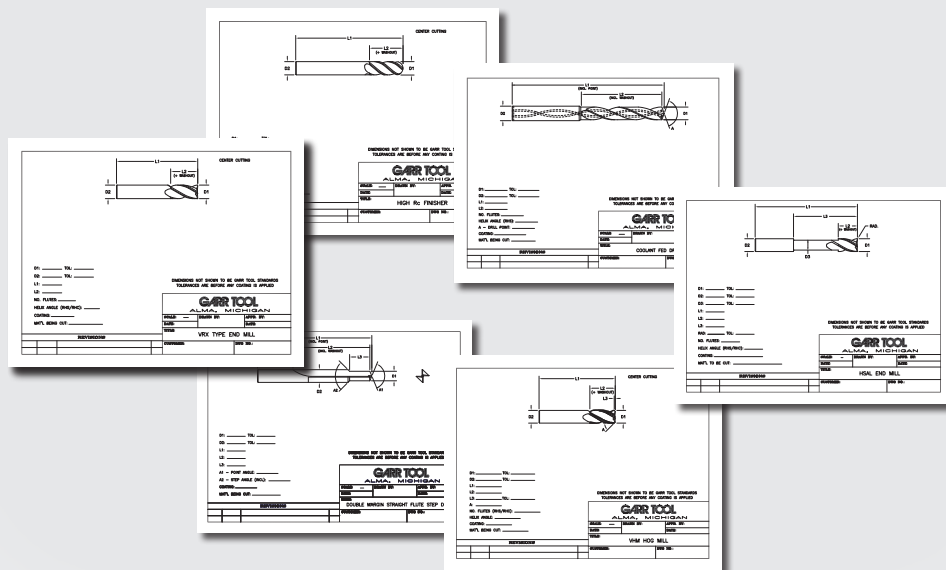
70

35

MATERIAL HARDNESS (Rc)

0

SPECIALS



Access an assortment of 'fill-in-the-blank' prints
from our website to aid in the quoting of custom tooling.

www.garrtool.com

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



TECH
PAGES
296-297

NEW
ITEMS

Series V4S, V4R, V4B

.1562" - .2188"
(3.967mm - 5.558mm)

Recommended for titanium, inconel, and stainless steel

Variable Helix End Mill

AlCrN Coating

Solid submicron grain carbide end mill - center cutting

Engineered for High Efficiency Milling

Helix geometry varies over length of flutes

Variable flute design helps with chip evacuation in slots and pockets

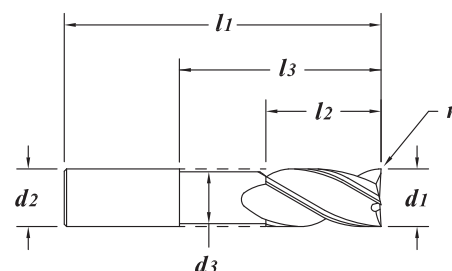
Variable rake aids in chip formation

PCT (Polish Carbide Treatment) enhances tool life

Minimizes burr on part

Smaller diameters can be modified with a flat within 48 hours

The combination of an extended flute length with a weldon flat may cause the flute washout to reach inside some end mill holders



HIGH PERFORMANCE
END MILLS

70

35

MATERIAL HARDNESS (Rc)

0

EDP#		$d1$ †			$d2$	$l1$	$l2$	r	$l3$	$d3$				
(plain)	(weldon)	Decimal	Diameter	Metric	Shank Diameter	Overall Length	Flute Length	Corner Radius	Reach Length	Neck Diameter	1-11	12-24	25-49	50-100
50171	-	.1562	5/32"	3.967	1/4"	2"	1/2"	-	-	-	23.64	22.62	21.59	20.56
50172	-	.1562	5/32"	3.967	1/4"	2"	1/2"	.010"	-	-	25.70	24.59	23.47	22.35
50173	-	.1562	5/32"	3.967	1/4"	2"	1/2"	.015"	-	-	25.70	24.59	23.47	22.35
50174	-	.1562	5/32"	3.967	1/4"	2"	1/2"	.020"	-	-	25.70	24.59	23.47	22.35
50175	-	.1562	5/32"	3.967	1/4"	2"	1/2"	.030"	-	-	25.70	24.59	23.47	22.35
50176	-	.1562	5/32"	3.967	1/4"	2"	1/2"	BALL	-	-	25.70	24.59	23.47	22.35
50177	-	.1575		4.000	6.0	50	12	-	-	-	26.32	25.18	24.03	22.89
50178	-	.1575		4.000	6.0	50	12	0.20	-	-	26.74	25.58	24.41	23.25
50179	-	.1575		4.000	6.0	50	12	0.30	-	-	26.74	25.58	24.41	23.25
50180	-	.1575		4.000	6.0	50	12	0.50	-	-	26.74	25.58	24.41	23.25
50181	-	.1575		4.000	6.0	50	12	BALL	-	-	26.74	25.58	24.41	23.25
50182	-	.1875	3/16"	4.763	1/4"	2"	1/2"	-	-	-	23.18	22.18	21.17	20.16
50183	-	.1875	3/16"	4.763	1/4"	2"	1/2"	.010"	-	-	25.20	24.10	23.01	21.91
50184	-	.1875	3/16"	4.763	1/4"	2"	1/2"	.015"	-	-	25.20	24.10	23.01	21.91
50185	-	.1875	3/16"	4.763	1/4"	2"	1/2"	.020"	-	-	25.20	24.10	23.01	21.91
50186	-	.1875	3/16"	4.763	1/4"	2"	1/2"	.030"	-	-	25.20	24.10	23.01	21.91
50187	-	.1875	3/16"	4.763	1/4"	2"	1/2"	BALL	-	-	25.20	24.10	23.01	21.91
50188	-	.1969		5.000	6.0	65	20	-	-	-	28.16	26.94	25.71	24.49
50189	-	.1969		5.000	6.0	65	20	0.20	-	-	29.03	27.76	26.50	25.24
50190	-	.1969		5.000	6.0	65	20	0.30	-	-	29.03	27.76	26.50	25.24
50191	-	.1969		5.000	6.0	65	20	0.50	-	-	29.03	27.76	26.50	25.24
50192	-	.1969		5.000	6.0	65	20	BALL	-	-	29.03	27.76	26.50	25.24
50193	-	.2188	7/32"	5.558	1/4"	2-1/2"	3/4"	-	-	-	25.61	24.50	23.38	22.27
NEW 50194	-	.2188	7/32"	5.558	1/4"	2-1/2"	3/4"	.010"	-	-	27.95	26.73	25.52	24.30
NEW 50195	-	.2188	7/32"	5.558	1/4"	2-1/2"	3/4"	.015"	-	-	27.95	26.73	25.52	24.30
NEW 50196	-	.2188	7/32"	5.558	1/4"	2-1/2"	3/4"	.020"	-	-	27.95	26.73	25.52	24.30
50197	-	.2188	7/32"	5.558	1/4"	2-1/2"	3/4"	.030"	-	-	27.95	26.73	25.52	24.30
50198	-	.2188	7/32"	5.558	1/4"	2-1/2"	3/4"	BALL	-	-	27.95	26.73	25.52	24.30

continued →

Series V4S, V4R, V4B (continued)

.2362" - .2500"
(6.000mm - 6.350mm)

EDP#		$d1$ † Diameter		$d2$ Shank Diameter	$l1$ Overall Length	$l2$ Flute Length	r Corner Radius	$l3$ Reach Length	$d3$ Neck Diameter	1-11	12-24	25-49	50-100
(plain)	(weldon)	Decimal	Metric										
50236	-	.2362	6.000	6.0	65	12	-	-	-	24.73	23.65	22.58	21.50
50199	-	.2362	6.000	6.0	65	12	0.30	-	-	28.11	26.88	25.66	24.44
50200	-	.2362	6.000	6.0	65	12	0.50	-	-	28.11	26.88	25.66	24.44
50201	-	.2362	6.000	6.0	65	12	0.75	-	-	28.11	26.88	25.66	24.44
50202	-	.2362	6.000	6.0	65	12	1.00	-	-	28.11	26.88	25.66	24.44
50203	-	.2362	6.000	6.0	65	12	1.50	-	-	28.11	26.88	25.66	24.44
50252	-	.2362	6.000	6.0	65	12	BALL	-	-	28.11	26.88	25.66	24.44
50237	-	.2362	6.000	6.0	65	19	-	-	-	24.73	23.65	22.58	21.50
50204	-	.2362	6.000	6.0	65	19	0.30	-	-	28.11	26.88	25.66	24.44
50205	-	.2362	6.000	6.0	65	19	0.50	-	-	28.11	26.88	25.66	24.44
50206	-	.2362	6.000	6.0	65	19	1.00	-	-	28.11	26.88	25.66	24.44
50253	-	.2362	6.000	6.0	65	19	BALL	-	-	28.11	26.88	25.66	24.44
50540	-	.2500 1/4"	6.350	1/4"	2"	3/8"	-	-	-	21.15	20.23	19.31	18.39
50489	-	.2500 1/4"	6.350	1/4"	2"	3/8"	.010"	-	-	24.40	23.34	22.28	21.22
50490	-	.2500 1/4"	6.350	1/4"	2"	3/8"	.015"	-	-	24.40	23.34	22.28	21.22
50491	-	.2500 1/4"	6.350	1/4"	2"	3/8"	.020"	-	-	24.40	23.34	22.28	21.22
50708	-	.2500 1/4"	6.350	1/4"	2"	3/8"	.030"	-	-	24.40	23.34	22.28	21.22
50709	-	.2500 1/4"	6.350	1/4"	2"	3/8"	.040"	-	-	24.40	23.34	22.28	21.22
50710	-	.2500 1/4"	6.350	1/4"	2"	3/8"	.060"	-	-	24.40	23.34	22.28	21.22
50711	-	.2500 1/4"	6.350	1/4"	2"	3/8"	.090"	-	-	24.40	23.34	22.28	21.22
50560	-	.2500 1/4"	6.350	1/4"	2"	3/8"	BALL	-	-	24.40	23.34	22.28	21.22
50645	-	.2500 1/4"	6.350	1/4"	2"	1/2"	-	-	-	21.15	20.23	19.31	18.39
50614	-	.2500 1/4"	6.350	1/4"	2"	1/2"	.010"	-	-	24.40	23.34	22.28	21.22
50616	-	.2500 1/4"	6.350	1/4"	2"	1/2"	.015"	-	-	24.40	23.34	22.28	21.22
50618	-	.2500 1/4"	6.350	1/4"	2"	1/2"	.020"	-	-	24.40	23.34	22.28	21.22
50712	-	.2500 1/4"	6.350	1/4"	2"	1/2"	.030"	-	-	24.40	23.34	22.28	21.22
50713	-	.2500 1/4"	6.350	1/4"	2"	1/2"	.040"	-	-	24.40	23.34	22.28	21.22
50714	-	.2500 1/4"	6.350	1/4"	2"	1/2"	.060"	-	-	24.40	23.34	22.28	21.22
50715	-	.2500 1/4"	6.350	1/4"	2"	1/2"	.090"	-	-	24.40	23.34	22.28	21.22
50238	-	.2500 1/4"	6.350	1/4"	2-1/2"	3/4"	-	-	-	23.86	22.83	21.79	20.75
50207	-	.2500 1/4"	6.350	1/4"	2-1/2"	3/4"	.010"	-	-	27.03	25.85	24.68	23.50
50208	-	.2500 1/4"	6.350	1/4"	2-1/2"	3/4"	.015"	-	-	27.03	25.85	24.68	23.50
50620	-	.2500 1/4"	6.350	1/4"	2-1/2"	3/4"	.020"	-	-	27.03	25.85	24.68	23.50
50209	-	.2500 1/4"	6.350	1/4"	2-1/2"	3/4"	.030"	-	-	27.03	25.85	24.68	23.50
50716	-	.2500 1/4"	6.350	1/4"	2-1/2"	3/4"	.040"	-	-	27.03	25.85	24.68	23.50
50210	-	.2500 1/4"	6.350	1/4"	2-1/2"	3/4"	.060"	-	-	27.03	25.85	24.68	23.50
50717	-	.2500 1/4"	6.350	1/4"	2-1/2"	3/4"	.090"	-	-	27.03	25.85	24.68	23.50
50254	-	.2500 1/4"	6.350	1/4"	2-1/2"	3/4"	BALL	-	-	27.03	25.85	24.68	23.50
50653	-	.2500 1/4"	6.350	1/4"	3"	1-1/8"	-	-	-	36.31	34.73	33.15	31.57
50493	-	.2500 1/4"	6.350	1/4"	3"	1-1/8"	.030"	-	-	40.03	38.29	36.55	34.81
50677	-	.2500 1/4"	6.350	1/4"	3"	1-1/8"	BALL	-	-	40.03	38.29	36.55	34.81

EDP#		$d1$ †		$d2$	$l1$	$l2$	r	$l3$	$d3$	1-11	12-24	25-49	50-100
		Decimal	Diameter										
(plain)	(weldon)			Shank Diameter	Overall Length	Flute Length	Corner Radius	Reach Length	Neck Diameter				
50654	-	.2500	1/4"	6.350	1/4"	4"	1-1/2"	-	-	39.07	37.37	35.67	33.97
50681	-	.2500	1/4"	6.350	1/4"	4"	1-1/2"	BALL	-	42.86	41.00	39.13	37.27
50655	-	.2500	1/4"	6.350	1/4"	4"	1-3/4"	-	-	39.07	37.37	35.67	33.97
50718	-	.2500	1/4"	6.350	1/4"	4"	1-3/4"	.020"	-	42.86	41.00	39.13	37.27
NEW 50682	-	.2500	1/4"	6.350	1/4"	4"	1-3/4"	BALL	-	42.86	41.00	39.13	37.27
50656	-	.2500	1/4"	6.350	1/4"	4"	2"	-	-	39.07	37.37	35.67	33.97
50683	-	.2500	1/4"	6.350	1/4"	4"	2"	BALL	-	42.86	41.00	39.13	37.27
50651	-	.2500	1/4"	6.350	1/4"	3"	3/8"	-	1-1/8"	.237"	45.77	43.78	41.79
50678	-	.2500	1/4"	6.350	1/4"	3"	3/8"	BALL	1-1/8"	.237"	49.54	47.39	45.23
50600	-	.2500	1/4"	6.350	1/4"	4"	3/8"	-	1-1/8"	.237"	48.73	46.61	44.49
50211	-	.2500	1/4"	6.350	1/4"	4"	3/8"	.015"	1-1/4"	.230"	52.37	50.09	47.82
50474	-	.2500	1/4"	6.350	1/4"	4"	3/8"	BALL	1-1/8"	.237"	52.37	50.09	47.82
50679	-	.2500	1/4"	6.350	1/4"	4"	3/8"	BALL	1-1/2"	.237"	52.37	50.09	47.82
50652	-	.2500	1/4"	6.350	1/4"	4"	3/8"	-	2"	.237"	48.73	46.61	44.49
50680	-	.2500	1/4"	6.350	1/4"	4"	3/8"	BALL	2"	.237"	52.37	50.09	47.82
50719	-	.2500	1/4"	6.350	1/4"	6"	3/8"	.010"	4"	.230"	65.94	63.07	60.21
50684	-	.2500	1/4"	6.350	1/4"	6"	3/8"	BALL	4"	.230"	65.94	63.07	60.21
50720	-	.3125	5/16"	7.937	5/16"	2"	3/8"	.030"	-	33.32	31.87	30.42	28.97
50541	-	.3125	5/16"	7.937	5/16"	2"	7/16"	-	-	29.21	27.94	26.67	25.40
50622	-	.3125	5/16"	7.937	5/16"	2"	7/16"	.010"	-	33.32	31.87	30.42	28.97
50624	-	.3125	5/16"	7.937	5/16"	2"	7/16"	.015"	-	33.32	31.87	30.42	28.97
50492	-	.3125	5/16"	7.937	5/16"	2"	7/16"	.020"	-	33.32	31.87	30.42	28.97
50721	-	.3125	5/16"	7.937	5/16"	2"	7/16"	.125"	-	33.32	31.87	30.42	28.97
50561	-	.3125	5/16"	7.937	5/16"	2"	7/16"	BALL	-	33.32	31.87	30.42	28.97
50239	-	.3125	5/16"	7.937	5/16"	2-1/2"	13/16"	-	-	34.02	32.54	31.06	29.58
50626	-	.3125	5/16"	7.937	5/16"	2-1/2"	13/16"	.010"	-	36.60	35.01	33.42	31.83
50628	-	.3125	5/16"	7.937	5/16"	2-1/2"	13/16"	.015"	-	36.60	35.01	33.42	31.83
50212	-	.3125	5/16"	7.937	5/16"	2-1/2"	13/16"	.020"	-	36.60	35.01	33.42	31.83
50213	-	.3125	5/16"	7.937	5/16"	2-1/2"	13/16"	.030"	-	36.60	35.01	33.42	31.83
50722	-	.3125	5/16"	7.937	5/16"	2-1/2"	13/16"	.060"	-	36.60	35.01	33.42	31.83
50723	-	.3125	5/16"	7.937	5/16"	2-1/2"	13/16"	.125"	-	36.60	35.01	33.42	31.83
50255	-	.3125	5/16"	7.937	5/16"	2-1/2"	13/16"	BALL	-	36.60	35.01	33.42	31.83
50657	-	.3125	5/16"	7.937	5/16"	3"	1-1/4"	-	-	46.43	44.41	42.39	40.37
50724	-	.3125	5/16"	7.937	5/16"	3"	1-1/4"	.015"	-	51.06	48.84	46.62	44.40
50725	-	.3125	5/16"	7.937	5/16"	3"	1-1/4"	.030"	-	51.06	48.84	46.62	44.40
50726	-	.3125	5/16"	7.937	5/16"	3"	1-1/4"	.060"	-	51.06	48.84	46.62	44.40
50685	-	.3125	5/16"	7.937	5/16"	3"	1-1/4"	BALL	-	51.06	48.84	46.62	44.40
50658	-	.3125	5/16"	7.937	5/16"	3"	7/16"	-	1-1/2"	.295"	57.55	55.04	52.54
50686	-	.3125	5/16"	7.937	5/16"	3"	7/16"	BALL	1-1/2"	.295"	62.18	59.48	56.77
50602	-	.3150		8.000	8.0	50	12	-	-	30.27	28.95	27.64	26.32
50630	-	.3150		8.000	8.0	50	12	0.50	-	34.56	33.06	31.55	30.05
50240	-	.3150		8.000	8.0	65	22	-	-	35.25	33.72	32.18	30.65
50214	-	.3150		8.000	8.0	65	22	0.50	-	37.98	36.33	34.68	33.03
50356	-	.3150		8.000	8.0	65	22	0.75	-	37.98	36.33	34.68	33.03
50215	-	.3150		8.000	8.0	65	22	1.00	-	37.98	36.33	34.68	33.03
50727	-	.3150		8.000	8.0	65	22	1.20	-	37.98	36.33	34.68	33.03
50357	-	.3150		8.000	8.0	65	22	1.50	-	37.98	36.33	34.68	33.03
50358	-	.3150		8.000	8.0	65	22	2.00	-	37.98	36.33	34.68	33.03
50728	-	.3150		8.000	8.0	65	22	3.00	-	37.98	36.33	34.68	33.03
50256	-	.3150		8.000	8.0	65	22	BALL	-	37.98	36.33	34.68	33.03

70

35

MATERIAL HARDNESS (Rc)

0

continued →

Series V4S, V4R, V4B (continued)

.3150" - .3937"
(8.000mm - 10.000mm)

EDP#		$d1$ † Diameter		$d2$ Shank Diameter	$l1$ Overall Length	$l2$ Flute Length	r Corner Radius	$l3$ Reach Length	$d3$ Neck Diameter	1-11	12-24	25-49	50-100
		Decimal	Metric										
50659	-	.3150	8.000	8.0	75	32	-	-	-	48.36	46.26	44.15	42.05
50687	-	.3150	8.000	8.0	75	32	BALL	-	-	53.23	50.92	48.60	46.29
50660	-	.3150	8.000	8.0	100	12	-	50	7.50	66.56	63.67	60.77	57.88
50688	-	.3150	8.000	8.0	100	12	BALL	50	7.50	71.93	68.81	65.68	62.55
50542	-	.3750	3/8"	9.525	3/8"	2"	1/2"	-	-	34.45	32.96	31.46	29.96
50632	-	.3750	3/8"	9.525	3/8"	2"	1/2"	.010"	-	39.34	37.63	35.92	34.21
50729	-	.3750	3/8"	9.525	3/8"	2"	1/2"	.015"	-	39.34	37.63	35.92	34.21
50494	-	.3750	3/8"	9.525	3/8"	2"	1/2"	.020"	-	39.34	37.63	35.92	34.21
50634	-	.3750	3/8"	9.525	3/8"	2"	1/2"	.030"	-	39.34	37.63	35.92	34.21
50730	-	.3750	3/8"	9.525	3/8"	2"	1/2"	.060"	-	39.34	37.63	35.92	34.21
50732	-	.3750	3/8"	9.525	3/8"	2"	1/2"	.090"	-	39.34	37.63	35.92	34.21
50733	-	.3750	3/8"	9.525	3/8"	2"	1/2"	.120"	-	39.34	37.63	35.92	34.21
50734	-	.3750	3/8"	9.525	3/8"	2"	1/2"	.125"	-	39.34	37.63	35.92	34.21
50562	-	.3750	3/8"	9.525	3/8"	2"	1/2"	BALL	-	39.34	37.63	35.92	34.21
50241	-	.3750	3/8"	9.525	3/8"	2-1/2"	1"	-	-	40.15	38.40	36.66	34.91
50216	-	.3750	3/8"	9.525	3/8"	2-1/2"	1"	.010"	-	42.76	40.90	39.04	37.18
50735	-	.3750	3/8"	9.525	3/8"	2-1/2"	1"	.015"	-	42.76	40.90	39.04	37.18
50217	-	.3750	3/8"	9.525	3/8"	2-1/2"	1"	.020"	-	42.76	40.90	39.04	37.18
50218	-	.3750	3/8"	9.525	3/8"	2-1/2"	1"	.030"	-	42.76	40.90	39.04	37.18
50736	-	.3750	3/8"	9.525	3/8"	2-1/2"	1"	.040"	-	42.76	40.90	39.04	37.18
50219	-	.3750	3/8"	9.525	3/8"	2-1/2"	1"	.060"	-	42.76	40.90	39.04	37.18
50636	-	.3750	3/8"	9.525	3/8"	2-1/2"	1"	.090"	-	42.76	40.90	39.04	37.18
50737	-	.3750	3/8"	9.525	3/8"	2-1/2"	1"	.120"	-	42.76	40.90	39.04	37.18
50738	-	.3750	3/8"	9.525	3/8"	2-1/2"	1"	.125"	-	42.76	40.90	39.04	37.18
50257	-	.3750	3/8"	9.525	3/8"	2-1/2"	1"	BALL	-	42.76	40.90	39.04	37.18
50661	-	.3750	3/8"	9.525	3/8"	3"	1-1/4"	-	-	51.21	48.98	46.76	44.53
50739	-	.3750	3/8"	9.525	3/8"	3"	1-1/4"	.015"	-	56.28	53.83	51.39	48.94
50637	-	.3750	3/8"	9.525	3/8"	3"	1-1/4"	.030"	-	56.28	53.83	51.39	48.94
50740	-	.3750	3/8"	9.525	3/8"	3"	1-1/4"	.060"	-	56.28	53.83	51.39	48.94
50689	-	.3750	3/8"	9.525	3/8"	3"	1-1/4"	BALL	-	56.28	53.83	51.39	48.94
50662	-	.3750	3/8"	9.525	3/8"	4"	1-1/2"	-	-	57.87	55.35	52.84	50.32
50741	-	.3750	3/8"	9.525	3/8"	4"	1-1/2"	.015"	-	63.33	60.58	57.82	55.07
50742	-	.3750	3/8"	9.525	3/8"	4"	1-1/2"	.030"	-	63.33	60.58	57.82	55.07
50743	-	.3750	3/8"	9.525	3/8"	4"	1-1/2"	.060"	-	63.33	60.58	57.82	55.07
50744	-	.3750	3/8"	9.525	3/8"	4"	1-1/2"	.120"	-	63.33	60.58	57.82	55.07
50690	-	.3750	3/8"	9.525	3/8"	4"	1-1/2"	BALL	-	63.33	60.58	57.82	55.07
50745	-	.3750	3/8"	9.525	3/8"	6"	2-1/2"	.060	-	87.69	83.88	80.06	76.25
50604	-	.3750	3/8"	9.525	3/8"	4"	1/2"	-	1-1/8"	.355"	70.27	67.21	64.16
50220	-	.3750	3/8"	9.525	3/8"	4"	1/2"	.020"	1-7/8"	.350"	75.58	72.29	69.01
50476	-	.3750	3/8"	9.525	3/8"	4"	1/2"	BALL	1-1/8"	.355"	75.58	72.29	69.01
50606	-	.3937	10.000	10.0	50	14	-	-	-	44.25	42.33	40.40	38.48
50638	-	.3937	10.000	10.0	50	14	0.50	-	-	47.48	45.42	43.35	41.29
50242	-	.3937	10.000	10.0	70	22	-	-	-	48.13	46.04	43.94	41.85
50746	-	.3937	10.000	10.0	70	22	0.25	-	-	51.64	49.39	47.15	44.90
50221	-	.3937	10.000	10.0	70	22	0.50	-	-	51.64	49.39	47.15	44.90
50359	-	.3937	10.000	10.0	70	22	0.75	-	-	51.64	49.39	47.15	44.90
50360	-	.3937	10.000	10.0	70	22	1.00	-	-	51.64	49.39	47.15	44.90
50361	-	.3937	10.000	10.0	70	22	1.50	-	-	51.64	49.39	47.15	44.90
50362	-	.3937	10.000	10.0	70	22	2.00	-	-	51.64	49.39	47.15	44.90
50747	-	.3937	10.000	10.0	70	22	3.00	-	-	51.64	49.39	47.15	44.90
50258	-	.3937	10.000	10.0	70	22	BALL	-	-	51.64	49.39	47.15	44.90
50608	-	.3937	10.000	10.0	70	26	-	-	-	48.13	46.04	43.94	41.85
NEW 50748	-	.3937	10.000	10.0	70	26	1.50	-	-	51.64	49.39	47.15	44.90
50663	-	.3937	10.000	10.0	70	30	-	-	-	48.13	46.04	43.94	41.85
50691	-	.3937	10.000	10.0	70	30	BALL	-	-	51.64	49.39	47.15	44.90

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
(plain)	(weldon)	Decimal	Metric										
50749	-	.3937	10.000	10.0	70	22	0.50	30	9.40	62.76	60.03	57.30	54.57
50750	-	.3937	10.000	10.0	100	12	0.30	50	9.40	91.31	87.34	83.37	79.40
50692	-	.3937	10.000	10.0	100	14	BALL	50	9.40	91.31	87.34	83.37	79.40
50450	50449	.4724	12.000	12.0	75	26	-	-	-	62.54	59.82	57.10	54.38
50363	50369	.4724	12.000	12.0	75	26	0.30	-	-	76.05	72.74	69.44	66.13
50364	50370	.4724	12.000	12.0	75	26	0.50	-	-	76.05	72.74	69.44	66.13
50365	50366	.4724	12.000	12.0	75	26	0.75	-	-	76.05	72.74	69.44	66.13
50367	50371	.4724	12.000	12.0	75	26	1.00	-	-	76.05	72.74	69.44	66.13
50372	50373	.4724	12.000	12.0	75	26	1.50	-	-	76.05	72.74	69.44	66.13
50374	50375	.4724	12.000	12.0	75	26	2.00	-	-	76.05	72.74	69.44	66.13
50470	-	.4724	12.000	12.0	75	26	BALL	-	-	76.05	72.74	69.44	66.13
50243	50283	.4724	12.000	12.0	75	32	-	-	-	62.54	59.82	57.10	54.38
50222	50270	.4724	12.000	12.0	75	32	0.50	-	-	76.05	72.74	69.44	66.13
50223	50271	.4724	12.000	12.0	75	32	1.00	-	-	76.05	72.74	69.44	66.13
50259	50291	.4724	12.000	12.0	75	32	BALL	-	-	76.05	72.74	69.44	66.13
50664	-	.4724	12.000	12.0	88	36	-	-	-	80.49	76.99	73.49	69.99
50751	-	.4724	12.000	12.0	88	36	0.30	-	-	85.46	81.74	78.03	74.31
50752	-	.4724	12.000	12.0	88	36	0.50	-	-	85.46	81.74	78.03	74.31
50753	-	.4724	12.000	12.0	88	36	1.00	-	-	85.46	81.74	78.03	74.31
50754	-	.4724	12.000	12.0	88	36	1.50	-	-	85.46	81.74	78.03	74.31
50755	-	.4724	12.000	12.0	88	36	3.00	-	-	85.46	81.74	78.03	74.31
50693	-	.4724	12.000	12.0	88	36	BALL	-	-	85.46	81.74	78.03	74.31
50564	-	.4724	12.000	12.0	100	42	-	-	-	83.58	79.95	76.31	72.68
50566	-	.4724	12.000	12.0	100	42	0.30	-	-	88.50	84.66	80.81	76.96
50568	-	.4724	12.000	12.0	100	42	0.50	-	-	88.50	84.66	80.81	76.96
50570	-	.4724	12.000	12.0	100	42	1.00	-	-	88.50	84.66	80.81	76.96
50572	-	.4724	12.000	12.0	100	42	2.00	-	-	88.50	84.66	80.81	76.96
50574	-	.4724	12.000	12.0	100	42	3.00	-	-	88.50	84.66	80.81	76.96
50576	-	.4724	12.000	12.0	100	42	BALL	-	-	88.50	84.66	80.81	76.96
50665	-	.4724	12.000	12.0	100	48	-	-	-	83.58	79.95	76.31	72.68
50756	-	.4724	12.000	12.0	100	48	0.30	-	-	88.50	84.66	80.81	76.96
50757	-	.4724	12.000	12.0	100	48	0.50	-	-	88.50	84.66	80.81	76.96
NEW 50758	-	.4724	12.000	12.0	100	48	1.00	-	-	88.50	84.66	80.81	76.96
NEW 50759	-	.4724	12.000	12.0	100	48	1.50	-	-	88.50	84.66	80.81	76.96
NEW 50760	-	.4724	12.000	12.0	100	48	3.00	-	-	88.50	84.66	80.81	76.96
50761	-	.4724	12.000	12.0	100	48	4.00	-	-	88.50	84.66	80.81	76.96
50694	-	.4724	12.000	12.0	100	48	BALL	-	-	88.50	84.66	80.81	76.96
50695	-	.4724	12.000	12.0	100	14	BALL	50	11.40	100.73	96.35	91.97	87.59
50543	-	.5000	12.700	1/2"	2-1/2"	5/8"	-	-	-	56.33	53.88	51.43	48.98
50640	-	.5000	12.700	1/2"	2-1/2"	5/8"	.010"	-	-	65.35	62.51	59.67	56.83
50762	-	.5000	12.700	1/2"	2-1/2"	5/8"	.015"	-	-	65.35	62.51	59.67	56.83
50496	50497	.5000	12.700	1/2"	2-1/2"	5/8"	.020"	-	-	65.35	62.51	59.67	56.83
50642	-	.5000	12.700	1/2"	2-1/2"	5/8"	.030"	-	-	65.35	62.51	59.67	56.83
50763	-	.5000	12.700	1/2"	2-1/2"	5/8"	.060"	-	-	65.35	62.51	59.67	56.83
50764	-	.5000	12.700	1/2"	2-1/2"	5/8"	.090"	-	-	65.35	62.51	59.67	56.83
50765	-	.5000	12.700	1/2"	2-1/2"	5/8"	.120"	-	-	65.35	62.51	59.67	56.83
50644	-	.5000	12.700	1/2"	2-1/2"	5/8"	.125"	-	-	65.35	62.51	59.67	56.83
50766	-	.5000	12.700	1/2"	2-1/2"	5/8"	.156"	-	-	65.35	62.51	59.67	56.83
50767	-	.5000	12.700	1/2"	2-1/2"	5/8"	.190"	-	-	65.35	62.51	59.67	56.83
50563	-	.5000	12.700	1/2"	2-1/2"	5/8"	BALL	-	-	65.35	62.51	59.67	56.83

70

35

MATERIAL HARDNESS (Rc)

0

continued →

Series V4S, V4R, V4B (continued)

.5000"
(12.700mm)

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
(plain)	(weldon)	Decimal		Metric										
50452	50453	.5000	1/2"	12.700	1/2"	3"	1"	-	-	-	60.04	57.43	54.82	52.21
50379	50380	.5000	1/2"	12.700	1/2"	3"	1"	.010"	-	-	72.94	69.77	66.60	63.43
50768	-	.5000	1/2"	12.700	1/2"	3"	1"	.015"	-	-	72.94	69.77	66.60	63.43
50381	50382	.5000	1/2"	12.700	1/2"	3"	1"	.020"	-	-	72.94	69.77	66.60	63.43
50383	50384	.5000	1/2"	12.700	1/2"	3"	1"	.030"	-	-	72.94	69.77	66.60	63.43
50385	50386	.5000	1/2"	12.700	1/2"	3"	1"	.060"	-	-	72.94	69.77	66.60	63.43
50769	-	.5000	1/2"	12.700	1/2"	3"	1"	.090"	-	-	72.94	69.77	66.60	63.43
50770	-	.5000	1/2"	12.700	1/2"	3"	1"	.120"	-	-	72.94	69.77	66.60	63.43
50771	-	.5000	1/2"	12.700	1/2"	3"	1"	.125"	-	-	72.94	69.77	66.60	63.43
50772	-	.5000	1/2"	12.700	1/2"	3"	1"	.190"	-	-	72.94	69.77	66.60	63.43
50472	50473	.5000	1/2"	12.700	1/2"	3"	1"	BALL	-	-	72.94	69.77	66.60	63.43
50244	50284	.5000	1/2"	12.700	1/2"	3"	1-1/4"	-	-	-	60.04	57.43	54.82	52.21
50224	50272	.5000	1/2"	12.700	1/2"	3"	1-1/4"	.010"	-	-	72.94	69.77	66.60	63.43
50773	-	.5000	1/2"	12.700	1/2"	3"	1-1/4"	.015"	-	-	72.94	69.77	66.60	63.43
50225	50273	.5000	1/2"	12.700	1/2"	3"	1-1/4"	.020"	-	-	72.94	69.77	66.60	63.43
50226	50274	.5000	1/2"	12.700	1/2"	3"	1-1/4"	.030"	-	-	72.94	69.77	66.60	63.43
50227	50275	.5000	1/2"	12.700	1/2"	3"	1-1/4"	.060"	-	-	72.94	69.77	66.60	63.43
50774	-	.5000	1/2"	12.700	1/2"	3"	1-1/4"	.090"	-	-	72.94	69.77	66.60	63.43
50775	-	.5000	1/2"	12.700	1/2"	3"	1-1/4"	.120"	-	-	72.94	69.77	66.60	63.43
50776	-	.5000	1/2"	12.700	1/2"	3"	1-1/4"	.125"	-	-	72.94	69.77	66.60	63.43
50777	-	.5000	1/2"	12.700	1/2"	3"	1-1/4"	.156"	-	-	72.94	69.77	66.60	63.43
50778	-	.5000	1/2"	12.700	1/2"	3"	1-1/4"	.190"	-	-	72.94	69.77	66.60	63.43
50260	50292	.5000	1/2"	12.700	1/2"	3"	1-1/4"	BALL	-	-	72.94	69.77	66.60	63.43
50666	-	.5000	1/2"	12.700	1/2"	3-1/2"	1-1/2"	-	-	-	78.14	74.75	71.35	67.95
50779	-	.5000	1/2"	12.700	1/2"	3-1/2"	1-1/2"	.010"	-	-	83.15	79.53	75.92	72.30
50780	-	.5000	1/2"	12.700	1/2"	3-1/2"	1-1/2"	.015"	-	-	83.15	79.53	75.92	72.30
50781	-	.5000	1/2"	12.700	1/2"	3-1/2"	1-1/2"	.020"	-	-	83.15	79.53	75.92	72.30
50782	-	.5000	1/2"	12.700	1/2"	3-1/2"	1-1/2"	.030"	-	-	83.15	79.53	75.92	72.30
50783	-	.5000	1/2"	12.700	1/2"	3-1/2"	1-1/2"	.060"	-	-	83.15	79.53	75.92	72.30
50784	-	.5000	1/2"	12.700	1/2"	3-1/2"	1-1/2"	.090"	-	-	83.15	79.53	75.92	72.30
50785	-	.5000	1/2"	12.700	1/2"	3-1/2"	1-1/2"	.120"	-	-	83.15	79.53	75.92	72.30
50696	-	.5000	1/2"	12.700	1/2"	3-1/2"	1-1/2"	BALL	-	-	83.15	79.53	75.92	72.30
50578	50579	.5000	1/2"	12.700	1/2"	4"	1-5/8"	-	-	-	81.24	77.70	74.17	70.64
50580	50581	.5000	1/2"	12.700	1/2"	4"	1-5/8"	.010"	-	-	86.22	82.47	78.72	74.97
50582	50583	.5000	1/2"	12.700	1/2"	4"	1-5/8"	.020"	-	-	86.22	82.47	78.72	74.97
50584	50585	.5000	1/2"	12.700	1/2"	4"	1-5/8"	.030"	-	-	86.22	82.47	78.72	74.97
50586	50587	.5000	1/2"	12.700	1/2"	4"	1-5/8"	.040"	-	-	86.22	82.47	78.72	74.97
50588	50589	.5000	1/2"	12.700	1/2"	4"	1-5/8"	.060"	-	-	86.22	82.47	78.72	74.97
50590	50591	.5000	1/2"	12.700	1/2"	4"	1-5/8"	.120"	-	-	86.22	82.47	78.72	74.97
50592	50593	.5000	1/2"	12.700	1/2"	4"	1-5/8"	BALL	-	-	86.22	82.47	78.72	74.97
50646	-	.5000	1/2"	12.700	1/2"	4"	1-3/4"	-	-	-	81.24	77.70	74.17	70.64
50647	-	.5000	1/2"	12.700	1/2"	4"	2"	-	-	-	81.24	77.70	74.17	70.64
50245	50285	.5000	1/2"	12.700	1/2"	4"	2-1/8"	-	-	-	81.24	77.70	74.17	70.64
50786	-	.5000	1/2"	12.700	1/2"	4"	2-1/8"	.010"	-	-	86.22	82.47	78.72	74.97
50787	-	.5000	1/2"	12.700	1/2"	4"	2-1/8"	.015"	-	-	86.22	82.47	78.72	74.97
50788	-	.5000	1/2"	12.700	1/2"	4"	2-1/8"	.020"	-	-	86.22	82.47	78.72	74.97
50789	-	.5000	1/2"	12.700	1/2"	4"	2-1/8"	.030"	-	-	86.22	82.47	78.72	74.97
50790	-	.5000	1/2"	12.700	1/2"	4"	2-1/8"	.060"	-	-	86.22	82.47	78.72	74.97
50791	-	.5000	1/2"	12.700	1/2"	4"	2-1/8"	.090"	-	-	86.22	82.47	78.72	74.97
50792	-	.5000	1/2"	12.700	1/2"	4"	2-1/8"	.120"	-	-	86.22	82.47	78.72	74.97
50793	-	.5000	1/2"	12.700	1/2"	4"	2-1/8"	.125"	-	-	86.22	82.47	78.72	74.97
50794	-	.5000	1/2"	12.700	1/2"	4"	2-1/8"	.190"	-	-	86.22	82.47	78.72	74.97
50261	50293	.5000	1/2"	12.700	1/2"	4"	2-1/8"	BALL	-	-	86.22	82.47	78.72	74.97

EDP#		$d1$ †			$d2$	$l1$	$l2$	r	$l3$	$d3$	1-11	12-24	25-49	50-100
(plain)	(weldon)	Decimal	Diameter	Metric	Shank Diameter	Overall Length	Flute Length	Corner Radius	Reach Length	Neck Diameter				
50668	-	.5000	1/2"	12.700	1/2"	6"	3"	-	-	-	116.92	111.84	106.75	101.67
50795	-	.5000	1/2"	12.700	1/2"	6"	3"	.020"	-	-	121.92	116.62	111.32	106.02
50796	-	.5000	1/2"	12.700	1/2"	6"	3"	.030"	-	-	121.92	116.62	111.32	106.02
50797	-	.5000	1/2"	12.700	1/2"	6"	3"	.060"	-	-	121.92	116.62	111.32	106.02
50798	-	.5000	1/2"	12.700	1/2"	6"	3"	.120"	-	-	121.92	116.62	111.32	106.02
50799	-	.5000	1/2"	12.700	1/2"	6"	3"	.190"	-	-	121.92	116.62	111.32	106.02
50699	-	.5000	1/2"	12.700	1/2"	6"	3"	BALL	-	-	121.92	116.62	111.32	106.02
50610	-	.5000	1/2"	12.700	1/2"	4"	5/8"	-	2-1/4"	.475"	93.38	89.32	85.26	81.20
50228	-	.5000	1/2"	12.700	1/2"	4"	5/8"	.020"	2-1/4"	.470"	98.42	94.14	89.86	85.58
50900	-	.5000	1/2"	12.700	1/2"	4"	5/8"	.030"	2-1/4"	.470"	98.42	94.14	89.86	85.58
50901	-	.5000	1/2"	12.700	1/2"	4"	5/8"	.060"	2-1/4"	.470"	98.42	94.14	89.86	85.58
50902	-	.5000	1/2"	12.700	1/2"	4"	5/8"	.120"	2-1/4"	.470"	98.42	94.14	89.86	85.58
50478	-	.5000	1/2"	12.700	1/2"	4"	5/8"	BALL	2-1/4"	.475"	98.42	94.14	89.86	85.58
50667	-	.5000	1/2"	12.700	1/2"	6"	5/8"	-	3-1/8"	.475"	129.16	123.54	117.93	112.31
50235	-	.5000	1/2"	12.700	1/2"	6"	5/8"	-	4-1/8"	.475"	129.16	123.54	117.93	112.31
50594	-	.5000	1/2"	12.700	1/2"	6"	5/8"	.020"	4-1/8"	.470"	134.15	128.32	122.48	116.65
50596	-	.5000	1/2"	12.700	1/2"	6"	5/8"	.030"	4-1/8"	.470"	134.15	128.32	122.48	116.65
NEW 50697	-	.5000	1/2"	12.700	1/2"	6"	5/8"	BALL	3-1/8"	.475"	134.15	128.32	122.48	116.65
50598	-	.5000	1/2"	12.700	1/2"	6"	5/8"	BALL	4-1/8"	.475"	134.15	128.32	122.48	116.65
50698	-	.5000	1/2"	12.700	1/2"	6"	1"	BALL	4-1/2"	.475"	134.15	128.32	122.48	116.65
50545	50546	.6250	5/8"	15.875	5/8"	3"	3/4"	-	-	-	104.75	100.20	95.64	91.09
50903	-	.6250	5/8"	15.875	5/8"	3"	3/4"	.010"	-	-	113.00	108.09	103.17	98.26
50904	-	.6250	5/8"	15.875	5/8"	3"	3/4"	.015"	-	-	113.00	108.09	103.17	98.26
50498	50499	.6250	5/8"	15.875	5/8"	3"	3/4"	.020"	-	-	113.00	108.09	103.17	98.26
50500	50501	.6250	5/8"	15.875	5/8"	3"	3/4"	.030"	-	-	113.00	108.09	103.17	98.26
50502	50503	.6250	5/8"	15.875	5/8"	3"	3/4"	.060"	-	-	113.00	108.09	103.17	98.26
NEW 50905	-	.6250	5/8"	15.875	5/8"	3"	3/4"	.090"	-	-	113.00	108.09	103.17	98.26
50906	-	.6250	5/8"	15.875	5/8"	3"	3/4"	.120"	-	-	113.00	108.09	103.17	98.26
50907	-	.6250	5/8"	15.875	5/8"	3"	3/4"	.125"	-	-	113.00	108.09	103.17	98.26
NEW 50908	-	.6250	5/8"	15.875	5/8"	3"	3/4"	.156"	-	-	113.00	108.09	103.17	98.26
50909	-	.6250	5/8"	15.875	5/8"	3"	3/4"	.190"	-	-	113.00	108.09	103.17	98.26
NEW 50910	-	.6250	5/8"	15.875	5/8"	3"	3/4"	.250"	-	-	113.00	108.09	103.17	98.26
50246	50286	.6250	5/8"	15.875	5/8"	3-1/2"	1-1/4"	-	-	-	110.77	105.95	101.14	96.32
50911	-	.6250	5/8"	15.875	5/8"	3-1/2"	1-1/4"	.010"	-	-	116.13	111.08	106.03	100.98
50912	-	.6250	5/8"	15.875	5/8"	3-1/2"	1-1/4"	.015"	-	-	116.13	111.08	106.03	100.98
50229	50277	.6250	5/8"	15.875	5/8"	3-1/2"	1-1/4"	.020"	-	-	116.13	111.08	106.03	100.98
50534	50535	.6250	5/8"	15.875	5/8"	3-1/2"	1-1/4"	.030"	-	-	116.13	111.08	106.03	100.98
50536	50537	.6250	5/8"	15.875	5/8"	3-1/2"	1-1/4"	.040"	-	-	116.13	111.08	106.03	100.98
50538	50539	.6250	5/8"	15.875	5/8"	3-1/2"	1-1/4"	.060"	-	-	116.13	111.08	106.03	100.98
NEW 50913	-	.6250	5/8"	15.875	5/8"	3-1/2"	1-1/4"	.090"	-	-	116.13	111.08	106.03	100.98
50230	50278	.6250	5/8"	15.875	5/8"	3-1/2"	1-1/4"	.120"	-	-	116.13	111.08	106.03	100.98
50914	-	.6250	5/8"	15.875	5/8"	3-1/2"	1-1/4"	.125"	-	-	116.13	111.08	106.03	100.98
NEW 50915	-	.6250	5/8"	15.875	5/8"	3-1/2"	1-1/4"	.156"	-	-	116.13	111.08	106.03	100.98
50916	-	.6250	5/8"	15.875	5/8"	3-1/2"	1-1/4"	.190"	-	-	116.13	111.08	106.03	100.98
50917	-	.6250	5/8"	15.875	5/8"	3-1/2"	1-1/4"	.250"	-	-	116.13	111.08	106.03	100.98
50262	50294	.6250	5/8"	15.875	5/8"	3-1/2"	1-1/4"	BALL	-	-	116.13	111.08	106.03	100.98

70

35

MATERIAL HARDNESS (Rc)

0

continued →

Series V4S, V4R, V4B (continued)

.6250" - .6299"
(15.875mm - 16.000mm)

EDP#		$d1$ † Diameter			$d2$ Shank Diameter	$l1$ Overall Length	$l2$ Flute Length	r Corner Radius	$l3$ Reach Length	$d3$ Neck Diameter	1-11	12-24	25-49	50-100
		Decimal		Metric										
	(plain)	(weldon)												
50669	-	-	.6250	5/8"	15.875	5/8"	4"	1-1/2"	-	-	118.30	113.16	108.01	102.87
50918	-	-	.6250	5/8"	15.875	5/8"	4"	1-1/2"	.010"	-	126.25	120.76	115.27	109.78
50919	-	-	.6250	5/8"	15.875	5/8"	4"	1-1/2"	.015"	-	126.25	120.76	115.27	109.78
NEW 50920	-	-	.6250	5/8"	15.875	5/8"	4"	1-1/2"	.020"	-	126.25	120.76	115.27	109.78
50921	-	-	.6250	5/8"	15.875	5/8"	4"	1-1/2"	.030"	-	126.25	120.76	115.27	109.78
50922	-	-	.6250	5/8"	15.875	5/8"	4"	1-1/2"	.060"	-	126.25	120.76	115.27	109.78
NEW 50923	-	-	.6250	5/8"	15.875	5/8"	4"	1-1/2"	.090"	-	126.25	120.76	115.27	109.78
50924	-	-	.6250	5/8"	15.875	5/8"	4"	1-1/2"	.120"	-	126.25	120.76	115.27	109.78
NEW 50925	-	-	.6250	5/8"	15.875	5/8"	4"	1-1/2"	.125"	-	126.25	120.76	115.27	109.78
NEW 50926	-	-	.6250	5/8"	15.875	5/8"	4"	1-1/2"	.156"	-	126.25	120.76	115.27	109.78
70 50927	-	-	.6250	5/8"	15.875	5/8"	4"	1-1/2"	.190"	-	126.25	120.76	115.27	109.78
50928	-	-	.6250	5/8"	15.875	5/8"	4"	1-1/2"	.250"	-	126.25	120.76	115.27	109.78
50700	-	-	.6250	5/8"	15.875	5/8"	4"	1-1/2"	BALL	-	126.25	120.76	115.27	109.78
50612	-	-	.6250	5/8"	15.875	5/8"	4"	1-5/8"	-	-	118.30	113.16	108.01	102.87
50670	-	-	.6250	5/8"	15.875	5/8"	4"	1-3/4"	-	-	118.30	113.16	108.01	102.87
50701	-	-	.6250	5/8"	15.875	5/8"	4"	1-3/4"	BALL	-	126.25	120.76	115.27	109.78
50547	-	-	.6299		16.000	16.0	75	19	-	-	109.53	104.76	100.00	95.24
50504	-	-	.6299		16.000	16.0	75	19	0.50	-	117.97	112.84	107.71	102.58
50506	-	-	.6299		16.000	16.0	75	19	1.00	-	117.97	112.84	107.71	102.58
50508	-	-	.6299		16.000	16.0	75	19	3.00	-	117.97	112.84	107.71	102.58
NEW 50929	-	-	.6299		16.000	16.0	75	19	4.00	-	117.97	112.84	107.71	102.58
NEW 50930	-	-	.6299		16.000	16.0	75	19	5.00	-	117.97	112.84	107.71	102.58
NEW 50931	-	-	.6299		16.000	16.0	75	19	6.00	-	117.97	112.84	107.71	102.58
50247	50287		.6299		16.000	16.0	88	32	-	-	115.58	110.55	105.53	100.50
50231	50279		.6299		16.000	16.0	88	32	0.50	-	121.20	115.93	110.66	105.39
50409	50410		.6299		16.000	16.0	88	32	0.75	-	121.20	115.93	110.66	105.39
50411	50412		.6299		16.000	16.0	88	32	1.00	-	121.20	115.93	110.66	105.39
50413	50414		.6299		16.000	16.0	88	32	1.50	-	121.20	115.93	110.66	105.39
50415	50416		.6299		16.000	16.0	88	32	2.00	-	121.20	115.93	110.66	105.39
50932	-		.6299		16.000	16.0	88	32	2.50	-	121.20	115.93	110.66	105.39
50417	50418		.6299		16.000	16.0	88	32	3.00	-	121.20	115.93	110.66	105.39
35 50933	-		.6299		16.000	16.0	88	32	4.00	-	121.20	115.93	110.66	105.39
50934	-		.6299		16.000	16.0	88	32	5.00	-	121.20	115.93	110.66	105.39
NEW 50935	-		.6299		16.000	16.0	88	32	6.00	-	121.20	115.93	110.66	105.39
50263	50295		.6299		16.000	16.0	88	32	BALL	-	121.20	115.93	110.66	105.39
50671	-		.6299		16.000	16.0	100	48	-	-	122.87	117.52	112.18	106.84
50936	-		.6299		16.000	16.0	100	48	0.50	-	128.87	123.27	117.66	112.06
50937	-		.6299		16.000	16.0	100	48	1.00	-	128.87	123.27	117.66	112.06
50938	-		.6299		16.000	16.0	100	48	1.50	-	128.87	123.27	117.66	112.06
50939	-		.6299		16.000	16.0	100	48	2.00	-	128.87	123.27	117.66	112.06
50940	-		.6299		16.000	16.0	100	48	3.00	-	128.87	123.27	117.66	112.06
50941	-		.6299		16.000	16.0	100	48	4.00	-	128.87	123.27	117.66	112.06
50942	-		.6299		16.000	16.0	100	48	5.00	-	128.87	123.27	117.66	112.06
50943	-		.6299		16.000	16.0	100	48	6.00	-	128.87	123.27	117.66	112.06
50702	-		.6299		16.000	16.0	100	48	BALL	-	128.87	123.27	117.66	112.06

EDP#			$d1$ †			$d2$	$l1$	$l2$	r	$l3$	$d3$				
(plain)	(weldon)		Decimal	Diameter	Metric	Shank Diameter	Overall Length	Flute Length	Corner Radius	Reach Length	Neck Diameter	1-11	12-24	25-49	50-100
NEW	50548	-	.7500	3/4"	19.050	3/4"	3"	7/8"	-	-	-	154.74	148.02	141.29	134.56
	50944	-	.7500	3/4"	19.050	3/4"	3"	7/8"	.010"	-	-	163.00	155.91	148.83	141.74
NEW	50945	-	.7500	3/4"	19.050	3/4"	3"	7/8"	.015"	-	-	163.00	155.91	148.83	141.74
NEW	50946	-	.7500	3/4"	19.050	3/4"	3"	7/8"	.020"	-	-	163.00	155.91	148.83	141.74
	50556	-	.7500	3/4"	19.050	3/4"	3"	7/8"	.030"	-	-	163.00	155.91	148.83	141.74
NEW	50947	-	.7500	3/4"	19.050	3/4"	3"	7/8"	.060"	-	-	163.00	155.91	148.83	141.74
NEW	50948	-	.7500	3/4"	19.050	3/4"	3"	7/8"	.120"	-	-	163.00	155.91	148.83	141.74
	50549	50550	.7500	3/4"	19.050	3/4"	4"	1"	-	-	-	158.13	151.25	144.38	137.50
NEW	50949	-	.7500	3/4"	19.050	3/4"	4"	1"	.010"	-	-	166.54	159.30	152.06	144.82
NEW	50950	-	.7500	3/4"	19.050	3/4"	4"	1"	.015"	-	-	166.54	159.30	152.06	144.82
	50510	50511	.7500	3/4"	19.050	3/4"	4"	1"	.020"	-	-	166.54	159.30	152.06	144.82
	50512	50513	.7500	3/4"	19.050	3/4"	4"	1"	.030"	-	-	166.54	159.30	152.06	144.82
	50514	50515	.7500	3/4"	19.050	3/4"	4"	1"	.060"	-	-	166.54	159.30	152.06	144.82
	50951	-	.7500	3/4"	19.050	3/4"	4"	1"	.090"	-	-	166.54	159.30	152.06	144.82
NEW	50952	-	.7500	3/4"	19.050	3/4"	4"	1"	.120"	-	-	166.54	159.30	152.06	144.82
	50954	-	.7500	3/4"	19.050	3/4"	4"	1"	.250"	-	-	166.54	159.30	152.06	144.82
NEW	50955	-	.7500	3/4"	19.050	3/4"	4"	1"	.3125"	-	-	166.54	159.30	152.06	144.82
NEW	50248	50288	.7500	3/4"	19.050	3/4"	4"	1-1/2"	-	-	-	158.13	151.25	144.38	137.50
	50956	-	.7500	3/4"	19.050	3/4"	4"	1-1/2"	.010"	-	-	166.54	159.30	152.06	144.82
	50957	-	.7500	3/4"	19.050	3/4"	4"	1-1/2"	.015"	-	-	166.54	159.30	152.06	144.82
NEW	50516	50517	.7500	3/4"	19.050	3/4"	4"	1-1/2"	.020"	-	-	166.54	159.30	152.06	144.82
	50232	50280	.7500	3/4"	19.050	3/4"	4"	1-1/2"	.030"	-	-	166.54	159.30	152.06	144.82
	50518	50519	.7500	3/4"	19.050	3/4"	4"	1-1/2"	.060"	-	-	166.54	159.30	152.06	144.82
	50958	-	.7500	3/4"	19.050	3/4"	4"	1-1/2"	.090"	-	-	166.54	159.30	152.06	144.82
	50520	50521	.7500	3/4"	19.050	3/4"	4"	1-1/2"	.120"	-	-	166.54	159.30	152.06	144.82
	50959	-	.7500	3/4"	19.050	3/4"	4"	1-1/2"	.125"	-	-	166.54	159.30	152.06	144.82
	50960	-	.7500	3/4"	19.050	3/4"	4"	1-1/2"	.156"	-	-	166.54	159.30	152.06	144.82
	50961	-	.7500	3/4"	19.050	3/4"	4"	1-1/2"	.190"	-	-	166.54	159.30	152.06	144.82
	50962	-	.7500	3/4"	19.050	3/4"	4"	1-1/2"	.250"	-	-	166.54	159.30	152.06	144.82
	50963	-	.7500	3/4"	19.050	3/4"	4"	1-1/2"	.3125"	-	-	166.54	159.30	152.06	144.82
NEW	50264	50296	.7500	3/4"	19.050	3/4"	4"	1-1/2"	BALL	-	-	166.54	159.30	152.06	144.82
	50551	50552	.7500	3/4"	19.050	3/4"	4"	1-3/4"	-	-	-	158.13	151.25	144.38	137.50
	50964	-	.7500	3/4"	19.050	3/4"	4"	1-3/4"	.010"	-	-	166.54	159.30	152.06	144.82
	50965	-	.7500	3/4"	19.050	3/4"	4"	1-3/4"	.015"	-	-	166.54	159.30	152.06	144.82
	50522	50523	.7500	3/4"	19.050	3/4"	4"	1-3/4"	.020"	-	-	166.54	159.30	152.06	144.82
	50524	50525	.7500	3/4"	19.050	3/4"	4"	1-3/4"	.030"	-	-	166.54	159.30	152.06	144.82
	50526	50527	.7500	3/4"	19.050	3/4"	4"	1-3/4"	.060"	-	-	166.54	159.30	152.06	144.82
	50966	-	.7500	3/4"	19.050	3/4"	4"	1-3/4"	.090"	-	-	166.54	159.30	152.06	144.82
	50967	-	.7500	3/4"	19.050	3/4"	4"	1-3/4"	.120"	-	-	166.54	159.30	152.06	144.82
NEW	50968	-	.7500	3/4"	19.050	3/4"	4"	1-3/4"	.125"	-	-	166.54	159.30	152.06	144.82
	50969	-	.7500	3/4"	19.050	3/4"	4"	1-3/4"	.156"	-	-	166.54	159.30	152.06	144.82
	50970	-	.7500	3/4"	19.050	3/4"	4"	1-3/4"	.190"	-	-	166.54	159.30	152.06	144.82
	50971	-	.7500	3/4"	19.050	3/4"	4"	1-3/4"	.250"	-	-	166.54	159.30	152.06	144.82
NEW	50972	-	.7500	3/4"	19.050	3/4"	4"	1-3/4"	.3125"	-	-	166.54	159.30	152.06	144.82

70

35

MATERIAL HARDNESS (Rc)

0

continued →

Series V4S, V4R, V4B (continued)

.7500" - .7874"
(19.050mm - 20.000mm)

EDP#		$d1$ †			$d2$	$l1$	$l2$	r	$l3$	$d3$					
(plain)	(weldon)	Decimal	Diameter	Metric	Shank Diameter	Overall Length	Flute Length	Corner Radius	Reach Length	Neck Diameter	1-11	12-24	25-49	50-100	
NEW	50553	50554	.7500	3/4"	19.050	3/4"	5"	2-1/8"	-	-	-	212.23	203.01	193.78	184.55
	50973	-	.7500	3/4"	19.050	3/4"	5"	2-1/8"	.010"	-	-	231.02	220.98	210.93	200.89
	50974	-	.7500	3/4"	19.050	3/4"	5"	2-1/8"	.015"	-	-	231.02	220.98	210.93	200.89
	50975	-	.7500	3/4"	19.050	3/4"	5"	2-1/8"	.020"	-	-	231.02	220.98	210.93	200.89
	50976	-	.7500	3/4"	19.050	3/4"	5"	2-1/8"	.030"	-	-	231.02	220.98	210.93	200.89
NEW	50977	-	.7500	3/4"	19.050	3/4"	5"	2-1/8"	.060"	-	-	231.02	220.98	210.93	200.89
	50978	-	.7500	3/4"	19.050	3/4"	5"	2-1/8"	.090"	-	-	231.02	220.98	210.93	200.89
	50979	-	.7500	3/4"	19.050	3/4"	5"	2-1/8"	.120"	-	-	231.02	220.98	210.93	200.89
	50980	-	.7500	3/4"	19.050	3/4"	5"	2-1/8"	.125"	-	-	231.02	220.98	210.93	200.89
	50981	-	.7500	3/4"	19.050	3/4"	5"	2-1/8"	.156"	-	-	231.02	220.98	210.93	200.89
NEW	50982	-	.7500	3/4"	19.050	3/4"	5"	2-1/8"	.190"	-	-	231.02	220.98	210.93	200.89
	50983	-	.7500	3/4"	19.050	3/4"	5"	2-1/8"	.250"	-	-	231.02	220.98	210.93	200.89
	50984	-	.7500	3/4"	19.050	3/4"	5"	2-1/8"	.3125"	-	-	231.02	220.98	210.93	200.89
	50672	-	.7500	3/4"	19.050	3/4"	5"	2-1/2"	-	-	-	212.23	203.01	193.78	184.55
	50985	-	.7500	3/4"	19.050	3/4"	5"	2-1/2"	.010"	-	-	231.02	220.98	210.93	200.89
NEW	50986	-	.7500	3/4"	19.050	3/4"	5"	2-1/2"	.015"	-	-	231.02	220.98	210.93	200.89
	50987	-	.7500	3/4"	19.050	3/4"	5"	2-1/2"	.020"	-	-	231.02	220.98	210.93	200.89
	50988	-	.7500	3/4"	19.050	3/4"	5"	2-1/2"	.030"	-	-	231.02	220.98	210.93	200.89
	50989	-	.7500	3/4"	19.050	3/4"	5"	2-1/2"	.060"	-	-	231.02	220.98	210.93	200.89
	50990	-	.7500	3/4"	19.050	3/4"	5"	2-1/2"	.090"	-	-	231.02	220.98	210.93	200.89
	50991	-	.7500	3/4"	19.050	3/4"	5"	2-1/2"	.120"	-	-	231.02	220.98	210.93	200.89
	50992	-	.7500	3/4"	19.050	3/4"	5"	2-1/2"	.125"	-	-	231.02	220.98	210.93	200.89
	50993	-	.7500	3/4"	19.050	3/4"	5"	2-1/2"	.156"	-	-	231.02	220.98	210.93	200.89
	50994	-	.7500	3/4"	19.050	3/4"	5"	2-1/2"	.190"	-	-	231.02	220.98	210.93	200.89
	50995	-	.7500	3/4"	19.050	3/4"	5"	2-1/2"	.250"	-	-	231.02	220.98	210.93	200.89
50996	-	.7500	3/4"	19.050	3/4"	5"	2-1/2"	.3125"	-	-	231.02	220.98	210.93	200.89	
NEW	50703	-	.7500	3/4"	19.050	3/4"	5"	2-1/2"	BALL	-	-	231.02	220.98	210.93	200.89
	50555	-	.7874		20.000	20.0	100	25	-	-	-	213.65	204.36	195.07	185.78
	50249	50289	.7874		20.000	20.0	100	38	-	-	-	213.65	204.36	195.07	185.78
	50997	-	.7874		20.000	20.0	100	38	0.50	-	-	235.72	225.47	215.22	204.97
	50528	-	.7874		20.000	20.0	100	38	1.00	-	-	235.72	225.47	215.22	204.97
	50530	-	.7874		20.000	20.0	100	38	2.00	-	-	235.72	225.47	215.22	204.97
	50998	-	.7874		20.000	20.0	100	38	2.50	-	-	235.72	225.47	215.22	204.97
	50532	-	.7874		20.000	20.0	100	38	3.00	-	-	235.72	225.47	215.22	204.97
	50999	-	.7874		20.000	20.0	100	38	4.00	-	-	235.72	225.47	215.22	204.97
	50121	-	.7874		20.000	20.0	100	38	5.00	-	-	235.72	225.47	215.22	204.97
NEW	50122	-	.7874		20.000	20.0	100	38	6.00	-	-	235.72	225.47	215.22	204.97
	50123	-	.7874		20.000	20.0	100	38	8.00	-	-	235.72	225.47	215.22	204.97
NEW	50265	50297	.7874		20.000	20.0	100	38	BALL	-	-	235.72	225.47	215.22	204.97
	50673	-	.7874		20.000	20.0	100	48	-	-	-	213.65	204.36	195.07	185.78
	50124	-	.7874		20.000	20.0	100	48	0.50	-	-	235.72	225.47	215.22	204.97
	50125	-	.7874		20.000	20.0	100	48	1.00	-	-	235.72	225.47	215.22	204.97
	50126	-	.7874		20.000	20.0	100	48	1.50	-	-	235.72	225.47	215.22	204.97
	50127	-	.7874		20.000	20.0	100	48	2.00	-	-	235.72	225.47	215.22	204.97
	50128	-	.7874		20.000	20.0	100	48	2.50	-	-	235.72	225.47	215.22	204.97
	50129	-	.7874		20.000	20.0	100	48	3.00	-	-	235.72	225.47	215.22	204.97
	50131	-	.7874		20.000	20.0	100	48	4.00	-	-	235.72	225.47	215.22	204.97
	50132	-	.7874		20.000	20.0	100	48	5.00	-	-	235.72	225.47	215.22	204.97
NEW	50133	-	.7874		20.000	20.0	100	48	6.00	-	-	235.72	225.47	215.22	204.97
NEW	50134	-	.7874		20.000	20.0	100	48	8.00	-	-	235.72	225.47	215.22	204.97

EDP#		d_1 †		d_2	l_1	l_2	r	l_3	d_3	1-11	12-24	25-49	50-100
(plain)	(weldon)	Decimal	Diameter	Shank Diameter	Overall Length	Flute Length	Corner Radius	Reach Length	Neck Diameter				
50674	-	.7874	20.000	20.0	150	60	-	-	-	268.07	256.41	244.76	233.10
50135	-	.7874	20.000	20.0	150	60	0.50	-	-	289.78	277.18	264.58	251.98
50136	-	.7874	20.000	20.0	150	60	1.00	-	-	289.78	277.18	264.58	251.98
NEW 50137	-	.7874	20.000	20.0	150	60	3.00	-	-	289.78	277.18	264.58	251.98
50138	-	.7874	20.000	20.0	150	60	6.00	-	-	289.78	277.18	264.58	251.98
NEW 50705	-	.7874	20.000	20.0	150	60	BALL	-	-	289.78	277.18	264.58	251.98
50250	50290	1.000	1"	25.400	1"	4"	1-1/2"	-	-	236.23	225.96	215.69	205.42
NEW 50139	-	1.000	1"	25.400	1"	4"	1-1/2"	.020"	-	284.34	271.98	259.61	247.25
50233	50281	1.000	1"	25.400	1"	4"	1-1/2"	.030"	-	284.34	271.98	259.61	247.25
NEW 50141	-	1.000	1"	25.400	1"	4"	1-1/2"	.060"	-	284.34	271.98	259.61	247.25
NEW 50142	-	1.000	1"	25.400	1"	4"	1-1/2"	.090"	-	284.34	271.98	259.61	247.25
NEW 50143	-	1.000	1"	25.400	1"	4"	1-1/2"	.120"	-	284.34	271.98	259.61	247.25
50557	-	1.000	1"	25.400	1"	4"	1-1/2"	.125"	-	284.34	271.98	259.61	247.25
NEW 50144	-	1.000	1"	25.400	1"	4"	1-1/2"	.156"	-	284.34	271.98	259.61	247.25
50145	-	1.000	1"	25.400	1"	4"	1-1/2"	.190"	-	284.34	271.98	259.61	247.25
50146	-	1.000	1"	25.400	1"	4"	1-1/2"	.250"	-	284.34	271.98	259.61	247.25
NEW 50147	-	1.000	1"	25.400	1"	4"	1-1/2"	.3125"	-	284.34	271.98	259.61	247.25
50148	-	1.000	1"	25.400	1"	4"	1-1/2"	.375"	-	284.34	271.98	259.61	247.25
50266	50298	1.000	1"	25.400	1"	4"	1-1/2"	BALL	-	284.34	271.98	259.61	247.25
50675	-	1.000	1"	25.400	1"	4-1/2"	2"	-	-	277.83	265.75	253.67	241.59
NEW 50149	-	1.000	1"	25.400	1"	4-1/2"	2"	.020"	-	317.10	303.31	289.53	275.74
50151	-	1.000	1"	25.400	1"	4-1/2"	2"	.030"	-	317.10	303.31	289.53	275.74
NEW 50152	-	1.000	1"	25.400	1"	4-1/2"	2"	.060"	-	317.10	303.31	289.53	275.74
NEW 50153	-	1.000	1"	25.400	1"	4-1/2"	2"	.090"	-	317.10	303.31	289.53	275.74
NEW 50154	-	1.000	1"	25.400	1"	4-1/2"	2"	.120"	-	317.10	303.31	289.53	275.74
NEW 50155	-	1.000	1"	25.400	1"	4-1/2"	2"	.156"	-	317.10	303.31	289.53	275.74
NEW 50156	-	1.000	1"	25.400	1"	4-1/2"	2"	.190"	-	317.10	303.31	289.53	275.74
NEW 50157	-	1.000	1"	25.400	1"	4-1/2"	2"	.250"	-	317.10	303.31	289.53	275.74
NEW 50158	-	1.000	1"	25.400	1"	4-1/2"	2"	.3125"	-	317.10	303.31	289.53	275.74
50706	-	1.000	1"	25.400	1"	4-1/2"	2"	BALL	-	317.10	303.31	289.53	275.74
50234	50282	1.000	1"	25.400	1"	5"	2-1/8"	.030"	-	349.85	334.64	319.43	304.22
50676	-	1.000	1"	25.400	1"	5"	2-1/2"	-	-	316.23	302.48	288.73	274.98
NEW 50159	-	1.000	1"	25.400	1"	5"	2-1/2"	.020"	-	349.85	334.64	319.43	304.22
NEW 50161	-	1.000	1"	25.400	1"	5"	2-1/2"	.030"	-	349.85	334.64	319.43	304.22
50162	-	1.000	1"	25.400	1"	5"	2-1/2"	.060"	-	349.85	334.64	319.43	304.22
NEW 50163	-	1.000	1"	25.400	1"	5"	2-1/2"	.090"	-	349.85	334.64	319.43	304.22
NEW 50164	-	1.000	1"	25.400	1"	5"	2-1/2"	.120"	-	349.85	334.64	319.43	304.22
NEW 50165	-	1.000	1"	25.400	1"	5"	2-1/2"	.156"	-	349.85	334.64	319.43	304.22
NEW 50166	-	1.000	1"	25.400	1"	5"	2-1/2"	.190"	-	349.85	334.64	319.43	304.22
50167	-	1.000	1"	25.400	1"	5"	2-1/2"	.250"	-	349.85	334.64	319.43	304.22
NEW 50168	-	1.000	1"	25.400	1"	5"	2-1/2"	.3125"	-	349.85	334.64	319.43	304.22
50707	-	1.000	1"	25.400	1"	5"	2-1/2"	BALL	-	349.85	334.64	319.43	304.22

70

35

MATERIAL HARDNESS (Rc)

0

[illegible]

GARR TOOL is on social media!

Follow us on all your favorite platforms for new product releases, company announcements, machining tips, and so much more! We are also looking to connect with you in any way we can. Don't be afraid to reach out with any questions, concerns, or feedback.



garrtool.com/facebook



garrtool.com/youtube



garrtool.com/linkedin



garrtool.com/instagram

Send us your videos!

GARR TOOL is always looking for videos of our tools in action. Send us an email with your machine information, speeds and feeds, and a link to your high-quality video to **social@garrtool.com**. We may add it to our online video resource page as well as give you a shout-out on our social media accounts!

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

.2362" - .3125"
(6.000mm - 7.938mm)



TECH
PAGES
298-299

Recommended for titanium and tool steels under 45Rc

Variable Helix End Mill

AlCrN Coating

Solid submicron grain carbide end mill - center cutting

Engineered for High Efficiency Milling

Staggered flutes to control harmonics

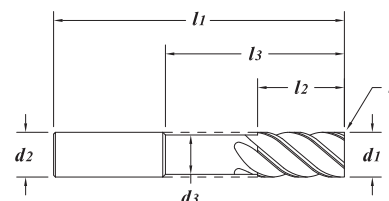
Variable flute design helps with chip evacuation in slots and pockets

PCT (Polish Carbide Treatment) enhances tool life

12mm and larger tools offered with weldon flat

.375" and larger diameters can be modified within 48 hours

The combination of an extended flute length with a weldon flat may cause the flute washout to reach inside some end mill holders



EDP#		$d1$ † Diameter		$d2$ Shank Diameter	$l1$ Overall Length	$l2$ Flute Length	r Corner Radius	$l3$ Reach Length	$d3$ Neck Diameter	1-11	12-24	25-49	50-100
		Decimal	Metric										
50000	(plain)	.2362	6.000	6.0	50	13	-	-	-	22.92	21.92	20.93	19.93
50001	(weldon)	.2362	6.000	6.0	50	13	0.5	-	-	26.51	25.36	24.20	23.05
50002	-	.2362	6.000	6.0	65	19	-	-	-	25.83	24.71	23.58	22.46
50003	-	.2362	6.000	6.0	65	19	0.5	-	-	29.37	28.09	26.82	25.54
50004	-	.2362	6.000	6.0	65	13	-	20	5.4	34.45	32.96	31.46	29.96
50005	-	.2362	6.000	6.0	65	13	0.5	20	5.4	38.00	36.34	34.69	33.04
50006	-	.2362	6.000	6.0	65	13	1.0	20	5.4	38.00	36.34	34.69	33.04
50007	-	.2500	6.350	1/4"	2"	3/8"	-	-	-	21.15	20.23	19.31	18.39
51000	-	.2500	6.350	1/4"	2"	3/8"	.010"	-	-	25.51	24.40	23.29	22.18
50008	-	.2500	6.350	1/4"	2"	3/8"	.015"	-	-	25.51	24.40	23.29	22.18
51001	-	.2500	6.350	1/4"	2"	3/8"	.020"	-	-	25.51	24.40	23.29	22.18
50009	-	.2500	6.350	1/4"	2"	3/8"	.030"	-	-	25.51	24.40	23.29	22.18
51002	-	.2500	6.350	1/4"	2"	1/2"	-	-	-	22.00	21.04	20.09	19.13
51003	-	.2500	6.350	1/4"	2"	1/2"	.010"	-	-	25.51	24.40	23.29	22.18
51004	-	.2500	6.350	1/4"	2"	1/2"	.015"	-	-	25.51	24.40	23.29	22.18
50011	-	.2500	6.350	1/4"	2-1/2"	3/4"	-	-	-	24.93	23.85	22.76	21.68
51005	-	.2500	6.350	1/4"	2-1/2"	3/4"	.010"	-	-	28.23	27.01	25.78	24.55
50012	-	.2500	6.350	1/4"	2-1/2"	3/4"	.015"	-	-	28.23	27.01	25.78	24.55
50013	-	.2500	6.350	1/4"	2-1/2"	3/4"	.020"	-	-	28.23	27.01	25.78	24.55
50014	-	.2500	6.350	1/4"	2-1/2"	3/4"	.030"	-	-	28.23	27.01	25.78	24.55
50015	-	.2500	6.350	1/4"	3"	1"	-	-	-	38.09	36.43	34.78	33.12
51006	-	.2500	6.350	1/4"	3"	1"	.010"	-	-	41.86	40.04	38.22	36.40
51007	-	.2500	6.350	1/4"	3"	1"	.015"	-	-	41.86	40.04	38.22	36.40
50016	-	.2500	6.350	1/4"	3"	1"	.030"	-	-	41.86	40.04	38.22	36.40
50113	-	.2500	6.350	1/4"	3"	1-1/8"	.030"	-	-	41.86	40.04	38.22	36.40
50017	-	.2500	6.350	1/4"	4"	1/2"	.015"	1-1/4"	.235"	54.74	52.36	49.98	47.60
51008	-	.2500	6.350	1/4"	4"	1/2"	.015"	2-1/8"	.235"	54.74	52.36	49.98	47.60
50023	-	.2756	7.000	8.0	65	22	0.2	-	-	45.46	43.48	41.51	39.53
50018	-	.3125	7.938	5/16"	2-1/2"	13/16"	-	-	-	35.57	34.02	32.48	30.93
50019	-	.3125	7.938	5/16"	2-1/2"	13/16"	.015"	-	-	38.28	36.62	34.95	33.29
50021	-	.3125	7.938	5/16"	2-1/2"	13/16"	.020"	-	-	38.28	36.62	34.95	33.29
50022	-	.3125	7.938	5/16"	2-1/2"	13/16"	.030"	-	-	38.28	36.62	34.95	33.29

70

35

0

EDP#		$d1$ †		$d2$	$l1$	$l2$	r	$l3$	$d3$					
(plain)	(weldon)	Decimal	Diameter	Metric	Shank Diameter	Overall Length	Flute Length	Corner Radius	Reach Length	Neck Diameter	1-11	12-24	25-49	50-100
50024	-	.3150		8.000	8.0	65	22	0.2	-	-	39.72	37.99	36.27	34.54
50025	-	.3150		8.000	8.0	65	22	0.5	-	-	39.72	37.99	36.27	34.54
50026	-	.3150		8.000	8.0	75	19	-	26	7.2	61.67	58.99	56.31	53.63
50027	-	.3150		8.000	8.0	75	19	0.5	26	7.2	66.73	63.83	60.93	58.03
50028	-	.3150		8.000	8.0	75	19	1.0	26	7.2	66.73	63.83	60.93	58.03
50029	-	.3750	3/8"	9.525	3/8"	2"	1/2"	-	-	-	35.91	34.35	32.79	31.23
50031	-	.3750	3/8"	9.525	3/8"	2"	1/2"	.015"	-	-	41.12	39.34	37.55	35.76
50032	-	.3750	3/8"	9.525	3/8"	2"	1/2"	.020"	-	-	41.12	39.34	37.55	35.76
50033	-	.3750	3/8"	9.525	3/8"	2"	1/2"	.030"	-	-	41.12	39.34	37.55	35.76
50034	-	.3750	3/8"	9.525	3/8"	2-1/2"	1"	-	-	-	41.96	40.14	38.31	36.49
50035	-	.3750	3/8"	9.525	3/8"	2-1/2"	1"	.015"	-	-	44.71	42.77	40.82	38.88
50036	-	.3750	3/8"	9.525	3/8"	2-1/2"	1"	.020"	-	-	44.71	42.77	40.82	38.88
50037	-	.3750	3/8"	9.525	3/8"	2-1/2"	1"	.030"	-	-	44.71	42.77	40.82	38.88
50038	-	.3750	3/8"	9.525	3/8"	2-1/2"	1"	.060"	-	-	44.71	42.77	40.82	38.88
51009	-	.3750	3/8"	9.525	3/8"	3"	1-1/4"	.015"	-	-	58.83	56.28	53.72	51.16
50114	-	.3750	3/8"	9.525	3/8"	3"	1-1/4"	.030"	-	-	58.83	56.28	53.72	51.16
51010	-	.3750	3/8"	9.525	3/8"	4"	1-1/2"	.015"	-	-	66.22	63.34	60.46	57.58
50039	-	.3750	3/8"	9.525	3/8"	4"	2"	-	-	-	60.56	57.93	55.29	52.66
50041	-	.3750	3/8"	9.525	3/8"	4"	2"	.030"	-	-	66.22	63.34	60.46	57.58
51011	-	.3750	3/8"	9.525	3/8"	4"	1/2"	.015"	1-1/8"	.355"	79.02	75.58	72.15	68.71
50042	-	.3750	3/8"	9.525	3/8"	4"	7/8"	.015"	1-7/8"	.355"	79.02	75.58	72.15	68.71
51012	-	.3750	3/8"	9.525	3/8"	6"	1/2"	.015"	2-1/8"	.355"	104.47	99.92	95.38	90.84
51013	-	.3750	3/8"	9.525	3/8"	6"	1/2"	.015"	3-1/8"	.355"	104.47	99.92	95.38	90.84
51014	-	.3750	3/8"	9.525	3/8"	6"	1/2"	.015"	4-1/8"	.355"	104.47	99.92	95.38	90.84
50043	-	.3937		10.000	10.0	70	22	-	-	-	50.32	48.14	45.95	43.76
51015	-	.3937		10.000	10.0	70	22	0.30	-	-	53.99	51.65	49.30	46.95
50044	-	.3937		10.000	10.0	70	22	0.50	-	-	53.99	51.65	49.30	46.95
51016	-	.3937		10.000	10.0	70	22	0.75	-	-	53.99	51.65	49.30	46.95
51017	-	.3937		10.000	10.0	70	22	1.00	-	-	53.99	51.65	49.30	46.95
50045	-	.3937		10.000	10.0	75	22	-	32	9.0	69.76	66.73	63.69	60.66
50046	-	.3937		10.000	10.0	75	22	0.50	32	9.0	75.26	71.98	68.71	65.44
NEW	51018	-	.3937	10.000	10.0	75	22	0.75	32	9.0	75.26	71.98	68.71	65.44
	50047	-	.3937	10.000	10.0	75	22	1.00	32	9.0	75.26	71.98	68.71	65.44
	51019	-	.4724	12.000	12.0	65	19	-	-	-	61.26	58.60	55.93	53.27
	51020	-	.4724	12.000	12.0	65	19	0.50	-	-	71.25	68.16	65.06	61.96
	50484	50485	.4724	12.000	12.0	75	26	-	-	-	65.37	62.52	59.68	56.84
	51021	-	.4724	12.000	12.0	75	26	0.30	-	-	79.51	76.05	72.60	69.14
	50486	50487	.4724	12.000	12.0	75	26	0.50	-	-	79.51	76.05	72.60	69.14
	51022	-	.4724	12.000	12.0	75	26	0.75	-	-	79.51	76.05	72.60	69.14
	51023	-	.4724	12.000	12.0	75	26	1.00	-	-	79.51	76.05	72.60	69.14
	50112	-	.4724	12.000	12.0	75	26	2.00	-	-	79.51	76.05	72.60	69.14
50115	-	.4724	12.000	12.0	75	26	2.50	-	-	79.51	76.05	72.60	69.14	
50048	50299	.4724	12.000	12.0	75	32	-	-	-	65.37	62.52	59.68	56.84	
51024	-	.4724	12.000	12.0	75	32	0.30	-	-	79.51	76.05	72.60	69.14	
50049	50300	.4724	12.000	12.0	75	32	0.50	-	-	79.51	76.05	72.60	69.14	
51025	-	.4724	12.000	12.0	75	32	0.75	-	-	79.51	76.05	72.60	69.14	
51026	-	.4724	12.000	12.0	75	32	1.00	-	-	79.51	76.05	72.60	69.14	
51027	-	.4724	12.000	12.0	100	38	-	-	-	87.37	83.57	79.77	75.97	
51028	-	.4724	12.000	12.0	100	38	0.50	-	-	92.52	88.50	84.47	80.45	
50423	-	.4724	12.000	12.0	100	42	-	-	-	87.37	83.57	79.77	75.97	
50425	-	.4724	12.000	12.0	100	42	0.30	-	-	92.52	88.50	84.47	80.45	
50427	-	.4724	12.000	12.0	100	42	0.50	-	-	92.52	88.50	84.47	80.45	
50429	-	.4724	12.000	12.0	100	42	1.00	-	-	92.52	88.50	84.47	80.45	
50431	-	.4724	12.000	12.0	100	42	2.00	-	-	92.52	88.50	84.47	80.45	
51029	-	.4724	12.000	12.0	100	52	-	-	-	87.37	83.57	79.77	75.97	
51030	-	.4724	12.000	12.0	100	52	0.50	-	-	92.52	88.50	84.47	80.45	
50051	50301	.4724	12.000	12.0	100	26	-	38	10.8	100.11	95.76	91.40	87.05	
50052	50302	.4724	12.000	12.0	100	26	0.50	38	10.8	105.26	100.68	96.11	91.53	
50053	50303	.4724	12.000	12.0	100	26	1.00	38	10.8	105.26	100.68	96.11	91.53	

continued →

Series V5 (continued)

.5000"
(12.700mm)

EDP#		$d1^{\dagger}$ Diameter			$d2$ Shank Diameter	$l1$ Overall Length	$l2$ Flute Length	r Corner Radius	$l3$ Reach Length	$d3$ Neck Diameter	1-11	12-24	25-49	50-100
(plain)	(weldon)	Decimal	1/2"	Metric										
50054	50304	.5000	1/2"	12.700	1/2"	2-1/2"	5/8"	-	-	-	58.74	56.19	53.63	51.08
50106	50305	.5000	1/2"	12.700	1/2"	2-1/2"	5/8"	.010"	-	-	68.33	65.36	62.39	59.42
50055	50306	.5000	1/2"	12.700	1/2"	2-1/2"	5/8"	.020"	-	-	68.33	65.36	62.39	59.42
50107	50307	.5000	1/2"	12.700	1/2"	2-1/2"	5/8"	.030"	-	-	68.33	65.36	62.39	59.42
50056	50308	.5000	1/2"	12.700	1/2"	3"	1"	-	-	-	62.77	60.04	57.31	54.58
50108	50309	.5000	1/2"	12.700	1/2"	3"	1"	.010"	-	-	76.27	72.95	69.64	66.32
50057	50310	.5000	1/2"	12.700	1/2"	3"	1"	.020"	-	-	76.27	72.95	69.64	66.32
50109	50311	.5000	1/2"	12.700	1/2"	3"	1"	.030"	-	-	76.27	72.95	69.64	66.32
50058	50312	.5000	1/2"	12.700	1/2"	3"	1-1/4"	-	-	-	62.77	60.04	57.31	54.58
50111	50313	.5000	1/2"	12.700	1/2"	3"	1-1/4"	.010"	-	-	76.27	72.95	69.64	66.32
50059	50314	.5000	1/2"	12.700	1/2"	3"	1-1/4"	.015"	-	-	76.27	72.95	69.64	66.32
50061	50315	.5000	1/2"	12.700	1/2"	3"	1-1/4"	.020"	-	-	76.27	72.95	69.64	66.32
50062	50316	.5000	1/2"	12.700	1/2"	3"	1-1/4"	.030"	-	-	76.27	72.95	69.64	66.32
50063	50317	.5000	1/2"	12.700	1/2"	3"	1-1/4"	.045"	-	-	76.27	72.95	69.64	66.32
50064	50318	.5000	1/2"	12.700	1/2"	3"	1-1/4"	.060"	-	-	76.27	72.95	69.64	66.32
50065	50319	.5000	1/2"	12.700	1/2"	3"	1-1/4"	.090"	-	-	76.27	72.95	69.64	66.32
50433	50435	.5000	1/2"	12.700	1/2"	4"	1-1/2"	.010"	-	-	90.13	86.21	82.29	78.37
51031	-	.5000	1/2"	12.700	1/2"	4"	1-1/2"	.015"	-	-	90.13	86.21	82.29	78.37
51032	-	.5000	1/2"	12.700	1/2"	4"	1-1/2"	.030"	-	-	90.13	86.21	82.29	78.37
50436	50437	.5000	1/2"	12.700	1/2"	4"	1-5/8"	-	-	-	84.93	81.24	77.54	73.85
50438	50439	.5000	1/2"	12.700	1/2"	4"	1-5/8"	.010"	-	-	90.13	86.21	82.29	78.37
50440	50441	.5000	1/2"	12.700	1/2"	4"	1-5/8"	.020"	-	-	90.13	86.21	82.29	78.37
50442	50443	.5000	1/2"	12.700	1/2"	4"	1-5/8"	.030"	-	-	90.13	86.21	82.29	78.37
50444	50445	.5000	1/2"	12.700	1/2"	4"	1-5/8"	.040"	-	-	90.13	86.21	82.29	78.37
50446	50447	.5000	1/2"	12.700	1/2"	4"	1-5/8"	.060"	-	-	90.13	86.21	82.29	78.37
50067	50321	.5000	1/2"	12.700	1/2"	4"	2-1/8"	-	-	-	84.93	81.24	77.54	73.85
51033	-	.5000	1/2"	12.700	1/2"	4"	2-1/8"	.015"	-	-	90.13	86.21	82.29	78.37
50068	50322	.5000	1/2"	12.700	1/2"	4"	2-1/8"	.030"	-	-	90.13	86.21	82.29	78.37
51034	-	.5000	1/2"	12.700	1/2"	6"	1"	.030"	-	-	127.47	121.92	116.38	110.84
51035	-	.5000	1/2"	12.700	1/2"	6"	3-1/8"	-	-	-	121.79	116.49	111.20	105.90
51036	-	.5000	1/2"	12.700	1/2"	6"	3-1/8"	.030"	-	-	127.47	121.92	116.38	110.84
51037	-	.5000	1/2"	12.700	1/2"	4"	5/8"	.015"	1-1/2"	.475"	102.89	98.42	93.94	89.47
51038	-	.5000	1/2"	12.700	1/2"	4"	5/8"	.015"	2-1/4"	.475"	102.89	98.42	93.94	89.47
50066	50320	.5000	1/2"	12.700	1/2"	4"	1-1/4"	.030"	2-1/4"	.475"	102.89	98.42	93.94	89.47
51039	-	.5000	1/2"	12.700	1/2"	6"	5/8"	.015"	3-3/8"	.475"	140.25	134.16	128.06	121.96
51040	-	.5000	1/2"	12.700	1/2"	6"	5/8"	.015"	4-1/8"	.475"	140.25	134.16	128.06	121.96

70

35

0

EDP#		$d1^{\dagger}$			$d2$	$l1$	$l2$	r	$l3$	$d3$	1-11	12-24	25-49	50-100
(plain)	(weldon)	Decimal	Diameter	Metric	Shank Diameter	Overall Length	Flute Length	Corner Radius	Reach Length	Neck Diameter				
50069	50323	.6250	5/8"	15.875	5/8"	3-1/2"	1-1/4"	-	-	-	115.81	110.77	105.74	100.70
51041	-	.6250	5/8"	15.875	5/8"	3-1/2"	1-1/4"	.020"	-	-	121.42	116.14	110.86	105.58
50071	50324	.6250	5/8"	15.875	5/8"	3-1/2"	1-1/4"	.030"	-	-	121.42	116.14	110.86	105.58
50072	50325	.6250	5/8"	15.875	5/8"	3-1/2"	1-1/4"	.060"	-	-	121.42	116.14	110.86	105.58
50401	50402	.6250	5/8"	15.875	5/8"	3-1/2"	1-1/4"	.120"	-	-	121.42	116.14	110.86	105.58
51042	-	.6250	5/8"	15.875	5/8"	4"	1-5/8"	-	-	-	123.68	118.31	112.93	107.55
51043	-	.6250	5/8"	15.875	5/8"	4"	1-5/8"	.030"	-	-	131.99	126.25	120.51	114.77
51044	-	.6250	5/8"	15.875	5/8"	4"	2-1/8"	-	-	-	123.68	118.31	112.93	107.55
51045	-	.6250	5/8"	15.875	5/8"	4"	2-1/8"	.030"	-	-	131.99	126.25	120.51	114.77
51046	-	.6250	5/8"	15.875	5/8"	6"	2-1/2"	.030"	-	-	181.69	173.79	165.89	157.99
50403	50404	.6250	5/8"	15.875	5/8"	6"	3-1/8"	.030"	-	-	181.69	173.79	165.89	157.99
51047	-	.6250	5/8"	15.875	5/8"	6"	3-1/8"	.060"	-	-	181.69	173.79	165.89	157.99
51048	-	.6250	5/8"	15.875	5/8"	6"	3-1/2"	.030"	-	-	181.69	173.79	165.89	157.99
51049	-	.6250	5/8"	15.875	5/8"	4"	3/4"	.030"	1-5/8"	.590"	143.09	136.87	130.65	124.43
50073	50326	.6250	5/8"	15.875	5/8"	4"	1-1/4"	.030"	2-1/4"	.590"	143.09	136.87	130.65	124.43
51050	-	.6250	5/8"	15.875	5/8"	6"	3/4"	.030"	2-3/8"	.590"	194.45	186.00	177.54	169.09
51051	-	.6250	5/8"	15.875	5/8"	6"	3/4"	.030"	3-3/8"	.590"	194.45	186.00	177.54	169.09
51052	-	.6250	5/8"	15.875	5/8"	6"	3/4"	.030"	4-1/8"	.590"	194.45	186.00	177.54	169.09
51053	-	.6299		16.000	16.0	75	19	-	-	-	117.59	112.48	107.36	102.25
51054	-	.6299		16.000	16.0	75	19	0.50	-	-	123.31	117.95	112.59	107.23
50074	50327	.6299		16.000	16.0	88	32	-	-	-	120.82	115.57	110.31	105.06
50075	50328	.6299		16.000	16.0	88	32	0.50	-	-	126.70	121.19	115.68	110.17
50420	-	.6299		16.000	16.0	88	32	1.00	-	-	126.70	121.19	115.68	110.17
51055	-	.6299		16.000	16.0	88	32	2.00	-	-	126.70	121.19	115.68	110.17
50422	-	.6299		16.000	16.0	88	32	3.00	-	-	126.70	121.19	115.68	110.17
50424	-	.6299		16.000	16.0	88	32	4.00	-	-	126.70	121.19	115.68	110.17
50430	-	.6299		16.000	16.0	100	40	0.50	-	-	134.72	128.87	123.01	117.15
50432	-	.6299		16.000	16.0	100	40	1.00	-	-	134.72	128.87	123.01	117.15
50434	-	.6299		16.000	16.0	100	40	3.00	-	-	134.72	128.87	123.01	117.15
50076	50329	.6299		16.000	16.0	100	32	-	50	14.4	139.62	133.55	127.48	121.41
50077	-	.6299		16.000	16.0	100	32	0.50	50	14.4	145.84	139.50	133.16	126.82
50426	-	.6299		16.000	16.0	100	32	1.00	50	14.4	145.84	139.50	133.16	126.82
51056	-	.6299		16.000	16.0	100	32	2.00	50	14.4	145.84	139.50	133.16	126.82
50428	-	.6299		16.000	16.0	100	32	3.00	50	14.4	145.84	139.50	133.16	126.82
50078	-	.7087		18.000	18.0	100	32	0.75	-	-	181.88	173.98	166.07	158.16

continued →

Series V5 (continued)

.7500"
(19.050mm)

EDP#		$d1^{\dagger}$			$d2$	$l1$	$l2$	r	$l3$	$d3$	1-11	12-24	25-49	50-100
(plain)	(weldon)	Decimal	Diameter	Metric	Shank Diameter	Overall Length	Flute Length	Corner Radius	Reach Length	Neck Diameter				
50079	50332	.7500	3/4"	19.050	3/4"	3"	7/8"	-	-	-	161.60	154.57	147.55	140.52
51103	-	.7500	3/4"	19.050	3/4"	3"	7/8"	.015"	-	-	170.43	163.02	155.61	148.20
50081	50333	.7500	3/4"	19.050	3/4"	3"	7/8"	.030"	-	-	170.42	163.01	155.60	148.19
51057	-	.7500	3/4"	19.050	3/4"	3"	7/8"	.060"	-	-	170.43	163.02	155.61	148.20
51105	-	.7500	3/4"	19.050	3/4"	3"	7/8"	.120"	-	-	170.43	163.02	155.61	148.20
51107	-	.7500	3/4"	19.050	3/4"	4"	1-1/4"	.015"	-	-	174.12	166.55	158.98	151.41
51058	-	.7500	3/4"	19.050	3/4"	4"	1-1/4"	.030"	-	-	174.12	166.55	158.98	151.41
51109	-	.7500	3/4"	19.050	3/4"	4"	1-1/4"	.060"	-	-	174.12	166.55	158.98	151.41
50082	50334	.7500	3/4"	19.050	3/4"	4"	1-1/2"	-	-	-	165.31	158.13	150.94	143.75
51111	-	.7500	3/4"	19.050	3/4"	4"	1-1/2"	.015"	-	-	174.12	166.55	158.98	151.41
50083	50335	.7500	3/4"	19.050	3/4"	4"	1-1/2"	.030"	-	-	174.12	166.55	158.98	151.41
50084	50336	.7500	3/4"	19.050	3/4"	4"	1-1/2"	.060"	-	-	174.12	166.55	158.98	151.41
51059	-	.7500	3/4"	19.050	3/4"	4"	1-1/2"	.078"	-	-	174.12	166.55	158.98	151.41
50085	50337	.7500	3/4"	19.050	3/4"	4"	1-1/2"	.120"	-	-	174.12	166.55	158.98	151.41
51113	-	.7500	3/4"	19.050	3/4"	4"	1-1/2"	.190"	-	-	174.12	166.55	158.98	151.41
51060	-	.7500	3/4"	19.050	3/4"	4"	1-5/8"	-	-	-	165.31	158.13	150.94	143.75
51115	-	.7500	3/4"	19.050	3/4"	4"	1-5/8"	.015"	-	-	174.12	166.55	158.98	151.41
51061	-	.7500	3/4"	19.050	3/4"	4"	1-5/8"	.030"	-	-	174.12	166.55	158.98	151.41
51119	-	.7500	3/4"	19.050	3/4"	4"	1-5/8"	.060"	-	-	174.12	166.55	158.98	151.41
51062	-	.7500	3/4"	19.050	3/4"	4"	1-3/4"	-	-	-	165.31	158.13	150.94	143.75
51121	-	.7500	3/4"	19.050	3/4"	4"	1-3/4"	.015"	-	-	174.12	166.55	158.98	151.41
51063	-	.7500	3/4"	19.050	3/4"	4"	1-3/4"	.030"	-	-	174.12	166.55	158.98	151.41
50086	50338	.7500	3/4"	19.050	3/4"	5"	2-1/8"	-	-	-	221.88	212.23	202.59	192.94
51125	-	.7500	3/4"	19.050	3/4"	5"	2-1/8"	.015"	-	-	241.53	231.03	220.53	210.03
50087	50339	.7500	3/4"	19.050	3/4"	5"	2-1/8"	.030"	-	-	241.53	231.03	220.53	210.03
51064	-	.7500	3/4"	19.050	3/4"	5"	2-1/8"	.060"	-	-	241.53	231.03	220.53	210.03
51065	-	.7500	3/4"	19.050	3/4"	5"	2-1/8"	.120"	-	-	241.53	231.03	220.53	210.03
51127	-	.7500	3/4"	19.050	3/4"	5"	2-1/4"	.015"	-	-	241.53	231.03	220.53	210.03
51066	-	.7500	3/4"	19.050	3/4"	5"	2-1/4"	.030"	-	-	241.53	231.03	220.53	210.03
51129	-	.7500	3/4"	19.050	3/4"	5"	2-1/4"	.060"	-	-	241.53	231.03	220.53	210.03
51131	-	.7500	3/4"	19.050	3/4"	5"	2-1/2"	.015"	-	-	241.53	231.03	220.53	210.03
51067	-	.7500	3/4"	19.050	3/4"	5"	2-1/2"	.030"	-	-	241.53	231.03	220.53	210.03
51133	-	.7500	3/4"	19.050	3/4"	5"	2-1/2"	.060"	-	-	241.53	231.03	220.53	210.03
51135	-	.7500	3/4"	19.050	3/4"	5"	2-3/4"	.015"	-	-	241.53	231.03	220.53	210.03
51068	-	.7500	3/4"	19.050	3/4"	5"	2-3/4"	.030"	-	-	241.53	231.03	220.53	210.03
51137	-	.7500	3/4"	19.050	3/4"	5"	2-3/4"	.060"	-	-	241.53	231.03	220.53	210.03
50089	50341	.7500	3/4"	19.050	3/4"	6"	3-1/4"	-	-	-	259.66	248.37	237.08	225.79
51139	-	.7500	3/4"	19.050	3/4"	6"	3-1/4"	.015"	-	-	286.90	274.43	261.95	249.48
50091	50342	.7500	3/4"	19.050	3/4"	6"	3-1/4"	.030"	-	-	286.90	274.43	261.95	249.48
51141	-	.7500	3/4"	19.050	3/4"	6"	3-1/4"	.060"	-	-	286.90	274.43	261.95	249.48
51143	-	.7500	3/4"	19.050	3/4"	7"	4-1/4"	.015"	-	-	361.84	346.10	330.37	314.64
51145	-	.7500	3/4"	19.050	3/4"	7"	4-1/4"	.030"	-	-	361.84	346.10	330.37	314.64
51147	-	.7500	3/4"	19.050	3/4"	7"	4-1/4"	.060"	-	-	361.84	346.10	330.37	314.64
51069	-	.7500	3/4"	19.050	3/4"	4"	1"	.030"	2"	.705"	186.91	178.78	170.66	162.53
51070	-	.7500	3/4"	19.050	3/4"	5"	1"	.030"	2-1/2"	.705"	254.33	243.28	232.22	221.16
50088	50340	.7500	3/4"	19.050	3/4"	5-1/2"	1-1/2"	.030"	3-1/4"	.705"	299.74	286.70	273.67	260.64
51071	-	.7500	3/4"	19.050	3/4"	6"	1"	.030"	4-1/8"	.705"	299.74	286.70	273.67	260.64

EDP#		$d1$ † Diameter		$d2$ Shank Diameter	$l1$ Overall Length	$l2$ Flute Length	r Corner Radius	$l3$ Reach Length	$d3$ Neck Diameter	1-11	12-24	25-49	50-100	
(plain)	(weldon)	Decimal	Metric											
50092	50343	.7874	20.000	20.0	100	38	-	-	-	223.34	213.63	203.92	194.21	
51072	-	.7874	20.000	20.0	100	38	0.50	-	-	246.43	235.72	225.00	214.29	
50093	50344	.7874	20.000	20.0	100	38	0.75	-	-	246.43	235.72	225.00	214.29	
51073	-	.7874	20.000	20.0	100	38	1.00	-	-	246.43	235.72	225.00	214.29	
51074	-	.7874	20.000	20.0	100	38	1.50	-	-	246.43	235.72	225.00	214.29	
51075	-	.7874	20.000	20.0	100	38	2.00	-	-	246.43	235.72	225.00	214.29	
51076	-	.7874	20.000	20.0	100	38	3.00	-	-	246.43	235.72	225.00	214.29	
51077	-	.9843	25.000	25.0	100	38	-	-	-	255.07	243.98	232.89	221.80	
NEW	51078	-	.9843	25.000	25.0	100	38	0.50	-	-	282.45	270.17	257.89	245.61
	51079	-	.9843	25.000	25.0	100	38	0.75	-	-	282.45	270.17	257.89	245.61
	51080	-	.9843	25.000	25.0	100	38	1.50	-	-	282.45	270.17	257.89	245.61
	51081	-	.9843	25.000	25.0	100	38	3.00	-	-	282.45	270.17	257.89	245.61
50094	-	1.000	1"	25.400	1"	4"	1-1/4"	-	-	246.96	236.23	225.49	214.75	
50095	-	1.000	1"	25.400	1"	4"	1-1/4"	.030"	-	297.28	284.35	271.43	258.50	
NEW	51082	-	1.000	1"	25.400	1"	4"	1-1/4"	.120"	-	297.28	284.35	271.43	258.50
	-	50348	1.000	1"	25.400	1"	4"	1-1/2"	-	-	237.46	227.14	216.81	206.49
	-	50349	1.000	1"	25.400	1"	4"	1-1/2"	.030"	-	285.84	273.42	260.99	248.56
-	50350	1.000	1"	25.400	1"	4"	1-1/2"	.060"	-	285.84	273.42	260.99	248.56	
51083	-	1.000	1"	25.400	1"	4"	1-1/2"	.120"	-	297.28	284.35	271.43	258.50	
NEW	50116	-	1.000	1"	25.400	1"	4"	1-1/2"	.125"	-	297.28	284.35	271.43	258.50
	50097	-	1.000	1"	25.400	1"	4"	1-3/4"	-	-	246.96	236.23	225.49	214.75
	50098	-	1.000	1"	25.400	1"	4"	1-3/4"	.030"	-	297.28	284.35	271.43	258.50
	50099	-	1.000	1"	25.400	1"	4"	1-3/4"	.060"	-	297.28	284.35	271.43	258.50
51084	-	1.000	1"	25.400	1"	4"	1-3/4"	.120"	-	297.28	284.35	271.43	258.50	
51085	-	1.000	1"	25.400	1"	4-1/2"	2"	.030"	-	331.51	317.10	302.68	288.27	
51087	-	1.000	1"	25.400	1"	4-1/2"	2"	.120"	-	331.51	317.10	302.68	288.27	
51088	-	1.000	1"	25.400	1"	4-1/2"	2"	.250"	-	331.51	317.10	302.68	288.27	
51089	-	1.000	1"	25.400	1"	5"	2-1/2"	.030"	-	365.75	349.84	333.94	318.04	
51090	-	1.000	1"	25.400	1"	5"	2-5/8"	.030"	-	365.75	349.84	333.94	318.04	
50104	50354	1.000	1"	25.400	1"	6"	3-1/4"	-	-	430.63	411.91	393.18	374.46	
50105	-	1.000	1"	25.400	1"	6"	3-1/4"	.030"	-	477.02	456.28	435.54	414.80	
51091	-	1.000	1"	25.400	1"	6"	3-3/8"	.060"	-	477.02	456.28	435.54	414.80	
51092	-	1.000	1"	25.400	1"	7"	4-1/4"	.030"	-	582.12	556.81	531.50	506.19	
51093	-	1.000	1"	25.400	1"	7"	4-1/4"	.060"	-	582.12	556.81	531.50	506.19	
51094	-	1.000	1"	25.400	1"	5"	1-1/4"	.030"	2-5/8"	.940"	378.56	362.10	345.64	329.18
50101	-	1.000	1"	25.400	1"	5-1/2"	1-3/4"	.030"	3-1/4"	.940"	485.02	463.94	442.85	421.76
50102	50352	1.000	1"	25.400	1"	5-1/2"	1-3/4"	.060"	3-1/4"	.940"	485.02	463.94	442.85	421.76
51095	-	1.000	1"	25.400	1"	6"	1-1/4"	.030"	3-3/8"	.940"	489.82	468.52	447.23	425.93
51096	-	1.000	1"	25.400	1"	7"	1-1/4"	.030"	4-1/4"	.940"	595.15	569.27	543.40	517.52

70

35

MATERIAL HARDNESS (Rc)

0

Series V5C - Chip Splitter

HIGH EFFICIENCY MILLING

.4724" - .6299"
(12.000mm - 16.000mm)



TECH
PAGES
298-299

TOLERANCES

$d1$	$+0.000" - .002" (+.000mm - .050mm)$
$d2$	$h6$
r	$+0.01" - .001" (+.025 - .025mm)$

Recommended for titanium and tool steels under 45Rc

Variable Helix End Mill

AlCrN Coating

Solid submicron grain carbide end mill - center cutting

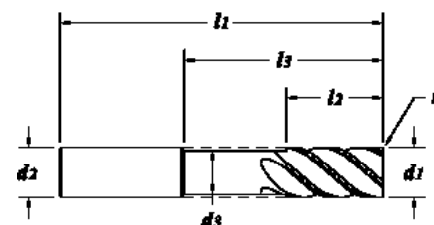
Chip splitter to help break long chips

Engineered for High Efficiency Milling

Staggered flutes to control harmonics

Variable flute design helps with chip evacuation in slots and pockets

PCT (Polish Carbide Treatment) enhances tool life



EDP#	$d1$ † Diameter		$d2$ Shank Diameter	$l1$ Overall Length	$l2$ Flute Length	r Corner Radius	$l3$ Reach Length	$d3$ Neck Diameter	1-11	12-24	25-49	50-100
	Decimal	Metric										
50801	.4724	12.000	12.0	100	42	0.30	-	-	98.80	94.50	90.21	85.91
50800	.4724	12.000	12.0	100	42	1.00	-	-	98.80	94.50	90.21	85.91
50803	.5000	12.700	12.700	3"	1"	-	-	-	69.05	66.04	63.04	60.04
50807	.5000	12.700	12.700	3"	1"	.015"	-	-	82.55	78.96	75.37	71.78
50805	.5000	12.700	12.700	3"	1"	.020"	-	-	82.55	78.96	75.37	71.78
50809	.5000	12.700	12.700	3"	1"	.030"	-	-	82.55	78.96	75.37	71.78
50811	.5000	12.700	12.700	3"	1-1/4"	.015"	-	-	82.55	78.96	75.37	71.78
50810	.5000	12.700	12.700	3"	1-1/4"	.020"	-	-	82.55	78.96	75.37	71.78
50815	.5000	12.700	12.700	3"	1-1/4"	.030"	-	-	82.55	78.96	75.37	71.78
50813	.5000	12.700	12.700	3"	1-1/4"	.060"	-	-	82.55	78.96	75.37	71.78
50820	.5000	12.700	12.700	3"	1-1/4"	.090"	-	-	82.55	78.96	75.37	71.78
50825	.5000	12.700	12.700	4"	1-1/2"	.010"	-	-	96.40	92.21	88.02	83.83
50817	.5000	12.700	12.700	4"	1-1/2"	.030"	-	-	96.40	92.21	88.02	83.83
50830	.5000	12.700	12.700	4"	1-5/8"	-	-	-	91.21	87.24	83.28	79.31
50819	.5000	12.700	12.700	4"	1-5/8"	.030"	-	-	96.40	92.21	88.02	83.83
50835	.5000	12.700	12.700	4"	2-1/8"	-	-	-	91.21	87.24	83.28	79.31
50836	.5000	12.700	12.700	4"	2-1/8"	.030"	-	-	96.40	92.21	88.02	83.83
50821	.5000	12.700	12.700	4"	5/8"	.015"	1-1/2"	.475"	109.17	104.42	99.68	94.93
50823	.6250	15.875	15.875	3-1/2"	1-1/4"	.020"	-	-	128.95	123.34	117.74	112.13
50840	.6250	15.875	15.875	3-1/2"	1-1/4"	.030"	-	-	128.95	123.34	117.74	112.13
50827	.6250	15.875	15.875	4"	1-5/8"	-	-	-	131.22	125.51	119.81	114.10
50829	.6250	15.875	15.875	4"	1-5/8"	.030"	-	-	139.53	133.46	127.40	121.33
50845	.6250	15.875	15.875	4"	2-1/8"	.030"	-	-	139.53	133.46	127.40	121.33
50831	.6250	15.875	15.875	6"	2-1/2"	.030"	-	-	189.22	180.99	172.77	164.54
50833	.6299	16.000	16.0	100	40	0.50	-	-	142.26	136.07	129.89	123.70
50837	.6299	16.000	16.0	100	40	1.00	-	-	142.26	136.07	129.89	123.70

Series V5C - Chip Splitter (continued)

.7500" - 1.0000"
(19.050mm - 25.400mm)

HIGH PERFORMANCE
END MILLS

EDP#	d_1 †			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	Diameter	Metric										
50839	.7500	3/4"	19.050	3/4"	3"	7/8"	-	-	-	169.46	162.10	154.73	147.36
50841	.7500	3/4"	19.050	3/4"	3"	7/8"	.030"	-	-	178.27	170.52	162.77	155.02
50843	.7500	3/4"	19.050	3/4"	4"	1-1/2"	.030"	-	-	181.99	174.08	166.16	158.25
50847	.7500	3/4"	19.050	3/4"	4"	1-1/2"	.060"	-	-	181.99	174.08	166.16	158.25
50850	.7500	3/4"	19.050	3/4"	4"	1-1/2"	.120"	-	-	181.99	174.08	166.16	158.25
50849	.7500	3/4"	19.050	3/4"	4"	1-3/4"	-	-	-	173.17	165.64	158.11	150.58
50851	.7500	3/4"	19.050	3/4"	4"	1-3/4"	.030"	-	-	181.99	174.08	166.16	158.25
50855	.7500	3/4"	19.050	3/4"	5"	2-1/8"	.030"	-	-	249.38	238.54	227.69	216.85
50853	.7500	3/4"	19.050	3/4"	5"	2-1/4"	.030"	-	-	249.38	238.54	227.69	216.85
50857	.7500	3/4"	19.050	3/4"	5"	2-1/2"	.030"	-	-	249.38	238.54	227.69	216.85
50859	.7500	3/4"	19.050	3/4"	5"	2-3/4"	.015"	-	-	249.38	238.54	227.69	216.85
50861	.7500	3/4"	19.050	3/4"	5"	2-3/4"	.030"	-	-	249.38	238.54	227.69	216.85
50863	.7500	3/4"	19.050	3/4"	6"	3-1/4"	-	-	-	267.52	255.89	244.26	232.63
50860	.7500	3/4"	19.050	3/4"	6"	3-1/4"	.030"	-	-	294.76	281.94	269.13	256.31
50867	.7500	3/4"	19.050	3/4"	7"	4-1/4"	.015"	-	-	369.69	353.62	337.54	321.47
50869	1.000	1"	25.400	1"	5"	2-1/2"	.030"	-	-	373.61	357.37	341.12	324.88
50871	1.000	1"	25.400	1"	5"	2-5/8"	.030"	-	-	373.61	357.37	341.12	324.88
50873	1.000	1"	25.400	1"	6"	3-1/4"	.030"	-	-	484.89	463.80	442.72	421.64

70

35

0

MATERIAL HARDNESS (Rc)



Series VX-7 **NEW ITEMS** HIGH EFFICIENCY MILLING

.3150" - .4724"
(8.000mm - 12.000mm)



TECH
PAGES
302-303

TOLERANCES

$d1$	+0.000" - .002" (+0.000mm - .050mm)
$d2$	h6
r	+0.001" - .001" (+0.025 - .025mm)

Recommended for titanium, stainless, and tool steels under 45Rc

Seven-Flute End Mill

BALIQ® ALCRONOS Coating (AlCrN-Based)

Solid submicron grain carbide end mill - non-center cutting

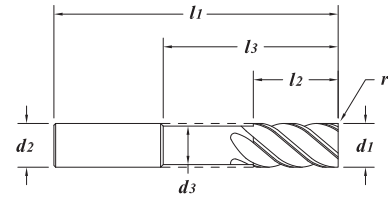
Engineered for High Efficiency Milling

Multiple flutes for increased feed rates

Staggered flute geometry

PCT (Polish Carbide Treatment) enhances tool life

Up to 15% Radial (ae) engagement



EDP#	$d1$ † Diameter		$d2$ Shank Diameter	$l1$ Overall Length	$l2$ Flute Length	r Corner Radius	$l3$ Reach Length	$d3$ Neck Diameter	1-11	12-24	25-49	50-100
	Decimal	Metric										
64100	.3150	8.000	8.0	65	22	-	-	-	53.99	51.65	49.30	46.95
64102	.3150	8.000	8.0	65	22	0.50	-	-	59.48	56.89	54.31	51.72
64104	.3150	8.000	8.0	65	22	1.00	-	-	59.48	56.89	54.31	51.72
64105	.3150	8.000	8.0	75	27	1.60	-	-	72.94	69.77	66.60	63.43
64106	.3150	8.000	8.0	75	32	-	-	-	66.75	63.84	60.94	58.04
64108	.3150	8.000	8.0	75	32	0.50	-	-	72.94	69.77	66.60	63.43
64110	.3150	8.000	8.0	75	32	1.00	-	-	72.94	69.77	66.60	63.43
NEW 64267	.3750	3/8"	9.525	3/8"	2"	5/8"	-	-	49.94	47.77	45.60	43.43
NEW 64268	.3750	3/8"	9.525	3/8"	2"	5/8"	.010"	-	57.05	54.57	52.09	49.61
NEW 64269	.3750	3/8"	9.525	3/8"	2"	5/8"	.015"	-	57.05	54.57	52.09	49.61
NEW 64270	.3750	3/8"	9.525	3/8"	2"	5/8"	.020"	-	57.05	54.57	52.09	49.61
NEW 64271	.3750	3/8"	9.525	3/8"	2"	5/8"	.030"	-	57.05	54.57	52.09	49.61
64112	.3750	3/8"	9.525	3/8"	2-1/2"	1"	-	-	58.67	56.12	53.57	51.02
64114	.3750	3/8"	9.525	3/8"	2-1/2"	1"	.020"	-	64.24	61.45	58.65	55.86
64116	.3750	3/8"	9.525	3/8"	2-1/2"	1"	.030"	-	64.24	61.45	58.65	55.86
64117	.3750	3/8"	9.525	3/8"	3"	1"	.025"	-	78.14	74.75	71.35	67.95
64118	.3750	3/8"	9.525	3/8"	3"	1-1/2"	-	-	70.76	67.68	64.61	61.53
64120	.3750	3/8"	9.525	3/8"	3"	1-1/2"	.020"	-	78.14	74.75	71.35	67.95
64122	.3750	3/8"	9.525	3/8"	3"	1-1/2"	.030"	-	78.14	74.75	71.35	67.95
64123	.3750	3/8"	9.525	3/8"	3"	1-1/2"	.060"	-	78.14	74.75	71.35	67.95
64246	.3750	3/8"	9.525	3/8"	4"	7/8"	.015"	1-7/8"	101.71	97.28	92.86	88.44
64124	.3937	10.000	10.0	70	25	-	-	-	68.70	65.71	62.73	59.74
64126	.3937	10.000	10.0	70	25	0.50	-	-	75.83	72.53	69.24	65.94
64128	.3937	10.000	10.0	70	25	1.00	-	-	75.83	72.53	69.24	65.94
64130	.4724	12.000	12.0	75	26	-	-	-	82.48	78.89	75.31	71.72
64132	.4724	12.000	12.0	75	26	0.50	-	-	100.42	96.05	91.69	87.32
64134	.4724	12.000	12.0	75	26	1.00	-	-	100.42	96.05	91.69	87.32
64136	.4724	12.000	12.0	75	32	-	-	-	82.48	78.89	75.31	71.72
64138	.4724	12.000	12.0	75	32	0.50	-	-	100.42	96.05	91.69	87.32
64140	.4724	12.000	12.0	75	32	1.00	-	-	100.42	96.05	91.69	87.32
64141	.4724	12.000	12.0	100	42	1.00	-	-	121.80	116.50	111.21	105.91
64142	.4724	12.000	12.0	100	50	-	-	-	110.76	105.94	101.13	96.31
64144	.4724	12.000	12.0	100	50	0.50	-	-	121.80	116.50	111.21	105.91
64146	.4724	12.000	12.0	100	50	1.00	-	-	121.80	116.50	111.21	105.91

MATERIAL HARDNESS (Rc)

EDP#	$d1$ † Diameter			$d2$ Shank Diameter	$l1$ Overall Length	$l2$ Flute Length	r Corner Radius	$l3$ Reach Length	$d3$ Neck Diameter	1-11	12-24	25-49	50-100
	Decimal		Metric										
64218	.5000	1/2"	12.700	1/2"	2-1/2"	5/8"	-	-	-	77.07	73.72	70.37	67.02
64220	.5000	1/2"	12.700	1/2"	2-1/2"	5/8"	.015"	-	-	89.80	85.90	81.99	78.09
64222	.5000	1/2"	12.700	1/2"	2-1/2"	5/8"	.030"	-	-	89.80	85.90	81.99	78.09
64223	.5000	1/2"	12.700	1/2"	2-1/2"	5/8"	.060"	-	-	89.80	85.90	81.99	78.09
64224	.5000	1/2"	12.700	1/2"	3"	1"	-	-	-	80.10	76.62	73.13	69.65
64226	.5000	1/2"	12.700	1/2"	3"	1"	.015"	-	-	97.27	93.04	88.81	84.58
64228	.5000	1/2"	12.700	1/2"	3"	1"	.030"	-	-	97.27	93.04	88.81	84.58
64148	.5000	1/2"	12.700	1/2"	3"	1-1/4"	-	-	-	80.10	76.62	73.13	69.65
64150	.5000	1/2"	12.700	1/2"	3"	1-1/4"	.015"	-	-	97.27	93.04	88.81	84.58
64152	.5000	1/2"	12.700	1/2"	3"	1-1/4"	.020"	-	-	97.27	93.04	88.81	84.58
64154	.5000	1/2"	12.700	1/2"	3"	1-1/4"	.030"	-	-	97.27	93.04	88.81	84.58
64156	.5000	1/2"	12.700	1/2"	3"	1-1/4"	.060"	-	-	97.27	93.04	88.81	84.58
64157	.5000	1/2"	12.700	1/2"	3"	1-1/4"	.125"	-	-	97.27	93.04	88.81	84.58
64158	.5000	1/2"	12.700	1/2"	3-1/2"	1-1/2"	-	-	-	104.17	99.64	95.11	90.58
64160	.5000	1/2"	12.700	1/2"	3-1/2"	1-1/2"	.030"	-	-	114.82	109.82	104.83	99.84
64161	.5000	1/2"	12.700	1/2"	4"	5/8"	.015"	2-1/8"	.475"	128.62	123.02	117.43	111.84
64242	.5000	1/2"	12.700	1/2"	4"	1-5/8"	-	-	-	106.87	102.22	97.58	92.93
64244	.5000	1/2"	12.700	1/2"	4"	1-5/8"	.015"	-	-	117.52	112.41	107.30	102.19
64162	.5000	1/2"	12.700	1/2"	4"	2"	-	-	-	106.87	102.22	97.58	92.93
64163	.5000	1/2"	12.700	1/2"	4"	2"	.015"	-	-	117.52	112.41	107.30	102.19
64164	.5000	1/2"	12.700	1/2"	4"	2"	.030"	-	-	117.52	112.41	107.30	102.19
64165	.5000	1/2"	12.700	1/2"	4"	2"	.125"	-	-	117.52	112.41	107.30	102.19
NEW 64248	.5512		14.000	14.0	88	32	0.50	-	-	143.31	137.08	130.85	124.62
64166	.6250	5/8"	15.875	5/8"	3-1/2"	1-1/4"	-	-	-	135.99	130.08	124.16	118.25
64168	.6250	5/8"	15.875	5/8"	3-1/2"	1-1/4"	.030"	-	-	148.65	142.19	135.72	129.26
64170	.6250	5/8"	15.875	5/8"	3-1/2"	1-1/4"	.060"	-	-	148.65	142.19	135.72	129.26
NEW 64171	.6250	5/8"	15.875	5/8"	3-1/2"	1-1/4"	.120"	-	-	148.65	142.19	135.72	129.26
64172	.6250	5/8"	15.875	5/8"	4"	1-3/4"	-	-	-	143.18	136.95	130.73	124.50
64174	.6250	5/8"	15.875	5/8"	4"	1-3/4"	.030"	-	-	156.71	149.90	143.08	136.27
64176	.6250	5/8"	15.875	5/8"	4"	1-3/4"	.060"	-	-	156.71	149.90	143.08	136.27
64177	.6250	5/8"	15.875	5/8"	4"	1-3/4"	.120"	-	-	156.71	149.90	143.08	136.27
64250	.6250	5/8"	15.875	5/8"	4"	2"	.120"	-	-	156.71	149.90	143.08	136.27
64178	.6299		16.000	16.0	88	32	-	-	-	145.51	139.18	132.86	126.53
64180	.6299		16.000	16.0	88	32	0.50	-	-	158.64	151.75	144.85	137.95
64182	.6299		16.000	16.0	88	32	1.00	-	-	158.64	151.75	144.85	137.95
64230	.6299		16.000	16.0	88	32	2.00	-	-	158.64	151.75	144.85	137.95
64231	.6299		16.000	16.0	100	40	1.00	-	-	166.49	159.25	152.01	144.77
64232	.6299		16.000	16.0	100	40	1.50	-	-	166.49	159.25	152.01	144.77
64234	.6299		16.000	16.0	125	65	0.50	-	-	209.33	200.23	191.13	182.03
64236	.6299		16.000	16.0	125	65	3.00	-	-	209.33	200.23	191.13	182.03
64252	.7500	3/4"	19.050	3/4"	3"	1"	-	-	-	176.90	169.21	161.52	153.83
64254	.7500	3/4"	19.050	3/4"	3"	1"	.030"	-	-	195.07	186.59	178.11	169.63
64184	.7500	3/4"	19.050	3/4"	4"	1-1/2"	-	-	-	186.22	178.12	170.03	161.93
64186	.7500	3/4"	19.050	3/4"	4"	1-1/2"	.030"	-	-	204.72	195.82	186.92	178.02
64188	.7500	3/4"	19.050	3/4"	4"	1-1/2"	.060"	-	-	204.72	195.82	186.92	178.02
64190	.7500	3/4"	19.050	3/4"	4"	1-1/2"	.120"	-	-	204.72	195.82	186.92	178.02
64256	.7500	3/4"	19.050	3/4"	4"	1-3/4"	-	-	-	186.23	178.13	170.04	161.94
64258	.7500	3/4"	19.050	3/4"	4"	1-3/4"	.030"	-	-	204.72	195.82	186.92	178.02
64260	.7500	3/4"	19.050	3/4"	5"	1"	.030"	3"	.730"	288.37	275.84	263.30	250.76

70

35

MATERIAL HARDNESS (Rc)

0

continued →

Series VX-7 (continued)

.7500" - 1.0000"
(19.050mm - 25.400mm)

EDP#	$d1$ † Diameter		$d2$ Shank Diameter	$l1$ Overall Length	$l2$ Flute Length	r Corner Radius	$l3$ Reach Length	$d3$ Neck Diameter	1-11	12-24	25-49	50-100
	Decimal	Metric										
64192	.7500	3/4"	19.050	3/4"	5"	2-1/4"	-	-	245.23	234.56	223.90	213.24
64194	.7500	3/4"	19.050	3/4"	5"	2-1/4"	.030"	-	277.27	265.21	253.16	241.10
64238	.7500	3/4"	19.050	3/4"	5"	2-1/4"	.060"	-	277.27	265.21	253.16	241.10
NEW 64262	.7500	3/4"	19.050	3/4"	5"	2-1/4"	.120"	-	277.27	265.21	253.16	241.10
NEW 64264	.7500	3/4"	19.050	3/4"	5"	2-1/2"	.060"	-	277.27	265.21	253.16	241.10
64266	.7500	3/4"	19.050	3/4"	6"	1-1/8"	.120"	3-5/8"	336.93	322.28	307.63	292.98
64196	.7500	3/4"	19.050	3/4"	6"	3-1/4"	-	-	287.04	274.56	262.08	249.60
64198	.7500	3/4"	19.050	3/4"	6"	3-1/4"	.030"	-	325.81	311.64	297.48	283.31
64200	.7874	20.000	20.0	100	38	-	-	-	249.19	238.36	227.52	216.69
64202	.7874	20.000	20.0	100	38	0.50	-	-	285.07	272.68	260.28	247.89
64204	.7874	20.000	20.0	100	38	1.00	-	-	285.07	272.68	260.28	247.89
64206	1.000	1"	25.400	1"	4"	1-1/2"	-	-	270.81	259.04	247.26	235.49
64208	1.000	1"	25.400	1"	4"	1-1/2"	.030"	-	334.04	319.52	304.99	290.47
64240	1.000	1"	25.400	1"	4"	1-1/2"	.125"	-	334.05	319.53	305.00	290.48
64210	1.000	1"	25.400	1"	5"	2"	-	-	353.38	338.02	322.65	307.29
64212	1.000	1"	25.400	1"	5"	2-1/2"	-	-	353.38	338.02	322.65	307.29
64213	1.000	1"	25.400	1"	5"	2-1/2"	.030"	-	406.56	388.88	371.21	353.53
64214	1.000	1"	25.400	1"	6"	3-1/4"	-	-	450.47	430.88	411.30	391.71
64216	1.000	1"	25.400	1"	6"	3-1/4"	.030"	-	515.95	493.52	471.08	448.65



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

HIGH EFFICIENCY MILLING

Series VX-7C - Chip Splitter



TECH
PAGES
302-303

Recommended for titanium, stainless, and tool steels under 45Rc

Seven-Flute End Mill

BALIQ® ALCRONOS Coating (AlCrN-Based)

Solid submicron grain carbide end mill - non-center cutting

Chip splitter to help break long chips

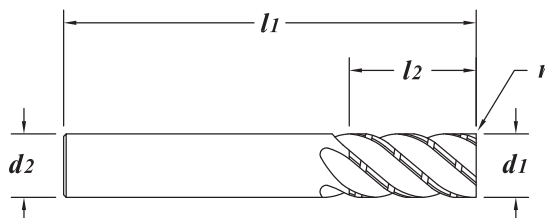
Engineered for High Efficiency Milling

Multiple flutes for increased feed rates

Staggered flute geometry

PCT (Polish Carbide Treatment) enhances tool life

Up to 15% Radial (ae) engagement



EDP#	d_1 †			d_2	l_1	l_2	r				
	Decimal	Diameter	Metric								
				Shank Diameter	Overall Length	Flute Length	Corner Radius	1-11	12-24	25-49	50-100
64300	.3750	3/8"	9.525	3/8"	2-1/2"	1"	-	65.50	62.66	59.81	56.96
64302	.3750	3/8"	9.525	3/8"	2-1/2"	1"	.020"	71.08	67.99	64.90	61.81
64304	.3750	3/8"	9.525	3/8"	2-1/2"	1"	.030"	71.08	67.99	64.90	61.81
64310	.4724		12.000	12.0	100	50	0.50	130.35	124.69	119.02	113.35
64316	.5000	1/2"	12.700	1/2"	2-1/2"	5/8"	.030"	98.35	94.07	89.80	85.52
64318	.5000	1/2"	12.700	1/2"	2-1/2"	5/8"	.060"	98.35	94.07	89.80	85.52
64322	.5000	1/2"	12.700	1/2"	3"	1"	.030"	105.81	101.21	96.61	92.01
64330	.5000	1/2"	12.700	1/2"	3"	1-1/4"	.030"	105.81	101.21	96.61	92.01
64332	.5000	1/2"	12.700	1/2"	3"	1-1/4"	.060"	105.81	101.21	96.61	92.01
64338	.5000	1/2"	12.700	1/2"	3-1/2"	1-1/2"	-	112.71	107.81	102.91	98.01
64342	.5000	1/2"	12.700	1/2"	3-1/2"	1-1/2"	.030"	123.36	118.00	112.63	107.27
64346	.5000	1/2"	12.700	1/2"	4"	2"	-	115.41	110.40	105.38	100.36
64348	.5000	1/2"	12.700	1/2"	4"	2"	.030"	126.06	120.58	115.10	109.62
64352	.5000	1/2"	12.700	1/2"	4"	2"	.125"	126.06	120.58	115.10	109.62
64360	.6250	5/8"	15.875	5/8"	4"	1-3/4"	-	153.43	146.76	140.09	133.42
64364	.6250	5/8"	15.875	5/8"	4"	1-3/4"	.030"	166.96	159.70	152.44	145.18
64368	.6299		16.000	16.0	100	40	0.75	176.73	169.05	161.36	153.68
64369	.6299		16.000	16.0	100	40	1.00	176.73	169.05	161.36	153.68
64372	.6299		16.000	16.0	100	50	1.00	176.73	169.05	161.36	153.68
64380	.7500	3/4"	19.050	3/4"	4"	1-1/2"	.030"	215.41	206.04	196.68	187.31
64386	.7500	3/4"	19.050	3/4"	6"	3-1/4"	.030"	336.48	321.85	307.22	292.59
64389	.7874		20.000	20.0	100	38	0.50	297.88	284.93	271.98	259.03
64400	1.000	1"	25.400	1"	5"	2-1/2"	.030"	419.38	401.15	382.91	364.68

HIGH
PERFORMANCE
END MILLS

70

35

MATERIAL HARDNESS (Rc)

0



TOLERANCES

$d1$	$+0.000" - .002" (+0.000mm - .050mm)$
$d2$	$h6$
r	$+0.001" - .001" (+0.025 - .025mm)$

Recommended for Inconel, pH materials, titanium and tool steels >40Rc

Square End, Corner Radius, Ball End

AlTiN Coating

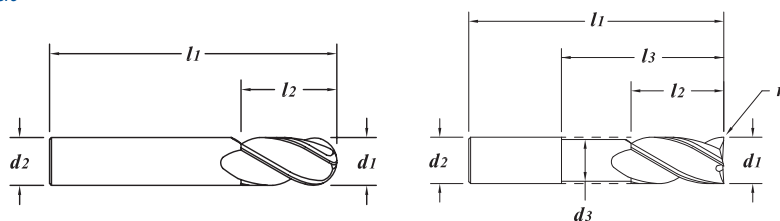
Solid submicron grain carbide end mill - center cutting

Excellent for High Efficiency Milling

Reduces vibration for more aggressive machining resulting in less cycle times and greater productivity

Staggered flute geometry

The combination of an extended flute length with a weldon flat may cause the flute washout to reach inside some end mill holders



EDP#		$d1$ †		$d2$	$l1$	$l2$	r	$l3$	$d3$	1-11	12-24	25-49	50-100
		Decimal	Metric										
61084	(plain)	.0591	1.500	3.0	38	3.0	-	-	-	15.08	14.42	13.77	13.11
61086	(weldon)	.0591	1.500	3.0	38	3.0	0.20	-	-	17.10	16.36	15.61	14.87
61088	(weldon)	.0591	1.500	3.0	38	3.0	BALL	-	-	17.10	16.36	15.61	14.87
61090	(plain)	.0591	1.500	3.0	38	6.0	-	-	-	15.08	14.42	13.77	13.11
61092	(weldon)	.0591	1.500	3.0	38	6.0	0.20	-	-	17.10	16.36	15.61	14.87
61094	(weldon)	.0591	1.500	3.0	38	6.0	BALL	-	-	17.10	16.36	15.61	14.87
61096	(weldon)	.0625	1/16"	1.588	1/8"	1-1/2"	-	-	-	14.21	13.60	12.98	12.36
61098	(weldon)	.0625	1/16"	1.588	1/8"	1-1/2"	.010"	-	-	16.11	15.41	14.71	14.01
61100	(weldon)	.0625	1/16"	1.588	1/8"	1-1/2"	BALL	-	-	16.11	15.41	14.71	14.01
61102	(weldon)	.0625	1/16"	1.588	1/8"	1-1/2"	-	-	-	14.21	13.60	12.98	12.36
61104	(weldon)	.0625	1/16"	1.588	1/8"	1-1/2"	.010"	-	-	16.11	15.41	14.71	14.01
61106	(weldon)	.0625	1/16"	1.588	1/8"	1-1/2"	BALL	-	-	16.11	15.41	14.71	14.01
61108	(weldon)	.0787	2.000	3.0	38	4.0	-	-	-	14.21	13.60	12.98	12.36
61110	(weldon)	.0787	2.000	3.0	38	4.0	0.20	-	-	16.11	15.41	14.71	14.01
61112	(weldon)	.0787	2.000	3.0	38	4.0	BALL	-	-	16.11	15.41	14.71	14.01
61114	(weldon)	.0787	2.000	3.0	38	8.0	-	-	-	14.21	13.60	12.98	12.36
61116	(weldon)	.0787	2.000	3.0	38	8.0	0.20	-	-	16.11	15.41	14.71	14.01
61118	(weldon)	.0787	2.000	3.0	38	8.0	BALL	-	-	16.11	15.41	14.71	14.01
61120	(weldon)	.0938	3/32"	2.383	1/8"	1-1/2"	-	-	-	13.57	12.98	12.39	11.80
61122	(weldon)	.0938	3/32"	2.383	1/8"	1-1/2"	.010"	-	-	15.53	14.85	14.18	13.50
61124	(weldon)	.0938	3/32"	2.383	1/8"	1-1/2"	BALL	-	-	15.53	14.85	14.18	13.50
61126	(weldon)	.0938	3/32"	2.383	1/8"	3/8"	-	-	-	13.57	12.98	12.39	11.80
61128	(weldon)	.0938	3/32"	2.383	1/8"	1-1/2"	.010"	-	-	15.53	14.85	14.18	13.50
61130	(weldon)	.0938	3/32"	2.383	1/8"	1-1/2"	BALL	-	-	15.53	14.85	14.18	13.50
61877	(weldon)	.1181	3.000	3.0	38	8	-	-	-	12.75	12.20	11.64	11.09
27420	(weldon)	.1181	3.000	3.0	50	8	0.20	-	-	14.34	13.72	13.09	12.47
61132	(weldon)	.1181	3.000	3.0	50	8	0.30	-	-	14.34	13.72	13.09	12.47
27425	(weldon)	.1181	3.000	3.0	50	8	0.50	-	-	14.34	13.72	13.09	12.47
61134	(weldon)	.1181	3.000	3.0	50	8	BALL	-	-	14.34	13.72	13.09	12.47
61887	(weldon)	.1181	3.000	3.0	38	12	-	-	-	12.75	12.20	11.64	11.09
27430	(weldon)	.1181	3.000	3.0	50	12	0.20	-	-	14.34	13.72	13.09	12.47
61136	(weldon)	.1181	3.000	3.0	50	12	0.30	-	-	14.34	13.72	13.09	12.47
27435	(weldon)	.1181	3.000	3.0	50	12	0.50	-	-	14.34	13.72	13.09	12.47
61138	(weldon)	.1181	3.000	3.0	50	12	BALL	-	-	14.34	13.72	13.09	12.47

EDP#		d_1 †			d_2	l_1	l_2	r	l_3	d_3	1-11	12-24	25-49	50-100
(plain)	(weldon)	Decimal	Diameter	Metric	Shank Diameter	Overall Length	Flute Length	Corner Radius	Reach Length	Neck Diameter				
61917	-	.1250	1/8"	3.175	1/8"	1-1/2"	1/4"	-	-	-	12.75	12.20	11.64	11.09
27440	-	.1250	1/8"	3.175	1/8"	1-1/2"	1/4"	.010"	-	-	14.34	13.72	13.09	12.47
61140	-	.1250	1/8"	3.175	1/8"	1-1/2"	1/4"	.015"	-	-	14.34	13.72	13.09	12.47
61073	-	.1250	1/8"	3.175	1/8"	1-1/2"	1/4"	.030"	-	-	14.34	13.72	13.09	12.47
61142	-	.1250	1/8"	3.175	1/8"	1-1/2"	1/4"	BALL	-	-	14.34	13.72	13.09	12.47
61144	-	.1250	1/8"	3.175	1/8"	1-1/2"	3/8"	-	-	-	12.75	12.20	11.64	11.09
61146	-	.1250	1/8"	3.175	1/8"	1-1/2"	3/8"	.010"	-	-	14.34	13.72	13.09	12.47
61148	-	.1250	1/8"	3.175	1/8"	1-1/2"	3/8"	.015"	-	-	14.34	13.72	13.09	12.47
61074	-	.1250	1/8"	3.175	1/8"	1-1/2"	3/8"	.030"	-	-	14.34	13.72	13.09	12.47
61149	-	.1250	1/8"	3.175	1/8"	1-1/2"	3/8"	BALL	-	-	14.34	13.72	13.09	12.47
61927	-	.1250	1/8"	3.175	1/8"	1-1/2"	1/2"	-	-	-	12.75	12.20	11.64	11.09
27450	-	.1250	1/8"	3.175	1/8"	1-1/2"	1/2"	.010"	-	-	14.34	13.72	13.09	12.47
61150	-	.1250	1/8"	3.175	1/8"	1-1/2"	1/2"	.015"	-	-	14.34	13.72	13.09	12.47
27455	-	.1250	1/8"	3.175	1/8"	1-1/2"	1/2"	.020"	-	-	14.34	13.72	13.09	12.47
61075	-	.1250	1/8"	3.175	1/8"	1-1/2"	1/2"	.030"	-	-	14.34	13.72	13.09	12.47
61152	-	.1250	1/8"	3.175	1/8"	1-1/2"	1/2"	BALL	-	-	14.34	13.72	13.09	12.47
NEW 61929	-	.1250	1/8"	3.175	1/8"	2-1/2"	3/4"	-	-	-	24.08	23.03	21.99	20.94
61154	-	.1562	5/32"	3.967	3/16"	2"	5/16"	-	-	-	16.80	16.07	15.34	14.61
27460	-	.1562	5/32"	3.967	3/16"	2"	5/16"	.010"	-	-	19.77	18.91	18.05	17.19
61156	-	.1562	5/32"	3.967	3/16"	2"	5/16"	.015"	-	-	19.77	18.91	18.05	17.19
61076	-	.1562	5/32"	3.967	3/16"	2"	5/16"	.030"	-	-	19.77	18.91	18.05	17.19
61077	-	.1562	5/32"	3.967	3/16"	2"	5/16"	BALL	-	-	19.77	18.91	18.05	17.19
61158	-	.1562	5/32"	3.967	3/16"	2"	1/2"	-	-	-	16.80	16.07	15.34	14.61
27470	-	.1562	5/32"	3.967	3/16"	2"	1/2"	.010"	-	-	19.77	18.91	18.05	17.19
61160	-	.1562	5/32"	3.967	3/16"	2"	1/2"	.015"	-	-	19.77	18.91	18.05	17.19
61078	-	.1562	5/32"	3.967	3/16"	2"	1/2"	.030"	-	-	19.77	18.91	18.05	17.19
61079	-	.1562	5/32"	3.967	3/16"	2"	1/2"	BALL	-	-	19.77	18.91	18.05	17.19
NEW 61083	-	.1562	5/32"	3.967	3/16"	2-1/2"	3/4"	-	-	-	20.15	19.27	18.40	17.52
NEW 61085	-	.1562	5/32"	3.967	3/16"	2-1/2"	3/4"	.010"	-	-	23.70	22.67	21.64	20.61
NEW 61087	-	.1562	5/32"	3.967	3/16"	2-1/2"	3/4"	.015"	-	-	23.70	22.67	21.64	20.61
61162	-	.1575		4.000	6.0	50	8	-	-	-	23.93	22.89	21.85	20.81
27480	-	.1575		4.000	6.0	50	8	0.30	-	-	24.30	23.24	22.19	21.13
61164	-	.1575		4.000	6.0	50	8	0.50	-	-	24.30	23.24	22.19	21.13
28470	-	.1575		4.000	6.0	50	8	BALL	-	-	24.30	23.24	22.19	21.13
61977	-	.1575		4.000	6.0	50	12	-	-	-	23.93	22.89	21.85	20.81
27490	-	.1575		4.000	6.0	50	12	0.30	-	-	24.30	23.24	22.19	21.13
27495	-	.1575		4.000	6.0	50	12	0.50	-	-	24.30	23.24	22.19	21.13
28480	-	.1575		4.000	6.0	50	12	BALL	-	-	24.30	23.24	22.19	21.13
61166	-	.1575		4.000	6.0	65	19	-	-	-	26.54	25.39	24.23	23.08
61168	-	.1575		4.000	6.0	65	19	0.30	-	-	26.93	25.76	24.59	23.42
62007	-	.1875	3/16"	4.763	3/16"	2"	5/16"	-	-	-	16.08	15.38	14.68	13.98
27500	-	.1875	3/16"	4.763	3/16"	2"	5/16"	.010"	-	-	18.01	17.23	16.44	15.66
61170	-	.1875	3/16"	4.763	3/16"	2"	5/16"	.015"	-	-	18.01	17.23	16.44	15.66
61172	-	.1875	3/16"	4.763	3/16"	2"	5/16"	.020"	-	-	18.01	17.23	16.44	15.66
28490	-	.1875	3/16"	4.763	3/16"	2"	5/16"	BALL	-	-	18.01	17.23	16.44	15.66
61174	-	.1875	3/16"	4.763	3/16"	2"	7/16"	-	-	-	16.08	15.38	14.68	13.98
61176	-	.1875	3/16"	4.763	3/16"	2"	7/16"	.010"	-	-	18.01	17.23	16.44	15.66
61178	-	.1875	3/16"	4.763	3/16"	2"	7/16"	.015"	-	-	18.01	17.23	16.44	15.66
62017	-	.1875	3/16"	4.763	3/16"	2"	9/16"	-	-	-	16.08	15.38	14.68	13.98
27520	-	.1875	3/16"	4.763	3/16"	2"	9/16"	.010"	-	-	18.01	17.23	16.44	15.66
61180	-	.1875	3/16"	4.763	3/16"	2"	9/16"	.015"	-	-	18.01	17.23	16.44	15.66
27521	-	.1875	3/16"	4.763	3/16"	2"	9/16"	.020"	-	-	18.01	17.23	16.44	15.66
61182	-	.1875	3/16"	4.763	3/16"	2"	9/16"	.030"	-	-	18.01	17.23	16.44	15.66
28500	-	.1875	3/16"	4.763	3/16"	2"	9/16"	BALL	-	-	18.01	17.23	16.44	15.66
61184	-	.1875	3/16"	4.763	3/16"	3"	1"	.010"	-	-	30.82	29.48	28.14	26.80
61186	-	.1875	3/16"	4.763	3/16"	3"	1-1/4"	.010"	-	-	30.82	29.48	28.14	26.80
63100	-	.1875	3/16"	4.763	3/16"	4"	5/16"	.010"	-	-	33.55	32.09	30.63	29.17

70

35

MATERIAL HARDNESS (Rc)

0

continued →

Series VRX (continued)

.1969" - .2500"
(5.000mm - 6.350mm)

EDP#		$d1$ †		$d2$	$l1$	$l2$	r	$l3$	$d3$	1-11	12-24	25-49	50-100
(plain)	(weldon)	Decimal	Diameter	Metric	Shank Diameter	Overall Length	Flute Length	Corner Radius	Reach Length	Neck Diameter			
61188	-	.1969		5.000	6.0	50	10	-	-	-	23.44	22.42	21.40
27522	-	.1969		5.000	6.0	50	10	0.30	-	-	23.82	22.78	21.75
61190	-	.1969		5.000	6.0	50	10	0.50	-	-	23.82	22.78	21.75
28510	-	.1969		5.000	6.0	50	10	BALL	-	-	23.82	22.78	21.75
62057	-	.1969		5.000	6.0	65	15	-	-	-	25.60	24.49	23.37
27524	-	.1969		5.000	6.0	65	15	0.30	-	-	26.38	25.23	24.09
27526	-	.1969		5.000	6.0	65	15	0.50	-	-	26.38	25.23	24.09
27528	-	.1969		5.000	6.0	65	15	1.00	-	-	26.38	25.23	24.09
28520	-	.1969		5.000	6.0	65	15	BALL	-	-	26.38	25.23	24.09
63110	-	.1969		5.000	6.0	100	10	0.30	-	-	50.55	48.36	46.16
61192	-	.1969		5.000	6.0	100	10	0.30	55	4.70	59.20	56.63	54.05
61194	-	.2188	7/32"	5.558	1/4"	2"	3/8"	-	-	-	19.76	18.90	18.04
61196	-	.2188	7/32"	5.558	1/4"	2"	3/8"	.010"	-	-	22.91	21.91	20.92
27525	-	.2188	7/32"	5.558	1/4"	2"	3/8"	.015"	-	-	22.91	21.91	20.92
61198	-	.2188	7/32"	5.558	1/4"	2"	3/8"	BALL	-	-	22.91	21.91	20.92
61200	-	.2188	7/32"	5.558	1/4"	2-1/2"	3/4"	-	-	-	22.43	21.45	20.48
61202	-	.2188	7/32"	5.558	1/4"	2-1/2"	3/4"	.010"	-	-	25.40	24.30	23.19
27530	-	.2188	7/32"	5.558	1/4"	2-1/2"	3/4"	.015"	-	-	25.40	24.30	23.19
61204	-	.2188	7/32"	5.558	1/4"	2-1/2"	3/4"	.020"	-	-	25.40	24.30	23.19
61206	-	.2188	7/32"	5.558	1/4"	2-1/2"	3/4"	BALL	-	-	25.40	24.30	23.19
61208	-	.2188	7/32"	5.558	1/4"	3"	1-1/4"	.015"	-	-	37.65	36.01	34.38
63120	-	.2188	7/32"	5.558	1/4"	4"	3/8"	.015"	-	-	48.82	46.70	44.57
61210	-	.2188	7/32"	5.558	1/4"	4"	3/8"	.015"	2-1/4"	.205"	57.47	54.97	52.47
62077	-	.2362		6.000	6.0	50	12	-	-	-	19.93	19.06	18.20
27535	-	.2362		6.000	6.0	50	12	0.30	-	-	23.05	22.04	21.04
61212	-	.2362		6.000	6.0	50	12	0.50	-	-	23.05	22.04	21.04
61214	-	.2362		6.000	6.0	50	12	0.75	-	-	23.05	22.04	21.04
28530	-	.2362		6.000	6.0	50	12	BALL	-	-	23.05	22.04	21.04
62087	-	.2362		6.000	6.0	65	19	-	-	-	22.46	21.48	20.51
61216	-	.2362		6.000	6.0	65	19	0.20	-	-	25.54	24.43	23.32
27540	-	.2362		6.000	6.0	65	19	0.30	-	-	25.54	24.43	23.32
27545	-	.2362		6.000	6.0	65	19	0.50	-	-	25.54	24.43	23.32
61218	-	.2362		6.000	6.0	65	19	0.75	-	-	25.54	24.43	23.32
27547	-	.2362		6.000	6.0	65	19	1.00	-	-	25.54	24.43	23.32
27548	-	.2362		6.000	6.0	65	19	1.50	-	-	25.54	24.43	23.32
28540	-	.2362		6.000	6.0	65	19	BALL	-	-	25.54	24.43	23.32
61220	-	.2362		6.000	6.0	75	26	0.30	-	-	38.00	36.34	34.69
61222	-	.2362		6.000	6.0	75	26	0.50	-	-	38.00	36.34	34.69
61224	-	.2362		6.000	6.0	75	38	0.30	-	-	38.00	36.34	34.69
61226	-	.2362		6.000	6.0	75	38	0.50	-	-	38.00	36.34	34.69
63130	-	.2362		6.000	6.0	100	12	0.30	32	5.70	49.29	47.15	45.00
62137	-	.2500	1/4"	6.350	1/4"	2"	3/8"	-	-	-	19.12	18.29	17.46
61228	-	.2500	1/4"	6.350	1/4"	2"	3/8"	.010"	-	-	21.32	20.39	19.47
27560	-	.2500	1/4"	6.350	1/4"	2"	3/8"	.015"	-	-	22.17	21.21	20.24
61230	-	.2500	1/4"	6.350	1/4"	2"	3/8"	.020"	-	-	22.17	21.21	20.24
28570	-	.2500	1/4"	6.350	1/4"	2"	3/8"	BALL	-	-	22.17	21.21	20.24
61232	-	.2500	1/4"	6.350	1/4"	2"	1/2"	-	-	-	19.12	18.29	17.46
61234	-	.2500	1/4"	6.350	1/4"	2"	1/2"	.015"	-	-	22.17	21.21	20.24
62147	-	.2500	1/4"	6.350	1/4"	2-1/2"	3/4"	-	-	-	21.69	20.75	19.80
27570	-	.2500	1/4"	6.350	1/4"	2-1/2"	3/4"	.010"	-	-	24.56	23.50	22.43
27580	-	.2500	1/4"	6.350	1/4"	2-1/2"	3/4"	.015"	-	-	24.56	23.50	22.43
61236	-	.2500	1/4"	6.350	1/4"	2-1/2"	3/4"	.020"	-	-	24.56	23.50	22.43
27581	-	.2500	1/4"	6.350	1/4"	2-1/2"	3/4"	.030"	-	-	24.56	23.50	22.43
61238	-	.2500	1/4"	6.350	1/4"	2-1/2"	3/4"	.040"	-	-	24.56	23.50	22.43

EDP#		d_1 †			d_2	l_1	l_2	r	l_3	d_3				
(plain)	(weldon)	Diameter		Metric	Shank Diameter	Overall Length	Flute Length	Corner Radius	Reach Length	Neck Diameter	1-11	12-24	25-49	50-100
27583	-	.2500	1/4"	6.350	1/4"	2-1/2"	3/4"	.060"	-	-	24.56	23.50	22.43	21.36
28580	-	.2500	1/4"	6.350	1/4"	2-1/2"	3/4"	BALL	-	-	24.56	23.50	22.43	21.36
61240	-	.2500	1/4"	6.350	1/4"	3"	1"	.015"	-	-	36.40	34.82	33.23	31.65
61241	-	.2500	1/4"	6.350	1/4"	3"	1-1/8"	.030"	-	-	36.40	34.82	33.23	31.65
61242	-	.2500	1/4"	6.350	1/4"	3"	1-1/2"	.015"	-	-	36.40	34.82	33.23	31.65
61244	-	.2500	1/4"	6.350	1/4"	4"	3/8"	.015"	3/4"	.240"	47.60	45.53	43.46	41.39
63140	-	.2500	1/4"	6.350	1/4"	4"	3/8"	.015"	1-1/4"	.240"	47.60	45.53	43.46	41.39
61246	-	.2500	1/4"	6.350	1/4"	4"	3/8"	.015"	2-1/8"	.240"	47.60	45.53	43.46	41.39
27585	-	.2756		7.000	8.0	50	12	0.30	-	-	35.96	34.40	32.83	31.27
27590	-	.2756		7.000	8.0	65	22	0.30	-	-	39.53	37.81	36.09	34.37
61248	-	.2812	9/32"	7.142	5/16"	2"	7/16"	-	-	-	30.25	28.93	27.62	26.30
27595	-	.2812	9/32"	7.142	5/16"	2"	7/16"	.015"	-	-	34.66	33.15	31.65	30.14
61250	-	.2812	9/32"	7.142	5/16"	2-1/2"	13/16"	-	-	-	35.40	33.86	32.32	30.78
61252	-	.2812	9/32"	7.142	5/16"	2-1/2"	13/16"	.010"	-	-	38.10	36.44	34.79	33.13
27597	-	.2812	9/32"	7.142	5/16"	2-1/2"	13/16"	.015"	-	-	38.10	36.44	34.79	33.13
61254	-	.2812	9/32"	7.142	5/16"	2-1/2"	13/16"	.020"	-	-	38.10	36.44	34.79	33.13
63150	-	.2812	9/32"	7.142	5/16"	4"	7/16"	.015"	-	-	65.83	62.96	60.10	57.24
62207	-	.3125	5/16"	7.938	5/16"	2"	7/16"	-	-	-	26.43	25.28	24.13	22.98
61256	-	.3125	5/16"	7.938	5/16"	2"	7/16"	.010"	-	-	30.29	28.97	27.66	26.34
61258	-	.3125	5/16"	7.938	5/16"	2"	7/16"	.015"	-	-	30.29	28.97	27.66	26.34
27600	-	.3125	5/16"	7.938	5/16"	2"	7/16"	.020"	-	-	30.29	28.97	27.66	26.34
61260	-	.3125	5/16"	7.938	5/16"	2"	7/16"	.030"	-	-	30.29	28.97	27.66	26.34
28610	-	.3125	5/16"	7.938	5/16"	2"	7/16"	BALL	-	-	30.29	28.97	27.66	26.34
62217	-	.3125	5/16"	7.938	5/16"	2-1/2"	13/16"	-	-	-	30.92	29.58	28.23	26.89
27610	-	.3125	5/16"	7.938	5/16"	2-1/2"	13/16"	.010"	-	-	33.29	31.85	30.40	28.95
61262	-	.3125	5/16"	7.938	5/16"	2-1/2"	13/16"	.015"	-	-	33.29	31.85	30.40	28.95
27620	-	.3125	5/16"	7.938	5/16"	2-1/2"	13/16"	.020"	-	-	33.29	31.85	30.40	28.95
27622	-	.3125	5/16"	7.938	5/16"	2-1/2"	13/16"	.030"	-	-	33.29	31.85	30.40	28.95
61264	-	.3125	5/16"	7.938	5/16"	2-1/2"	13/16"	.040"	-	-	33.29	31.85	30.40	28.95
27624	-	.3125	5/16"	7.938	5/16"	2-1/2"	13/16"	.060"	-	-	33.29	31.85	30.40	28.95
28620	-	.3125	5/16"	7.938	5/16"	2-1/2"	13/16"	BALL	-	-	33.29	31.85	30.40	28.95
61266	-	.3125	5/16"	7.938	5/16"	3"	1-1/4"	.015"	-	-	46.41	44.40	42.38	40.36
63160	-	.3125	5/16"	7.938	5/16"	4"	7/16"	.020"	1-7/8"	.300"	64.19	61.40	58.61	55.82
62257	-	.3150		8.000	8.0	50	12	-	-	-	27.52	26.32	25.13	23.93
61268	-	.3150		8.000	8.0	50	12	0.30	-	-	31.41	30.04	28.68	27.31
27630	-	.3150		8.000	8.0	50	12	0.50	-	-	31.41	30.04	28.68	27.31
61270	-	.3150		8.000	8.0	50	12	0.75	-	-	31.41	30.04	28.68	27.31
28630	-	.3150		8.000	8.0	50	12	BALL	-	-	31.41	30.04	28.68	27.31
62267	-	.3150		8.000	8.0	65	22	-	-	-	32.05	30.66	29.26	27.87
27635	-	.3150		8.000	8.0	65	22	0.30	-	-	34.55	33.04	31.54	30.04
27640	-	.3150		8.000	8.0	65	22	0.50	-	-	34.55	33.04	31.54	30.04
61272	-	.3150		8.000	8.0	65	22	0.75	-	-	34.55	33.04	31.54	30.04
27642	-	.3150		8.000	8.0	65	22	1.00	-	-	34.55	33.04	31.54	30.04
27643	-	.3150		8.000	8.0	65	22	1.50	-	-	34.55	33.04	31.54	30.04
61274	-	.3150		8.000	8.0	65	22	2.00	-	-	34.55	33.04	31.54	30.04
28640	-	.3150		8.000	8.0	65	22	BALL	-	-	34.55	33.04	31.54	30.04
61276	-	.3150		8.000	8.0	75	38	0.50	-	-	48.39	46.29	44.18	42.08
61278	-	.3150		8.000	8.0	100	50	0.50	-	-	55.28	52.88	50.47	48.07
63170	-	.3150		8.000	8.0	100	12	0.50	47	7.60	66.40	63.51	60.63	57.74
61280	-	.3438	11/32"	8.733	3/8"	2"	1/2"	-	-	-	35.34	33.80	32.27	30.73
27645	-	.3438	11/32"	8.733	3/8"	2"	1/2"	.020"	-	-	40.45	38.69	36.93	35.17
61282	-	.3438	11/32"	8.733	3/8"	2-1/2"	7/8"	-	-	-	41.29	39.49	37.70	35.90
27650	-	.3438	11/32"	8.733	3/8"	2-1/2"	7/8"	.020"	-	-	43.98	42.06	40.15	38.24
61284	-	.3438	11/32"	8.733	3/8"	3"	1-1/4"	.015"	-	-	57.88	55.36	52.85	50.33

continued →

70

35

MATERIAL HARDNESS (Rc)

0

Series VRX (continued)

.3438" - .3937"
(8.733mm - 10.000mm)



TECH
PAGES
294-295

TOLERANCES

d_1	+0.00" - .002" (+.000mm - .050mm)
d_2	h6
r	+0.01" - .001" (+.025 - .025mm)

Recommended for Inconel, pH materials, titanium and tool steels >40Rc

AlTiN Coating

Solid submicron grain carbide end mill - center cutting

Excellent for High Efficiency Milling

Reduces vibration for more aggressive machining resulting in less cycle times and greater productivity

Staggered flute geometry



EDP#		$d1$ †			$d2$	$l1$	$l2$	r	$l3$	$d3$	1-11	12-24	25-49	50-100
(plain)	(weldon)	Decimal	Diameter	Metric	Shank Diameter	Overall Length	Flute Length	Corner Radius	Reach Length	Neck Diameter				
63180	-	.3438	11/32"	8.733	3/8"	4"	1/2"	.020"	-	-	70.48	67.42	64.35	61.29
27655	-	.3543		9.000	10.0	50	14	0.50	-	-	48.83	46.71	44.58	42.46
62287	-	.3543		9.000	10.0	65	22	-	-	-	49.50	47.34	45.19	43.04
27657	-	.3543		9.000	10.0	65	22	0.50	-	-	53.08	50.78	48.47	46.16
62317	-	.3750	3/8"	9.525	3/8"	2"	1/2"	-	-	-	31.22	29.87	28.51	27.15
27658	-	.3750	3/8"	9.525	3/8"	2"	1/2"	.010"	-	-	35.75	34.20	32.64	31.09
61286	-	.3750	3/8"	9.525	3/8"	2"	1/2"	.015"	-	-	35.75	34.20	32.64	31.09
27660	-	.3750	3/8"	9.525	3/8"	2"	1/2"	.020"	-	-	35.75	34.20	32.64	31.09
27662	-	.3750	3/8"	9.525	3/8"	2"	1/2"	.030"	-	-	35.75	34.20	32.64	31.09
61288	-	.3750	3/8"	9.525	3/8"	2"	1/2"	.060"	-	-	35.75	34.20	32.64	31.09
28670	-	.3750	3/8"	9.525	3/8"	2"	1/2"	BALL	-	-	35.75	34.20	32.64	31.09
28676	-	.3750	3/8"	9.525	3/8"	2"	5/8"	.045"	-	-	35.75	34.20	32.64	31.09
62327	-	.3750	3/8"	9.525	3/8"	2-1/2"	7/8"	-	-	-	36.49	34.90	33.32	31.73
27670	-	.3750	3/8"	9.525	3/8"	2-1/2"	7/8"	.010"	-	-	38.88	37.19	35.50	33.81
61290	-	.3750	3/8"	9.525	3/8"	2-1/2"	7/8"	.015"	-	-	38.88	37.19	35.50	33.81
27680	-	.3750	3/8"	9.525	3/8"	2-1/2"	7/8"	.020"	-	-	38.88	37.19	35.50	33.81
27682	-	.3750	3/8"	9.525	3/8"	2-1/2"	7/8"	.030"	-	-	38.88	37.19	35.50	33.81
61292	-	.3750	3/8"	9.525	3/8"	2-1/2"	7/8"	.040"	-	-	38.88	37.19	35.50	33.81
61294	-	.3750	3/8"	9.525	3/8"	2-1/2"	7/8"	.050"	-	-	38.88	37.19	35.50	33.81
27684	-	.3750	3/8"	9.525	3/8"	2-1/2"	7/8"	.060"	-	-	38.88	37.19	35.50	33.81
61296	-	.3750	3/8"	9.525	3/8"	2-1/2"	7/8"	.094"	-	-	38.88	37.19	35.50	33.81
28680	-	.3750	3/8"	9.525	3/8"	2-1/2"	7/8"	BALL	-	-	38.88	37.19	35.50	33.81
61298	-	.3750	3/8"	9.525	3/8"	3"	1-1/4"	.015"	-	-	51.16	48.94	46.71	44.49
61299	-	.3750	3/8"	9.525	3/8"	3"	1-1/4"	.030"	-	-	51.16	48.94	46.71	44.49
61300	-	.3750	3/8"	9.525	3/8"	4"	1-1/2"	.015"	-	-	57.58	55.08	52.57	50.07
61302	-	.3750	3/8"	9.525	3/8"	4"	1-1/2"	BALL	-	-	57.58	55.08	52.57	50.07
61304	-	.3750	3/8"	9.525	3/8"	4"	2"	.015"	-	-	57.58	55.08	52.57	50.07
61306	-	.3750	3/8"	9.525	3/8"	4"	1/2"	.015"	1-1/8"	.360"	68.71	65.73	62.74	59.75
63190	-	.3750	3/8"	9.525	3/8"	4"	1/2"	.020"	1-7/8"	.360"	68.71	65.73	62.74	59.75
61308	-	.3750	3/8"	9.525	3/8"	4"	1/2"	.015"	2-1/8"	.360"	68.71	65.73	62.74	59.75
61310	-	.3750	3/8"	9.525	3/8"	6"	1/2"	.015"	3-1/8"	.360"	90.85	86.90	82.95	79.00
61312	-	.3937		10.000	10.0	50	16	-	-	-	40.24	38.49	36.74	34.99
27690	-	.3937		10.000	10.0	50	16	0.50	-	-	43.16	41.28	39.41	37.53
61314	-	.3937		10.000	10.0	50	16	1.00	-	-	43.16	41.28	39.41	37.53
28690	-	.3937		10.000	10.0	50	16	BALL	-	-	43.16	41.28	39.41	37.53
62397	-	.3937		10.000	10.0	70	22	-	-	-	43.76	41.86	39.95	38.05
27698	-	.3937		10.000	10.0	70	22	0.30	-	-	46.94	44.90	42.86	40.82
27700	-	.3937		10.000	10.0	70	22	0.50	-	-	46.94	44.90	42.86	40.82
61316	-	.3937		10.000	10.0	70	22	0.75	-	-	46.94	44.90	42.86	40.82
27702	-	.3937		10.000	10.0	70	22	1.00	-	-	46.94	44.90	42.86	40.82
28700	-	.3937		10.000	10.0	70	22	BALL	-	-	46.94	44.90	42.86	40.82
61318	-	.3937		10.000	10.0	70	32	0.50	-	-	46.94	44.90	42.86	40.82
61320	-	.3937		10.000	10.0	100	38	0.50	-	-	72.90	69.73	66.56	63.39
61322	-	.3937		10.000	10.0	100	50	0.50	-	-	72.90	69.73	66.56	63.39
63200	-	.3937		10.000	10.0	100	14	0.50	47	9.50	84.03	80.38	76.72	73.07

MATERIAL HARDNESS (Rc)

70

35

0

EDP#		d_1 †			d_2	l_1	l_2	r	l_3	d_3				
(plain)	(weldon)	Decimal	Diameter	Metric	Shank Diameter	Overall Length	Flute Length	Corner Radius	Reach Length	Neck Diameter	1-11	12-24	25-49	50-100
27705	-	.4375	7/16"	11.113	7/16"	2-1/2"	5/8"	.020"	-	-	47.01	44.97	42.92	40.88
28705	-	.4375	7/16"	11.113	7/16"	2-1/2"	5/8"	BALL	-	-	47.01	44.97	42.92	40.88
62437	-	.4375	7/16"	11.113	7/16"	2-3/4"	7/8"	-	-	-	43.87	41.97	40.06	38.15
27708	-	.4375	7/16"	11.113	7/16"	2-3/4"	7/8"	.010"	-	-	47.01	44.97	42.92	40.88
27710	-	.4375	7/16"	11.113	7/16"	2-3/4"	7/8"	.020"	-	-	47.01	44.97	42.92	40.88
28710	-	.4375	7/16"	11.113	7/16"	2-3/4"	7/8"	BALL	-	-	47.01	44.97	42.92	40.88
63210	-	.4375	7/16"	11.113	7/16"	6"	1"	.020"	-	-	101.35	96.94	92.54	88.13
62475	-	.4724		12.000	12.0	65	19	-	-	-	53.27	50.95	48.64	46.32
27712	-	.4724		12.000	12.0	65	19	0.30	-	-	61.96	59.27	56.57	53.88
27715	-	.4724		12.000	12.0	65	19	0.50	-	-	61.96	59.27	56.57	53.88
28715	-	.4724		12.000	12.0	65	19	BALL	-	-	61.96	59.27	56.57	53.88
61324	-	.4724		12.000	12.0	75	26	-	-	-	56.83	54.36	51.89	49.42
61326	-	.4724		12.000	12.0	75	26	0.50	-	-	69.13	66.12	63.12	60.11
62485	-	.4724		12.000	12.0	75	32	-	-	-	56.83	54.36	51.89	49.42
27718	-	.4724		12.000	12.0	75	32	0.30	-	-	69.13	66.12	63.12	60.11
27720	-	.4724		12.000	12.0	75	32	0.50	-	-	69.13	66.12	63.12	60.11
61328	-	.4724		12.000	12.0	75	32	0.75	-	-	69.13	66.12	63.12	60.11
27722	-	.4724		12.000	12.0	75	32	1.00	-	-	69.13	66.12	63.12	60.11
27730	-	.4724		12.000	12.0	75	32	1.50	-	-	69.13	66.12	63.12	60.11
27735	-	.4724		12.000	12.0	75	32	2.00	-	-	69.13	66.12	63.12	60.11
61330	-	.4724		12.000	12.0	75	32	3.00	-	-	69.13	66.12	63.12	60.11
28720	-	.4724		12.000	12.0	75	32	BALL	-	-	69.13	66.12	63.12	60.11
61332	-	.4724		12.000	12.0	100	38	-	-	-	77.51	74.14	70.77	67.40
61334	-	.4724		12.000	12.0	100	38	0.50	-	-	81.89	78.33	74.77	71.21
61336	-	.4724		12.000	12.0	100	42	-	-	-	77.51	74.14	70.77	67.40
61338	-	.4724		12.000	12.0	100	42	0.50	-	-	81.89	78.33	74.77	71.21
61340	-	.4724		12.000	12.0	100	52	-	-	-	77.51	74.14	70.77	67.40
61342	-	.4724		12.000	12.0	100	52	0.50	-	-	81.89	78.33	74.77	71.21
63220	-	.4724		12.000	12.0	150	19	0.50	57	11.50	121.96	116.66	111.35	106.05
62525	62527	.5000	1/2"	12.700	1/2"	2-1/2"	5/8"	-	-	-	51.08	48.86	46.64	44.42
27739	27738	.5000	1/2"	12.700	1/2"	2-1/2"	5/8"	.010"	-	-	59.42	56.84	54.25	51.67
61344	-	.5000	1/2"	12.700	1/2"	2-1/2"	5/8"	.015"	-	-	59.42	56.84	54.25	51.67
27741	27740	.5000	1/2"	12.700	1/2"	2-1/2"	5/8"	.020"	-	-	59.42	56.84	54.25	51.67
27743	27742	.5000	1/2"	12.700	1/2"	2-1/2"	5/8"	.030"	-	-	59.42	56.84	54.25	51.67
61346	-	.5000	1/2"	12.700	1/2"	2-1/2"	5/8"	.060"	-	-	59.42	56.84	54.25	51.67
28751	28750	.5000	1/2"	12.700	1/2"	2-1/2"	5/8"	BALL	-	-	59.42	56.84	54.25	51.67
61348	-	.5000	1/2"	12.700	1/2"	3"	1"	-	-	-	54.58	52.21	49.83	47.46
61350	-	.5000	1/2"	12.700	1/2"	3"	1"	.015"	-	-	66.32	63.44	60.55	57.67
61352	-	.5000	1/2"	12.700	1/2"	3"	1"	.030"	-	-	66.32	63.44	60.55	57.67
61354	-	.5000	1/2"	12.700	1/2"	3"	1"	.060"	-	-	66.32	63.44	60.55	57.67
61356	-	.5000	1/2"	12.700	1/2"	3"	1"	.125"	-	-	66.32	63.44	60.55	57.67
61358	-	.5000	1/2"	12.700	1/2"	3"	1"	BALL	-	-	66.32	63.44	60.55	57.67
62535	62537	.5000	1/2"	12.700	1/2"	3"	1-1/4"	-	-	-	54.58	52.21	49.83	47.46
27751	27750	.5000	1/2"	12.700	1/2"	3"	1-1/4"	.010"	-	-	66.32	63.44	60.55	57.67
61360	-	.5000	1/2"	12.700	1/2"	3"	1-1/4"	.015"	-	-	66.32	63.44	60.55	57.67
27761	27760	.5000	1/2"	12.700	1/2"	3"	1-1/4"	.020"	-	-	66.32	63.44	60.55	57.67
27763	27762	.5000	1/2"	12.700	1/2"	3"	1-1/4"	.030"	-	-	66.32	63.44	60.55	57.67
61362	-	.5000	1/2"	12.700	1/2"	3"	1-1/4"	.040"	-	-	66.32	63.44	60.55	57.67
61364	-	.5000	1/2"	12.700	1/2"	3"	1-1/4"	.050"	-	-	66.32	63.44	60.55	57.67
27767	27764	.5000	1/2"	12.700	1/2"	3"	1-1/4"	.060"	-	-	66.32	63.44	60.55	57.67
61366	-	.5000	1/2"	12.700	1/2"	3"	1-1/4"	.078"	-	-	66.32	63.44	60.55	57.67
63398	63399	.5000	1/2"	12.700	1/2"	3"	1-1/4"	.090"	-	-	66.32	63.44	60.55	57.67

70

35

MATERIAL HARDNESS (Rc)

0

continued →

Series VRX (continued)

.5000" - .6250"
(12.700mm - 15.875mm)

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
(plain)	(weldon)	Decimal	1/2"	Metric										
61368	-	.5000	1/2"	12.700	1/2"	3"	1-1/4"	.094"	-	-	66.32	63.44	60.55	57.67
61370	-	.5000	1/2"	12.700	1/2"	3"	1-1/4"	.100"	-	-	66.32	63.44	60.55	57.67
27769	27768	.5000	1/2"	12.700	1/2"	3"	1-1/4"	.120"	-	-	66.32	63.44	60.55	57.67
61372	-	.5000	1/2"	12.700	1/2"	3"	1-1/4"	.125"	-	-	66.32	63.44	60.55	57.67
28761	28760	.5000	1/2"	12.700	1/2"	3"	1-1/4"	BALL	-	-	66.32	63.44	60.55	57.67
28771	28770	.5000	1/2"	12.700	1/2"	4"	5/8"	BALL	-	-	78.37	74.97	71.56	68.15
61374	-	.5000	1/2"	12.700	1/2"	4"	1-1/2"	-	-	-	73.85	70.64	67.43	64.22
63401	63400	.5000	1/2"	12.700	1/2"	4"	1-1/2"	.010"	-	-	78.37	74.97	71.56	68.15
61376	-	.5000	1/2"	12.700	1/2"	4"	1-1/2"	.015"	-	-	78.37	74.97	71.56	68.15
63411	63410	.5000	1/2"	12.700	1/2"	4"	1-1/2"	.030"	-	-	78.37	74.97	71.56	68.15
63421	63420	.5000	1/2"	12.700	1/2"	4"	1-1/2"	.060"	-	-	78.37	74.97	71.56	68.15
63424	-	.5000	1/2"	12.700	1/2"	4"	1-1/2"	.125"	-	-	78.37	74.97	71.56	68.15
61378	-	.5000	1/2"	12.700	1/2"	4"	1-1/2"	BALL	-	-	78.37	74.97	71.56	68.15
61380	-	.5000	1/2"	12.700	1/2"	4"	1-5/8"	.015"	-	-	78.37	74.97	71.56	68.15
61382	-	.5000	1/2"	12.700	1/2"	4"	1-3/4"	.015"	-	-	78.37	74.97	71.56	68.15
62565	62567	.5000	1/2"	12.700	1/2"	4"	2"	-	-	-	73.85	70.64	67.43	64.22
63431	63430	.5000	1/2"	12.700	1/2"	4"	2"	.010"	-	-	78.37	74.97	71.56	68.15
61384	-	.5000	1/2"	12.700	1/2"	4"	2"	.015"	-	-	78.37	74.97	71.56	68.15
63441	63440	.5000	1/2"	12.700	1/2"	4"	2"	.030"	-	-	78.37	74.97	71.56	68.15
63451	63450	.5000	1/2"	12.700	1/2"	4"	2"	.060"	-	-	78.37	74.97	71.56	68.15
61386	-	.5000	1/2"	12.700	1/2"	4"	2-1/8"	.015"	-	-	78.37	74.97	71.56	68.15
63241	63240	.5000	1/2"	12.700	1/2"	6"	2"	.020"	-	-	110.84	106.02	101.20	96.38
61388	-	.5000	1/2"	12.700	1/2"	6"	2-1/2"	.015"	-	-	110.84	106.02	101.20	96.38
61390	-	.5000	1/2"	12.700	1/2"	6"	2-1/2"	.030"	-	-	110.84	106.02	101.20	96.38
61392	-	.5000	1/2"	12.700	1/2"	6"	3-1/4"	.030"	-	-	110.84	106.02	101.20	96.38
61394	-	.5000	1/2"	12.700	1/2"	4"	5/8"	.015"	1-1/2"	.480"	89.46	85.57	81.68	77.79
61396	-	.5000	1/2"	12.700	1/2"	4"	5/8"	.015"	2-1/4"	.480"	89.46	85.57	81.68	77.79
63231	63230	.5000	1/2"	12.700	1/2"	4"	5/8"	.020"	2-1/4"	.480"	89.46	85.57	81.68	77.79
61398	-	.5000	1/2"	12.700	1/2"	6"	5/8"	.015"	3-3/8"	.480"	121.92	116.62	111.32	106.02
61400	-	.5000	1/2"	12.700	1/2"	6"	5/8"	.015"	4-1/8"	.480"	121.92	116.62	111.32	106.02
27766	27765	.5512		14.000	14.0	75	19	0.50	-	-	97.85	93.60	89.34	85.09
28781	28780	.5512		14.000	14.0	75	19	BALL	-	-	97.85	93.60	89.34	85.09
27771	27770	.5512		14.000	14.0	88	32	0.50	-	-	100.57	96.20	91.82	87.45
28786	28785	.5512		14.000	14.0	88	32	BALL	-	-	100.57	96.20	91.82	87.45
63261	63260	.5512		14.000	14.0	150	50	0.50	-	-	145.16	138.85	132.54	126.23
63251	-	.5512		14.000	14.0	150	19	0.50	57	13.50	155.86	149.08	142.31	135.53
62625	62627	.5625	9/16"	14.288	9/16"	3-1/2"	1-1/4"	-	-	-	90.76	86.81	82.87	78.92
61402	-	.6250	5/8"	15.875	5/8"	3"	3/4"	-	-	-	97.84	93.59	89.33	85.08
63461	63460	.6250	5/8"	15.875	5/8"	3"	3/4"	.010"	-	-	102.73	98.26	93.80	89.33
61404	-	.6250	5/8"	15.875	5/8"	3"	3/4"	.015"	-	-	102.73	98.26	93.80	89.33
27781	27780	.6250	5/8"	15.875	5/8"	3"	3/4"	.025"	-	-	102.73	98.26	93.80	89.33
61406	-	.6250	5/8"	15.875	5/8"	3"	3/4"	.060"	-	-	102.73	98.26	93.80	89.33
28796	28795	.6250	5/8"	15.875	5/8"	3"	3/4"	BALL	-	-	102.73	98.26	93.80	89.33
62655	62657	.6250	5/8"	15.875	5/8"	3-1/2"	1-1/4"	-	-	-	100.71	96.33	91.95	87.57
27791	27790	.6250	5/8"	15.875	5/8"	3-1/2"	1-1/4"	.010"	-	-	105.58	100.99	96.40	91.81
61408	-	.6250	5/8"	15.875	5/8"	3-1/2"	1-1/4"	.015"	-	-	105.58	100.99	96.40	91.81
61410	-	.6250	5/8"	15.875	5/8"	3-1/2"	1-1/4"	.020"	-	-	105.58	100.99	96.40	91.81
27801	27800	.6250	5/8"	15.875	5/8"	3-1/2"	1-1/4"	.025"	-	-	105.58	100.99	96.40	91.81
61412	-	.6250	5/8"	15.875	5/8"	3-1/2"	1-1/4"	.030"	-	-	105.58	100.99	96.40	91.81
61414	-	.6250	5/8"	15.875	5/8"	3-1/2"	1-1/4"	.040"	-	-	105.58	100.99	96.40	91.81
27803	27802	.6250	5/8"	15.875	5/8"	3-1/2"	1-1/4"	.060"	-	-	105.58	100.99	96.40	91.81
61416	-	.6250	5/8"	15.875	5/8"	3-1/2"	1-1/4"	.078"	-	-	105.58	100.99	96.40	91.81
61418	-	.6250	5/8"	15.875	5/8"	3-1/2"	1-1/4"	.094"	-	-	105.58	100.99	96.40	91.81
27805	27804	.6250	5/8"	15.875	5/8"	3-1/2"	1-1/4"	.120"	-	-	105.58	100.99	96.40	91.81
61420	-	.6250	5/8"	15.875	5/8"	3-1/2"	1-1/4"	.125"	-	-	105.58	100.99	96.40	91.81
28801	28800	.6250	5/8"	15.875	5/8"	3-1/2"	1-1/4"	BALL	-	-	105.58	100.99	96.40	91.81

EDP#		$d1$ †			$d2$	$l1$	$l2$	r	$l3$	$d3$	1-11	12-24	25-49	50-100
(plain)	(weldon)	Decimal	Diameter	Metric	Shank Diameter	Overall Length	Flute Length	Corner Radius	Reach Length	Neck Diameter				
61422	-	.6250	5/8"	15.875	5/8"	4"	1-1/2"	-	-	-	107.55	102.87	98.20	93.52
63501	63500	.6250	5/8"	15.875	5/8"	4"	1-1/2"	.010"	-	-	114.77	109.78	104.79	99.80
61424	-	.6250	5/8"	15.875	5/8"	4"	1-1/2"	.015"	-	-	114.77	109.78	104.79	99.80
63511	63510	.6250	5/8"	15.875	5/8"	4"	1-1/2"	.030"	-	-	114.77	109.78	104.79	99.80
63521	63520	.6250	5/8"	15.875	5/8"	4"	1-1/2"	.060"	-	-	114.77	109.78	104.79	99.80
61426	-	.6250	5/8"	15.875	5/8"	4"	1-5/8"	-	-	-	107.55	102.87	98.20	93.52
61428	-	.6250	5/8"	15.875	5/8"	4"	1-5/8"	.015"	-	-	114.77	109.78	104.79	99.80
61430	-	.6250	5/8"	15.875	5/8"	4"	1-5/8"	.030"	-	-	114.77	109.78	104.79	99.80
61432	-	.6250	5/8"	15.875	5/8"	4"	1-5/8"	.060"	-	-	114.77	109.78	104.79	99.80
62675	62677	.6250	5/8"	15.875	5/8"	4"	1-3/4"	-	-	-	107.55	102.87	98.20	93.52
63531	63530	.6250	5/8"	15.875	5/8"	4"	1-3/4"	.010"	-	-	114.77	109.78	104.79	99.80
63541	63540	.6250	5/8"	15.875	5/8"	4"	1-3/4"	.030"	-	-	114.77	109.78	104.79	99.80
63551	63550	.6250	5/8"	15.875	5/8"	4"	1-3/4"	.060"	-	-	114.77	109.78	104.79	99.80
63281	63280	.6250	5/8"	15.875	5/8"	6"	2"	.025"	-	-	157.99	151.12	144.25	137.38
63283	-	.6250	5/8"	15.875	5/8"	6"	2"	.090"	-	-	157.99	151.12	144.25	137.38
63285	-	.6250	5/8"	15.875	5/8"	6"	2"	.125"	-	-	157.99	151.12	144.25	137.38
28806	28805	.6250	5/8"	15.875	5/8"	6"	2"	BALL	-	-	157.99	151.12	144.25	137.38
61434	-	.6250	5/8"	15.875	5/8"	6"	2-1/2"	.030"	-	-	157.99	151.12	144.25	137.38
61436	-	.6250	5/8"	15.875	5/8"	6"	3-1/4"	.030"	-	-	157.99	151.12	144.25	137.38
61438	-	.6250	5/8"	15.875	5/8"	4"	3/4"	.030"	1-5/8"	.600"	125.87	120.40	114.92	109.45
61440	-	.6250	5/8"	15.875	5/8"	6"	3/4"	.030"	2-3/8"	.600"	169.10	161.74	154.39	147.04
63271	63270	.6250	5/8"	15.875	5/8"	6"	3/4"	.025"	3-1/4"	.600"	169.10	161.74	154.39	147.04
61442	-	.6250	5/8"	15.875	5/8"	6"	3/4"	.030"	4-1/8"	.600"	169.10	161.74	154.39	147.04
61444	-	.6299		16.000	16.0	75	19	-	-	-	102.26	97.81	93.37	88.92
27809	-	.6299		16.000	16.0	75	19	0.30	-	-	107.24	102.58	97.91	93.25
27811	27810	.6299		16.000	16.0	75	19	0.50	-	-	107.24	102.58	97.91	93.25
61446	-	.6299		16.000	16.0	75	19	1.00	-	-	107.24	102.58	97.91	93.25
28811	28810	.6299		16.000	16.0	75	19	BALL	-	-	107.24	102.58	97.91	93.25
62715	62717	.6299		16.000	16.0	88	32	-	-	-	105.05	100.49	95.92	91.35
27819	27818	.6299		16.000	16.0	88	32	0.30	-	-	110.17	105.38	100.59	95.80
27821	27820	.6299		16.000	16.0	88	32	0.50	-	-	110.17	105.38	100.59	95.80
61448	-	.6299		16.000	16.0	88	32	0.75	-	-	110.17	105.38	100.59	95.80
27823	27822	.6299		16.000	16.0	88	32	1.00	-	-	110.17	105.38	100.59	95.80
61450	-	.6299		16.000	16.0	88	32	1.50	-	-	110.17	105.38	100.59	95.80
27825	27824	.6299		16.000	16.0	88	32	2.00	-	-	110.17	105.38	100.59	95.80
61452	-	.6299		16.000	16.0	88	32	3.00	-	-	110.17	105.38	100.59	95.80
28821	28820	.6299		16.000	16.0	88	32	BALL	-	-	110.17	105.38	100.59	95.80
63581	63580	.6299		16.000	16.0	100	38	0.30	-	-	117.15	112.06	106.96	101.87
61454	-	.6299		16.000	16.0	100	38	0.50	-	-	117.15	112.06	106.96	101.87
61456	-	.6299		16.000	16.0	100	42	0.50	-	-	117.15	112.06	106.96	101.87
63291	63290	.6299		16.000	16.0	150	19	0.50	82	15.25	169.10	161.74	154.39	147.04
27831	-	.7087		18.000	18.0	75	22	0.80	-	-	154.69	147.96	141.24	134.51
28831	-	.7087		18.000	18.0	75	22	BALL	-	-	154.69	147.96	141.24	134.51
27836	27835	.7087		18.000	18.0	100	38	0.80	-	-	158.17	151.29	144.42	137.54
28836	28835	.7087		18.000	18.0	100	38	BALL	-	-	158.17	151.29	144.42	137.54
63301	-	.7087		18.000	18.0	150	25	0.80	82	17.25	246.48	235.76	225.05	214.33
61458	-	.7500	3/4"	19.050	3/4"	3"	7/8"	-	-	-	140.67	134.55	128.44	122.32
27841	27840	.7500	3/4"	19.050	3/4"	3"	7/8"	.030"	-	-	148.19	141.75	135.30	128.86
61460	-	.7500	3/4"	19.050	3/4"	3"	7/8"	.060"	-	-	148.19	141.75	135.30	128.86
28841	28840	.7500	3/4"	19.050	3/4"	3"	7/8"	BALL	-	-	148.19	141.75	135.30	128.86
61462	-	.7500	3/4"	19.050	3/4"	4"	1-1/4"	-	-	-	143.75	137.50	131.25	125.00
61464	-	.7500	3/4"	19.050	3/4"	4"	1-1/4"	.030"	-	-	151.41	144.83	138.24	131.66
62775	62777	.7500	3/4"	19.050	3/4"	4"	1-1/2"	-	-	-	143.75	137.50	131.25	125.00
27851	27850	.7500	3/4"	19.050	3/4"	4"	1-1/2"	.015"	-	-	151.41	144.83	138.24	131.66
27861	27860	.7500	3/4"	19.050	3/4"	4"	1-1/2"	.030"	-	-	151.41	144.83	138.24	131.66
27865	27864	.7500	3/4"	19.050	3/4"	4"	1-1/2"	.060"	-	-	151.41	144.83	138.24	131.66
27867	27866	.7500	3/4"	19.050	3/4"	4"	1-1/2"	.120"	-	-	151.41	144.83	138.24	131.66
28861	28860	.7500	3/4"	19.050	3/4"	4"	1-1/2"	BALL	-	-	151.41	144.83	138.24	131.66

continued →

Series VRX (continued)

.7500" - .8661"
(19.050mm - 22.000mm)

EDP#		d_1 †			d_2	l_1	l_2	r	l_3	d_3	1-11	12-24	25-49	50-100
(plain)	(weldon)	Decimal	Diameter	Metric	Shank Diameter	Overall Length	Flute Length	Corner Radius	Reach Length	Neck Diameter				
61466	-	.7500	3/4"	19.050	3/4"	4"	1-5/8"	-	-	-	143.75	137.50	131.25	125.00
61468	-	.7500	3/4"	19.050	3/4"	4"	1-5/8"	.015"	-	-	151.41	144.83	138.24	131.66
61470	-	.7500	3/4"	19.050	3/4"	4"	1-5/8"	.030"	-	-	151.41	144.83	138.24	131.66
61472	-	.7500	3/4"	19.050	3/4"	4"	1-5/8"	.060"	-	-	151.41	144.83	138.24	131.66
61474	-	.7500	3/4"	19.050	3/4"	4"	1-5/8"	BALL	-	-	151.41	144.83	138.24	131.66
62785	62787	.7500	3/4"	19.050	3/4"	4"	1-3/4"	-	-	-	143.75	137.50	131.25	125.00
63601	63600	.7500	3/4"	19.050	3/4"	4"	1-3/4"	.015"	-	-	151.41	144.83	138.24	131.66
27869	27868	.7500	3/4"	19.050	3/4"	4"	1-3/4"	.030"	-	-	151.41	144.83	138.24	131.66
63611	63610	.7500	3/4"	19.050	3/4"	4"	1-3/4"	.060"	-	-	151.41	144.83	138.24	131.66
61476	-	.7500	3/4"	19.050	3/4"	4"	1-3/4"	.094"	-	-	151.41	144.83	138.24	131.66
63621	63620	.7500	3/4"	19.050	3/4"	4"	1-3/4"	.120"	-	-	151.41	144.83	138.24	131.66
61478	-	.7500	3/4"	19.050	3/4"	4"	1-3/4"	.190"	-	-	151.41	144.83	138.24	131.66
61480	-	.7500	3/4"	19.050	3/4"	4"	1-3/4"	BALL	-	-	151.41	144.83	138.24	131.66
62795	62797	.7500	3/4"	19.050	3/4"	5"	2"	-	-	-	192.94	184.55	176.16	167.77
63631	63630	.7500	3/4"	19.050	3/4"	5"	2"	.015"	-	-	210.01	200.88	191.75	182.62
63311	63310	.7500	3/4"	19.050	3/4"	5"	2"	.030"	-	-	210.01	200.88	191.75	182.62
63641	63640	.7500	3/4"	19.050	3/4"	5"	2"	.060"	-	-	210.01	200.88	191.75	182.62
61482	-	.7500	3/4"	19.050	3/4"	5"	2"	.094"	-	-	210.01	200.88	191.75	182.62
61484	-	.7500	3/4"	19.050	3/4"	5"	2"	.125"	-	-	210.01	200.88	191.75	182.62
28866	28865	.7500	3/4"	19.050	3/4"	5"	2"	BALL	-	-	210.01	200.88	191.75	182.62
61486	-	.7500	3/4"	19.050	3/4"	5"	2-1/2"	-	-	-	192.94	184.55	176.16	167.77
61488	-	.7500	3/4"	19.050	3/4"	5"	2-1/2"	.030"	-	-	210.01	200.88	191.75	182.62
62805	62807	.7500	3/4"	19.050	3/4"	6"	3"	-	-	-	225.79	215.97	206.16	196.34
63651	63650	.7500	3/4"	19.050	3/4"	6"	3"	.015"	-	-	249.47	238.62	227.78	216.93
63661	63660	.7500	3/4"	19.050	3/4"	6"	3"	.030"	-	-	249.47	238.62	227.78	216.93
63671	63670	.7500	3/4"	19.050	3/4"	6"	3"	.060"	-	-	249.47	238.62	227.78	216.93
61490	-	.7500	3/4"	19.050	3/4"	6"	3-1/4"	-	-	-	225.79	215.97	206.16	196.34
61492	-	.7500	3/4"	19.050	3/4"	6"	3-1/4"	.030"	-	-	249.47	238.62	227.78	216.93
61494	-	.7500	3/4"	19.050	3/4"	7"	4-1/4"	-	-	-	283.58	271.25	258.92	246.59
61496	-	.7500	3/4"	19.050	3/4"	7"	4-1/4"	.030"	-	-	314.64	300.96	287.28	273.60
63321	63320	.7500	3/4"	19.050	3/4"	6"	1"	.030"	3-1/4"	.730"	260.66	249.33	237.99	226.66
63323	-	.7500	3/4"	19.050	3/4"	6"	1"	.060"	3-1/4"	.730"	260.66	249.33	237.99	226.66
63325	-	.7500	3/4"	19.050	3/4"	6"	1"	.090"	3-1/4"	.730"	260.66	249.33	237.99	226.66
63327	-	.7500	3/4"	19.050	3/4"	6"	1"	.125"	3-1/4"	.730"	260.66	249.33	237.99	226.66
63329	-	.7500	3/4"	19.050	3/4"	6"	1"	.190"	3-1/4"	.730"	260.66	249.33	237.99	226.66
61498	-	.7874		20.000	20.0	75	22	-	-	-	189.92	181.67	173.41	165.15
61500	-	.7874		20.000	20.0	75	22	0.50	-	-	209.56	200.45	191.34	182.23
27871	27870	.7874		20.000	20.0	75	22	1.00	-	-	209.56	200.45	191.34	182.23
28871	28870	.7874		20.000	20.0	75	22	BALL	-	-	209.56	200.45	191.34	182.23
62825	62827	.7874		20.000	20.0	100	38	-	-	-	194.21	185.77	177.32	168.88
27879	27878	.7874		20.000	20.0	100	38	0.50	-	-	214.29	204.97	195.66	186.34
61502	-	.7874		20.000	20.0	100	38	0.75	-	-	214.29	204.97	195.66	186.34
27881	27880	.7874		20.000	20.0	100	38	1.00	-	-	214.29	204.97	195.66	186.34
27891	27890	.7874		20.000	20.0	100	38	1.50	-	-	214.29	204.97	195.66	186.34
61504	-	.7874		20.000	20.0	100	38	3.00	-	-	214.29	204.97	195.66	186.34
28881	28880	.7874		20.000	20.0	100	38	BALL	-	-	214.29	204.97	195.66	186.34
61506	-	.7874		20.000	20.0	100	42	0.50	-	-	214.29	204.97	195.66	186.34
61508	-	.7874		20.000	20.0	125	52	0.50	-	-	237.57	227.24	216.91	206.58
63331	63330	.7874		20.000	20.0	150	25	1.00	82	19.30	274.52	262.58	250.65	238.71
27911	-	.8661		22.000	22.0	100	38	1.00	-	-	235.39	225.16	214.92	204.69

NEW

35

EDP#		d_1 †		d_2	l_1	l_2	r	l_3	d_3	1-11	12-24	25-49	50-100
(plain)	(weldon)	Decimal	Diameter	Metric	Shank Diameter	Overall Length	Flute Length	Corner Radius	Reach Length	Neck Diameter			
61510	-	.9843		25.000	25.0	100	26	-	-	-	221.79	212.15	192.86
62855	62857	.9843		25.000	25.0	100	38	-	-	-	221.79	212.15	192.86
61514	-	.9843		25.000	25.0	100	38	0.50	-	-	245.59	234.92	213.56
27941	27940	.9843		25.000	25.0	100	38	1.00	-	-	245.59	234.92	213.56
27951	-	.9843		25.000	25.0	100	38	1.50	-	-	245.59	234.92	213.56
61516	-	.9843		25.000	25.0	100	38	3.00	-	-	245.59	234.92	213.56
28901	28900	.9843		25.000	25.0	100	38	BALL	-	-	245.59	234.92	213.56
61518	-	.9843		25.000	25.0	100	42	-	-	-	221.79	212.15	192.86
61520	-	.9843		25.000	25.0	100	42	0.50	-	-	245.59	234.92	213.56
NEW 61522	-	.9843		25.000	25.0	125	50	0.50	-	-	306.61	293.28	266.62
63351	63350	.9843		25.000	25.0	125	50	1.00	-	-	306.61	293.28	266.62
63361	63360	.9843		25.000	25.0	150	32	1.00	82	24.40	411.17	393.29	357.54
61524	-	1.000	1"	25.400	1"	4"	1"	-	-	-	214.75	205.41	186.74
27959	27958	1.000	1"	25.400	1"	4"	1"	.015"	-	-	258.50	247.26	224.78
27961	27960	1.000	1"	25.400	1"	4"	1"	.035"	-	-	258.50	247.26	224.78
-	27962	1.000	1"	25.400	1"	4"	1"	.060"	-	-	258.50	247.26	224.78
28911	28910	1.000	1"	25.400	1"	4"	1"	BALL	-	-	258.50	247.26	224.78
62885	62887	1.000	1"	25.400	1"	4"	1-1/2"	-	-	-	214.75	205.41	186.74
27967	27966	1.000	1"	25.400	1"	4"	1-1/2"	.015"	-	-	258.50	247.26	224.78
61526	-	1.000	1"	25.400	1"	4"	1-1/2"	.025"	-	-	258.50	247.26	224.78
27971	27970	1.000	1"	25.400	1"	4"	1-1/2"	.035"	-	-	258.50	247.26	224.78
27981	27980	1.000	1"	25.400	1"	4"	1-1/2"	.060"	-	-	258.50	247.26	224.78
27991	-	1.000	1"	25.400	1"	4"	1-1/2"	.090"	-	-	258.50	247.26	224.78
61528	-	1.000	1"	25.400	1"	4"	1-1/2"	.125"	-	-	258.50	247.26	224.78
61532	-	1.000	1"	25.400	1"	4"	1-1/2"	.250"	-	-	258.50	247.26	224.78
28916	28915	1.000	1"	25.400	1"	4"	1-1/2"	BALL	-	-	258.50	247.26	224.78
61534	-	1.000	1"	25.400	1"	4"	1-5/8"	.030"	-	-	258.50	247.26	224.78
62895	62897	1.000	1"	25.400	1"	4"	1-3/4"	-	-	-	214.75	205.41	186.74
28001	28000	1.000	1"	25.400	1"	4"	1-3/4"	.015"	-	-	258.50	247.26	224.78
61536	-	1.000	1"	25.400	1"	4"	1-3/4"	.030"	-	-	258.50	247.26	224.78
28011	28012	1.000	1"	25.400	1"	4"	1-3/4"	.060"	-	-	258.50	247.26	224.78
28021	-	1.000	1"	25.400	1"	4"	1-3/4"	.090"	-	-	258.50	247.26	224.78
61538	-	1.000	1"	25.400	1"	4"	1-3/4"	.125"	-	-	258.50	247.26	224.78
61540	-	1.000	1"	25.400	1"	4"	1-3/4"	.190"	-	-	258.50	247.26	224.78
61542	-	1.000	1"	25.400	1"	4"	1-3/4"	.250"	-	-	258.50	247.26	224.78
62905	62907	1.000	1"	25.400	1"	5"	2"	-	-	-	287.47	274.97	249.97
63369	63368	1.000	1"	25.400	1"	5"	2"	.015"	-	-	318.04	304.22	276.56
63371	63370	1.000	1"	25.400	1"	5"	2"	.035"	-	-	318.04	304.22	276.56
63373	63372	1.000	1"	25.400	1"	5"	2"	.060"	-	-	318.04	304.22	276.56
63375	63374	1.000	1"	25.400	1"	5"	2"	.090"	-	-	318.04	304.22	276.56
61544	-	1.000	1"	25.400	1"	5"	2"	.125"	-	-	318.04	304.22	276.56
61546	-	1.000	1"	25.400	1"	5"	2"	.250"	-	-	318.04	304.22	276.56
28931	28930	1.000	1"	25.400	1"	5"	2"	BALL	-	-	318.04	304.22	276.56
61548	-	1.000	1"	25.400	1"	5"	2-1/2"	-	-	-	287.47	274.97	249.97
61550	-	1.000	1"	25.400	1"	5"	2-1/2"	.030"	-	-	318.04	304.22	276.56
62915	62917	1.000	1"	25.400	1"	6"	3"	-	-	-	374.44	358.16	325.60
61552	-	1.000	1"	25.400	1"	6"	3-1/4"	.030"	-	-	414.81	396.77	360.70
61554	-	1.000	1"	25.400	1"	7"	4-1/4"	.030"	-	-	506.18	484.18	440.16
61556	-	1.000	1"	25.400	1"	7"	4-1/4"	.060"	-	-	506.18	484.18	440.16
61558	-	1.000	1"	25.400	1"	6"	1-1/4"	.030"	2-5/8"	.980"	429.63	410.95	373.59
63381	63380	1.000	1"	25.400	1"	6"	1-1/4"	.035"	3-1/4"	.980"	429.63	410.95	373.59
61562	-	1.000	1"	25.400	1"	7"	1-1/4"	.030"	4-1/4"	.980"	521.00	498.34	453.04

70

35

MATERIAL HARDNESS (Rc)

0

Series VRX-6

HIGH EFFICIENCY MILLING

TOLERANCES

d_1	$+0.001" - .002" (+.000mm - .050mm)$
d_2	$h6$
r	$+0.001" - .001" (+.025 - .025mm)$

.2362" - .4724"
(6.000mm - 12.000mm)



TECH
PAGES
300-301

Recommended for inconel, pH materials, titanium and tool steels >40Rc

Square End, Corner Radius

AlTiN Coating

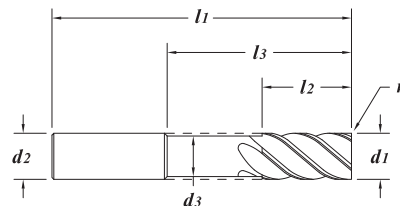
Solid submicron grain carbide end mill - center cutting

6 flutes for better finish and longer tool life

Reduces vibration for more aggressive machining resulting in less cycle times and greater productivity

Staggered flute geometry

Engineered for High Efficiency Milling



EDP#	d_1 †		d_2	l_1	l_2	r	l_3	d_3	1-11	12-24	25-49	50-100
	Decimal	Diameter Metric										
60101	.2362	6.000	6.0	65	20	-	-	-	22.46	21.48	20.51	19.53
60103	.2362	6.000	6.0	65	20	0.50	-	-	27.54	26.35	25.15	23.95
60100	.2500	1/4"	6.350	1/4"	2-1/2"	3/4"	-	-	21.69	20.75	19.80	18.86
60102	.2500	1/4"	6.350	1/4"	2-1/2"	3/4"	.010"	-	26.54	25.39	24.23	23.08
60104	.2500	1/4"	6.350	1/4"	2-1/2"	3/4"	.015"	-	26.54	25.39	24.23	23.08
60105	.2500	1/4"	6.350	1/4"	2-1/2"	3/4"	.020"	-	26.54	25.39	24.23	23.08
60106	.2500	1/4"	6.350	1/4"	2-1/2"	3/4"	.030"	-	26.54	25.39	24.23	23.08
60162	.3150	8.000	8.0	65	22	-	-	-	32.05	30.66	29.26	27.87
60107	.3150	8.000	8.0	65	22	0.50	-	-	37.27	35.65	34.03	32.41
60109	.3750	3/8"	9.525	3/8"	2"	1/2"	-	-	31.22	29.87	28.51	27.15
60111	.3750	3/8"	9.525	3/8"	2"	1/2"	.020"	-	38.00	36.34	34.69	33.04
60108	.3750	3/8"	9.525	3/8"	2-1/2"	7/8"	-	-	36.49	34.90	33.32	31.73
60110	.3750	3/8"	9.525	3/8"	2-1/2"	7/8"	.015"	-	41.79	39.97	38.16	36.34
60113	.3750	3/8"	9.525	3/8"	2-1/2"	7/8"	.020"	-	41.79	39.97	38.16	36.34
60112	.3750	3/8"	9.525	3/8"	2-1/2"	7/8"	.030"	-	41.79	39.97	38.16	36.34
60114	.3750	3/8"	9.525	3/8"	2-1/2"	7/8"	.060"	-	41.79	39.97	38.16	36.34
60184	.3750	3/8"	9.525	3/8"	3"	1-1/4"	.030"	-	54.99	52.60	50.21	47.82
60164	.3937	10.000	10.0	70	22	-	-	-	43.76	41.86	39.95	38.05
60115	.3937	10.000	10.0	70	22	0.50	-	-	50.52	48.32	46.13	43.93
60117	.3937	10.000	10.0	70	22	1.00	-	-	50.52	48.32	46.13	43.93
60119	.4724	12.000	12.0	65	20	-	-	-	53.27	50.95	48.64	46.32
60121	.4724	12.000	12.0	65	20	0.50	-	-	66.22	63.34	60.46	57.58
60123	.4724	12.000	12.0	75	26	-	-	-	56.83	54.36	51.89	49.42
60125	.4724	12.000	12.0	75	26	0.75	-	-	73.88	70.66	67.45	64.24
60166	.4724	12.000	12.0	75	32	-	-	-	56.83	54.36	51.89	49.42
60127	.4724	12.000	12.0	75	32	0.50	-	-	73.88	70.66	67.45	64.24
60129	.4724	12.000	12.0	75	32	1.00	-	-	73.88	70.66	67.45	64.24

70

35

0

EDP#	$d1$ † Diameter			$d2$ Shank Diameter	$l1$ Overall Length	$l2$ Flute Length	r Corner Radius	$l3$ Reach Length	$d3$ Neck Diameter	1-11	12-24	25-49	50-100
	Decimal		Metric										
60131	.5000	1/2"	12.700	1/2"	2-1/2"	5/8"	-	-	-	51.08	48.86	46.64	44.42
60185	.5000	1/2"	12.700	1/2"	2-1/2"	5/8"	.010"	-	-	63.50	60.74	57.98	55.22
60157	.5000	1/2"	12.700	1/2"	2-1/2"	5/8"	.015"	-	-	63.50	60.74	57.98	55.22
60133	.5000	1/2"	12.700	1/2"	2-1/2"	5/8"	.020"	-	-	63.50	60.74	57.98	55.22
60159	.5000	1/2"	12.700	1/2"	2-1/2"	5/8"	.030"	-	-	63.50	60.74	57.98	55.22
60189	.5000	1/2"	12.700	1/2"	2-1/2"	5/8"	.060"	-	-	63.50	60.74	57.98	55.22
60186	.5000	1/2"	12.700	1/2"	2-1/2"	5/8"	.125"	-	-	63.50	60.74	57.98	55.22
60135	.5000	1/2"	12.700	1/2"	3"	1"	-	-	-	54.58	52.21	49.83	47.46
60201	.5000	1/2"	12.700	1/2"	3"	1"	.030"	-	-	70.89	67.80	64.72	61.64
60116	.5000	1/2"	12.700	1/2"	3"	1-1/4"	-	-	-	54.58	52.21	49.83	47.46
60118	.5000	1/2"	12.700	1/2"	3"	1-1/4"	.010"	-	-	70.89	67.80	64.72	61.64
60120	.5000	1/2"	12.700	1/2"	3"	1-1/4"	.015"	-	-	70.89	67.80	64.72	61.64
60122	.5000	1/2"	12.700	1/2"	3"	1-1/4"	.020"	-	-	70.89	67.80	64.72	61.64
60124	.5000	1/2"	12.700	1/2"	3"	1-1/4"	.030"	-	-	70.89	67.80	64.72	61.64
60126	.5000	1/2"	12.700	1/2"	3"	1-1/4"	.060"	-	-	70.89	67.80	64.72	61.64
60128	.5000	1/2"	12.700	1/2"	3"	1-1/4"	.125"	-	-	70.89	67.80	64.72	61.64
60137	.5000	1/2"	12.700	1/2"	4"	1-1/2"	-	-	-	73.85	70.64	67.43	64.22
60139	.5000	1/2"	12.700	1/2"	4"	1-1/2"	.030"	-	-	83.97	80.32	76.67	73.02
60190	.5000	1/2"	12.700	1/2"	4"	1-5/8"	-	-	-	73.85	70.64	67.43	64.22
60194	.5000	1/2"	12.700	1/2"	4"	1-5/8"	.030"	-	-	83.97	80.32	76.67	73.02
60196	.5000	1/2"	12.700	1/2"	4"	1-5/8"	.060"	-	-	83.97	80.32	76.67	73.02
60130	.5000	1/2"	12.700	1/2"	4"	2-1/8"	-	-	-	73.85	70.64	67.43	64.22
60132	.5000	1/2"	12.700	1/2"	4"	2-1/8"	.010"	-	-	83.97	80.32	76.67	73.02
60134	.5000	1/2"	12.700	1/2"	4"	2-1/8"	.020"	-	-	83.97	80.32	76.67	73.02
60136	.5000	1/2"	12.700	1/2"	4"	2-1/8"	.030"	-	-	83.97	80.32	76.67	73.02
60200	.5000	1/2"	12.700	1/2"	4"	2-1/8"	.060"	-	-	83.97	80.32	76.67	73.02
60141	.6250	5/8"	15.875	5/8"	3"	3/4"	-	-	-	97.84	93.59	89.33	85.08
60143	.6250	5/8"	15.875	5/8"	3"	3/4"	.020"	-	-	109.68	104.91	100.14	95.37
60138	.6250	5/8"	15.875	5/8"	3-1/2"	1-1/4"	-	-	-	100.71	96.33	91.95	87.57
60140	.6250	5/8"	15.875	5/8"	3-1/2"	1-1/4"	.015"	-	-	112.73	107.83	102.93	98.03
60145	.6250	5/8"	15.875	5/8"	3-1/2"	1-1/4"	.020"	-	-	112.73	107.83	102.93	98.03
60142	.6250	5/8"	15.875	5/8"	3-1/2"	1-1/4"	.030"	-	-	112.73	107.83	102.93	98.03
60144	.6250	5/8"	15.875	5/8"	3-1/2"	1-1/4"	.060"	-	-	112.73	107.83	102.93	98.03
60146	.6250	5/8"	15.875	5/8"	3-1/2"	1-1/4"	.125"	-	-	112.73	107.83	102.93	98.03
60148	.6250	5/8"	15.875	5/8"	4"	1-5/8"	-	-	-	107.55	102.87	98.20	93.52
60150	.6250	5/8"	15.875	5/8"	4"	1-5/8"	.030"	-	-	120.39	115.16	109.92	104.69
60168	.6299		16.000	16.0	88	32	-	-	-	105.05	100.49	95.92	91.35
60170	.6299		16.000	16.0	88	32	0.50	-	-	117.55	112.44	107.33	102.22
60174	.6299		16.000	16.0	100	40	-	-	-	111.71	106.85	102.00	97.14
60176	.6299		16.000	16.0	100	40	0.50	-	-	124.99	119.56	114.12	108.69
60180	.6299		16.000	16.0	100	32	-	50	14.50	122.29	116.97	111.66	106.34
60182	.6299		16.000	16.0	100	32	0.50	50	14.50	135.57	129.68	123.78	117.89
60152	.7500	3/4"	19.050	3/4"	4"	1-1/2"	-	-	-	143.75	137.50	131.25	125.00
60154	.7500	3/4"	19.050	3/4"	4"	1-1/2"	.015"	-	-	161.33	154.32	147.30	140.29
60147	.7500	3/4"	19.050	3/4"	4"	1-1/2"	.020"	-	-	161.33	154.32	147.30	140.29
60156	.7500	3/4"	19.050	3/4"	4"	1-1/2"	.030"	-	-	161.33	154.32	147.30	140.29
60158	.7500	3/4"	19.050	3/4"	4"	1-1/2"	.060"	-	-	161.33	154.32	147.30	140.29
60160	.7500	3/4"	19.050	3/4"	4"	1-1/2"	.125"	-	-	161.33	154.32	147.30	140.29
60149	.7500	3/4"	19.050	3/4"	6"	3"	-	-	-	225.79	215.97	206.16	196.34
60151	.7500	3/4"	19.050	3/4"	6"	3"	.030"	-	-	262.61	251.20	239.78	228.36
60188	1.000	1"	25.400	1"	4"	1-1/2"	.125"	-	-	274.83	262.88	250.93	238.98
60153	1.000	1"	25.400	1"	6"	3"	.030"	-	-	436.63	417.65	398.66	379.68
60155	1.000	1"	25.400	1"	7"	1-1/4"	-	4-1/8"	.980"	471.50	451.00	430.50	410.00

70

35

MATERIAL HARDNESS (Rc)

0