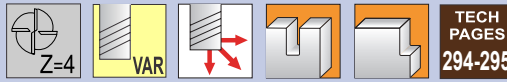


TOLERANCES	
d_1	+0.000" - .002" (+.000mm - .050mm)
d_2	h6
r	+0.001" - .001" (+.025 - .025mm)

HIGH EFFICIENCY MILLING

NEW ITEMS

Series V4R



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

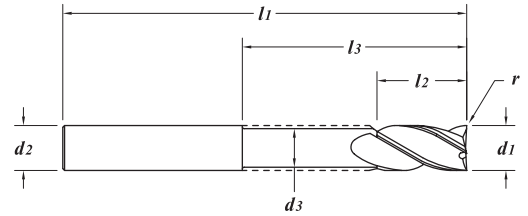
Recommended for titanium, inconel, and stainless steel

Variable Helix End Mill - Corner Radius

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
- Can be modified with a flat within 48 hours
- V4 Square End - page 139
- V4 Ball End - page 149

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

EDP#		d_1 †		d_2	l_1	l_2	r	l_3	d_3	1-11	12-24	25-49	50-100
		(plain)	(weldon)										
50199	-	.2362	6.000	6.0	65	12	0.30	-	-	27.03	25.85	24.68	23.50
50200	-	.2362	6.000	6.0	65	12	0.50	-	-	27.03	25.85	24.68	23.50
50201	-	.2362	6.000	6.0	65	12	0.75	-	-	27.03	25.85	24.68	23.50
50202	-	.2362	6.000	6.0	65	12	1.00	-	-	27.03	25.85	24.68	23.50
50203	-	.2362	6.000	6.0	65	12	1.50	-	-	27.03	25.85	24.68	23.50
50204	-	.2362	6.000	6.0	65	19	0.30	-	-	27.03	25.85	24.68	23.50
50205	-	.2362	6.000	6.0	65	19	0.50	-	-	27.03	25.85	24.68	23.50
50206	-	.2362	6.000	6.0	65	19	1.00	-	-	27.03	25.85	24.68	23.50
50489	-	.2500	1/4"	6.350	1/4"	2"	3/8"	.010"	-	23.46	22.44	21.42	20.40
50490	-	.2500	1/4"	6.350	1/4"	2"	3/8"	.015"	-	23.46	22.44	21.42	20.40
50491	-	.2500	1/4"	6.350	1/4"	2"	3/8"	.020"	-	23.46	22.44	21.42	20.40
NEW 50708	-	.2500	1/4"	6.350	1/4"	2"	3/8"	.030"	-	23.46	22.44	21.42	20.40
NEW 50709	-	.2500	1/4"	6.350	1/4"	2"	3/8"	.040"	-	23.46	22.44	21.42	20.40
NEW 50710	-	.2500	1/4"	6.350	1/4"	2"	3/8"	.060"	-	23.46	22.44	21.42	20.40
NEW 50711	-	.2500	1/4"	6.350	1/4"	2"	3/8"	.090"	-	23.46	22.44	21.42	20.40
50614	-	.2500	1/4"	6.350	1/4"	2"	1/2"	.010"	-	23.46	22.44	21.42	20.40
50616	-	.2500	1/4"	6.350	1/4"	2"	1/2"	.015"	-	23.46	22.44	21.42	20.40
50618	-	.2500	1/4"	6.350	1/4"	2"	1/2"	.020"	-	23.46	22.44	21.42	20.40
NEW 50712	-	.2500	1/4"	6.350	1/4"	2"	1/2"	.030"	-	23.46	22.44	21.42	20.40
NEW 50713	-	.2500	1/4"	6.350	1/4"	2"	1/2"	.040"	-	23.46	22.44	21.42	20.40
NEW 50714	-	.2500	1/4"	6.350	1/4"	2"	1/2"	.060"	-	23.46	22.44	21.42	20.40
NEW 50715	-	.2500	1/4"	6.350	1/4"	2"	1/2"	.090"	-	23.46	22.44	21.42	20.40
50207	-	.2500	1/4"	6.350	1/4"	2-1/2"	3/4"	.010"	-	25.99	24.86	23.73	22.60
50208	-	.2500	1/4"	6.350	1/4"	2-1/2"	3/4"	.015"	-	25.99	24.86	23.73	22.60
50620	-	.2500	1/4"	6.350	1/4"	2-1/2"	3/4"	.020"	-	25.99	24.86	23.73	22.60
50209	-	.2500	1/4"	6.350	1/4"	2-1/2"	3/4"	.030"	-	25.99	24.86	23.73	22.60
NEW 50716	-	.2500	1/4"	6.350	1/4"	2-1/2"	3/4"	.040"	-	25.99	24.86	23.73	22.60
50210	-	.2500	1/4"	6.350	1/4"	2-1/2"	3/4"	.060"	-	25.99	24.86	23.73	22.60
NEW 50717	-	.2500	1/4"	6.350	1/4"	2-1/2"	3/4"	.090"	-	25.99	24.86	23.73	22.60
50493	-	.2500	1/4"	6.350	1/4"	3"	1-1/8"	.030"	-	38.49	36.82	35.14	33.47
NEW 50718	-	.2500	1/4"	6.350	1/4"	4"	1-3/4"	.020"	-	41.22	39.43	37.64	35.84
50211	-	.2500	1/4"	6.350	1/4"	4"	3/8"	.015"	1-1/4"	50.36	48.17	45.98	43.79
NEW 50719	-	.2500	1/4"	6.350	1/4"	6"	3/8"	.010"	4"	63.40	60.64	57.89	55.13

70

35

MATERIAL HARDNESS (Rc)

0

Series V4R (continued)

.3125" - .3750"
(7.937mm - 9.525mm)

MATERIAL HARDNESS (Rc)
70
35
0

NEW	EDP#	$d1$ †		$d2$	$l1$	$l2$	r	$l3$	$d3$	1-11	12-24	25-49	50-100		
		(plain)	(weldon)											Decimal	Diameter
	50720	-	.3125	5/16"	7.937	5/16"	2"	3/8"	.030"	-	-	32.04	30.65	29.25	27.86
	50622	-	.3125	5/16"	7.937	5/16"	2"	7/16"	.010"	-	-	32.04	30.65	29.25	27.86
	50624	-	.3125	5/16"	7.937	5/16"	2"	7/16"	.015"	-	-	32.04	30.65	29.25	27.86
	50492	-	.3125	5/16"	7.937	5/16"	2"	7/16"	.020"	-	-	32.04	30.65	29.25	27.86
	50721	-	.3125	5/16"	7.937	5/16"	2"	7/16"	.125"	-	-	32.04	30.65	29.25	27.86
	50626	-	.3125	5/16"	7.937	5/16"	2-1/2"	13/16"	.010"	-	-	35.20	33.67	32.14	30.61
	50628	-	.3125	5/16"	7.937	5/16"	2-1/2"	13/16"	.015"	-	-	35.20	33.67	32.14	30.61
	50212	-	.3125	5/16"	7.937	5/16"	2-1/2"	13/16"	.020"	-	-	35.20	33.67	32.14	30.61
	50213	-	.3125	5/16"	7.937	5/16"	2-1/2"	13/16"	.030"	-	-	35.20	33.67	32.14	30.61
	50722	-	.3125	5/16"	7.937	5/16"	2-1/2"	13/16"	.060"	-	-	35.20	33.67	32.14	30.61
	50723	-	.3125	5/16"	7.937	5/16"	2-1/2"	13/16"	.125"	-	-	35.20	33.67	32.14	30.61
	50724	-	.3125	5/16"	7.937	5/16"	3"	1-1/4"	.015"	-	-	49.09	46.96	44.82	42.69
	50725	-	.3125	5/16"	7.937	5/16"	3"	1-1/4"	.030"	-	-	49.09	46.96	44.82	42.69
	50726	-	.3125	5/16"	7.937	5/16"	3"	1-1/4"	.060"	-	-	49.09	46.96	44.82	42.69
	50630	-	.3150		8.000	8.0	50	12	0.50	-	-	33.22	31.78	30.33	28.89
	50214	-	.3150		8.000	8.0	65	22	0.50	-	-	36.52	34.94	33.35	31.76
	50356	-	.3150		8.000	8.0	65	22	0.75	-	-	36.52	34.94	33.35	31.76
	50215	-	.3150		8.000	8.0	65	22	1.00	-	-	36.52	34.94	33.35	31.76
	50727	-	.3150		8.000	8.0	65	22	1.20	-	-	36.52	34.94	33.35	31.76
	50357	-	.3150		8.000	8.0	65	22	1.50	-	-	36.52	34.94	33.35	31.76
	50358	-	.3150		8.000	8.0	65	22	2.00	-	-	36.52	34.94	33.35	31.76
	50728	-	.3150		8.000	8.0	65	22	3.00	-	-	36.52	34.94	33.35	31.76
	50632	-	.3750	3/8"	9.525	3/8"	2"	1/2"	.010"	-	-	37.82	36.18	34.53	32.89
	50729	-	.3750	3/8"	9.525	3/8"	2"	1/2"	.015"	-	-	37.82	36.18	34.53	32.89
	50494	-	.3750	3/8"	9.525	3/8"	2"	1/2"	.020"	-	-	37.82	36.18	34.53	32.89
	50634	-	.3750	3/8"	9.525	3/8"	2"	1/2"	.030"	-	-	37.82	36.18	34.53	32.89
	50730	-	.3750	3/8"	9.525	3/8"	2"	1/2"	.060"	-	-	37.82	36.18	34.53	32.89
	50732	-	.3750	3/8"	9.525	3/8"	2"	1/2"	.090"	-	-	37.82	36.18	34.53	32.89
	50733	-	.3750	3/8"	9.525	3/8"	2"	1/2"	.120"	-	-	37.82	36.18	34.53	32.89
	50734	-	.3750	3/8"	9.525	3/8"	2"	1/2"	.125"	-	-	37.82	36.18	34.53	32.89
	50216	-	.3750	3/8"	9.525	3/8"	2-1/2"	1"	.010"	-	-	41.11	39.33	37.54	35.75
	50735	-	.3750	3/8"	9.525	3/8"	2-1/2"	1"	.015"	-	-	41.11	39.33	37.54	35.75
	50217	-	.3750	3/8"	9.525	3/8"	2-1/2"	1"	.020"	-	-	41.11	39.33	37.54	35.75
	50218	-	.3750	3/8"	9.525	3/8"	2-1/2"	1"	.030"	-	-	41.11	39.33	37.54	35.75
	50736	-	.3750	3/8"	9.525	3/8"	2-1/2"	1"	.040"	-	-	41.11	39.33	37.54	35.75
	50219	-	.3750	3/8"	9.525	3/8"	2-1/2"	1"	.060"	-	-	41.11	39.33	37.54	35.75
	50636	-	.3750	3/8"	9.525	3/8"	2-1/2"	1"	.090"	-	-	41.11	39.33	37.54	35.75
	50737	-	.3750	3/8"	9.525	3/8"	2-1/2"	1"	.120"	-	-	41.11	39.33	37.54	35.75
	50738	-	.3750	3/8"	9.525	3/8"	2-1/2"	1"	.125"	-	-	41.11	39.33	37.54	35.75
	50739	-	.3750	3/8"	9.525	3/8"	3"	1-1/4"	.015"	-	-	54.12	51.77	49.41	47.06
	50637	-	.3750	3/8"	9.525	3/8"	3"	1-1/4"	.030"	-	-	54.12	51.77	49.41	47.06
	50740	-	.3750	3/8"	9.525	3/8"	3"	1-1/4"	.060"	-	-	54.12	51.77	49.41	47.06
	50741	-	.3750	3/8"	9.525	3/8"	4"	1-1/2"	.015"	-	-	60.89	58.24	55.60	52.95
	50742	-	.3750	3/8"	9.525	3/8"	4"	1-1/2"	.030"	-	-	60.89	58.24	55.60	52.95
	50743	-	.3750	3/8"	9.525	3/8"	4"	1-1/2"	.060"	-	-	60.89	58.24	55.60	52.95
	50744	-	.3750	3/8"	9.525	3/8"	4"	1-1/2"	.120"	-	-	60.89	58.24	55.60	52.95
	50745	-	.3750	3/8"	9.525	3/8"	6"	2-1/2"	.060"	-	-	84.32	80.65	76.99	73.32
	50220	-	.3750	3/8"	9.525	3/8"	4"	1/2"	.020"	1-7/8"	.350"	72.67	69.51	66.35	63.19

EDP#	<i>d1</i> † Diameter	<i>d2</i> Shank Diameter	<i>l1</i> Overall Length	<i>l2</i> Flute Length	<i>r</i> Corner Radius	<i>l3</i> Reach Length	<i>d3</i> Neck Diameter	1-11	12-24	25-49	50-100			
												(plain)	(weldon)	Decimal
NEW 50638	-	.3937	10.000	10.0	50	14	0.50	-	-	45.66	43.67	41.69	39.70	
NEW 50746	-	.3937	10.000	10.0	70	22	0.25	-	-	49.65	47.49	45.33	43.17	
NEW 50221	-	.3937	10.000	10.0	70	22	0.50	-	-	49.65	47.49	45.33	43.17	
NEW 50359	-	.3937	10.000	10.0	70	22	0.75	-	-	49.65	47.49	45.33	43.17	
NEW 50360	-	.3937	10.000	10.0	70	22	1.00	-	-	49.65	47.49	45.33	43.17	
NEW 50361	-	.3937	10.000	10.0	70	22	1.50	-	-	49.65	47.49	45.33	43.17	
NEW 50362	-	.3937	10.000	10.0	70	22	2.00	-	-	49.65	47.49	45.33	43.17	
NEW 50747	-	.3937	10.000	10.0	70	22	3.00	-	-	49.65	47.49	45.33	43.17	
NEW 50748	-	.3937	10.000	10.0	70	26	1.50	-	-	49.65	47.49	45.33	43.17	
NEW 50749	-	.3937	10.000	10.0	70	22	0.50	30	9.40	60.34	57.72	55.09	52.47	
NEW 50750	-	.3937	10.000	10.0	100	12	0.30	50	9.40	87.80	83.98	80.16	76.35	
50363	50369	.4724	12.000	12.0	75	26	0.30	-	-	73.13	69.95	66.77	63.59	
50364	50370	.4724	12.000	12.0	75	26	0.50	-	-	73.13	69.95	66.77	63.59	
50365	50366	.4724	12.000	12.0	75	26	0.75	-	-	73.13	69.95	66.77	63.59	
50367	50371	.4724	12.000	12.0	75	26	1.00	-	-	73.13	69.95	66.77	63.59	
50372	50373	.4724	12.000	12.0	75	26	1.50	-	-	73.13	69.95	66.77	63.59	
50374	50375	.4724	12.000	12.0	75	26	2.00	-	-	73.13	69.95	66.77	63.59	
50222	50270	.4724	12.000	12.0	75	32	0.50	-	-	73.13	69.95	66.77	63.59	
50223	50271	.4724	12.000	12.0	75	32	1.00	-	-	73.13	69.95	66.77	63.59	
NEW 50751	-	.4724	12.000	12.0	88	36	0.30	-	-	82.17	78.60	75.02	71.45	
NEW 50752	-	.4724	12.000	12.0	88	36	0.50	-	-	82.17	78.60	75.02	71.45	
NEW 50753	-	.4724	12.000	12.0	88	36	1.00	-	-	82.17	78.60	75.02	71.45	
NEW 50754	-	.4724	12.000	12.0	88	36	1.50	-	-	82.17	78.60	75.02	71.45	
NEW 50755	-	.4724	12.000	12.0	88	36	3.00	-	-	82.17	78.60	75.02	71.45	
50566	-	.4724	12.000	12.0	100	42	0.30	-	-	85.10	81.40	77.70	74.00	
50568	-	.4724	12.000	12.0	100	42	0.50	-	-	85.10	81.40	77.70	74.00	
50570	-	.4724	12.000	12.0	100	42	1.00	-	-	85.10	81.40	77.70	74.00	
50572	-	.4724	12.000	12.0	100	42	2.00	-	-	85.10	81.40	77.70	74.00	
50574	-	.4724	12.000	12.0	100	42	3.00	-	-	85.10	81.40	77.70	74.00	
NEW 50756	-	.4724	12.000	12.0	100	48	0.30	-	-	85.10	81.40	77.70	74.00	
NEW 50757	-	.4724	12.000	12.0	100	48	0.50	-	-	85.10	81.40	77.70	74.00	
NEW 50758	-	.4724	12.000	12.0	100	48	1.00	-	-	85.10	81.40	77.70	74.00	
NEW 50759	-	.4724	12.000	12.0	100	48	1.50	-	-	85.10	81.40	77.70	74.00	
NEW 50760	-	.4724	12.000	12.0	100	48	3.00	-	-	85.10	81.40	77.70	74.00	
NEW 50761	-	.4724	12.000	12.0	100	48	4.00	-	-	85.10	81.40	77.70	74.00	
50640	-	.5000	1/2"	12.700	1/2"	2-1/2"	5/8"	.010"	-	-	62.84	60.10	57.37	54.64
NEW 50762	-	.5000	1/2"	12.700	1/2"	2-1/2"	5/8"	.015"	-	-	62.84	60.10	57.37	54.64
50496	50497	.5000	1/2"	12.700	1/2"	2-1/2"	5/8"	.020"	-	-	62.84	60.10	57.37	54.64
50642	-	.5000	1/2"	12.700	1/2"	2-1/2"	5/8"	.030"	-	-	62.84	60.10	57.37	54.64
NEW 50763	-	.5000	1/2"	12.700	1/2"	2-1/2"	5/8"	.060"	-	-	62.84	60.10	57.37	54.64
NEW 50764	-	.5000	1/2"	12.700	1/2"	2-1/2"	5/8"	.090"	-	-	62.84	60.10	57.37	54.64
NEW 50765	-	.5000	1/2"	12.700	1/2"	2-1/2"	5/8"	.120"	-	-	62.84	60.10	57.37	54.64
50644	-	.5000	1/2"	12.700	1/2"	2-1/2"	5/8"	.125"	-	-	62.84	60.10	57.37	54.64
NEW 50766	-	.5000	1/2"	12.700	1/2"	2-1/2"	5/8"	.156"	-	-	62.84	60.10	57.37	54.64
NEW 50767	-	.5000	1/2"	12.700	1/2"	2-1/2"	5/8"	.190"	-	-	62.84	60.10	57.37	54.64
50379	50380	.5000	1/2"	12.700	1/2"	3"	1"	.010"	-	-	70.14	67.09	64.04	60.99
NEW 50768	-	.5000	1/2"	12.700	1/2"	3"	1"	.015"	-	-	70.14	67.09	64.04	60.99
50381	50382	.5000	1/2"	12.700	1/2"	3"	1"	.020"	-	-	70.14	67.09	64.04	60.99
50383	50384	.5000	1/2"	12.700	1/2"	3"	1"	.030"	-	-	70.14	67.09	64.04	60.99
50385	50386	.5000	1/2"	12.700	1/2"	3"	1"	.060"	-	-	70.14	67.09	64.04	60.99
NEW 50769	-	.5000	1/2"	12.700	1/2"	3"	1"	.090"	-	-	70.14	67.09	64.04	60.99
NEW 50770	-	.5000	1/2"	12.700	1/2"	3"	1"	.120"	-	-	70.14	67.09	64.04	60.99
NEW 50771	-	.5000	1/2"	12.700	1/2"	3"	1"	.125"	-	-	70.14	67.09	64.04	60.99
NEW 50772	-	.5000	1/2"	12.700	1/2"	3"	1"	.190"	-	-	70.14	67.09	64.04	60.99

70

35

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MATERIAL HARDNESS (Rc)

continued →

Series V4R (continued)

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

MATERIAL HARDNESS (Rc)
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		
(plain)	(weldon)	Decimal	Metric												
NEW	50224	50272	.5000	1/2"	12.700	1/2"	3"	1-1/4"	.010"	-	-	70.14	67.09	64.04	60.99
NEW	50773	-	.5000	1/2"	12.700	1/2"	3"	1-1/4"	.015"	-	-	70.14	67.09	64.04	60.99
	50225	50273	.5000	1/2"	12.700	1/2"	3"	1-1/4"	.020"	-	-	70.14	67.09	64.04	60.99
	50226	50274	.5000	1/2"	12.700	1/2"	3"	1-1/4"	.030"	-	-	70.14	67.09	64.04	60.99
	50227	50275	.5000	1/2"	12.700	1/2"	3"	1-1/4"	.060"	-	-	70.14	67.09	64.04	60.99
NEW	50774	-	.5000	1/2"	12.700	1/2"	3"	1-1/4"	.090"	-	-	70.14	67.09	64.04	60.99
NEW	50775	-	.5000	1/2"	12.700	1/2"	3"	1-1/4"	.120"	-	-	70.14	67.09	64.04	60.99
NEW	50776	-	.5000	1/2"	12.700	1/2"	3"	1-1/4"	.125"	-	-	70.14	67.09	64.04	60.99
NEW	50777	-	.5000	1/2"	12.700	1/2"	3"	1-1/4"	.156"	-	-	70.14	67.09	64.04	60.99
NEW	50778	-	.5000	1/2"	12.700	1/2"	3"	1-1/4"	.190"	-	-	70.14	67.09	64.04	60.99
NEW	50779	-	.5000	1/2"	12.700	1/2"	3-1/2"	1-1/2"	.010"	-	-	79.95	76.47	73.00	69.52
NEW	50780	-	.5000	1/2"	12.700	1/2"	3-1/2"	1-1/2"	.015"	-	-	79.95	76.47	73.00	69.52
NEW	50781	-	.5000	1/2"	12.700	1/2"	3-1/2"	1-1/2"	.020"	-	-	79.95	76.47	73.00	69.52
NEW	50782	-	.5000	1/2"	12.700	1/2"	3-1/2"	1-1/2"	.030"	-	-	79.95	76.47	73.00	69.52
NEW	50783	-	.5000	1/2"	12.700	1/2"	3-1/2"	1-1/2"	.060"	-	-	79.95	76.47	73.00	69.52
NEW	50784	-	.5000	1/2"	12.700	1/2"	3-1/2"	1-1/2"	.090"	-	-	79.95	76.47	73.00	69.52
NEW	50785	-	.5000	1/2"	12.700	1/2"	3-1/2"	1-1/2"	.120"	-	-	79.95	76.47	73.00	69.52
	50580	50581	.5000	1/2"	12.700	1/2"	4"	1-5/8"	.010"	-	-	82.90	79.30	75.69	72.09
	50582	50583	.5000	1/2"	12.700	1/2"	4"	1-5/8"	.020"	-	-	82.90	79.30	75.69	72.09
	50584	50585	.5000	1/2"	12.700	1/2"	4"	1-5/8"	.030"	-	-	82.90	79.30	75.69	72.09
	50586	50587	.5000	1/2"	12.700	1/2"	4"	1-5/8"	.040"	-	-	82.90	79.30	75.69	72.09
	50588	50589	.5000	1/2"	12.700	1/2"	4"	1-5/8"	.060"	-	-	82.90	79.30	75.69	72.09
	50590	50591	.5000	1/2"	12.700	1/2"	4"	1-5/8"	.120"	-	-	82.90	79.30	75.69	72.09
NEW	50786	-	.5000	1/2"	12.700	1/2"	4"	2-1/8"	.010"	-	-	82.90	79.30	75.69	72.09
NEW	50787	-	.5000	1/2"	12.700	1/2"	4"	2-1/8"	.015"	-	-	82.90	79.30	75.69	72.09
NEW	50788	-	.5000	1/2"	12.700	1/2"	4"	2-1/8"	.020"	-	-	82.90	79.30	75.69	72.09
NEW	50789	-	.5000	1/2"	12.700	1/2"	4"	2-1/8"	.030"	-	-	82.90	79.30	75.69	72.09
NEW	50790	-	.5000	1/2"	12.700	1/2"	4"	2-1/8"	.060"	-	-	82.90	79.30	75.69	72.09
NEW	50791	-	.5000	1/2"	12.700	1/2"	4"	2-1/8"	.090"	-	-	82.90	79.30	75.69	72.09
NEW	50792	-	.5000	1/2"	12.700	1/2"	4"	2-1/8"	.120"	-	-	82.90	79.30	75.69	72.09
NEW	50793	-	.5000	1/2"	12.700	1/2"	4"	2-1/8"	.125"	-	-	82.90	79.30	75.69	72.09
NEW	50794	-	.5000	1/2"	12.700	1/2"	4"	2-1/8"	.190"	-	-	82.90	79.30	75.69	72.09
NEW	50795	-	.5000	1/2"	12.700	1/2"	6"	3"	.020"	-	-	117.23	112.13	107.04	101.94
NEW	50796	-	.5000	1/2"	12.700	1/2"	6"	3"	.030"	-	-	117.23	112.13	107.04	101.94
NEW	50797	-	.5000	1/2"	12.700	1/2"	6"	3"	.060"	-	-	117.23	112.13	107.04	101.94
NEW	50798	-	.5000	1/2"	12.700	1/2"	6"	3"	.120"	-	-	117.23	112.13	107.04	101.94
NEW	50799	-	.5000	1/2"	12.700	1/2"	6"	3"	.190"	-	-	117.23	112.13	107.04	101.94
	50228	-	.5000	1/2"	12.700	1/2"	4"	5/8"	.020"	2-1/4"	.470"	94.63	90.52	86.40	82.29
NEW	50900	-	.5000	1/2"	12.700	1/2"	4"	5/8"	.030"	2-1/4"	.470"	94.63	90.52	86.40	82.29
NEW	50901	-	.5000	1/2"	12.700	1/2"	4"	5/8"	.060"	2-1/4"	.470"	94.63	90.52	86.40	82.29
NEW	50902	-	.5000	1/2"	12.700	1/2"	4"	5/8"	.120"	2-1/4"	.470"	94.63	90.52	86.40	82.29
	50594	-	.5000	1/2"	12.700	1/2"	6"	5/8"	.020"	4-1/8"	.470"	128.98	123.38	117.77	112.16
	50596	-	.5000	1/2"	12.700	1/2"	6"	5/8"	.030"	4-1/8"	.470"	128.98	123.38	117.77	112.16
NEW	50903	-	.6250	5/8"	15.875	5/8"	3"	3/4"	.010"	-	-	108.65	103.93	99.20	94.48
NEW	50904	-	.6250	5/8"	15.875	5/8"	3"	3/4"	.015"	-	-	108.65	103.93	99.20	94.48
	50498	50499	.6250	5/8"	15.875	5/8"	3"	3/4"	.020"	-	-	108.65	103.93	99.20	94.48
	50500	50501	.6250	5/8"	15.875	5/8"	3"	3/4"	.030"	-	-	108.65	103.93	99.20	94.48
	50502	50503	.6250	5/8"	15.875	5/8"	3"	3/4"	.060"	-	-	108.65	103.93	99.20	94.48
NEW	50905	-	.6250	5/8"	15.875	5/8"	3"	3/4"	.090"	-	-	108.65	103.93	99.20	94.48
NEW	50906	-	.6250	5/8"	15.875	5/8"	3"	3/4"	.120"	-	-	108.65	103.93	99.20	94.48
NEW	50907	-	.6250	5/8"	15.875	5/8"	3"	3/4"	.125"	-	-	108.65	103.93	99.20	94.48
NEW	50908	-	.6250	5/8"	15.875	5/8"	3"	3/4"	.156"	-	-	108.65	103.93	99.20	94.48
NEW	50909	-	.6250	5/8"	15.875	5/8"	3"	3/4"	.190"	-	-	108.65	103.93	99.20	94.48
NEW	50910	-	.6250	5/8"	15.875	5/8"	3"	3/4"	.250"	-	-	108.65	103.93	99.20	94.48

	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	
	(plain)	(weldon)	Decimal	Diameter Metric											
NEW	50911	-	.6250	5/8"	15.875	5/8"	3-1/2"	1-1/4"	.010"	-	-	111.67	106.81	101.96	97.10
NEW	50912	-	.6250	5/8"	15.875	5/8"	3-1/2"	1-1/4"	.015"	-	-	111.67	106.81	101.96	97.10
	50229	50277	.6250	5/8"	15.875	5/8"	3-1/2"	1-1/4"	.020"	-	-	111.67	106.81	101.96	97.10
	50534	50535	.6250	5/8"	15.875	5/8"	3-1/2"	1-1/4"	.030"	-	-	111.67	106.81	101.96	97.10
	50536	50537	.6250	5/8"	15.875	5/8"	3-1/2"	1-1/4"	.040"	-	-	111.67	106.81	101.96	97.10
	50538	50539	.6250	5/8"	15.875	5/8"	3-1/2"	1-1/4"	.060"	-	-	111.67	106.81	101.96	97.10
NEW	50913	-	.6250	5/8"	15.875	5/8"	3-1/2"	1-1/4"	.090"	-	-	111.67	106.81	101.96	97.10
	50230	50278	.6250	5/8"	15.875	5/8"	3-1/2"	1-1/4"	.120"	-	-	111.67	106.81	101.96	97.10
NEW	50914	-	.6250	5/8"	15.875	5/8"	3-1/2"	1-1/4"	.125"	-	-	111.67	106.81	101.96	97.10
NEW	50915	-	.6250	5/8"	15.875	5/8"	3-1/2"	1-1/4"	.156"	-	-	111.67	106.81	101.96	97.10
NEW	50916	-	.6250	5/8"	15.875	5/8"	3-1/2"	1-1/4"	.190"	-	-	111.67	106.81	101.96	97.10
NEW	50917	-	.6250	5/8"	15.875	5/8"	3-1/2"	1-1/4"	.250"	-	-	111.67	106.81	101.96	97.10
NEW	50918	-	.6250	5/8"	15.875	5/8"	4"	1-1/2"	.010"	-	-	121.39	116.11	110.83	105.56
NEW	50919	-	.6250	5/8"	15.875	5/8"	4"	1-1/2"	.015"	-	-	121.39	116.11	110.83	105.56
NEW	50920	-	.6250	5/8"	15.875	5/8"	4"	1-1/2"	.020"	-	-	121.39	116.11	110.83	105.56
NEW	50921	-	.6250	5/8"	15.875	5/8"	4"	1-1/2"	.030"	-	-	121.39	116.11	110.83	105.56
NEW	50922	-	.6250	5/8"	15.875	5/8"	4"	1-1/2"	.060"	-	-	121.39	116.11	110.83	105.56
NEW	50923	-	.6250	5/8"	15.875	5/8"	4"	1-1/2"	.090"	-	-	121.39	116.11	110.83	105.56
NEW	50924	-	.6250	5/8"	15.875	5/8"	4"	1-1/2"	.120"	-	-	121.39	116.11	110.83	105.56
NEW	50925	-	.6250	5/8"	15.875	5/8"	4"	1-1/2"	.125"	-	-	121.39	116.11	110.83	105.56
NEW	50926	-	.6250	5/8"	15.875	5/8"	4"	1-1/2"	.156"	-	-	121.39	116.11	110.83	105.56
NEW	50927	-	.6250	5/8"	15.875	5/8"	4"	1-1/2"	.190"	-	-	121.39	116.11	110.83	105.56
NEW	50928	-	.6250	5/8"	15.875	5/8"	4"	1-1/2"	.250"	-	-	121.39	116.11	110.83	105.56
	50504	-	.6299		16.000	16.0	75	19	0.50	-	-	113.42	108.49	103.56	98.63
	50506	-	.6299		16.000	16.0	75	19	1.00	-	-	113.42	108.49	103.56	98.63
	50508	-	.6299		16.000	16.0	75	19	3.00	-	-	113.42	108.49	103.56	98.63
NEW	50929	-	.6299		16.000	16.0	75	19	4.00	-	-	113.42	108.49	103.56	98.63
NEW	50930	-	.6299		16.000	16.0	75	19	5.00	-	-	113.42	108.49	103.56	98.63
NEW	50931	-	.6299		16.000	16.0	75	19	6.00	-	-	113.42	108.49	103.56	98.63
	50231	50279	.6299		16.000	16.0	88	32	0.50	-	-	116.54	111.47	106.41	101.34
	50409	50410	.6299		16.000	16.0	88	32	0.75	-	-	116.54	111.47	106.41	101.34
	50411	50412	.6299		16.000	16.0	88	32	1.00	-	-	116.54	111.47	106.41	101.34
	50413	50414	.6299		16.000	16.0	88	32	1.50	-	-	116.54	111.47	106.41	101.34
	50415	50416	.6299		16.000	16.0	88	32	2.00	-	-	116.54	111.47	106.41	101.34
NEW	50932	-	.6299		16.000	16.0	88	32	2.50	-	-	116.54	111.47	106.41	101.34
	50417	50418	.6299		16.000	16.0	88	32	3.00	-	-	116.54	111.47	106.41	101.34
NEW	50933	-	.6299		16.000	16.0	88	32	4.00	-	-	116.54	111.47	106.41	101.34
NEW	50934	-	.6299		16.000	16.0	88	32	5.00	-	-	116.54	111.47	106.41	101.34
NEW	50935	-	.6299		16.000	16.0	88	32	6.00	-	-	116.54	111.47	106.41	101.34
NEW	50936	-	.6299		16.000	16.0	100	48	0.50	-	-	123.91	118.52	113.13	107.75
NEW	50937	-	.6299		16.000	16.0	100	48	1.00	-	-	123.91	118.52	113.13	107.75
NEW	50938	-	.6299		16.000	16.0	100	48	1.50	-	-	123.91	118.52	113.13	107.75
NEW	50939	-	.6299		16.000	16.0	100	48	2.00	-	-	123.91	118.52	113.13	107.75
NEW	50940	-	.6299		16.000	16.0	100	48	3.00	-	-	123.91	118.52	113.13	107.75
NEW	50941	-	.6299		16.000	16.0	100	48	4.00	-	-	123.91	118.52	113.13	107.75
NEW	50942	-	.6299		16.000	16.0	100	48	5.00	-	-	123.91	118.52	113.13	107.75
NEW	50943	-	.6299		16.000	16.0	100	48	6.00	-	-	123.91	118.52	113.13	107.75

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MATERIAL HARDNESS (Rc)

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continued →

Series V4R (continued)

.7500"
(19.050mm)

	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											
NEW	50944	-	.7500	3/4"	19.050	3/4"	3"	7/8"	.010"	-	-	156.73	149.92	143.10	136.29
NEW	50945	-	.7500	3/4"	19.050	3/4"	3"	7/8"	.015"	-	-	156.73	149.92	143.10	136.29
NEW	50946	-	.7500	3/4"	19.050	3/4"	3"	7/8"	.020"	-	-	156.73	149.92	143.10	136.29
	50556	-	.7500	3/4"	19.050	3/4"	3"	7/8"	.030"	-	-	156.73	149.92	143.10	136.29
NEW	50947	-	.7500	3/4"	19.050	3/4"	3"	7/8"	.060"	-	-	156.73	149.92	143.10	136.29
NEW	50948	-	.7500	3/4"	19.050	3/4"	3"	7/8"	.120"	-	-	156.73	149.92	143.10	136.29
NEW	50949	-	.7500	3/4"	19.050	3/4"	4"	1"	.010"	-	-	160.14	153.18	146.21	139.25
NEW	50950	-	.7500	3/4"	19.050	3/4"	4"	1"	.015"	-	-	160.14	153.18	146.21	139.25
	50510	50511	.7500	3/4"	19.050	3/4"	4"	1"	.020"	-	-	160.14	153.18	146.21	139.25
	50512	50513	.7500	3/4"	19.050	3/4"	4"	1"	.030"	-	-	160.14	153.18	146.21	139.25
	50514	50515	.7500	3/4"	19.050	3/4"	4"	1"	.060"	-	-	160.14	153.18	146.21	139.25
NEW	50951	-	.7500	3/4"	19.050	3/4"	4"	1"	.090"	-	-	160.14	153.18	146.21	139.25
NEW	50952	-	.7500	3/4"	19.050	3/4"	4"	1"	.120"	-	-	160.14	153.18	146.21	139.25
NEW	50953	-	.7500	3/4"	19.050	3/4"	4"	1"	.190"	-	-	160.14	153.18	146.21	139.25
NEW	50954	-	.7500	3/4"	19.050	3/4"	4"	1"	.250"	-	-	160.14	153.18	146.21	139.25
NEW	50955	-	.7500	3/4"	19.050	3/4"	4"	1"	.3125"	-	-	160.14	153.18	146.21	139.25
NEW	50956	-	.7500	3/4"	19.050	3/4"	4"	1-1/2"	.010"	-	-	160.14	153.18	146.21	139.25
NEW	50957	-	.7500	3/4"	19.050	3/4"	4"	1-1/2"	.015"	-	-	160.14	153.18	146.21	139.25
	50516	50517	.7500	3/4"	19.050	3/4"	4"	1-1/2"	.020"	-	-	160.14	153.18	146.21	139.25
	50232	50280	.7500	3/4"	19.050	3/4"	4"	1-1/2"	.030"	-	-	160.14	153.18	146.21	139.25
	50518	50519	.7500	3/4"	19.050	3/4"	4"	1-1/2"	.060"	-	-	160.14	153.18	146.21	139.25
NEW	50958	-	.7500	3/4"	19.050	3/4"	4"	1-1/2"	.090"	-	-	160.14	153.18	146.21	139.25
	50520	50521	.7500	3/4"	19.050	3/4"	4"	1-1/2"	.120"	-	-	160.14	153.18	146.21	139.25
NEW	50959	-	.7500	3/4"	19.050	3/4"	4"	1-1/2"	.125"	-	-	160.14	153.18	146.21	139.25
NEW	50960	-	.7500	3/4"	19.050	3/4"	4"	1-1/2"	.156"	-	-	160.14	153.18	146.21	139.25
NEW	50961	-	.7500	3/4"	19.050	3/4"	4"	1-1/2"	.190"	-	-	160.14	153.18	146.21	139.25
NEW	50962	-	.7500	3/4"	19.050	3/4"	4"	1-1/2"	.250"	-	-	160.14	153.18	146.21	139.25
NEW	50963	-	.7500	3/4"	19.050	3/4"	4"	1-1/2"	.3125"	-	-	160.14	153.18	146.21	139.25
NEW	50964	-	.7500	3/4"	19.050	3/4"	4"	1-3/4"	.010"	-	-	160.14	153.18	146.21	139.25
NEW	50965	-	.7500	3/4"	19.050	3/4"	4"	1-3/4"	.015"	-	-	160.14	153.18	146.21	139.25
	50522	50523	.7500	3/4"	19.050	3/4"	4"	1-3/4"	.020"	-	-	160.14	153.18	146.21	139.25
	50524	50525	.7500	3/4"	19.050	3/4"	4"	1-3/4"	.030"	-	-	160.14	153.18	146.21	139.25
	50526	50527	.7500	3/4"	19.050	3/4"	4"	1-3/4"	.060"	-	-	160.14	153.18	146.21	139.25
NEW	50966	-	.7500	3/4"	19.050	3/4"	4"	1-3/4"	.090"	-	-	160.14	153.18	146.21	139.25
NEW	50967	-	.7500	3/4"	19.050	3/4"	4"	1-3/4"	.120"	-	-	160.14	153.18	146.21	139.25
NEW	50968	-	.7500	3/4"	19.050	3/4"	4"	1-3/4"	.125"	-	-	160.14	153.18	146.21	139.25
NEW	50969	-	.7500	3/4"	19.050	3/4"	4"	1-3/4"	.156"	-	-	160.14	153.18	146.21	139.25
NEW	50970	-	.7500	3/4"	19.050	3/4"	4"	1-3/4"	.190"	-	-	160.14	153.18	146.21	139.25
NEW	50971	-	.7500	3/4"	19.050	3/4"	4"	1-3/4"	.250"	-	-	160.14	153.18	146.21	139.25
NEW	50972	-	.7500	3/4"	19.050	3/4"	4"	1-3/4"	.3125"	-	-	160.14	153.18	146.21	139.25
NEW	50973	-	.7500	3/4"	19.050	3/4"	5"	2-1/8"	.010"	-	-	222.13	212.47	202.81	193.16
NEW	50974	-	.7500	3/4"	19.050	3/4"	5"	2-1/8"	.015"	-	-	222.13	212.47	202.81	193.16
NEW	50975	-	.7500	3/4"	19.050	3/4"	5"	2-1/8"	.020"	-	-	222.13	212.47	202.81	193.16
NEW	50976	-	.7500	3/4"	19.050	3/4"	5"	2-1/8"	.030"	-	-	222.13	212.47	202.81	193.16
NEW	50977	-	.7500	3/4"	19.050	3/4"	5"	2-1/8"	.060"	-	-	222.13	212.47	202.81	193.16
NEW	50978	-	.7500	3/4"	19.050	3/4"	5"	2-1/8"	.090"	-	-	222.13	212.47	202.81	193.16
NEW	50979	-	.7500	3/4"	19.050	3/4"	5"	2-1/8"	.120"	-	-	222.13	212.47	202.81	193.16
NEW	50980	-	.7500	3/4"	19.050	3/4"	5"	2-1/8"	.125"	-	-	222.13	212.47	202.81	193.16
NEW	50981	-	.7500	3/4"	19.050	3/4"	5"	2-1/8"	.156"	-	-	222.13	212.47	202.81	193.16
NEW	50982	-	.7500	3/4"	19.050	3/4"	5"	2-1/8"	.190"	-	-	222.13	212.47	202.81	193.16
NEW	50983	-	.7500	3/4"	19.050	3/4"	5"	2-1/8"	.250"	-	-	222.13	212.47	202.81	193.16
NEW	50984	-	.7500	3/4"	19.050	3/4"	5"	2-1/8"	.3125"	-	-	222.13	212.47	202.81	193.16

	EDP#		$d1^{\dagger}$		$d2$	$l1$	$l2$	r	$l3$	$d3$	1-11	12-24	25-49	50-100	
	(plain)	(weldon)	Decimal	Diameter											Metric
NEW	50985	-	.7500	3/4"	19.050	3/4"	5"	2-1/2"	.010"	-	-	222.13	212.47	202.81	193.16
NEW	50986	-	.7500	3/4"	19.050	3/4"	5"	2-1/2"	.015"	-	-	222.13	212.47	202.81	193.16
NEW	50987	-	.7500	3/4"	19.050	3/4"	5"	2-1/2"	.020"	-	-	222.13	212.47	202.81	193.16
NEW	50988	-	.7500	3/4"	19.050	3/4"	5"	2-1/2"	.030"	-	-	222.13	212.47	202.81	193.16
NEW	50989	-	.7500	3/4"	19.050	3/4"	5"	2-1/2"	.060"	-	-	222.13	212.47	202.81	193.16
NEW	50990	-	.7500	3/4"	19.050	3/4"	5"	2-1/2"	.090"	-	-	222.13	212.47	202.81	193.16
NEW	50991	-	.7500	3/4"	19.050	3/4"	5"	2-1/2"	.120"	-	-	222.13	212.47	202.81	193.16
NEW	50992	-	.7500	3/4"	19.050	3/4"	5"	2-1/2"	.125"	-	-	222.13	212.47	202.81	193.16
NEW	50993	-	.7500	3/4"	19.050	3/4"	5"	2-1/2"	.156"	-	-	222.13	212.47	202.81	193.16
NEW	50994	-	.7500	3/4"	19.050	3/4"	5"	2-1/2"	.190"	-	-	222.13	212.47	202.81	193.16
NEW	50995	-	.7500	3/4"	19.050	3/4"	5"	2-1/2"	.250"	-	-	222.13	212.47	202.81	193.16
NEW	50996	-	.7500	3/4"	19.050	3/4"	5"	2-1/2"	.3125"	-	-	222.13	212.47	202.81	193.16
NEW	50997	-	.7874		20.000	20.0	100	38	0.50	-	-	226.65	216.80	206.94	197.09
	50528	-	.7874		20.000	20.0	100	38	1.00	-	-	226.65	216.80	206.94	197.09
	50530	-	.7874		20.000	20.0	100	38	2.00	-	-	226.65	216.80	206.94	197.09
NEW	50998	-	.7874		20.000	20.0	100	38	2.50	-	-	226.65	216.80	206.94	197.09
	50532	-	.7874		20.000	20.0	100	38	3.00	-	-	226.65	216.80	206.94	197.09
NEW	50999	-	.7874		20.000	20.0	100	38	4.00	-	-	226.65	216.80	206.94	197.09
NEW	50121	-	.7874		20.000	20.0	100	38	5.00	-	-	226.65	216.80	206.94	197.09
NEW	50122	-	.7874		20.000	20.0	100	38	6.00	-	-	226.65	216.80	206.94	197.09
NEW	50123	-	.7874		20.000	20.0	100	38	8.00	-	-	226.65	216.80	206.94	197.09
NEW	50124	-	.7874		20.000	20.0	100	48	0.50	-	-	226.65	216.80	206.94	197.09
NEW	50125	-	.7874		20.000	20.0	100	48	1.00	-	-	226.65	216.80	206.94	197.09
NEW	50126	-	.7874		20.000	20.0	100	48	1.50	-	-	226.65	216.80	206.94	197.09
NEW	50127	-	.7874		20.000	20.0	100	48	2.00	-	-	226.65	216.80	206.94	197.09
NEW	50128	-	.7874		20.000	20.0	100	48	2.50	-	-	226.65	216.80	206.94	197.09
NEW	50129	-	.7874		20.000	20.0	100	48	3.00	-	-	226.65	216.80	206.94	197.09
NEW	50131	-	.7874		20.000	20.0	100	48	4.00	-	-	226.65	216.80	206.94	197.09
NEW	50132	-	.7874		20.000	20.0	100	48	5.00	-	-	226.65	216.80	206.94	197.09
NEW	50133	-	.7874		20.000	20.0	100	48	6.00	-	-	226.65	216.80	206.94	197.09
NEW	50134	-	.7874		20.000	20.0	100	48	8.00	-	-	226.65	216.80	206.94	197.09
NEW	50135	-	.7874		20.000	20.0	150	60	0.50	-	-	278.63	266.52	254.40	242.29
NEW	50136	-	.7874		20.000	20.0	150	60	1.00	-	-	278.63	266.52	254.40	242.29
NEW	50137	-	.7874		20.000	20.0	150	60	3.00	-	-	278.63	266.52	254.40	242.29
NEW	50138	-	.7874		20.000	20.0	150	60	6.00	-	-	278.63	266.52	254.40	242.29
NEW	50139	-	1.000	1"	25.400	1"	4"	1-1/2"	.020"	-	-	273.40	261.51	249.63	237.74
	50233	50281	1.000	1"	25.400	1"	4"	1-1/2"	.030"	-	-	273.40	261.51	249.63	237.74
NEW	50141	-	1.000	1"	25.400	1"	4"	1-1/2"	.060"	-	-	273.40	261.51	249.63	237.74
NEW	50142	-	1.000	1"	25.400	1"	4"	1-1/2"	.090"	-	-	273.40	261.51	249.63	237.74
NEW	50143	-	1.000	1"	25.400	1"	4"	1-1/2"	.120"	-	-	273.40	261.51	249.63	237.74
	50557	-	1.000	1"	25.400	1"	4"	1-1/2"	.125"	-	-	273.40	261.51	249.63	237.74
NEW	50144	-	1.000	1"	25.400	1"	4"	1-1/2"	.156"	-	-	273.40	261.51	249.63	237.74
NEW	50145	-	1.000	1"	25.400	1"	4"	1-1/2"	.190"	-	-	273.40	261.51	249.63	237.74
NEW	50146	-	1.000	1"	25.400	1"	4"	1-1/2"	.250"	-	-	273.40	261.51	249.63	237.74
NEW	50147	-	1.000	1"	25.400	1"	4"	1-1/2"	.3125"	-	-	273.40	261.51	249.63	237.74
NEW	50148	-	1.000	1"	25.400	1"	4"	1-1/2"	.375"	-	-	273.40	261.51	249.63	237.74

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MATERIAL HARDNESS (Rc)

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continued →

Series V4R (continued)

1.000"
(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	
	(plain)	(weldon)	Decimal	Metric											
NEW	50149	-	1.000	1"	25.400	1"	4-1/2"	2"	.020"	-	-	304.90	291.64	278.39	265.13
NEW	50151	-	1.000	1"	25.400	1"	4-1/2"	2"	.030"	-	-	304.90	291.64	278.39	265.13
NEW	50152	-	1.000	1"	25.400	1"	4-1/2"	2"	.060"	-	-	304.90	291.64	278.39	265.13
NEW	50153	-	1.000	1"	25.400	1"	4-1/2"	2"	.090"	-	-	304.90	291.64	278.39	265.13
NEW	50154	-	1.000	1"	25.400	1"	4-1/2"	2"	.120"	-	-	304.90	291.64	278.39	265.13
NEW	50155	-	1.000	1"	25.400	1"	4-1/2"	2"	.156"	-	-	304.90	291.64	278.39	265.13
NEW	50156	-	1.000	1"	25.400	1"	4-1/2"	2"	.190"	-	-	304.90	291.64	278.39	265.13
NEW	50157	-	1.000	1"	25.400	1"	4-1/2"	2"	.250"	-	-	304.90	291.64	278.39	265.13
NEW	50158	-	1.000	1"	25.400	1"	4-1/2"	2"	.3125"	-	-	304.90	291.64	278.39	265.13
	50234	50282	1.000	1"	25.400	1"	5"	2-1/8"	.030"	-	-	336.40	321.77	307.15	292.52
NEW	50159	-	1.000	1"	25.400	1"	5"	2-1/2"	.020"	-	-	336.40	321.77	307.15	292.52
NEW	50161	-	1.000	1"	25.400	1"	5"	2-1/2"	.030"	-	-	336.40	321.77	307.15	292.52
NEW	50162	-	1.000	1"	25.400	1"	5"	2-1/2"	.060"	-	-	336.40	321.77	307.15	292.52
NEW	50163	-	1.000	1"	25.400	1"	5"	2-1/2"	.090"	-	-	336.40	321.77	307.15	292.52
NEW	50164	-	1.000	1"	25.400	1"	5"	2-1/2"	.120"	-	-	336.40	321.77	307.15	292.52
NEW	50165	-	1.000	1"	25.400	1"	5"	2-1/2"	.156"	-	-	336.40	321.77	307.15	292.52
NEW	50166	-	1.000	1"	25.400	1"	5"	2-1/2"	.190"	-	-	336.40	321.77	307.15	292.52
NEW	50167	-	1.000	1"	25.400	1"	5"	2-1/2"	.250"	-	-	336.40	321.77	307.15	292.52
NEW	50168	-	1.000	1"	25.400	1"	5"	2-1/2"	.3125"	-	-	336.40	321.77	307.15	292.52

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MATERIAL HARDNESS (Rc)