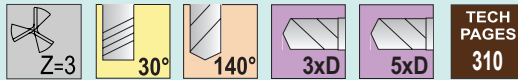


**TOLERANCES**

<i>d</i>	+0.000" - .0005" (+0.000 - .0127mm)
<i>l<sub>1</sub></i>	+0.125" - .125" (+3.175 - 3.175mm)
<i>l<sub>2</sub></i>	+0.125" - .125" (+3.175 - 3.175mm)



**Series 1160, 1180**

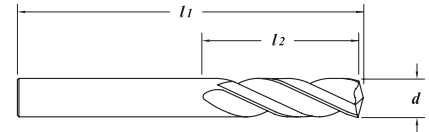
.1562" - .1910"  
(3.967mm - 4.851mm)

**HIGH PERFORMANCE DRILLS**

Recommended for aluminum and other soft materials <40 Rc

**Alumastar Coated**

- High performance solid submicron grain carbide drill
- No spot drilling required
- Unique point geometry and coating for higher speeds and feeds
- High performance drill point
- Live tooling recommended on lathe processes



	3xD (1160) EDP#	5xD (1180) EDP#	<i>d</i> † Diameter		<i>l<sub>1</sub></i> Overall Length	<i>l<sub>2</sub></i> Flute Length	1-11	12-24	25-49	50-100	
			Decimal	Metric							
<b>NEW</b>	70631		.1562	5/32"	3.967	2-1/16"	9/16"	41.33	39.53	37.74	35.94
		70161	.1562	5/32"	3.967	2-1/2"	1"	42.56	40.71	38.86	37.01
	70633		.1570	#22	3.988	2-1/8"	5/8"	41.72	39.91	38.09	36.28
		70163	.1570	#22	3.988	2-1/2"	1"	42.87	41.01	39.14	37.28
	70635		.1575		4.000	54	16	42.06	40.23	38.40	36.57
		70166	.1575		4.000	65	24	43.19	41.32	39.44	37.56
	70637		.1590	#21	4.039	2-1/8"	5/8"	42.41	40.57	38.72	36.88
		70177	.1590	#21	4.039	2-1/2"	1"	43.49	41.60	39.71	37.82
	70639		.1610	#20	4.089	2-1/8"	5/8"	42.78	40.92	39.06	37.20
		70179	.1610	#20	4.089	2-1/2"	1"	43.85	41.94	40.04	38.13
	70641		.1660	#19	4.216	2-1/8"	5/8"	43.15	41.27	39.40	37.52
		70181	.1660	#19	4.216	2-3/4"	1-1/8"	44.16	42.24	40.32	38.40
	70643		.1695	#18	4.305	2-1/8"	5/8"	43.48	41.59	39.70	37.81
		70183	.1695	#18	4.305	2-3/4"	1-1/8"	44.45	42.52	40.58	38.65
	70645		.1719	11/64"	4.366	2-1/8"	5/8"	43.85	41.94	40.04	38.13
<b>NEW</b>		70185	.1719	11/64"	4.366	2-3/4"	1-1/8"	44.77	42.82	40.88	38.93
	70647		.1730	#17	4.394	2-3/16"	11/16"	44.21	42.29	40.37	38.44
<b>NEW</b>		70187	.1730	#17	4.394	2-3/4"	1-1/8"	45.08	43.12	41.16	39.20
	70649		.1770	#16	4.496	2-3/16"	11/16"	44.52	42.58	40.65	38.71
		70189	.1770	#16	4.496	2-3/4"	1-1/8"	45.43	43.45	41.48	39.50
	70651		.1772		4.500	55	18	44.90	42.95	41.00	39.04
		70191	.1772		4.500	65	25	45.63	43.65	41.66	39.68
	70653		.1800	#15	4.572	2-3/16"	11/16"	45.20	43.23	41.27	39.30
<b>NEW</b>		70196	.1800	#15	4.572	2-3/4"	1-1/4"	46.02	44.02	42.02	40.02
	70655		.1820	#14	4.623	2-3/16"	11/16"	45.61	43.63	41.64	39.66
		70201	.1820	#14	4.623	2-3/4"	1-1/4"	46.33	44.32	42.30	40.29
	70657		.1850	#13	4.700	2-3/16"	11/16"	45.94	43.94	41.95	39.95
		70206	.1850	#13	4.700	2-3/4"	1-1/4"	46.68	44.65	42.62	40.59
	70659		.1875	3/16"	4.763	2-3/16"	11/16"	46.31	44.30	42.28	40.27
		70211	.1875	3/16"	4.763	2-3/4"	1-1/4"	46.83	44.79	42.76	40.72
<b>NEW</b>	70661		.1890	#12	4.801	2-1/4"	3/4"	47.83	45.75	43.67	41.59
		70216	.1890	#12	4.801	2-3/4"	1-1/4"	48.56	46.45	44.34	42.23
	70663		.1910	#11	4.851	2-1/4"	3/4"	48.27	46.17	44.07	41.97
		70221	.1910	#11	4.851	2-3/4"	1-1/4"	48.86	46.74	44.61	42.49

continued →

Series 1160, 1180 (continued)

.1935" - .2570"  
(4.914mm - 6.528mm)

3xD (1160) EDP#	5xD (1180) EDP#	$d$ † Diameter		$l_1$ Overall Length	$l_2$ Flute Length	1-11	12-24	25-49	50-100	
		Decimal	Metric							
70665		.1935	#10	4.914	2-1/4"	3/4"	48.55	46.44	44.33	42.22
	70226	.1935	#10	4.914	2-3/4"	1-1/4"	49.17	47.04	44.90	42.76
70667		.1960	#9	4.978	2-1/4"	3/4"	48.90	46.77	44.65	42.52
	70229	.1960	#9	4.978	3"	1-5/16"	49.46	47.31	45.16	43.01
70669		.1969		5.000	57	19	49.16	47.02	44.89	42.75
	70231	.1969		5.000	75	32	49.78	47.62	45.45	43.29
70671		.1990	#8	5.055	2-1/4"	3/4"	49.62	47.46	45.31	43.15
	70236	.1990	#8	5.055	3"	1-5/16"	50.03	47.85	45.68	43.50
70673		.2010	#7	5.105	2-1/4"	3/4"	49.77	47.61	45.44	43.28
	70241	.2010	#7	5.105	3"	1-5/16"	50.22	48.04	45.85	43.67
70675		.2031	13/64"	5.159	2-1/4"	3/4"	50.11	47.93	45.75	43.57
	70246	.2031	13/64"	5.159	3"	1-5/16"	50.58	48.38	46.18	43.98
70677		.2040	#6	5.182	2-3/8"	7/8"	50.45	48.26	46.06	43.87
	70251	.2040	#6	5.182	3"	1-3/8"	50.92	48.71	46.49	44.28
70679		.2055	#5	5.220	2-3/8"	7/8"	50.82	48.61	46.40	44.19
	70256	.2055	#5	5.220	3"	1-3/8"	51.26	49.03	46.80	44.57
70681		.2090	#4	5.309	2-3/8"	7/8"	51.12	48.90	46.67	44.45
	70261	.2090	#4	5.309	3"	1-3/8"	51.54	49.30	47.06	44.82
70683		.2130	#3	5.410	2-3/8"	7/8"	51.46	49.22	46.99	44.75
	70266	.2130	#3	5.410	3"	1-3/8"	51.89	49.63	47.38	45.12
70685		.2165		5.500	60	22	51.78	49.53	47.28	45.03
	70271	.2165		5.500	75	35	52.19	49.92	47.65	45.38
70687		.2188	7/32"	5.558	2-3/8"	7/8"	52.21	49.94	47.67	45.40
	70276	.2188	7/32"	5.558	3"	1-3/8"	52.50	50.22	47.93	45.65
70689		.2210	#2	5.613	2-7/16"	15/16"	52.59	50.30	48.02	45.73
	70281	.2210	#2	5.613	3"	1-3/8"	53.56	51.23	48.90	46.57
70691		.2280	#1	5.791	2-7/16"	15/16"	52.99	50.69	48.38	46.08
	70286	.2280	#1	5.791	3"	1-3/8"	53.81	51.47	49.13	46.79
70693		.2340	A	5.944	2-7/16"	15/16"	53.35	51.03	48.71	46.39
	70294	.2340	A	5.944	3-1/4"	1-1/2"	54.35	51.99	49.62	47.26
70695		.2344	15/64"	5.954	2-7/16"	15/16"	53.76	51.42	49.09	46.75
	70296	.2344	15/64"	5.954	3-1/4"	1-1/2"	54.89	52.50	50.12	47.73
70697		.2362		6.000	64	26	54.13	51.78	49.42	47.07
	70301	.2362		6.000	82	38	55.05	52.66	50.26	47.87
70699		.2380	B	6.045	2-1/2"	1"	54.50	52.13	49.76	47.39
	70306	.2380	B	6.045	3-1/4"	1-5/8"	55.20	52.80	50.40	48.00
70701		.2420	C	6.147	2-1/2"	1"	54.95	52.56	50.17	47.78
	70311	.2420	C	6.147	3-1/4"	1-5/8"	55.56	53.14	50.73	48.31
70703		.2460	D	6.248	2-1/2"	1"	55.25	52.85	50.45	48.04
	70316	.2460	D	6.248	3-1/4"	1-5/8"	55.89	53.46	51.03	48.60
70705		.2500	1/4" / E	6.350	2-1/2"	1"	55.72	53.30	50.87	48.45
	70321	.2500	1/4" / E	6.350	3-1/4"	1-5/8"	56.19	53.75	51.30	48.86
70707		.2510		6.375	2-1/2"	1"	56.44	53.99	51.53	49.08
	70911	.2510		6.375	3-1/4"	1-5/8"	57.05	54.57	52.09	49.61
70709		.2559		6.500	66	28	58.63	56.08	53.53	50.98
	70326	.2559		6.500	82	41	59.60	57.01	54.42	51.83
70711		.2570	F	6.528	2-5/8"	1-1/8"	59.56	56.97	54.38	51.79
	70331	.2570	F	6.528	3-1/4"	1-11/16"	60.50	57.87	55.24	52.61

3xD (1160) EDP#	5xD (1180) EDP#	$d \dagger$ Diameter		$l_1$ Overall Length	$l_2$ Flute Length	1-11	12-24	25-49	50-100	
		Decimal	Metric							
70713		.2610	G	6.629	2-5/8"	1-1/8"	60.47	57.84	55.21	52.58
	70336	.2610	G	6.629	3-1/2"	1-11/16"	61.42	58.75	56.08	53.41
<b>NEW</b>	70715	.2656	17/64"	6.746	2-5/8"	1-1/8"	61.38	58.71	56.04	53.37
	70341	.2656	17/64"	6.746	3-1/2"	1-11/16"	62.33	59.62	56.91	54.20
	70717	.2660	H	6.756	2-11/16"	1-3/16"	62.28	59.57	56.86	54.16
	70346	.2660	H	6.756	3-1/2"	1-11/16"	63.28	60.53	57.78	55.03
	70719	.2720	I	6.909	2-11/16"	1-3/16"	62.43	59.72	57.00	54.29
	70351	.2720	I	6.909	3-1/2"	1-11/16"	64.19	61.40	58.61	55.82
	70721	.2756		7.000	68	30	63.34	60.59	57.83	55.08
	70356	.2756		7.000	88	43	65.10	62.27	59.44	56.61
	70723	.2770	J	7.036	2-11/16"	1-3/16"	64.23	61.44	58.64	55.85
	70361	.2770	J	7.036	3-1/2"	1-11/16"	66.02	63.15	60.28	57.41
	70725	.2812	9/32"	7.142	2-11/16"	1-3/16"	66.06	63.19	60.32	57.44
	70371	.2812	9/32"	7.142	3-1/2"	1-3/4"	67.88	64.93	61.98	59.03
	70727	.2900	L	7.366	2-3/4"	1-1/4"	66.95	64.04	61.13	58.22
	70376	.2900	L	7.366	3-1/2"	1-3/4"	68.74	65.75	62.76	59.77
	70728	.2950	M	7.493	2-3/4"	1-1/4"	68.25	65.28	62.31	59.35
	70378	.2950	M	7.493	3-3/4"	1-7/8"	69.63	66.61	63.58	60.55
<b>NEW</b>	70729	.2953		7.500	70	32	68.25	65.28	62.31	59.35
	70381	.2953		7.500	95	44	69.63	66.61	63.58	60.55
	70731	.2969	19/64"	7.541	2-3/4"	1-1/4"	68.86	65.87	62.87	59.88
	70386	.2969	19/64"	7.541	3-3/4"	1-7/8"	70.24	67.19	64.13	61.08
	70733	.3020	N	7.671	2-15/16"	1-7/16"	71.07	67.98	64.89	61.80
	70391	.3020	N	7.671	3-3/4"	1-7/8"	72.80	69.63	66.47	63.30
	70735	.3125	5/16"	7.938	2-15/16"	1-7/16"	71.32	68.22	65.12	62.02
	70396	.3125	5/16"	7.938	3-3/4"	1-7/8"	72.98	69.81	66.63	63.46
<b>NEW</b>	70737	.3150		8.000	76	36	75.28	72.01	68.73	65.46
	70401	.3150		8.000	95	48	77.02	73.67	70.32	66.97
<b>NEW</b>	70739	.3160	O	8.026	2-15/16"	1-7/16"	75.28	72.01	68.73	65.46
	70406	.3160	O	8.026	3-3/4"	1-7/8"	77.02	73.67	70.32	66.97
	70741	.3230	P	8.204	2-15/16"	1-7/16"	75.82	72.52	69.23	65.93
	70411	.3230	P	8.204	3-3/4"	2-3/32"	77.27	73.91	70.55	67.19
	70743	.3281	21/64"	8.334	2-15/16"	1-7/16"	77.21	73.85	70.50	67.14
	70416	.3281	21/64"	8.334	4"	2-3/32"	77.94	74.55	71.16	67.77
	70745	.3320	Q	8.433	3"	1-7/16"	78.60	75.18	71.76	68.35
	70421	.3320	Q	8.433	4"	2-3/32"	79.36	75.91	72.46	69.01
	70747	.3346		8.500	76	36	78.94	75.51	72.08	68.64
	70426	.3346		8.500	100	53	79.90	76.43	72.95	69.48
	70749	.3390	R	8.611	3"	1-7/16"	81.06	77.54	74.01	70.49
	70431	.3390	R	8.611	4"	2-3/32"	81.89	78.33	74.77	71.21
	70751	.3438	11/32"	8.733	3"	1-7/16"	82.83	79.23	75.63	72.03
	70436	.3438	11/32"	8.733	4"	2-3/16"	84.57	80.89	77.22	73.54
<b>NEW</b>	70753	.3480	S	8.839	3-1/16"	1-1/2"	86.63	82.86	79.10	75.33
	70441	.3480	S	8.839	4"	2-3/16"	89.44	85.55	81.66	77.77
<b>NEW</b>	70755	.3543		9.000	78	38	88.83	84.97	81.11	77.24
	70446	.3543		9.000	100	55	89.92	86.01	82.10	78.19
<b>NEW</b>	70757	.3580	T	9.093	3-1/16"	1-1/2"	93.44	89.38	85.31	81.25
	70451	.3580	T	9.093	4-1/4"	2-9/32"	94.75	90.63	86.51	82.39
	70759	.3594	23/64"	9.129	3-1/16"	1-1/2"	94.02	89.93	85.84	81.76
	70456	.3594	23/64"	9.129	4-1/4"	2-9/32"	95.25	91.11	86.97	82.83

continued →

Series 1160, 1180 (continued)

.3680" - .5118"  
(9.347mm - 13.000mm)

3xD (1160) EDP#	5xD (1180) EDP#	$d$ † Diameter		$l_1$ Overall Length	$l_2$ Flute Length	1-11	12-24	25-49	50-100	
		Decimal	Metric							
70761		.3680	U	9.347	3-1/8"	1-9/16"	94.82	90.70	86.57	82.45
	70461	.3680	U	9.347	4-1/4"	2-9/32"	99.73	95.39	91.06	86.72
70763		.3740		9.500	79	39	95.60	91.44	87.29	83.13
	70466	.3740		9.500	108	58	100.61	96.24	91.86	87.49
70765		.3750	3/8"	9.525	3-1/8"	1-9/16"	96.17	91.99	87.81	83.63
	70471	.3750	3/8"	9.525	4-1/4"	2-3/8"	101.51	97.10	92.68	88.27
70767		.3760		9.550	3-1/8"	1-9/16"	98.01	93.75	89.49	85.23
	70913	.3760		9.550	4-1/4"	2-3/8"	102.87	98.40	93.92	89.45
70769		.3770	V	9.576	3-1/4"	1-5/8"	99.87	95.53	91.19	86.84
	70476	.3770	V	9.576	4-1/4"	2-3/8"	104.21	99.68	95.15	90.62
70771		.3860	W	9.804	3-1/4"	1-5/8"	101.61	97.19	92.77	88.36
	70481	.3860	W	9.804	4-1/2"	2-3/8"	105.87	101.27	96.66	92.06
70773		.3906	25/64"	9.921	3-1/4"	1-5/8"	102.89	98.42	93.94	89.47
	70486	.3906	25/64"	9.921	4-1/2"	2-3/8"	107.05	102.40	97.74	93.09
<b>NEW</b>	70775	.3937		10.000	84	43	106.01	101.40	96.79	92.18
	70491	.3937		10.000	114	60	109.95	105.17	100.39	95.61
70777		.3970	X	10.084	3-5/16"	1-11/16"	107.46	102.79	98.12	93.44
	70496	.3970	X	10.084	4-1/2"	2-1/2"	111.08	106.25	101.42	96.59
70779		.4040	Y	10.262	3-5/16"	1-11/16"	108.16	103.46	98.75	94.05
	70501	.4040	Y	10.262	4-1/2"	2-9/16"	114.15	109.19	104.22	99.26
70781		.4062	13/32"	10.317	3-5/16"	1-11/16"	111.49	106.64	101.79	96.95
	70506	.4062	13/32"	10.317	4-1/2"	2-9/16"	115.03	110.03	105.03	100.03
70783		.4134		10.500	85	43	112.53	107.64	102.74	97.85
	70511	.4134		10.500	114	67	116.00	110.96	105.91	100.87
70785		.4219	27/64"	10.716	3-3/8"	1-11/16"	113.60	108.66	103.72	98.78
	70516	.4219	27/64"	10.716	4-1/2"	2-11/16"	116.97	111.88	106.80	101.71
<b>NEW</b>	70787	.4331		11.000	87	45	121.59	116.30	111.02	105.73
	70521	.4331		11.000	114	68	124.80	119.37	113.95	108.52
<b>NEW</b>	70789	.4375	7/16"	11.113	3-7/16"	1-3/4"	121.92	116.62	111.32	106.02
	70526	.4375	7/16"	11.113	4-3/4"	2-13/16"	125.26	119.81	114.37	108.92
<b>NEW</b>	70791	.4528		11.500	90	47	129.29	123.67	118.05	112.43
	70531	.4528		11.500	120	70	133.20	127.41	121.62	115.83
70793		.4531	29/64"	11.509	3-9/16"	1-13/16"	129.29	123.67	118.05	112.43
	70536	.4531	29/64"	11.509	4-3/4"	2-7/8"	133.20	127.41	121.62	115.83
70795		.4688	15/32"	11.909	3-11/16"	2-1/16"	135.85	129.94	124.04	118.13
	70541	.4688	15/32"	11.909	4-3/4"	2-7/8"	139.41	133.35	127.29	121.23
70797		.4724		12.000	93	53	136.25	130.33	124.40	118.48
	70546	.4724		12.000	120	73	139.78	133.71	127.63	121.55
70799		.4844	31/64"	12.304	3-11/16"	2-1/16"	137.20	131.23	125.27	119.31
	70551	.4844	31/64"	12.304	5-5/16"	3"	142.26	136.07	129.89	123.70
<b>NEW</b>	70801	.4921		12.500	95	53	138.55	132.53	126.50	120.48
	70556	.4921		12.500	135	75	143.84	137.59	131.33	125.08
70803		.5000	1/2"	12.700	3-3/4"	2-1/16"	139.44	133.38	127.31	121.25
	70561	.5000	1/2"	12.700	5-3/8"	3-1/16"	144.12	137.85	131.59	125.32
70805		.5010		12.725	3-3/4"	2-1/16"	140.92	134.79	128.67	122.54
	70915	.5010		12.725	5-3/8"	3-1/16"	145.73	139.39	133.06	126.72
<b>NEW</b>	70807	.5118		13.000	107	55	152.84	146.19	139.55	132.91
	70566	.5118		13.000	136	78	158.56	151.67	144.77	137.88

3xD (1160) EDP#	5xD (1180) EDP#	$d$ † Diameter		$l_1$ Overall Length	$l_2$ Flute Length	1-11	12-24	25-49	50-100	
		Decimal	Metric							
70809		.5156	33/64"	13.096	4-1/4"	2-3/16"	156.46	149.66	142.85	136.05
	70571	.5156	33/64"	13.096	5-3/8"	3-1/8"	161.95	154.91	147.87	140.83
70811		.5312	17/32"	13.492	4-1/4"	2-1/4"	160.06	153.10	146.14	139.18
	70576	.5312	17/32"	13.492	5-11/16"	3-5/16"	165.45	158.26	151.06	143.87
<b>NEW</b> 70813		.5469	35/64"	13.891	4-1/4"	2-1/4"	167.26	159.99	152.72	145.44
	70581	.5469	35/64"	13.891	5-13/16"	3-3/8"	172.18	164.69	157.21	149.72
<b>NEW</b> 70815		.5512		14.000	107	59	170.88	163.45	156.02	148.59
	70586	.5512		14.000	148	86	175.59	167.96	160.32	152.69
<b>NEW</b> 70817		.5625	9/16"	14.287	4-1/2"	2-3/8"	181.76	173.86	165.95	158.05
	70591	.5625	9/16"	14.287	5-15/16"	3-1/2"	187.65	179.49	171.33	163.17
70819		.5781	37/64"	14.683	4-1/2"	2-1/2"	188.49	180.29	172.10	163.91
	70596	.5781	37/64"	14.683	6"	3-1/2"	194.02	185.58	177.15	168.71
<b>NEW</b> 70821		.5906		15.000	115	64	191.96	183.61	175.27	166.92
	70601	.5906		15.000	152	90	197.40	188.82	180.23	171.65
<b>NEW</b> 70823		.5938	19/32"	15.082	4-1/2"	2-1/2"	192.99	184.60	176.21	167.82
	70606	.5938	19/32"	15.082	6"	3-9/16"	198.34	189.72	181.09	172.47
<b>NEW</b> 70825		.6094	39/64"	15.478	4-1/2"	2-9/16"	193.98	185.55	177.11	168.68
	70611	.6094	39/64"	15.478	6-3/16"	3-11/16"	215.02	205.67	196.32	186.97
<b>NEW</b> 70827		.6250	5/8"	15.875	4-1/2"	2-5/8"	195.97	187.45	178.93	170.41
	70616	.6250	5/8"	15.875	6-5/16"	3-3/4"	216.89	207.46	198.03	188.60
70829		.6299		16.000	115	66	200.70	191.97	183.25	174.52
	70621	.6299		16.000	160	95	221.43	211.81	202.18	192.55



*1180 Series  
High Performance Drill in aluminum*