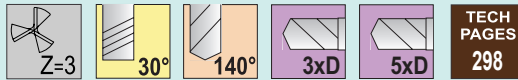


**TOLERANCES**

|           |                                     |
|-----------|-------------------------------------|
| <i>d</i>  | +0.000" - .0005" (+0.000 - .0127mm) |
| <i>l1</i> | + .125" - .125" (+3.175 - 3.175mm)  |
| <i>l2</i> | + .125" - .125" (+3.175 - 3.175mm)  |

**NEW  
ITEMS**

**Series 1160, 1180**

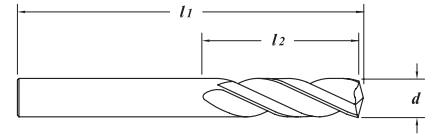


.1562" - .1910"  
(3.967mm - 4.851mm)

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
- Up to 5x longer tool life than Zrn coated drills
- High performance drill point
- Live tooling recommended on lathe processes



**HIGH PERFORMANCE  
DRILLS**

|     | 3xD<br>(1160)<br>EDP# | 5xD<br>(1180)<br>EDP# | <i>d</i> †<br>Diameter |        | <i>l1</i><br>Overall<br>Length | <i>l2</i><br>Flute<br>Length | 1-11   | 12-24 | 25-49 | 50-100 |       |
|-----|-----------------------|-----------------------|------------------------|--------|--------------------------------|------------------------------|--------|-------|-------|--------|-------|
|     |                       |                       | Decimal                | Metric |                                |                              |        |       |       |        |       |
| NEW | 70631                 |                       | .1562                  | 5/32"  | 3.967                          | 2-1/16"                      | 9/16"  | 41.33 | 39.53 | 37.74  | 35.94 |
| NEW |                       | 70161                 | .1562                  | 5/32"  | 3.967                          | 2-1/2"                       | 1"     | 42.56 | 40.71 | 38.86  | 37.01 |
| NEW | 70633                 |                       | .1570                  | #22    | 3.988                          | 2-1/8"                       | 5/8"   | 41.72 | 39.91 | 38.09  | 36.28 |
| NEW |                       | 70163                 | .1570                  | #22    | 3.988                          | 2-1/2"                       | 1"     | 42.87 | 41.01 | 39.14  | 37.28 |
| NEW | 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 |
| NEW | 70637                 |                       | .1590                  | #21    | 4.039                          | 2-1/8"                       | 5/8"   | 42.41 | 40.57 | 38.72  | 36.88 |
| NEW |                       | 70177                 | .1590                  | #21    | 4.039                          | 2-1/2"                       | 1"     | 43.49 | 41.60 | 39.71  | 37.82 |
| NEW | 70639                 |                       | .1610                  | #20    | 4.089                          | 2-1/8"                       | 5/8"   | 42.78 | 40.92 | 39.06  | 37.20 |
| NEW |                       | 70179                 | .1610                  | #20    | 4.089                          | 2-1/2"                       | 1"     | 43.85 | 41.94 | 40.04  | 38.13 |
| NEW | 70641                 |                       | .1660                  | #19    | 4.216                          | 2-1/8"                       | 5/8"   | 43.15 | 41.27 | 39.40  | 37.52 |
| NEW |                       | 70181                 | .1660                  | #19    | 4.216                          | 2-3/4"                       | 1-1/8" | 44.16 | 42.24 | 40.32  | 38.40 |
| NEW | 70643                 |                       | .1695                  | #18    | 4.305                          | 2-1/8"                       | 5/8"   | 43.48 | 41.59 | 39.70  | 37.81 |
| NEW |                       | 70183                 | .1695                  | #18    | 4.305                          | 2-3/4"                       | 1-1/8" | 44.45 | 42.52 | 40.58  | 38.65 |
| NEW | 70645                 |                       | .1719                  | 11/64" | 4.366                          | 2-1/8"                       | 5/8"   | 43.85 | 41.94 | 40.04  | 38.13 |
| NEW |                       | 70185                 | .1719                  | 11/64" | 4.366                          | 2-3/4"                       | 1-1/8" | 44.77 | 42.82 | 40.88  | 38.93 |
| NEW | 70647                 |                       | .1730                  | #17    | 4.394                          | 2-3/16"                      | 11/16" | 44.21 | 42.29 | 40.37  | 38.44 |
| NEW |                       | 70187                 | .1730                  | #17    | 4.394                          | 2-3/4"                       | 1-1/8" | 45.08 | 43.12 | 41.16  | 39.20 |
| NEW | 70649                 |                       | .1770                  | #16    | 4.496                          | 2-3/16"                      | 11/16" | 44.52 | 42.58 | 40.65  | 38.71 |
| NEW |                       | 70189                 | .1770                  | #16    | 4.496                          | 2-3/4"                       | 1-1/8" | 45.43 | 43.45 | 41.48  | 39.50 |
| NEW | 70651                 |                       | .1772                  |        | 4.500                          | 55                           | 18     | 44.90 | 42.95 | 41.00  | 39.04 |
| NEW |                       | 70191                 | .1772                  |        | 4.500                          | 65                           | 25     | 45.63 | 43.65 | 41.66  | 39.68 |
| NEW | 70653                 |                       | .1800                  | #15    | 4.572                          | 2-3/16"                      | 11/16" | 45.20 | 43.23 | 41.27  | 39.30 |
| NEW |                       | 70196                 | .1800                  | #15    | 4.572                          | 2-3/4"                       | 1-1/4" | 46.02 | 44.02 | 42.02  | 40.02 |
| NEW | 70655                 |                       | .1820                  | #14    | 4.623                          | 2-3/16"                      | 11/16" | 45.61 | 43.63 | 41.64  | 39.66 |
| NEW |                       | 70201                 | .1820                  | #14    | 4.623                          | 2-3/4"                       | 1-1/4" | 46.33 | 44.32 | 42.30  | 40.29 |
| NEW | 70657                 |                       | .1850                  | #13    | 4.700                          | 2-3/16"                      | 11/16" | 45.94 | 43.94 | 41.95  | 39.95 |
| NEW |                       | 70206                 | .1850                  | #13    | 4.700                          | 2-3/4"                       | 1-1/4" | 46.68 | 44.65 | 42.62  | 40.59 |
| NEW | 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 |
| NEW | 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 |
| NEW | 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<br>(1160)<br>EDP# | 5xD<br>(1180)<br>EDP# | $d$ †<br>Diameter |          | $l_1$<br>Overall<br>Length | $l_2$<br>Flute<br>Length | 1-11     | 12-24 | 25-49 | 50-100 |       |
|-----|-----------------------|-----------------------|-------------------|----------|----------------------------|--------------------------|----------|-------|-------|--------|-------|
|     |                       |                       | Decimal           | Metric   |                            |                          |          |       |       |        |       |
| NEW | 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 |
| NEW | 70667                 |                       | .1960             | #9       | 4.978                      | 2-1/4"                   | 3/4"     | 48.90 | 46.77 | 44.65  | 42.52 |
| NEW |                       | 70229                 | .1960             | #9       | 4.978                      | 3"                       | 1-5/16"  | 49.46 | 47.31 | 45.16  | 43.01 |
| NEW | 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 |
| NEW | 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 |
| NEW | 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 |
| NEW | 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 |
| NEW | 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 |
| NEW | 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 |
| NEW | 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 |
| NEW | 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 |
| NEW | 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 |
| NEW | 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 |
| NEW | 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 |
| NEW | 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 |
| NEW | 70693                 |                       | .2340             | A        | 5.944                      | 2-7/16"                  | 15/16"   | 53.35 | 51.03 | 48.71  | 46.39 |
| NEW |                       | 70294                 | .2340             | A        | 5.944                      | 3-1/4"                   | 1-1/2"   | 54.35 | 51.99 | 49.62  | 47.26 |
| NEW | 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 |
| NEW | 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 |
| NEW | 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 |
| NEW | 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 |
| NEW | 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 |
| NEW | 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 |
| NEW | 70707                 |                       | .2510             |          | 6.375                      | 2-1/2"                   | 1"       | 56.44 | 53.99 | 51.53  | 49.08 |
| NEW |                       | 70911                 | .2510             |          | 6.375                      | 3-1/4"                   | 1-5/8"   | 57.05 | 54.57 | 52.09  | 49.61 |
| NEW | 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 |
| NEW | 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<br>(1160)<br>EDP# | 5xD<br>(1180)<br>EDP# | $d \dagger$<br>Diameter |        | $l_1$<br>Overall<br>Length | $l_2$<br>Flute<br>Length | 1-11     | 12-24 | 25-49 | 50-100 |       |
|-----|-----------------------|-----------------------|-------------------------|--------|----------------------------|--------------------------|----------|-------|-------|--------|-------|
|     |                       |                       | Decimal                 | Metric |                            |                          |          |       |       |        |       |
| NEW | 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 |
| NEW | 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 |
| NEW | 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 |
| NEW | 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 |
| NEW | 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 |
| NEW | 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 |
| NEW | 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 |
| NEW | 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 |
| NEW | 70728                 |                       | .2950                   | M      | 7.493                      | 2-3/4"                   | 1-1/4"   | 68.25 | 65.28 | 62.31  | 59.35 |
| NEW |                       | 70378                 | .2950                   | M      | 7.493                      | 3-3/4"                   | 1-7/8"   | 69.63 | 66.61 | 63.58  | 60.55 |
| NEW | 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 |
| NEW | 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 |
| NEW | 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 |
| NEW | 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 |
| NEW | 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 |
| NEW | 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 |
| NEW | 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 |
| NEW | 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 |
| NEW | 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 |
| NEW | 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 |
| NEW | 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 |
| NEW | 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 |
| NEW | 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 |
| NEW | 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 |
| NEW | 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 |
| NEW | 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<br>(1160)<br>EDP# | 5xD<br>(1180)<br>EDP# | $d^{\dagger}$<br>Diameter |        | $l_1$<br>Overall<br>Length | $l_2$<br>Flute<br>Length | 1-11     | 12-24  | 25-49  | 50-100 |        |
|-----|-----------------------|-----------------------|---------------------------|--------|----------------------------|--------------------------|----------|--------|--------|--------|--------|
|     |                       |                       | Decimal                   | Metric |                            |                          |          |        |        |        |        |
| NEW | 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  |
| NEW | 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  |
| NEW | 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  |
| NEW | 70767                 |                       | .3760                     |        | 9.550                      | 3-1/8"                   | 1-9/16"  | 98.01  | 93.75  | 89.49  | 85.23  |
| NEW |                       | 70913                 | .3760                     |        | 9.550                      | 4-1/4"                   | 2-3/8"   | 102.87 | 98.40  | 93.92  | 89.45  |
| NEW | 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  |
| NEW | 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  |
| NEW | 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  |
| NEW | 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  |
| NEW | 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  |
| NEW | 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  |
| NEW | 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 |
| NEW | 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 |
| NEW | 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 |
| NEW | 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 |
| NEW | 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 |
| NEW | 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 |
| NEW | 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 |
| NEW | 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 |
| NEW | 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 |
| NEW | 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 |
| NEW | 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 |
| NEW | 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 |
| NEW | 70805                 |                       | .5010                     |        | 12.725                     | 3-3/4"                   | 2-1/16"  | 140.92 | 134.79 | 128.67 | 122.54 |
| NEW |                       | 70915                 | .5010                     |        | 12.725                     | 5-3/8"                   | 3-1/16"  | 145.73 | 139.39 | 133.06 | 126.72 |
| NEW | 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<br>(1160)<br>EDP# | 5xD<br>(1180)<br>EDP# | $d$ †<br>Diameter |        | $l_1$<br>Overall<br>Length | $l_2$<br>Flute<br>Length | 1-11     | 12-24  | 25-49  | 50-100 |        |
|-----|-----------------------|-----------------------|-------------------|--------|----------------------------|--------------------------|----------|--------|--------|--------|--------|
|     |                       |                       | Decimal           | Metric |                            |                          |          |        |        |        |        |
| NEW | 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 |
| NEW | 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 |
| NEW | 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 |
| NEW | 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 |
| NEW | 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 |
| NEW | 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 |
| NEW | 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 |
| NEW | 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 |
| NEW | 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 |
| NEW | 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 |
| NEW | 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 |