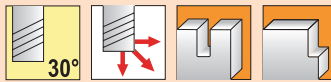


# 220RA / z = 2 230RA (830RA metric) / z = 4

.0625" - .3125"  
(1,59mm - 7,94mm)

Technical information:  
page 200, 202



## TOLERANCES

|       |                                                                                                |
|-------|------------------------------------------------------------------------------------------------|
| $d_1$ | +0,000 -0,050mm (+.000" -.002")                                                                |
| $d_2$ | 3mm - 6mm -0,0000 -0,0075mm (+.0000" -.0003")<br>1/4" - 1" -0,0025 -0,0100mm (-.0001" -.0004") |
| $r$   | +0,025 -0,025mm (+.001" -.001")                                                                |

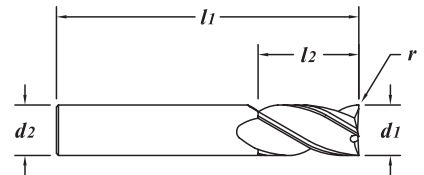
## Standard Length - Corner Radius - TiALN Coated Standard Länge - Eckenradius - TiALN-Beschichtet Longitud Estándar - Ángulo Redondeado - Recubrimiento de TiALN Longueur Standart - Rayon de Coin - Revêtement TiALN Lunghezza Standard - Torico - Rivestimento in TiALN 标准长度 - 圆角半径 - TiALN 涂层



END MILLS



Solid submicron grain carbide end mill - center cutting  
Dry or semi-dry machining  
Up to 40% faster than uncoated  
For stronger corners and part radius  
Extremely versatile  
Uncoated - page 137



Vollhartmetallfräser aus Feinkornhartmetall - Zentrumschnitt  
Trocken oder Halbtrockene Bearbeitung  
Bis zu 40% schneller als unbeschichtete Werkzeuge  
Für stärkere Schneidecken und Radiusteile  
Extrem Vielseitig  
Unbeschichtet - Seite 137



Fresa de submicrograno sólido carburo - corte centrado  
Mecanizado seco o semiseco  
Hasta un 40% más rápido que sin recubrimiento  
Para un mejor refuerzo de esquinas y zonas curvas  
Extremadamente versátil  
Sin recubrimiento - Página 137



Fraises carbure submicrograin - coupe au centre  
Usinage a sec ou avec l'air  
40% plus rapide que le non revetu  
Rayon de coin renforces  
Utilisations variables  
Sans revêtement - Page 137



Super sub-micrograno metallo duro - taglio al centro  
Lavorazione a secco o a umido  
40% più veloce rispetto non rivestito  
Raggi rinforzati  
Estremamente versatile  
Non Rivestito - Pagina 137



超细晶粒整体硬质合金立铣刀 - 中心切削  
干式或半干式机加工  
跟无涂层刀具相比可提高速度高达40%  
用于强化圆角和零件半径  
功能极多  
未涂层 - 137页

| z = 2<br>EDP# | z = 4<br>EDP# | $d_1$ † |          |             | $d_2$<br>Shank<br>Diameter | $l_1$<br>Overall<br>Length | $l_2$<br>Flute<br>Length | $r$<br>Corner<br>Radius |
|---------------|---------------|---------|----------|-------------|----------------------------|----------------------------|--------------------------|-------------------------|
|               |               | Decimal | Diameter | Metric      |                            |                            |                          |                         |
| 79587         | 80587         | .0625   | 1/16"    | 1,59        | 1/8"                       | 1-1/2"                     | 1/4"                     | .010"                   |
| 79597         | 80597         | .0625   | 1/16"    | 1,59        | 1/8"                       | 1-1/2"                     | 1/4"                     | .015"                   |
| 79607         | 80607         | .0938   | 3/32"    | 2,38        | 1/8"                       | 1-1/2"                     | 3/8"                     | .010"                   |
| 79617         | 80617         | .0938   | 3/32"    | 2,38        | 1/8"                       | 1-1/2"                     | 3/8"                     | .015"                   |
| 79627         | 80627         | .0938   | 3/32"    | 2,38        | 1/8"                       | 1-1/2"                     | 3/8"                     | .020"                   |
| -             | 24077         | .1181   |          | <b>3,00</b> | <b>3,0</b>                 | <b>38</b>                  | <b>12</b>                | <b>0,2</b>              |
| -             | 24087         | .1181   |          | <b>3,00</b> | <b>3,0</b>                 | <b>38</b>                  | <b>12</b>                | <b>0,5</b>              |
| 79007         | 80007         | .1250   | 1/8"     | 3,17        | 1/8"                       | 1-1/2"                     | 1/2"                     | .010"                   |
| 79017         | 80017         | .1250   | 1/8"     | 3,17        | 1/8"                       | 1-1/2"                     | 1/2"                     | .015"                   |
| 79027         | 80027         | .1250   | 1/8"     | 3,17        | 1/8"                       | 1-1/2"                     | 1/2"                     | .020"                   |
| 79037         | 80037         | .1250   | 1/8"     | 3,17        | 1/8"                       | 1-1/2"                     | 1/2"                     | .030"                   |
| -             | 24097         | .1575   |          | <b>4,00</b> | <b>4,0</b>                 | <b>50</b>                  | <b>14</b>                | <b>0,3</b>              |
| -             | 24107         | .1575   |          | <b>4,00</b> | <b>4,0</b>                 | <b>50</b>                  | <b>14</b>                | <b>0,5</b>              |
| 79047         | 80047         | .1875   | 3/16"    | 4,76        | 3/16"                      | 2"                         | 5/8"                     | .010"                   |
| 79057         | 80057         | .1875   | 3/16"    | 4,76        | 3/16"                      | 2"                         | 5/8"                     | .015"                   |
| 79067         | 80067         | .1875   | 3/16"    | 4,76        | 3/16"                      | 2"                         | 5/8"                     | .020"                   |
| 79077         | 80077         | .1875   | 3/16"    | 4,76        | 3/16"                      | 2"                         | 5/8"                     | .030"                   |
| -             | 24117         | .1969   |          | <b>5,00</b> | <b>5,0</b>                 | <b>50</b>                  | <b>16</b>                | <b>0,3</b>              |
| -             | 24127         | .1969   |          | <b>5,00</b> | <b>5,0</b>                 | <b>65</b>                  | <b>16</b>                | <b>0,5</b>              |
| -             | 24177         | .2362   |          | <b>6,00</b> | <b>6,0</b>                 | <b>65</b>                  | <b>19</b>                | <b>0,5</b>              |
| -             | 24187         | .2362   |          | <b>6,00</b> | <b>6,0</b>                 | <b>65</b>                  | <b>19</b>                | <b>0,8</b>              |
| -             | 24197         | .2362   |          | <b>6,00</b> | <b>6,0</b>                 | <b>65</b>                  | <b>19</b>                | <b>1,0</b>              |
| -             | 24207         | .2362   |          | <b>6,00</b> | <b>6,0</b>                 | <b>65</b>                  | <b>19</b>                | <b>1,5</b>              |
| -             | 24217         | .2362   |          | <b>6,00</b> | <b>6,0</b>                 | <b>65</b>                  | <b>19</b>                | <b>2,0</b>              |
| NEW           | 80097         | .2500   | 1/4"     | 6,35        | 1/4"                       | 2-1/2"                     | 3/4"                     | .010"                   |
| 79107         | 80107         | .2500   | 1/4"     | 6,35        | 1/4"                       | 2-1/2"                     | 3/4"                     | .015"                   |
| 79117         | 80117         | .2500   | 1/4"     | 6,35        | 1/4"                       | 2-1/2"                     | 3/4"                     | .020"                   |
| 79127         | 80127         | .2500   | 1/4"     | 6,35        | 1/4"                       | 2-1/2"                     | 3/4"                     | .030"                   |
| 79137         | 80137         | .2500   | 1/4"     | 6,35        | 1/4"                       | 2-1/2"                     | 3/4"                     | .045"                   |
| 79147         | 80147         | .2500   | 1/4"     | 6,35        | 1/4"                       | 2-1/2"                     | 3/4"                     | .060"                   |
| 79167         | 80167         | .3125   | 5/16"    | 7,94        | 5/16"                      | 2-1/2"                     | 7/8"                     | .015"                   |
| 79177         | 80177         | .3125   | 5/16"    | 7,94        | 5/16"                      | 2-1/2"                     | 7/8"                     | .020"                   |
| 79187         | 80187         | .3125   | 5/16"    | 7,94        | 5/16"                      | 2-1/2"                     | 7/8"                     | .030"                   |
| 79197         | 80197         | .3125   | 5/16"    | 7,94        | 5/16"                      | 2-1/2"                     | 7/8"                     | .045"                   |
| 79207         | 80207         | .3125   | 5/16"    | 7,94        | 5/16"                      | 2-1/2"                     | 7/8"                     | .060"                   |

continued →

# 220RA / z = 2 (continued)

## 230RA (830RA metric) / z = 4 (continued)

.3150" - .7500"  
(8,00mm - 19,05mm)

| z = 2<br>EDP# | z = 4<br>EDP# | $d1^{\dagger}$<br>Diameter |            |        | $d2$<br>Shank<br>Diameter | $l1$<br>Overall<br>Length | $l2$<br>Flute<br>Length | $r$<br>Corner<br>Radius |
|---------------|---------------|----------------------------|------------|--------|---------------------------|---------------------------|-------------------------|-------------------------|
|               |               | Decimal                    |            | Metric |                           |                           |                         |                         |
| -             | 24227         | .3150                      |            | 8,00   | 8,0                       | 65                        | 22                      | 0,5                     |
| -             | 24237         | .3150                      |            | 8,00   | 8,0                       | 65                        | 22                      | 0,8                     |
| -             | 24247         | .3150                      |            | 8,00   | 8,0                       | 65                        | 22                      | 1,0                     |
| -             | 24257         | .3150                      |            | 8,00   | 8,0                       | 65                        | 22                      | 1,5                     |
| -             | 24267         | .3150                      |            | 8,00   | 8,0                       | 65                        | 22                      | 2,0                     |
| -             | 24277         | .3150                      |            | 8,00   | 8,0                       | 65                        | 22                      | 2,5                     |
| -             | 24287         | .3150                      |            | 8,00   | 8,0                       | 65                        | 22                      | 3,0                     |
| NEW           | -             | 80227                      | .3750 3/8" | 9,52   | 3/8"                      | 2-1/2"                    | 7/8"                    | .010"                   |
| 79237         | 80237         | .3750                      | 3/8"       | 9,52   | 3/8"                      | 2-1/2"                    | 7/8"                    | .015"                   |
| 79247         | 80247         | .3750                      | 3/8"       | 9,52   | 3/8"                      | 2-1/2"                    | 7/8"                    | .020"                   |
| 79257         | 80257         | .3750                      | 3/8"       | 9,52   | 3/8"                      | 2-1/2"                    | 7/8"                    | .030"                   |
| 79267         | 80267         | .3750                      | 3/8"       | 9,52   | 3/8"                      | 2-1/2"                    | 7/8"                    | .045"                   |
| 79277         | 80277         | .3750                      | 3/8"       | 9,52   | 3/8"                      | 2-1/2"                    | 7/8"                    | .060"                   |
| -             | 24297         | .3937                      |            | 10,00  | 10,0                      | 70                        | 25                      | 0,5                     |
| -             | 24307         | .3937                      |            | 10,00  | 10,0                      | 70                        | 25                      | 0,8                     |
| -             | 24317         | .3937                      |            | 10,00  | 10,0                      | 70                        | 25                      | 1,0                     |
| -             | 24327         | .3937                      |            | 10,00  | 10,0                      | 70                        | 25                      | 1,5                     |
| -             | 24337         | .3937                      |            | 10,00  | 10,0                      | 70                        | 25                      | 2,0                     |
| -             | 24347         | .3937                      |            | 10,00  | 10,0                      | 70                        | 25                      | 2,5                     |
| -             | 24357         | .3937                      |            | 10,00  | 10,0                      | 70                        | 25                      | 3,0                     |
| -             | 24367         | .3937                      |            | 10,00  | 10,0                      | 70                        | 25                      | 3,2                     |
| -             | 24377         | .4724                      |            | 12,00  | 12,0                      | 75                        | 25                      | 0,5                     |
| -             | 24387         | .4724                      |            | 12,00  | 12,0                      | 75                        | 25                      | 0,8                     |
| -             | 24397         | .4724                      |            | 12,00  | 12,0                      | 75                        | 25                      | 1,0                     |
| -             | 24407         | .4724                      |            | 12,00  | 12,0                      | 75                        | 25                      | 1,5                     |
| -             | 24417         | .4724                      |            | 12,00  | 12,0                      | 75                        | 25                      | 2,0                     |
| -             | 24427         | .4724                      |            | 12,00  | 12,0                      | 75                        | 25                      | 2,5                     |
| -             | 24437         | .4724                      |            | 12,00  | 12,0                      | 75                        | 25                      | 3,0                     |
| -             | 24447         | .4724                      |            | 12,00  | 12,0                      | 75                        | 25                      | 3,2                     |
| NEW           | -             | 80297                      | .5000 1/2" | 12,70  | 1/2"                      | 3"                        | 1"                      | .010"                   |
| 79307         | 80307         | .5000                      | 1/2"       | 12,70  | 1/2"                      | 3"                        | 1"                      | .015"                   |
| 79317         | 80317         | .5000                      | 1/2"       | 12,70  | 1/2"                      | 3"                        | 1"                      | .020"                   |
| 79327         | 80327         | .5000                      | 1/2"       | 12,70  | 1/2"                      | 3"                        | 1"                      | .030"                   |
| 79337         | 80337         | .5000                      | 1/2"       | 12,70  | 1/2"                      | 3"                        | 1"                      | .045"                   |
| 79347         | 80347         | .5000                      | 1/2"       | 12,70  | 1/2"                      | 3"                        | 1"                      | .060"                   |
| 79357         | 80357         | .5000                      | 1/2"       | 12,70  | 1/2"                      | 3"                        | 1"                      | .090"                   |
| 79367         | 80367         | .5000                      | 1/2"       | 12,70  | 1/2"                      | 3"                        | 1"                      | .125"                   |
| 79377         | 80377         | .6250                      | 5/8"       | 15,87  | 5/8"                      | 3-1/2"                    | 1-1/4"                  | .015"                   |
| 79387         | 80387         | .6250                      | 5/8"       | 15,87  | 5/8"                      | 3-1/2"                    | 1-1/4"                  | .020"                   |
| 79397         | 80397         | .6250                      | 5/8"       | 15,87  | 5/8"                      | 3-1/2"                    | 1-1/4"                  | .030"                   |
| 79407         | 80407         | .6250                      | 5/8"       | 15,87  | 5/8"                      | 3-1/2"                    | 1-1/4"                  | .045"                   |
| 79417         | 80417         | .6250                      | 5/8"       | 15,87  | 5/8"                      | 3-1/2"                    | 1-1/4"                  | .060"                   |
| 79427         | 80427         | .6250                      | 5/8"       | 15,87  | 5/8"                      | 3-1/2"                    | 1-1/4"                  | .090"                   |
| -             | 24457         | .6299                      |            | 16,00  | 16,0                      | 88                        | 38                      | 0,5                     |
| -             | 24467         | .6299                      |            | 16,00  | 16,0                      | 88                        | 38                      | 1,0                     |
| -             | 24477         | .6299                      |            | 16,00  | 16,0                      | 88                        | 38                      | 2,0                     |
| -             | 24487         | .6299                      |            | 16,00  | 16,0                      | 88                        | 38                      | 2,5                     |
| -             | 24497         | .6299                      |            | 16,00  | 16,0                      | 88                        | 38                      | 3,0                     |
| -             | 24507         | .6299                      |            | 16,00  | 16,0                      | 88                        | 38                      | 4,0                     |
| -             | 24517         | .6299                      |            | 16,00  | 16,0                      | 88                        | 38                      | 5,0                     |
| 79447         | 80447         | .7500                      | 3/4"       | 19,05  | 3/4"                      | 4"                        | 1-1/2"                  | .015"                   |
| 79457         | 80457         | .7500                      | 3/4"       | 19,05  | 3/4"                      | 4"                        | 1-1/2"                  | .020"                   |
| 79467         | 80467         | .7500                      | 3/4"       | 19,05  | 3/4"                      | 4"                        | 1-1/2"                  | .030"                   |
| 79477         | 80477         | .7500                      | 3/4"       | 19,05  | 3/4"                      | 4"                        | 1-1/2"                  | .045"                   |
| 79487         | 80487         | .7500                      | 3/4"       | 19,05  | 3/4"                      | 4"                        | 1-1/2"                  | .060"                   |
| 79497         | 80497         | .7500                      | 3/4"       | 19,05  | 3/4"                      | 4"                        | 1-1/2"                  | .090"                   |
| 79507         | 80507         | .7500                      | 3/4"       | 19,05  | 3/4"                      | 4"                        | 1-1/2"                  | .125"                   |
| NEW           | 79637         | 80637                      | .7500 3/4" | 19,05  | 3/4"                      | 4"                        | 1-1/2"                  | .250"                   |

**220RA / z = 2 (continued)**  
**230RA (830RA metric) / z = 4 (continued)**

.7874" - 1.000"  
 (20,00mm - 25,40mm)

END MILLS

| z = 2<br>EDP#    | z = 4<br>EDP# | $d1^{\dagger}$<br>Diameter |              | $d2$              | $l1$              | $l2$            | $r$              |       |
|------------------|---------------|----------------------------|--------------|-------------------|-------------------|-----------------|------------------|-------|
|                  |               | Decimal                    | Metric       | Shank<br>Diameter | Overall<br>Length | Flute<br>Length | Corner<br>Radius |       |
| -                | 24527         | .7874                      | <b>20,00</b> | <b>20,0</b>       | <b>100</b>        | <b>38</b>       | <b>0,5</b>       |       |
| -                | 24537         | .7874                      | <b>20,00</b> | <b>20,0</b>       | <b>100</b>        | <b>38</b>       | <b>1,0</b>       |       |
| -                | 24547         | .7874                      | <b>20,00</b> | <b>20,0</b>       | <b>100</b>        | <b>38</b>       | <b>2,0</b>       |       |
| -                | 24557         | .7874                      | <b>20,00</b> | <b>20,0</b>       | <b>100</b>        | <b>38</b>       | <b>3,0</b>       |       |
| -                | 24567         | .7874                      | <b>20,00</b> | <b>20,0</b>       | <b>100</b>        | <b>38</b>       | <b>5,0</b>       |       |
| 79517            | 80517         | 1.000                      | 1"           | 25,40             | 1"                | 4"              | 1-1/2"           | .015" |
| 79527            | 80527         | 1.000                      | 1"           | 25,40             | 1"                | 4"              | 1-1/2"           | .020" |
| 79537            | 80537         | 1.000                      | 1"           | 25,40             | 1"                | 4"              | 1-1/2"           | .030" |
| 79547            | 80547         | 1.000                      | 1"           | 25,40             | 1"                | 4"              | 1-1/2"           | .045" |
| 79557            | 80557         | 1.000                      | 1"           | 25,40             | 1"                | 4"              | 1-1/2"           | .060" |
| 79567            | 80567         | 1.000                      | 1"           | 25,40             | 1"                | 4"              | 1-1/2"           | .090" |
| 79577            | 80577         | 1.000                      | 1"           | 25,40             | 1"                | 4"              | 1-1/2"           | .125" |
| <b>NEW</b> 79647 | 80647         | 1.000                      | 1"           | 25,40             | 1"                | 4"              | 1-1/2"           | .250" |

