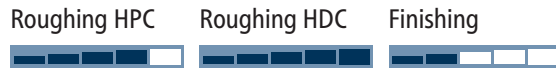
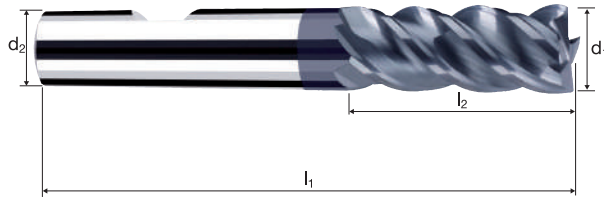
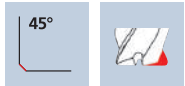


# Cylindrical end mills NX

Smooth-edged, normal version



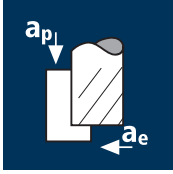
HM  
MG10     $\lambda$  45°  
                   $\gamma$  -20°



|                |                 |                 |              |              |  |                |                     |
|----------------|-----------------|-----------------|--------------|--------------|--|----------------|---------------------|
| Rm<br>850-1100 | Rm<br>1100-1300 | Rm<br>1300-1500 | HRC<br>48-56 | HRC<br>56-60 |  | Ti<br>Titanium | GG(G)<br>Tool Steel |
|----------------|-----------------|-----------------|--------------|--------------|--|----------------|---------------------|

| Ø<br>Code | d <sub>1</sub><br>e8 | d <sub>2</sub><br>h6 | l <sub>1</sub> | l <sub>2</sub> | l <sub>4</sub> | 45°  | α    | z | POLYCHROM |        |
|-----------|----------------------|----------------------|----------------|----------------|----------------|------|------|---|-----------|--------|
|           |                      |                      |                |                |                |      |      |   | P15322    | P15222 |
| 180       | 3.00                 | 6.00                 | 57             | 8.00           | 15.56          | 0.10 | 6.0° | 4 |           | ●      |
| 220       | 4.00                 | 6.00                 | 57             | 8.00           | 14.59          | 0.10 | 4.5° | 4 |           | ●      |
| 260       | 5.00                 | 6.00                 | 57             | 10.00          | 14.72          | 0.15 | 2.5° | 4 |           | ●      |
| 300       | 6.00                 | 6.00                 | 57             | 12.00          | -              | 0.15 | 0.0° | 4 |           | ●      |
| 391       | 8.00                 | 8.00                 | 63             | 19.00          | -              | 0.15 | 0.0° | 4 |           | ●      |
| 450       | 10.00                | 10.00                | 72             | 23.00          | -              | 0.20 | 0.0° | 4 |           | ●      |
| 501       | 12.00                | 12.00                | 83             | 27.00          | -              | 0.20 | 0.0° | 4 |           | ●      |
| 610       | 16.00                | 16.00                | 92             | 32.00          | -              | 0.20 | 0.0° | 4 |           | ●      |
| 682       | 20.00                | 20.00                | 104            | 39.00          | -              | 0.20 | 0.0° | 4 |           | ●      |
|           |                      |                      |                |                |                |      |      |   |           |        |
|           |                      |                      |                |                |                |      |      |   |           |        |
|           |                      |                      |                |                |                |      |      |   |           |        |
|           |                      |                      |                |                |                |      |      |   |           |        |
|           |                      |                      |                |                |                |      |      |   |           |        |
|           |                      |                      |                |                |                |      |      |   |           |        |
|           |                      |                      |                |                |                |      |      |   |           |        |
|           |                      |                      |                |                |                |      |      |   |           |        |
|           |                      |                      |                |                |                |      |      |   |           |        |
|           |                      |                      |                |                |                |      |      |   |           |        |
|           |                      |                      |                |                |                |      |      |   |           |        |
|           |                      |                      |                |                |                |      |      |   |           |        |
|           |                      |                      |                |                |                |      |      |   |           |        |
|           |                      |                      |                |                |                |      |      |   |           |        |
|           |                      |                      |                |                |                |      |      |   |           |        |
|           |                      |                      |                |                |                |      |      |   |           |        |
|           |                      |                      |                |                |                |      |      |   |           |        |

## Application



## Material

Steel  
850 - 1100 N/mm<sup>2</sup>



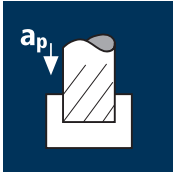
Steel  
1100 - 1300 N/mm<sup>2</sup>



Hardened tool steel  
52 - 56 HRC



Titanium alloys  
> 300 HB  
[Ti6Al4V]



Steel  
850 - 1100 N/mm<sup>2</sup>



Steel  
1100 - 1300 N/mm<sup>2</sup>



Hardened tool steel  
52 - 56 HRC



Titanium alloys  
> 300 HB  
[Ti6Al4V]



| d1 [mm] | z | v <sub>c</sub> [m/min] | f <sub>s</sub> [mm] | a <sub>p</sub> [mm] | a <sub>e</sub> [mm] | n [min <sup>-1</sup> ] | v <sub>r</sub> [mm/min] | Q [cm <sup>3</sup> /min] |
|---------|---|------------------------|---------------------|---------------------|---------------------|------------------------|-------------------------|--------------------------|
| 4.00    | 4 | 150                    | 0.030               | 6.000               | 1.600               | 11935                  | 1430                    | 13.8                     |
| 5.00    | 4 | 150                    | 0.035               | 7.500               | 2.000               | 9550                   | 1335                    | 20.1                     |
| 6.00    | 4 | 150                    | 0.040               | 9.000               | 2.400               | 7960                   | 1275                    | 27.5                     |
| 8.00    | 4 | 150                    | 0.050               | 12.000              | 3.200               | 5970                   | 1195                    | 45.8                     |
| 10.00   | 4 | 150                    | 0.065               | 15.000              | 4.000               | 4775                   | 1240                    | 74.5                     |
| 12.00   | 4 | 150                    | 0.075               | 18.000              | 4.800               | 3980                   | 1195                    | 103.1                    |
| 16.00   | 4 | 150                    | 0.085               | 24.000              | 6.400               | 2985                   | 1015                    | 155.8                    |
| 20.00   | 4 | 150                    | 0.100               | 30.000              | 8.000               | 2385                   | 955                     | 229.2                    |

|       |   |     |       |        |       |      |      |       |
|-------|---|-----|-------|--------|-------|------|------|-------|
| 4.00  | 4 | 115 | 0.030 | 6.000  | 1.600 | 9150 | 1100 | 10.5  |
| 5.00  | 4 | 115 | 0.035 | 7.500  | 2.000 | 7320 | 1025 | 15.4  |
| 6.00  | 4 | 115 | 0.040 | 9.000  | 2.400 | 6100 | 975  | 21.1  |
| 8.00  | 4 | 115 | 0.050 | 12.000 | 3.200 | 4575 | 915  | 35.1  |
| 10.00 | 4 | 115 | 0.065 | 15.000 | 4.000 | 3660 | 950  | 57.1  |
| 12.00 | 4 | 115 | 0.075 | 18.000 | 4.800 | 3050 | 915  | 79.1  |
| 16.00 | 4 | 115 | 0.085 | 24.000 | 6.400 | 2290 | 780  | 119.5 |
| 20.00 | 4 | 115 | 0.100 | 30.000 | 8.000 | 1830 | 730  | 175.7 |

|       |   |    |       |        |       |      |     |      |
|-------|---|----|-------|--------|-------|------|-----|------|
| 4.00  | 4 | 50 | 0.015 | 6.000  | 1.600 | 3980 | 240 | 2.3  |
| 5.00  | 4 | 50 | 0.020 | 7.500  | 2.000 | 3185 | 255 | 3.8  |
| 6.00  | 4 | 50 | 0.025 | 9.000  | 2.400 | 2655 | 265 | 5.7  |
| 8.00  | 4 | 50 | 0.030 | 12.000 | 3.200 | 1990 | 240 | 9.2  |
| 10.00 | 4 | 50 | 0.035 | 15.000 | 4.000 | 1590 | 225 | 13.4 |
| 12.00 | 4 | 50 | 0.045 | 18.000 | 4.800 | 1325 | 240 | 20.6 |
| 16.00 | 4 | 50 | 0.055 | 24.000 | 6.400 | 995  | 220 | 33.6 |
| 20.00 | 4 | 50 | 0.070 | 30.000 | 8.000 | 795  | 225 | 53.5 |

|       |   |    |       |        |       |      |     |      |
|-------|---|----|-------|--------|-------|------|-----|------|
| 4.00  | 4 | 60 | 0.020 | 6.000  | 1.600 | 4775 | 380 | 3.7  |
| 5.00  | 4 | 60 | 0.025 | 7.500  | 2.000 | 3820 | 380 | 5.7  |
| 6.00  | 4 | 60 | 0.030 | 9.000  | 2.400 | 3185 | 380 | 8.3  |
| 8.00  | 4 | 60 | 0.040 | 12.000 | 3.200 | 2385 | 380 | 14.7 |
| 10.00 | 4 | 60 | 0.045 | 15.000 | 4.000 | 1910 | 345 | 20.6 |
| 12.00 | 4 | 60 | 0.055 | 18.000 | 4.800 | 1590 | 350 | 30.3 |
| 16.00 | 4 | 60 | 0.065 | 24.000 | 6.400 | 1195 | 310 | 47.7 |
| 20.00 | 4 | 60 | 0.080 | 30.000 | 8.000 | 955  | 305 | 73.3 |

|       |   |     |       |        |        |      |     |       |
|-------|---|-----|-------|--------|--------|------|-----|-------|
| 4.00  | 4 | 120 | 0.025 | 5.000  | 4.000  | 9550 | 955 | 19.1  |
| 5.00  | 4 | 120 | 0.025 | 6.250  | 5.000  | 7640 | 765 | 23.9  |
| 6.00  | 4 | 120 | 0.030 | 7.500  | 6.000  | 6365 | 765 | 34.4  |
| 8.00  | 4 | 120 | 0.040 | 10.000 | 8.000  | 4775 | 765 | 61.1  |
| 10.00 | 4 | 120 | 0.050 | 12.500 | 10.000 | 3820 | 765 | 95.5  |
| 12.00 | 4 | 120 | 0.055 | 15.000 | 12.000 | 3185 | 700 | 126.1 |
| 16.00 | 4 | 120 | 0.065 | 20.000 | 16.000 | 2385 | 620 | 198.6 |
| 20.00 | 4 | 120 | 0.075 | 25.000 | 20.000 | 1910 | 575 | 286.5 |

|       |   |    |       |        |        |      |     |       |
|-------|---|----|-------|--------|--------|------|-----|-------|
| 4.00  | 4 | 90 | 0.025 | 5.000  | 4.000  | 7160 | 715 | 14.3  |
| 5.00  | 4 | 90 | 0.025 | 6.250  | 5.000  | 5730 | 575 | 17.9  |
| 6.00  | 4 | 90 | 0.030 | 7.500  | 6.000  | 4775 | 575 | 25.8  |
| 8.00  | 4 | 90 | 0.040 | 10.000 | 8.000  | 3580 | 575 | 45.8  |
| 10.00 | 4 | 90 | 0.050 | 12.500 | 10.000 | 2865 | 575 | 71.6  |
| 12.00 | 4 | 90 | 0.055 | 15.000 | 12.000 | 2385 | 525 | 94.5  |
| 16.00 | 4 | 90 | 0.065 | 20.000 | 16.000 | 1790 | 465 | 149.0 |
| 20.00 | 4 | 90 | 0.075 | 25.000 | 20.000 | 1430 | 430 | 214.9 |

|       |   |    |       |        |        |      |     |      |
|-------|---|----|-------|--------|--------|------|-----|------|
| 4.00  | 4 | 40 | 0.010 | 5.000  | 4.000  | 3185 | 125 | 2.5  |
| 5.00  | 4 | 40 | 0.015 | 6.250  | 5.000  | 2545 | 155 | 4.8  |
| 6.00  | 4 | 40 | 0.020 | 7.500  | 6.000  | 2120 | 170 | 7.6  |
| 8.00  | 4 | 40 | 0.025 | 10.000 | 8.000  | 1590 | 160 | 12.7 |
| 10.00 | 4 | 40 | 0.025 | 12.500 | 10.000 | 1275 | 125 | 15.9 |
| 12.00 | 4 | 40 | 0.035 | 15.000 | 12.000 | 1060 | 150 | 26.7 |
| 16.00 | 4 | 40 | 0.040 | 20.000 | 16.000 | 795  | 125 | 40.7 |
| 20.00 | 4 | 40 | 0.055 | 25.000 | 20.000 | 635  | 140 | 70.0 |

|       |   |    |       |        |        |      |     |      |
|-------|---|----|-------|--------|--------|------|-----|------|
| 4.00  | 4 | 50 | 0.015 | 5.000  | 4.000  | 3980 | 240 | 4.8  |
| 5.00  | 4 | 50 | 0.020 | 6.250  | 5.000  | 3185 | 255 | 8.0  |
| 6.00  | 4 | 50 | 0.025 | 7.500  | 6.000  | 2655 | 265 | 11.9 |
| 8.00  | 4 | 50 | 0.030 | 10.000 | 8.000  | 1990 | 240 | 19.1 |
| 10.00 | 4 | 50 | 0.035 | 12.500 | 10.000 | 1590 | 225 | 27.9 |
| 12.00 | 4 | 50 | 0.040 | 15.000 | 12.000 | 1325 | 210 | 38.2 |
| 16.00 | 4 | 50 | 0.050 | 20.000 | 16.000 | 995  | 200 | 63.7 |
| 20.00 | 4 | 50 | 0.060 | 25.000 | 20.000 | 795  | 190 | 95.5 |