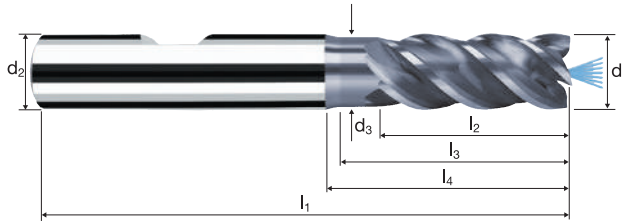
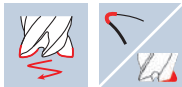
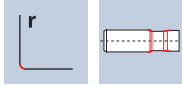


# Cylindrical end mills MFC

Smooth-edged, normal version, short neck  
High-performance penetration edge, central air/cooling channel



HM  
MG10     $\lambda$  45°  
           $\gamma$  10°

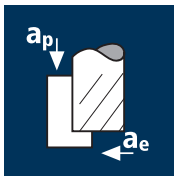


Roughing HPC    Roughing HDC    Finishing

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

|                     |             |             |       |       |       |       |       |       |          |   | POLYCHROM |  |
|---------------------|-------------|-------------|-------|-------|-------|-------|-------|-------|----------|---|-----------|--|
| Example: Order-N°.  |             |             |       |       |       |       |       |       |          |   | P8201     |  |
|                     |             |             |       |       |       |       |       |       |          |   | P8101     |  |
| $\emptyset$<br>Code | $d_1$<br>e8 | $d_2$<br>h5 | $d_3$ | $l_1$ | $l_2$ | $l_3$ | $l_4$ | r     | $\alpha$ | z |           |  |
| 220                 | 4.00        | 6.00        | 3.70  | 57    | 8.00  | 16.00 | 20.82 | 0.100 | 3.0°     | 4 | ●         |  |
| 260                 | 5.00        | 6.00        | 4.60  | 57    | 10.00 | 18.00 | 21.27 | 0.100 | 1.5°     | 4 | ●         |  |
| 300                 | 6.00        | 6.00        | 5.50  | 57    | 12.00 | 18.15 | 20.00 | 0.100 | 0.0°     | 4 | ●         |  |
| 391                 | 8.00        | 8.00        | 7.40  | 63    | 19.00 | 23.63 | 26.00 | 0.150 | 0.0°     | 4 | ●         |  |
| 450                 | 10.00       | 10.00       | 9.20  | 72    | 23.00 | 27.99 | 31.00 | 0.200 | 0.0°     | 4 | ●         |  |
| 501                 | 12.00       | 12.00       | 11.00 | 83    | 27.00 | 33.29 | 37.00 | 0.200 | 0.0°     | 4 | ●         |  |
| 503*                | 12.00       | 12.00       | 11.00 | 83    | 27.00 | 33.29 | 37.00 | 0.200 | 0.0°     | 4 | ●         |  |
| 610                 | 16.00       | 16.00       | 15.00 | 92    | 32.00 | 38.73 | 43.00 | 0.200 | 0.0°     | 4 | ●         |  |
| 612*                | 16.00       | 16.00       | 15.00 | 92    | 32.00 | 38.73 | 43.00 | 0.200 | 0.0°     | 4 | ●         |  |
| 682                 | 20.00       | 20.00       | 19.00 | 104   | 39.00 | 48.23 | 53.00 | 0.200 | 0.0°     | 4 | ●         |  |
| 684*                | 20.00       | 20.00       | 19.00 | 104   | 39.00 | 48.23 | 53.00 | 0.200 | 0.0°     | 4 | ●         |  |
| * with chip breaker |             |             |       |       |       |       |       |       |          |   |           |  |

## Application

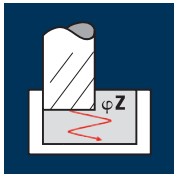


## Material

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



| 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] | q <sub>Z</sub> [°] |
|---------|---|------------------------|---------------------|---------------------|---------------------|------------------------|-------------------------|--------------------------|--------------------|
| 4.00    | 4 | 150                    | 0.030               | 7.200               | 1.600               | 11935                  | 1430                    | 16.5                     | 18°                |
| 5.00    | 4 | 150                    | 0.035               | 9.000               | 2.000               | 9550                   | 1335                    | 24.1                     | 18°                |
| 6.00    | 4 | 150                    | 0.040               | 10.800              | 2.400               | 7960                   | 1275                    | 33.0                     | 18°                |
| 8.00    | 4 | 150                    | 0.050               | 14.400              | 3.200               | 5970                   | 1195                    | 55.0                     | 18°                |
| 10.00   | 4 | 150                    | 0.065               | 18.000              | 4.000               | 4775                   | 1240                    | 89.4                     | 18°                |
| 12.00   | 4 | 150                    | 0.075               | 21.600              | 4.800               | 3980                   | 1195                    | 123.8                    | 18°                |
| 16.00   | 4 | 150                    | 0.085               | 24.000              | 6.400               | 2985                   | 1015                    | 155.8                    | 18°                |
| 20.00   | 4 | 150                    | 0.100               | 30.000              | 8.000               | 2385                   | 955                     | 229.2                    | 18°                |



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



| 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] | q <sub>Z</sub> [°] |
|---------|---|------------------------|---------------------|---------------------|---------------------|------------------------|-------------------------|--------------------------|--------------------|
| 4.00    | 4 | 115                    | 0.025               | 7.200               | 1.600               | 9150                   | 915                     | 10.5                     | 15°                |
| 5.00    | 4 | 115                    | 0.030               | 9.000               | 2.000               | 7320                   | 880                     | 15.8                     | 15°                |
| 6.00    | 4 | 115                    | 0.035               | 10.800              | 2.400               | 6100                   | 855                     | 22.1                     | 15°                |
| 8.00    | 4 | 115                    | 0.045               | 14.400              | 3.200               | 4575                   | 825                     | 38.0                     | 15°                |
| 10.00   | 4 | 115                    | 0.055               | 18.000              | 4.000               | 3660                   | 805                     | 58.0                     | 15°                |
| 12.00   | 4 | 115                    | 0.065               | 21.600              | 4.800               | 3050                   | 795                     | 82.2                     | 15°                |
| 16.00   | 4 | 115                    | 0.075               | 24.000              | 6.400               | 2290                   | 685                     | 105.4                    | 15°                |
| 20.00   | 4 | 115                    | 0.090               | 30.000              | 8.000               | 1830                   | 660                     | 158.1                    | 15°                |

Inox normal  
[Cr-Ni/1.4301]  
[Cr-Ni-Mo/1.4571]



| 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] | q <sub>R</sub> [°] |
|---------|---|------------------------|---------------------|---------------------|---------------------|------------------------|-------------------------|--------------------------|--------------------|
| 4.00    | 4 | 90                     | 0.020               | 7.200               | 1.600               | 7160                   | 575                     | 6.6                      | 12°                |
| 5.00    | 4 | 90                     | 0.025               | 9.000               | 2.000               | 5730                   | 575                     | 10.3                     | 12°                |
| 6.00    | 4 | 90                     | 0.030               | 10.800              | 2.400               | 4775                   | 575                     | 14.9                     | 12°                |
| 8.00    | 4 | 90                     | 0.035               | 14.400              | 3.200               | 3580                   | 500                     | 23.1                     | 12°                |
| 10.00   | 4 | 90                     | 0.045               | 18.000              | 4.000               | 2865                   | 515                     | 37.1                     | 12°                |
| 12.00   | 4 | 90                     | 0.055               | 21.600              | 4.800               | 2385                   | 525                     | 54.5                     | 12°                |
| 16.00   | 4 | 90                     | 0.065               | 24.000              | 6.400               | 1790                   | 465                     | 71.5                     | 12°                |
| 20.00   | 4 | 90                     | 0.080               | 30.000              | 8.000               | 1430                   | 460                     | 110.0                    | 12°                |

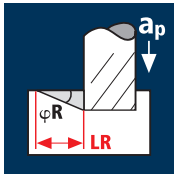
## Application



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



| 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] | q <sub>R</sub> [°] | LR [mm] |
|---------|---|------------------------|---------------------|---------------------|---------------------|------------------------|-------------------------|--------------------------|--------------------|---------|
| 4.00    | 4 | 120                    | 0.020               | 6.000               | 4.000               | 9550                   | 765                     | 18.3                     | 20°                | 16.5    |
| 5.00    | 4 | 120                    | 0.023               | 7.500               | 5.000               | 7640                   | 705                     | 26.4                     | 20°                | 20.6    |
| 6.00    | 4 | 120                    | 0.026               | 9.000               | 6.000               | 6365                   | 660                     | 35.8                     | 20°                | 24.7    |
| 8.00    | 4 | 120                    | 0.033               | 12.000              | 8.000               | 4775                   | 630                     | 60.5                     | 20°                | 33.0    |
| 10.00   | 4 | 120                    | 0.042               | 15.000              | 10.000              | 3820                   | 640                     | 96.3                     | 20°                | 41.2    |
| 12.00   | 4 | 120                    | 0.049               | 18.000              | 12.000              | 3185                   | 625                     | 134.8                    | 20°                | 49.5    |
| 16.00   | 4 | 120                    | 0.055               | 24.000              | 16.000              | 2385                   | 525                     | 201.7                    | 20°                | 65.9    |
| 20.00   | 4 | 120                    | 0.065               | 25.000              | 20.000              | 1910                   | 495                     | 248.3                    | 20°                | 68.7    |



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



| 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] | q <sub>R</sub> [°] | LR [mm] |
|---------|---|------------------------|---------------------|---------------------|---------------------|------------------------|-------------------------|--------------------------|--------------------|---------|
| 4.00    | 4 | 90                     | 0.016               | 6.000               | 4.000               | 7160                   | 460                     | 11.0                     | 20°                | 16.5    |
| 5.00    | 4 | 90                     | 0.020               | 7.500               | 5.000               | 5730                   | 460                     | 17.2                     | 20°                | 20.6    |
| 6.00    | 4 | 90                     | 0.023               | 9.000               | 6.000               | 4775                   | 440                     | 23.7                     | 20°                | 24.7    |
| 8.00    | 4 | 90                     | 0.029               | 12.000              | 8.000               | 3580                   | 415                     | 39.9                     | 20°                | 33.0    |
| 10.00   | 4 | 90                     | 0.036               | 15.000              | 10.000              | 2865                   | 415                     | 61.9                     | 20°                | 41.2    |
| 12.00   | 4 | 90                     | 0.042               | 18.000              | 12.000              | 2385                   | 400                     | 86.6                     | 20°                | 49.5    |
| 16.00   | 4 | 90                     | 0.049               | 24.000              | 16.000              | 1790                   | 350                     | 134.8                    | 20°                | 65.9    |
| 20.00   | 4 | 90                     | 0.058               | 25.000              | 20.000              | 1430                   | 330                     | 166.2                    | 20°                | 68.7    |

Inox normal  
[Cr-Ni/1.4301]  
[Cr-Ni-Mo/1.4571]



| 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] | q <sub>R</sub> [°] | LR [mm] |
|---------|---|------------------------|---------------------|---------------------|---------------------|------------------------|-------------------------|--------------------------|--------------------|---------|
| 4.00    | 4 | 70                     | 0.013               | 6.000               | 4.000               | 5570                   | 290                     | 7.0                      | 14°                | 24.1    |
| 5.00    | 4 | 70                     | 0.016               | 7.500               | 5.000               | 4455                   | 285                     | 10.7                     | 14°                | 30.1    |
| 6.00    | 4 | 70                     | 0.020               | 9.000               | 6.000               | 3715                   | 295                     | 16.0                     | 14°                | 36.1    |
| 8.00    | 4 | 70                     | 0.023               | 12.000              | 8.000               | 2785                   | 255                     | 24.6                     | 14°                | 48.1    |
| 10.00   | 4 | 70                     | 0.029               | 15.000              | 10.000              | 2230                   | 260                     | 38.8                     | 14°                | 60.2    |
| 12.00   | 4 | 70                     | 0.036               | 18.000              | 12.000              | 1855                   | 265                     | 57.8                     | 14°                | 72.2    |
| 16.00   | 4 | 70                     | 0.042               | 24.000              | 16.000              | 1395                   | 235                     | 89.8                     | 14°                | 96.3    |
| 20.00   | 4 | 70                     | 0.052               | 25.000              | 20.000              | 1115                   | 230                     | 115.9                    | 14°                | 100.3   |

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