

# Cylindrical end mills Microcut

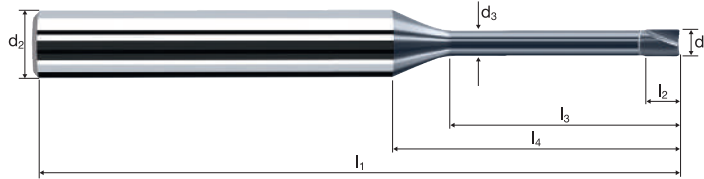
Shank  $\varnothing$  4mm, cylindrical neck, 12xd



|           |           |           |
|-----------|-----------|-----------|
| <b>HM</b> | $\lambda$ | <b>0°</b> |
| <b>XA</b> | $\gamma$  | <b>0°</b> |

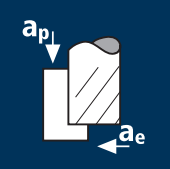



























**new!**



|                    |                       |                        |                        |                     |                     |                          |                       |   |
|--------------------|-----------------------|------------------------|------------------------|---------------------|---------------------|--------------------------|-----------------------|---|
| <b>Rm</b><br>< 850 | <b>Rm</b><br>850-1100 | <b>Rm</b><br>1100-1300 | <b>Rm</b><br>1300-1500 | <b>HRC</b><br>48-56 | <b>HRC</b><br>56-60 | <b>Inox</b><br>Stainless | <b>Ti</b><br>Titanium | <b>Cobalt-Chrome</b><br><b>Gold / Platinum</b><br><b>Copper</b> |
|--------------------|-----------------------|------------------------|------------------------|---------------------|---------------------|--------------------------|-----------------------|---|

| Example:<br>Order-N°. |                           |                      |                |                |                |                |                |      |          |   | X-AL  |  |
|-----------------------|---------------------------|----------------------|----------------|----------------|----------------|----------------|----------------|------|----------|---|-------|--|
|                       |                           |                      |                |                |                |                |                |      |          |   | X6810 |  |
| $\varnothing$<br>Code | d <sub>1</sub><br>0/-0.01 | d <sub>2</sub><br>h4 | d <sub>3</sub> | l <sub>1</sub> | l <sub>2</sub> | l <sub>3</sub> | l <sub>4</sub> | 45°  | $\alpha$ | z |       |  |
| 100                   | 1.00                      | 4.00                 | 0.95           | 50             | 1.20           | 12.00          | 17.85          | 0.04 | 5.0°     | 2 | ●     |  |
| 120                   | 1.50                      | 4.00                 | 1.40           | 57             | 1.80           | 18.00          | 22.80          | 0.04 | 3.3°     | 2 | ●     |  |
| 140                   | 2.00                      | 4.00                 | 1.90           | 57             | 2.40           | 24.00          | 27.87          | 0.07 | 2.3°     | 2 | ●     |  |
| 180                   | 3.00                      | 4.00                 | 2.80           | 75             | 3.60           | 36.00          | 37.91          | 0.07 | 1.0°     | 2 | ●     |  |
|                       |                           |                      |                |                |                |                |                |      |          |   |       |  |
|                       |                           |                      |                |                |                |                |                |      |          |   |       |  |
|                       |                           |                      |                |                |                |                |                |      |          |   |       |  |
|                       |                           |                      |                |                |                |                |                |      |          |   |       |  |
|                       |                           |                      |                |                |                |                |                |      |          |   |       |  |
|                       |                           |                      |                |                |                |                |                |      |          |   |       |  |
|                       |                           |                      |                |                |                |                |                |      |          |   |       |  |
|                       |                           |                      |                |                |                |                |                |      |          |   |       |  |
|                       |                           |                      |                |                |                |                |                |      |          |   |       |  |
|                       |                           |                      |                |                |                |                |                |      |          |   |       |  |
|                       |                           |                      |                |                |                |                |                |      |          |   |       |  |
|                       |                           |                      |                |                |                |                |                |      |          |   |       |  |
|                       |                           |                      |                |                |                |                |                |      |          |   |       |  |
|                       |                           |                      |                |                |                |                |                |      |          |   |       |  |
|                       |                           |                      |                |                |                |                |                |      |          |   |       |  |
|                       |                           |                      |                |                |                |                |                |      |          |   |       |  |

| Application  | Material  | $d_1$<br>[mm] | $z$ | $v_c$<br>[m/min] | $f_z$<br>[mm] | $a_p$<br>[mm] | $a_e$<br>[mm] | $n$<br>[min <sup>-1</sup> ] | $v_f$<br>[mm/min] | $Q$<br>[mm <sup>3</sup> /min] |
|--|---|---------------|-----|------------------|---------------|---------------|---------------|-----------------------------|-------------------|-------------------------------|
|  | Steel<br>850 - 1100 N/mm <sup>2</sup><br><br>     | 1.00          | 2   | 59               | 0.007         | 0.200         | 0.100         | 18780                       | 263               | 5.3                           |
|  |   | 1.50          | 2   | 59               | 0.011         | 0.300         | 0.150         | 12520                       | 263               | 11.9                          |
|  |   | 2.00          | 2   | 59               | 0.014         | 0.400         | 0.200         | 9390                        | 263               | 21.1                          |
|  |   | 3.00          | 2   | 59               | 0.021         | 0.600         | 0.300         | 6260                        | 263               | 47.3                          |
|  |   |               |     |                  |               |               |               |                             |                   |                               |
|  | Steel<br>1100 - 1300 N/mm <sup>2</sup><br><br>    | 1.00          | 2   | 45               | 0.006         | 0.200         | 0.100         | 14325                       | 172               | 3.5                           |
|  |   | 1.50          | 2   | 45               | 0.009         | 0.300         | 0.150         | 9550                        | 172               | 7.8                           |
|  |   | 2.00          | 2   | 45               | 0.012         | 0.400         | 0.200         | 7160                        | 172               | 13.8                          |
|  |   | 3.00          | 2   | 45               | 0.018         | 0.600         | 0.300         | 4775                        | 172               | 31.0                          |
|  |   |               |     |                  |               |               |               |                             |                   |                               |
|  | Inox normal<br>[Cr-Ni/1.4301]<br>[Cr-Ni-Mo/1.4571]<br><br>    | 1.00          | 2   | 36               | 0.005         | 0.200         | 0.100         | 11460                       | 103               | 2.1                           |
|  |   | 1.50          | 2   | 36               | 0.007         | 0.300         | 0.150         | 7640                        | 103               | 4.7                           |
|  |   | 2.00          | 2   | 36               | 0.009         | 0.400         | 0.200         | 5730                        | 103               | 8.3                           |
|  |   | 3.00          | 2   | 36               | 0.014         | 0.600         | 0.300         | 3820                        | 103               | 18.6                          |
|  |   |               |     |                  |               |               |               |                             |                   |                               |
|  | Titanium alloys<br>> 300 HB<br>[Ti6Al4V]<br><br>    | 1.00          | 2   | 23               | 0.005         | 0.200         | 0.100         | 7320                        | 66                | 1.3                           |
|  |   | 1.50          | 2   | 23               | 0.007         | 0.300         | 0.150         | 4880                        | 66                | 3.0                           |
|  |   | 2.00          | 2   | 23               | 0.009         | 0.400         | 0.200         | 3660                        | 66                | 5.3                           |
|  |   | 3.00          | 2   | 23               | 0.014         | 0.600         | 0.300         | 2440                        | 66                | 11.9                          |
|  |   |               |     |                  |               |               |               |                             |                   |                               |

| Application   | Material  | $d_1$<br>[mm] | $z$ | $v_c$<br>[m/min] | $f_z$<br>[mm] | $a_p$<br>[mm] | $a_e$<br>[mm] | $n$<br>[min <sup>-1</sup> ] | $v_f$<br>[mm/min] | $Q$<br>[mm <sup>3</sup> /min] |
|---|---|---------------|-----|------------------|---------------|---------------|---------------|-----------------------------|-------------------|-------------------------------|
|  | Steel<br>850 - 1100 N/mm <sup>2</sup><br><br>     | 1.00          | 2   | 53               | 0.006         | 0.100         | 1.000         | 16870                       | 189               | 18.9                          |
|   |   | 1.50          | 2   | 53               | 0.008         | 0.150         | 1.500         | 11245                       | 189               | 42.5                          |
|   |   | 2.00          | 2   | 53               | 0.011         | 0.200         | 2.000         | 8435                        | 189               | 75.6                          |
|   |   | 3.00          | 2   | 53               | 0.017         | 0.300         | 3.000         | 5625                        | 189               | 170.1                         |
|   |   |               |     |                  |               |               |               |                             |                   |                               |
|   | Steel<br>1100 - 1300 N/mm <sup>2</sup><br><br>    | 1.00          | 2   | 41               | 0.005         | 0.100         | 1.000         | 13050                       | 125               | 12.6                          |
|   |   | 1.50          | 2   | 41               | 0.007         | 0.150         | 1.500         | 8700                        | 125               | 28.2                          |
|   |   | 2.00          | 2   | 41               | 0.010         | 0.200         | 2.000         | 6525                        | 125               | 50.1                          |
|   |   | 3.00          | 2   | 41               | 0.014         | 0.300         | 3.000         | 4350                        | 125               | 112.8                         |
|   |   |               |     |                  |               |               |               |                             |                   |                               |
|   | Inox normal<br>[Cr-Ni/1.4301]<br>[Cr-Ni-Mo/1.4571]<br><br>    | 1.00          | 2   | 33               | 0.004         | 0.100         | 1.000         | 10505                       | 76                | 7.6                           |
|   |   | 1.50          | 2   | 33               | 0.005         | 0.150         | 1.500         | 7005                        | 76                | 17.1                          |
|   |   | 2.00          | 2   | 33               | 0.007         | 0.200         | 2.000         | 5250                        | 76                | 30.3                          |
|   |   | 3.00          | 2   | 33               | 0.011         | 0.300         | 3.000         | 3500                        | 76                | 68.1                          |
|   |   |               |     |                  |               |               |               |                             |                   |                               |
|   | Titanium alloys<br>> 300 HB<br>[Ti6Al4V]<br><br>    | 1.00          | 2   | 20               | 0.004         | 0.100         | 1.000         | 6365                        | 46                | 4.6                           |
|   |   | 1.50          | 2   | 20               | 0.005         | 0.150         | 1.500         | 4245                        | 46                | 10.3                          |
|   |   | 2.00          | 2   | 20               | 0.007         | 0.200         | 2.000         | 3185                        | 46                | 18.4                          |
|   |   | 3.00          | 2   | 20               | 0.011         | 0.300         | 3.000         | 2120                        | 46                | 41.2                          |
|   |   |               |     |                  |               |               |               |                             |                   |                               |