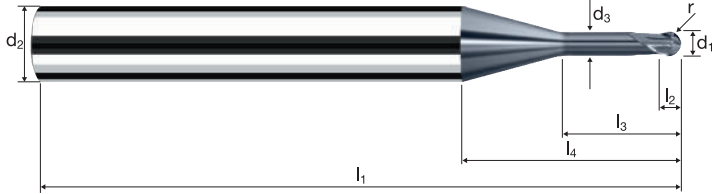
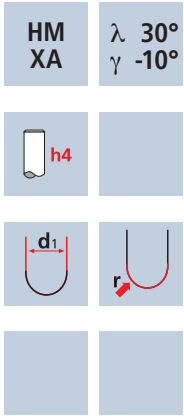


# Ball nose end mills MicroHX

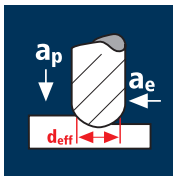
Shank  $\varnothing$  6mm, cylindrical neck, 4xd



|  |  |                 |                 |              |              |             |                   |                |     |
|--|--|-----------------|-----------------|--------------|--------------|-------------|-------------------|----------------|-----|
|  |  | Rm<br>1100-1300 | Rm<br>1300-1500 | HRC<br>48-56 | HRC<br>56-60 | HRC<br>> 60 | Inox<br>Stainless | Ti<br>Titanium | HSS |
|--|--|-----------------|-----------------|--------------|--------------|-------------|-------------------|----------------|-----|

| Example:<br>Order-N°. |                | Coating<br><b>Y</b>  | Article-N°<br><b>6463</b> | ø-Code<br><b>040</b> |                |                |                |             |       |   |       | DURO-AI |  |
|-----------------------|----------------|----------------------|---------------------------|----------------------|----------------|----------------|----------------|-------------|-------|---|-------|---------|--|
| Ø<br>Code             | d <sub>1</sub> | 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> | r<br>±0.005 | α     | z | Y6463 |         |  |
| 040                   | 0.40           | 6.00                 | 0.35                      | 57                   | 0.24           | 1.60           | 17.56          | 0.200       | 13.2° | 2 | ●     |         |  |
| 050                   | 0.50           | 6.00                 | 0.45                      | 57                   | 0.30           | 2.00           | 12.51          | 0.250       | 12.8° | 2 | ●     |         |  |
| 060                   | 0.60           | 6.00                 | 0.55                      | 57                   | 0.36           | 2.40           | 12.73          | 0.300       | 12.4° | 2 | ●     |         |  |
| 080                   | 0.80           | 6.00                 | 0.75                      | 57                   | 0.48           | 3.20           | 13.15          | 0.400       | 11.7° | 2 | ●     |         |  |
| 100                   | 1.00           | 6.00                 | 0.95                      | 57                   | 0.60           | 4.00           | 13.58          | 0.500       | 11.0° | 2 | ●     |         |  |
| 120                   | 1.50           | 6.00                 | 1.40                      | 57                   | 0.90           | 6.00           | 14.53          | 0.750       | 9.2°  | 2 | ●     |         |  |
| 140                   | 2.00           | 6.00                 | 1.90                      | 57                   | 1.20           | 8.00           | 15.60          | 1.000       | 7.8°  | 2 | ●     |         |  |
|                       |                |                      |                           |                      |                |                |                |             |       |   |       |         |  |
|                       |                |                      |                           |                      |                |                |                |             |       |   |       |         |  |
|                       |                |                      |                           |                      |                |                |                |             |       |   |       |         |  |
|                       |                |                      |                           |                      |                |                |                |             |       |   |       |         |  |
|                       |                |                      |                           |                      |                |                |                |             |       |   |       |         |  |
|                       |                |                      |                           |                      |                |                |                |             |       |   |       |         |  |
|                       |                |                      |                           |                      |                |                |                |             |       |   |       |         |  |
|                       |                |                      |                           |                      |                |                |                |             |       |   |       |         |  |
|                       |                |                      |                           |                      |                |                |                |             |       |   |       |         |  |
|                       |                |                      |                           |                      |                |                |                |             |       |   |       |         |  |
|                       |                |                      |                           |                      |                |                |                |             |       |   |       |         |  |
|                       |                |                      |                           |                      |                |                |                |             |       |   |       |         |  |
|                       |                |                      |                           |                      |                |                |                |             |       |   |       |         |  |
|                       |                |                      |                           |                      |                |                |                |             |       |   |       |         |  |
|                       |                |                      |                           |                      |                |                |                |             |       |   |       |         |  |
|                       |                |                      |                           |                      |                |                |                |             |       |   |       |         |  |

## Application



## Material

Hardened tool steel  
52 - 56 HRC

**Y**

| d1 [mm] | z | v <sub>c</sub> [m/min] | f <sub>t</sub> [mm] | a <sub>s</sub> [mm] | a <sub>e</sub> [mm] | d <sub>eff</sub> [mm] | n [min <sup>-1</sup> ] | v <sub>t</sub> [mm/min] | Q [mm <sup>3</sup> /min] |
|---------|---|------------------------|---------------------|---------------------|---------------------|-----------------------|------------------------|-------------------------|--------------------------|
| 0.40    | 2 | 21                     | 0.010               | 0.016               | 0.080               | 0.16                  | 41780                  | 835                     | 1.1                      |
| 0.50    | 2 | 26                     | 0.013               | 0.020               | 0.100               | 0.20                  | 41380                  | 1075                    | 2.2                      |
| 0.60    | 2 | 32                     | 0.015               | 0.024               | 0.120               | 0.24                  | 42440                  | 1275                    | 3.7                      |
| 0.80    | 2 | 41                     | 0.020               | 0.032               | 0.160               | 0.31                  | 42100                  | 1685                    | 8.6                      |
| 1.00    | 2 | 51                     | 0.025               | 0.040               | 0.200               | 0.39                  | 41625                  | 2080                    | 16.7                     |
| 1.50    | 2 | 78                     | 0.038               | 0.060               | 0.300               | 0.59                  | 42080                  | 3200                    | 57.6                     |
| 2.00    | 2 | 100                    | 0.050               | 0.080               | 0.400               | 0.78                  | 40810                  | 4080                    | 130.6                    |

Hardened tool steel  
56 - 60 HRC

**Y**

|      |   |    |       |       |       |      |       |      |      |
|------|---|----|-------|-------|-------|------|-------|------|------|
| 0.40 | 2 | 21 | 0.009 | 0.016 | 0.080 | 0.16 | 41780 | 750  | 1.0  |
| 0.50 | 2 | 26 | 0.012 | 0.020 | 0.100 | 0.20 | 41380 | 970  | 1.9  |
| 0.60 | 2 | 32 | 0.014 | 0.024 | 0.120 | 0.24 | 42440 | 1145 | 3.3  |
| 0.80 | 2 | 41 | 0.018 | 0.032 | 0.160 | 0.31 | 42100 | 1515 | 7.8  |
| 1.00 | 2 | 51 | 0.023 | 0.040 | 0.200 | 0.39 | 41625 | 1875 | 15.0 |
| 1.50 | 2 | 60 | 0.034 | 0.060 | 0.300 | 0.59 | 32370 | 2215 | 39.9 |
| 2.00 | 2 | 60 | 0.045 | 0.080 | 0.400 | 0.78 | 24485 | 2205 | 70.5 |

Hardened tool steel  
> 60 HRC

**Y**

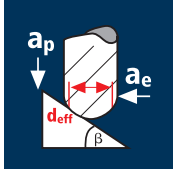
|      |   |    |       |       |       |      |       |      |      |
|------|---|----|-------|-------|-------|------|-------|------|------|
| 0.40 | 2 | 18 | 0.007 | 0.013 | 0.080 | 0.14 | 40925 | 590  | 0.6  |
| 0.50 | 2 | 24 | 0.009 | 0.016 | 0.100 | 0.18 | 42440 | 795  | 1.3  |
| 0.60 | 2 | 28 | 0.011 | 0.019 | 0.120 | 0.21 | 42440 | 915  | 2.1  |
| 0.80 | 2 | 37 | 0.014 | 0.026 | 0.160 | 0.28 | 42060 | 1210 | 5.0  |
| 1.00 | 2 | 46 | 0.018 | 0.032 | 0.200 | 0.35 | 41835 | 1505 | 9.6  |
| 1.50 | 2 | 50 | 0.027 | 0.048 | 0.300 | 0.53 | 30030 | 1645 | 23.7 |
| 2.00 | 2 | 50 | 0.036 | 0.064 | 0.400 | 0.70 | 22735 | 1635 | 41.9 |

High speed steel,  
hardened  
64 - 70 HRC

**Y**

|      |   |    |       |       |       |      |       |      |      |
|------|---|----|-------|-------|-------|------|-------|------|------|
| 0.40 | 2 | 17 | 0.006 | 0.010 | 0.080 | 0.13 | 41625 | 480  | 0.4  |
| 0.50 | 2 | 21 | 0.007 | 0.013 | 0.100 | 0.16 | 41780 | 625  | 0.8  |
| 0.60 | 2 | 25 | 0.009 | 0.015 | 0.120 | 0.19 | 41885 | 725  | 1.3  |
| 0.80 | 2 | 33 | 0.012 | 0.020 | 0.160 | 0.25 | 42015 | 970  | 3.2  |
| 1.00 | 2 | 40 | 0.014 | 0.026 | 0.200 | 0.32 | 39790 | 1145 | 5.9  |
| 1.50 | 2 | 40 | 0.022 | 0.038 | 0.300 | 0.47 | 27090 | 1185 | 13.7 |
| 2.00 | 2 | 40 | 0.029 | 0.051 | 0.400 | 0.63 | 20210 | 1165 | 23.8 |

## Application



## Material

Hardened tool steel  
52 - 56 HRC

**Y**

| d1 [mm] | z | v <sub>c</sub> [m/min] | f <sub>t</sub> [mm] | a <sub>s</sub> [mm] | a <sub>e</sub> [mm] | d <sub>eff</sub> [mm] | n [min <sup>-1</sup> ] | v <sub>t</sub> [mm/min] | β [°] |
|---------|---|------------------------|---------------------|---------------------|---------------------|-----------------------|------------------------|-------------------------|-------|
| 0.40    | 2 | 49                     | 0.012               | 0.016               | 0.016               | 0.37                  | 42155                  | 1010                    | 45°   |
| 0.50    | 2 | 62                     | 0.018               | 0.022               | 0.022               | 0.47                  | 41990                  | 1510                    | 45°   |
| 0.60    | 2 | 74                     | 0.018               | 0.026               | 0.026               | 0.56                  | 42060                  | 1515                    | 45°   |
| 0.80    | 2 | 99                     | 0.020               | 0.034               | 0.034               | 0.75                  | 42015                  | 1680                    | 45°   |
| 1.00    | 2 | 123                    | 0.026               | 0.042               | 0.042               | 0.93                  | 42100                  | 2190                    | 45°   |
| 1.50    | 2 | 185                    | 0.030               | 0.064               | 0.064               | 1.40                  | 42060                  | 2525                    | 45°   |
| 2.00    | 2 | 200                    | 0.034               | 0.084               | 0.084               | 1.86                  | 34225                  | 2325                    | 45°   |

Hardened tool steel  
56 - 60 HRC

**Y**

|      |   |     |       |       |       |      |       |      |     |
|------|---|-----|-------|-------|-------|------|-------|------|-----|
| 0.40 | 2 | 49  | 0.012 | 0.016 | 0.016 | 0.37 | 42155 | 1010 | 45° |
| 0.50 | 2 | 62  | 0.016 | 0.022 | 0.022 | 0.47 | 41990 | 1345 | 45° |
| 0.60 | 2 | 74  | 0.016 | 0.026 | 0.026 | 0.56 | 42060 | 1345 | 45° |
| 0.80 | 2 | 99  | 0.018 | 0.034 | 0.034 | 0.75 | 42015 | 1515 | 45° |
| 1.00 | 2 | 123 | 0.022 | 0.042 | 0.042 | 0.93 | 42100 | 1850 | 45° |
| 1.50 | 2 | 150 | 0.028 | 0.064 | 0.064 | 1.40 | 34105 | 1910 | 45° |
| 2.00 | 2 | 150 | 0.030 | 0.084 | 0.084 | 1.86 | 25670 | 1540 | 45° |

Hardened tool steel  
> 60 HRC

**Y**

|      |   |     |       |       |       |      |       |      |     |
|------|---|-----|-------|-------|-------|------|-------|------|-----|
| 0.40 | 2 | 48  | 0.010 | 0.010 | 0.010 | 0.36 | 42440 | 850  | 45° |
| 0.50 | 2 | 61  | 0.015 | 0.020 | 0.020 | 0.46 | 42210 | 1265 | 45° |
| 0.60 | 2 | 73  | 0.015 | 0.020 | 0.020 | 0.55 | 42250 | 1265 | 45° |
| 0.80 | 2 | 98  | 0.015 | 0.030 | 0.030 | 0.74 | 42155 | 1265 | 45° |
| 1.00 | 2 | 120 | 0.020 | 0.040 | 0.040 | 0.93 | 41070 | 1645 | 45° |
| 1.50 | 2 | 120 | 0.020 | 0.060 | 0.060 | 1.39 | 27480 | 1100 | 45° |
| 2.00 | 2 | 120 | 0.025 | 0.080 | 0.080 | 1.86 | 20535 | 1025 | 45° |

High speed steel,  
hardened  
64 - 70 HRC

**Y**

|      |   |    |       |       |       |      |       |     |     |
|------|---|----|-------|-------|-------|------|-------|-----|-----|
| 0.40 | 2 | 48 | 0.010 | 0.010 | 0.010 | 0.36 | 42440 | 850 | 45° |
| 0.50 | 2 | 61 | 0.010 | 0.020 | 0.020 | 0.46 | 42210 | 845 | 45° |
| 0.60 | 2 | 73 | 0.010 | 0.020 | 0.020 | 0.55 | 42250 | 845 | 45° |
| 0.80 | 2 | 85 | 0.010 | 0.020 | 0.030 | 0.71 | 38110 | 760 | 45° |
| 1.00 | 2 | 85 | 0.015 | 0.030 | 0.040 | 0.91 | 29730 | 890 | 45° |
| 1.50 | 2 | 85 | 0.015 | 0.050 | 0.060 | 1.37 | 19750 | 590 | 45° |
| 2.00 | 2 | 85 | 0.020 | 0.060 | 0.080 | 1.81 | 14950 | 600 | 45° |