

Needle Rollers

Features

IKO Needle Rollers are made of high carbon chromium bearing steel. They are rigid and highly accurate and are finished to a hardness of 58HRC or more (See Table 1.) and a surface roughness of $0.1 \mu m R_a$ or less.

These needle rollers are widely used as rolling elements for bearings, and also as pins and shafts. Please contact IKO, if Needle Rollers made of stainless steel are required.

Table 1 Hardness

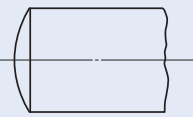
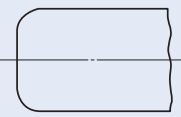
| Nominal diameter D_w mm | | Hardness | |
|---------------------------|-------|-----------|-------------|
| Over | Incl. | HRC | HV |
| — | 3 | (60 ~ 67) | 697 ~ 900 |
| 3 | — | 58 ~ 66 | (653 ~ 865) |

Remarks 1. Hardness is flat surface hardness.
2. The values in parentheses are converted values for reference.

End Shapes

Needle Rollers come in spherical and flat end shapes, as shown in Table 2. Please contact IKO, if other shapes are required.

Table 2 Shapes of ends

| Type | Spherical end | Flat end |
|--------|---|---|
| Shapes |  |  |
| Symbol | A | F |

Accuracy

The dimensional accuracy of Needle Rollers conforms to JIS B 1506 (Rolling bearings-Rollers), and is shown in Table 3.

The selective classification for the mean diameter tolerance is shown in Table 4. The selective classification rollers according to Table 4 can be provided as requested.

Table 3 Dimensional accuracy of needle rollers unit: μm

| Class | Diameter variation in a single radial plane ⁽¹⁾ | Circularity ⁽¹⁾ | Gauge lot diameter variation ⁽¹⁾ | Deviation of a single length ⁽²⁾ |
|-------|--|----------------------------|---|---|
| | V_{Dwp} (Max.) | Δ_R (Max.) | V_{DwL} (Max.) | Δ_{Lws} |
| 2 | 1 | 1 | 2 | h13 |
| 3 | 1.5 | 1.5 | 3 | h13 |
| 5 | 2 | 2.5 | 5 | h13 |

Notes ⁽¹⁾ Applicable to the measurement at the center of roller length

⁽²⁾ Tolerance is based on the classification according to the nominal length L_w .

Remark Any measured diameter along the total length of roller must not be larger than the actual maximum diameter at the center of roller length by the amount exceeding the values given below.
0.5 μm for Class 2
0.8 μm for Class 3
1 μm for Class 5

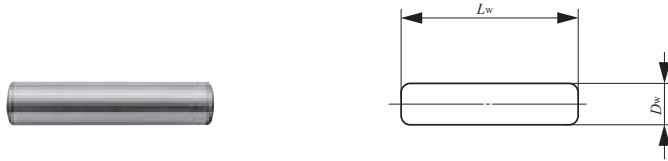
Table 4 Classification of needle rollers unit: μm

| Classification symbol | Tolerance for mean dia. |
|-----------------------|-------------------------|
| C 3 | 0 ~ - 3 |
| B 2 | 0 ~ - 2 |
| B 4 | - 2 ~ - 4 |
| B 6 | - 4 ~ - 6 |
| B 8 | - 6 ~ - 8 |
| B10 | - 8 ~ - 10 |

Use as Full-complement Bearings

For normal rotation, Needle Roller Bearings with cage are most suitable, but for low rotational speeds and for oscillating movement, full-complement bearings are also used.

If Needle Rollers are combined with a shaft and a housing which have been hardened and ground to form a suitable raceway surface, the combined assembly can be used as a full-complement bearing which has a large load capacity and a low sectional height. (See page A44, Design of shaft and housing.) Normally in this case, the radial clearance is made a little larger than that of a bearing with cage and the circumferential clearance is made to be approximately 1/10 of the diameter of needle rollers. When the bearing is used under severe conditions, please contact IKO for further information.



Roller dia. 1 – 6mm

| Nominal dimensions mm | | Mass (Ref.) |
|-----------------------|-------|-------------|
| D_w | L_w | g |
| 1 | 5.8 | 0.03 |
| | 6.8 | 0.04 |
| | 7.8 | 0.05 |
| | 9.8 | 0.06 |
| 1.5 | 5.8 | 0.08 |
| | 6.8 | 0.09 |
| | 7.8 | 0.1 |
| | 9.8 | 0.13 |
| | 11.8 | 0.16 |
| | 13.8 | 0.18 |
| 2 | 6.8 | 0.16 |
| | 7.8 | 0.19 |
| | 9.8 | 0.23 |
| | 11.8 | 0.28 |
| | 13.8 | 0.33 |
| | 15.8 | 0.38 |
| | 17.8 | 0.42 |
| 19.8 | 0.47 | |
| 2.5 | 7.8 | 0.29 |
| | 9.8 | 0.36 |
| | 11.8 | 0.44 |
| | 13.8 | 0.51 |
| | 15.8 | 0.59 |
| | 17.8 | 0.66 |
| | 19.8 | 0.73 |
| | 21.8 | 0.81 |
| 23.8 | 0.88 | |
| 3 | 9.8 | 0.52 |
| | 11.8 | 0.63 |
| | 13.8 | 0.74 |
| | 15.8 | 0.84 |
| | 17.8 | 0.95 |
| | 19.8 | 1.06 |
| | 21.8 | 1.16 |
| | 23.8 | 1.27 |
| | 25.8 | 1.38 |
| | 27.8 | 1.48 |
| | 29.8 | 1.59 |

| Nominal dimensions mm | | Mass (Ref.) |
|-----------------------|-------|-------------|
| D_w | L_w | g |
| 3.5 | 11.8 | 0.86 |
| | 13.8 | 1 |
| | 15.8 | 1.15 |
| | 17.8 | 1.29 |
| | 19.8 | 1.44 |
| | 21.8 | 1.58 |
| | 23.8 | 1.73 |
| | 25.8 | 1.88 |
| | 27.8 | 2.1 |
| | 29.8 | 2.2 |
| | 31.8 | 2.3 |
| 34.8 | 2.5 | |
| 4 | 11.8 | 1.12 |
| | 13.8 | 1.31 |
| | 15.8 | 1.5 |
| | 17.8 | 1.69 |
| | 19.8 | 1.88 |
| | 21.8 | 2.1 |
| | 23.8 | 2.3 |
| | 25.8 | 2.5 |
| | 27.8 | 2.6 |
| | 29.8 | 2.8 |
| | 31.8 | 3 |
| 34.8 | 3.3 | |
| 4.5 | 17.8 | 2.1 |
| | 19.8 | 2.4 |
| | 21.8 | 2.6 |
| | 23.8 | 2.9 |
| | 25.8 | 3.1 |
| | 29.8 | 3.6 |
| | 31.8 | 3.8 |
| | 34.8 | 4.2 |
| | 37.8 | 4.5 |
| | 39.8 | 4.8 |
| | 44.8 | 5.4 |

| Nominal dimensions mm | | Mass (Ref.) |
|-----------------------|-------|-------------|
| D_w | L_w | g |
| 5 | 15.8 | 2.3 |
| | 17.8 | 2.6 |
| | 19.8 | 2.9 |
| | 21.8 | 3.2 |
| | 23.8 | 3.5 |
| | 25.8 | 3.8 |
| | 27.8 | 4.1 |
| | 29.8 | 4.4 |
| | 31.8 | 4.7 |
| | 34.8 | 5.2 |
| | 37.8 | 5.6 |
| 39.8 | 5.9 | |
| 49.8 | 7.4 | |
| 6 | 17.8 | 3.9 |
| | 19.8 | 4.3 |
| | 21.8 | 4.8 |
| | 23.8 | 5.2 |
| | 25.8 | 5.5 |
| | 27.8 | 6 |
| | 29.8 | 6.4 |
| | 34.8 | 7.5 |
| | 39.8 | 8.6 |
| | 49.8 | 10.8 |
| | 59.8 | 13 |

Remark For the names of the needle rollers, nominal dimensions are used.
 Needle Rollers other than those shown in the dimension table can also be manufactured. Please contact IKO for further information.