# Angular contact ball bearings

Angular contact ball bearings are suitable for applications which require high accuracy and good high-speed performance. This type of bearing is designed to carry a combined load.

■ Single-row angular contact ball bearings and matched pair angular contact ball bearings

Contact angle

- The standard contact angles are 15°, 30° and 40°. They are identified, respectively, by the supplementary codes "C", "A" (omitted) and "B". Bearings with a smaller contact angle are more suitable for applications involving high-speed rotation. Those with a larger contact angle feature superior axial load resistance.
- Angular contact ball bearings are often preloaded to enhance their rigidity and rotating performance.
  (refer to p. A 112.)
  For high-precision matched pair angular contact ball bearings of class 5 or higher, which are used in machine tools and other precision equipment, the standard preload is specified in three levels: slight (S), light (L), medium (M) and heavy (H). (refer to Table 11-2 on p. A 114.)
- When this type of bearing is loaded radially, an axial component of force is produced. In this case, two bearings are used together facing one another, or two or more bearings are matched and used. (refer to p. A 38.)
- Tables 1 and 2 list the different types of single-row and matched pair/stack angular contact ball bearings and describe their characteristics.

■ Double-row angular contact ball bearings
Consist of two single-row angular contact ball bearings matched back-to-back, with inner and outer rings integrated.
Table 3 shows major types and their characteristics.

■ Four-point contact ball bearings
- Have a contact angle of 35° and an inner ring divided into two annular pieces. They are suitable for applications that involve either axial loading or combined loading, where the axial load makes up the major part of the load.
- Able to support both axial load and a certain degree of radial load. Each rolling element is in contact with each of the inner and outer rings at a single point, and both contact points lie on the contact angle line. The line runs to either the right or left depending on the direction of the axial load.
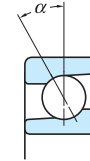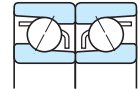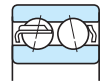
**Single-row angular contact ball bearings**

Bore diameter **10 – 380** mm

**Matched pair angular contact ball bearings**

Bore diameter **10 – 380** mm

**Double-row angular contact ball bearings**
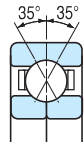
Bore diameter **10 – 110** mm

**Four-point contact ball bearings**

Bore diameter **20 – 110** mm

35° 35°

- Consult with JTEKT when using the four-point contact ball bearing because application conditions such as load magnitude should be examined carefully.

## Table 1  Single-row angular contact ball bearings

Standard type



(with pressed cage)



(with machined cage)

- Single-row angular contact ball bearings accommodate radial load and axial load in one direction.

- Bearings with a machined cage are suitable for high-speed applications.

**Reference**  G-type bearing

"G-type" bearings have a stand-out between the inner ring and outer ring on both sides that are equal in size.
This arrangement is called "flush ground processing." These bearings can be matched in a variety of ways.
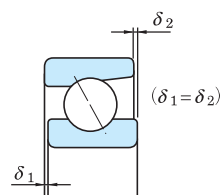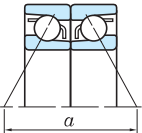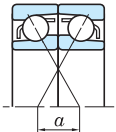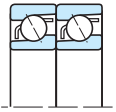


$$(\delta_1 = \delta_2)$$

## Table 2  Matched pair and stack angular contact ball bearings

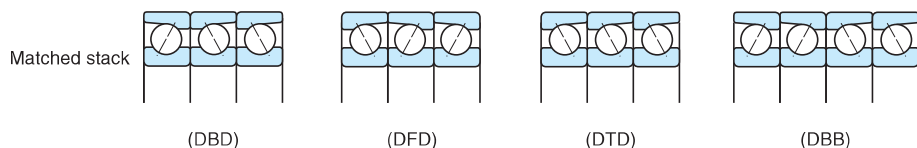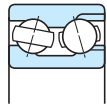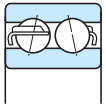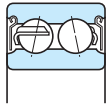| Back-to-back arrangement (DB) |  | • Carries radial load and axial load in both directions.<br>• Suitable for applications involving moment loading because the distance between the load centers ($a$) is long.<br>• As for the preloaded type, the clearance is pre-adjusted so that bearings will be preloaded the proper amount when the inner ring is fixed with a nut. |
|---|---|---|
| Face-to-face arrangement (DF) |  | • Carries radial load and axial load in both directions.<br>• Has a smaller moment load accommodating capacity than the back-to-back arrangement, because the distance between the load centers ($a$) is shorter.<br>• As for the preloaded type, the clearance is pre-adjusted so that bearings will be preloaded the proper amount when the outer rings are pressed together. |
| Tandem arrangement (DT) |  | • Carries radial load and axial load in one direction.<br>• Suitable for applications which involve a high degree of axial loading. |



(DBD)          (DFD)          (DTD)          (DBB)

Matched stack
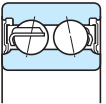
## Table 3  Double-row angular contact ball bearings



(with filling slot)
32, 33



(without filling slot)
52, 53



Shielded
52...ZZ, 53...ZZ



Sealed
52...2RS, 53...2RS

- Accommodates radial load and axial load in both directions. Also able to accommodate moment load. When installing bearings with filling slot (32 and 33 series), the raceway side without filling slot must accommodate main load.

- The 32 and 33 series are provided with a filling slot, while the 52 and 53 series are not.

  32 and 33 series : contact angle 32°
  52 and 53 series : contact angle 24°

- Inferior to single-row and matched pair angular contact ball bearings in terms of high-speed and high accuracy performance.

- Shielded or sealed 52 and 53 series bearings are also available.

| Boundary dimensions | The dimensions of standard series are as specified in JIS B 1512. |
|---|---|
| Tolerances | · As specified in JIS B 1514-1. (refer to Table 7-3 on pp. A 60 – A 63.)<br><br>· JTEKT has established "special tolerances" for bore diameter and outside diameter, as listed in the table to the right, to make it easy to produce high-precision matched stack bearings. Bearings which are produced based on these tolerances are identified by the supplementary code "K5." |
| Internal clearance | ■ Matched pair bearing axial internal clearance............(refer to Table 10-4 on p. A 103.)<br>■ Double-row bearing radial internal clearance.............(refer to Table 10-5 on p. A 104.) |
| Recommended fits | ■ Classes 0 and 6 bearings.....................................(refer to Table 9-4 on pp. A 91, 92.)<br>■ Classes 5 and 4 bearings.....................................as listed in the table below. |

**Special tolerances (K5)**   Unit : μm

| Nominal bore diameter $d$ (mm) | | Single plane mean bore diameter ($\triangle_{dmp}$) or single plane mean outside diameter deviation ($\triangle_{Dmp}$) | | | |
|---|---|---|---|---|---|
| | | class 5 | | class 4 | |
| over | up to | upper | lower | upper | lower |
| − | 50 | − 1 | − 4 | − 1 | − 3 |
| 50 | 80 | − 1 | − 5 | − 1 | − 4 |
| 80 | 120 | − 1 | − 5 | − 1 | − 4 |

| Fit | | class 5 | class 4 |
|---|---|---|---|
| | | Tolerance class | |
| With shaft | Inner ring rotation | js 5 | js 4 |
| | Outer ring rotation | h 5 | h 4 |
| With housing | Fixed side | JS 6 | JS 5 |
| | Free side | H 6 | H 5 |
| | Outer ring rotation | M 5 | M 4 |

■ Refer to Table 11-3 on page A 115 for the recommended fits of high-precision matched pair bearings (class 5 and class 4), which are used with light preload (L) or middle preload (M).

## Standard cages

- Pressed cage (supplementary code : // )
- Copper alloy machined cage (supplementary code : FY )

[Note] Machine tools are generally equipped with bearings that have a phenolic resin machined cage (FT). Bearings with a polyamide molded cage can also be used depending on the applications. Four-point contact ball bearings usually use a copper alloy machined cage.

### Application of standard cages

| Bearing series | Pressed cage | Machined cage |
|---|---|---|
| 79C | — | 7900C – 7932C |
| 79CPA | — | 7900CPA – 7932CPA |
| 70 | — | 7000 – 7040 |
| 70B | — | 7000B – 7040B |
| 70C | — | 7000C – 7040C |
| 70CPA | — | 7000CPA – 7034CPA |
| 72 | 7200 – 7220 | 7200 – 7240 |
| 72B | 7200B – 7220B | 7200B – 7240B |
| 72C | 7200C – 7220C | 7200C – 7240C |
| 72CPA | — | 7200CPA – 7230CPA |
| 73 | 7300 – 7320 | 7300 – 7340 |
| 73B | 7303B – 7320B | 7303B – 7340B |
| 73C | 7303C – 7320C | 7303C – 7334C |
| 74 | 7405 – 7409 | 7404 – 7418 |
| 74B | 7405B – 7409B | 7404B – 7418B |
| 32 | 3200 – 3215 | 3216 – 3222 |
| 33 | 3302 – 3313 | 3314 – 3322 |
| 52 | 5203 – 5214 | — |
| 53 | 5304 – 5315 | — |

## Allowable misalignment

Single-row.........0.000 6 rad (2') : Matched pair, double-row......misalignment not allowed

## Equivalent radial load

[ Single-row and matched pair angular contact ball bearings ]

Dynamic equivalent radial load

$$P_r = XF_r + YF_a$$

| Contact angle | $\dfrac{if_0F_a^*}{C_{0r}}$ | $e$ | Single-row and tandem arrangement | | | | Back-to-back and face-to-face arrangement | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | $F_a/F_r \leqq e$ | | $F_a/F_r > e$ | | $F_a/F_r \leqq e$ | | $F_a/F_r > e$ | |
| | | | $X$ | $Y$ | $X$ | $Y$ | $X$ | $Y$ | $X$ | $Y$ |
| 15° | 0.178 | 0.38 | 1 | 0 | 0.44 | 1.47 | 1 | | 0.72 | 2.39 |
| | 0.357 | 0.40 | | | | 1.40 | | | | 2.28 |
| | 0.714 | 0.43 | | | | 1.30 | | 1.65 | | 2.11 |
| | 1.07 | 0.46 | | | | 1.23 | | 1.57 | | 2.00 |
| | 1.43 | 0.47 | | | | 1.19 | | 1.46 | | 1.93 |
| | 2.14 | 0.50 | | | | 1.12 | | 1.38 | | 1.82 |
| | 3.57 | 0.55 | | | | 1.02 | | 1.34 | | 1.66 |
| | 5.35 | 0.56 | | | | 1.00 | | 1.26 | | 1.63 |
| | 7.14 | 0.56 | | | | 1.00 | | 1.14 | | 1.63 |
| | | | | | | | | 1.12 | | |
| | | | | | | | | 1.12 | | |
| 30° | – | 0.80 | 1 | 0 | 0.39 | 0.76 | 1 | 0.78 | 0.63 | 1.24 |
| 40° | – | 1.14 | 1 | 0 | 0.35 | 0.57 | 1 | 0.55 | 0.57 | 0.93 |

\* For $i$, use 2 for DB&DF and 1 for single&DT.
Factor $f_0$ is shown in the bearing dimention table.

[Note]
When two single-row angular contact ball bearings are used facing one another, an axial component of force is produced under radial load. In this case, refer to page A 38 for calculation of the dynamic equivalent radial load.

Static equivalent radial load

$$P_{0r} = X_0 F_r + Y_0 F_a$$

In reference to single-row and tandem arrangement bearings,
when  $P_{0r} < F_r$,
$P_{0r} = F_r$

| Contact angle | Single-row and tandem arrangement | | Back-to-back and face-to-face arrangement | |
|---|---|---|---|---|
| | $X_0$ | $Y_0$ | $X_0$ | $Y_0$ |
| 15° | 0.5 | 0.46 | 1 | 0.92 |
| 30° | 0.5 | 0.33 | 1 | 0.66 |
| 40° | 0.5 | 0.26 | 1 | 0.52 |

## Equivalent radial load

[ Double-row angular contact ball bearings ]

Dynamic equivalent radial load

$$P_r = XF_r + YF_a$$

| Contact angle | $e$ | $F_a/F_r \leqq e$ | | $F_a/F_r > e$ | | (reference) |
|---|---|---|---|---|---|---|
| | | $X$ | $Y$ | $X$ | $Y$ | |
| 24° | 0.66 | 1 | 0.95 | 0.68 | 1.45 | 52, 53 series |
| 32° | 0.86 | 1 | 0.73 | 0.62 | 1.17 | 32, 33 series |

Static equivalent radial load

$$P_{0r} = X_0 F_r + Y_0 F_a$$

| Contact angle | $X_0$ | $Y_0$ | (reference) |
|---|---|---|---|
| 24° | 1 | 0.78 | 52, 53 series |
| 32° | 1 | 0.63 | 32, 33 series |

[Note] In angular contact ball bearings, slippage occurs between the balls and raceways under too small a load, causing smearing to develop.
Matched pair bearings may develop smearing when the ratio of the axial load to the radial load exceeds the value of $e$ ($F_a / F_r > e$), as listed in the specification table. Consult with JTEKT when these bearings are used under the above conditions.

## [Reference] Relationship between axial load and axial displacement

Diagrams (1) to (9) illustrate the relationship between axial load and axial displacement.

### (1) 7900C (contact angle 15°)
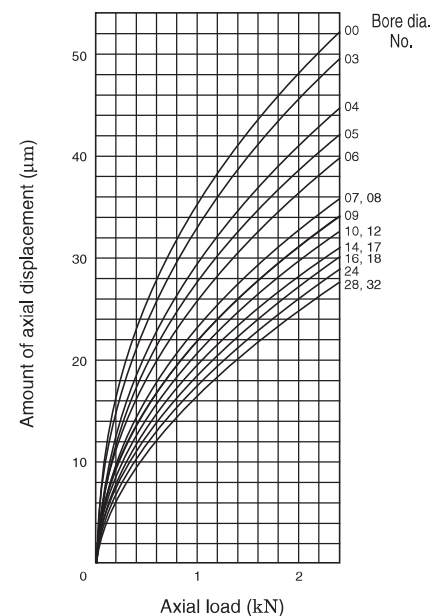


### (2) 7000C (contact angle 15°)

## (3) 7200C (contact angle 15°)



Amount of axial displacement (μm) vs Axial load (kN)

Bore dia. No.: 00, 01, 02,03, 04, 05,06,07, 08,09, 12,14, 13,15, 17,18,21, 24, 26,30, 28

## (6) 7000B (contact angle 40°)



Amount of axial displacement (μm) vs Axial load (kN)

Bore dia. No.: 02, 05, 09, 12, 13,14, 17,18, 20,22, 26

## (7) 7200B (contact angle 40°)



Amount of axial displacement (μm) vs Axial load (kN)

Bore dia. No.: 00, 01, 02, 03, 04, 05, 06, 07, 08, 10, 12, 15,16, 18,20, 22,24, 26, 28

## (4) 7000 (contact angle 30°)



Amount of axial displacement (μm) vs Axial load (kN)

Bore dia. No.: 00, 01, 02, 03, 04, 05, 07, 09, 10,11, 13,14, 17,18, 24,26, 32,34

## (5) 7200 (contact angle 30°)



Amount of axial displacement (μm) vs Axial load (kN)

Bore dia. No.: 00, 01, 02, 03, 04, 05, 06, 07, 08,09, 10, 12, 15,16, 18,19,20, 24, 26, 28,30

With machined cage   With pressed cage



| Boundary dimensions (mm) | | | | | Basic load ratings (kN) | | | | Fatigue load limits (kN) $C_u$ | | Factor | Limiting speeds [1] (min⁻¹) | | Bearing No. [2] | Load center (mm) | Mounting dimensions (mm) | | | (Refer.) Mass (kg) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | With machined cage | | With pressed cage | | With machined cage | With pressed cage | | | | | | | | | |
| $d$ | $D$ | $B$ | $r$ min. | $r_1$ min. | $C_r$ | $C_{0r}$ | $C_r$ | $C_{0r}$ | | | $f_0$ | Grease lub. | Oil lub. | | $a$ | $d_a$ min. | $D_a$ max. | $r_a$ max. | |
| 10 | 22 | 6 | 0.3 | 0.15 | 3.75 | 1.50 | — | — | 0.060 | — | 14.2 | 52 000 | 69 000 | 7900C | 5.1 | 12.5 | 19.5 | 0.3 | 0.008 |
| | 26 | 8 | 0.3 | 0.15 | 6.25 | 2.35 | — | — | 0.120 | — | — | 34 000 | 42 000 | 7000 | 9.1 | 12.5 | 23.5 | 0.3 | 0.021 |
| | 26 | 8 | 0.3 | 0.15 | 5.80 | 2.15 | — | — | 0.110 | — | — | 25 000 | 33 000 | 7000B | 11.6 | 12.5 | 23.5 | 0.3 | 0.021 |
| | 26 | 8 | 0.3 | 0.15 | 6.60 | 2.45 | — | — | 0.130 | — | 12.5 | 47 000 | 62 000 | 7000C | 6.4 | 12.5 | 23.5 | 0.3 | 0.021 |
| | 30 | 9 | 0.6 | 0.3 | 5.85 | 2.20 | 6.75 | 2.75 | 0.110 | 0.140 | — | 29 000 | 37 000 | 7200 | 10.4 | 14.5 | 25.5 | 0.6 | 0.031 |
| | 30 | 9 | 0.6 | 0.3 | 5.35 | 2.00 | 6.20 | 2.50 | 0.100 | 0.130 | — | 22 000 | 29 000 | 7200B | 13.1 | 14.5 | 25.5 | 0.6 | 0.031 |
| | 30 | 9 | 0.6 | 0.3 | 6.25 | 2.35 | 7.25 | 2.95 | 0.120 | 0.150 | 13.4 | 40 000 | 54 000 | 7200C | 7.2 | 14.5 | 25.5 | 0.6 | 0.031 |
| | 35 | 11 | 0.6 | 0.3 | 10.6 | 3.75 | 11.6 | 4.30 | 0.300 | 0.340 | — | 27 000 | 33 000 | 7300 | 12.0 | 14.5 | 30.5 | 0.6 | 0.054 |
| 12 | 24 | 6 | 0.3 | 0.15 | 4.00 | 1.70 | — | — | 0.070 | — | 14.7 | 48 000 | 62 000 | 7901C | 5.4 | 14.5 | 21.5 | 0.3 | 0.010 |
| | 28 | 8 | 0.3 | 0.15 | 6.75 | 2.75 | — | — | 0.140 | — | — | 29 000 | 37 000 | 7001 | 9.9 | 14.5 | 25.5 | 0.3 | 0.024 |
| | 28 | 8 | 0.3 | 0.15 | 6.20 | 2.50 | — | — | 0.130 | — | — | 22 000 | 29 000 | 7001B | 12.6 | 14.5 | 25.5 | 0.3 | 0.024 |
| | 28 | 8 | 0.3 | 0.15 | 7.25 | 2.95 | — | — | 0.150 | — | 13.4 | 40 000 | 54 000 | 7001C | 6.7 | 14.5 | 25.5 | 0.3 | 0.024 |
| | 32 | 10 | 0.6 | 0.3 | 9.30 | 3.65 | 10.0 | 4.05 | 0.280 | 0.310 | — | 27 000 | 34 000 | 7201 | 11.4 | 16.5 | 27.5 | 0.6 | 0.038 |
| | 32 | 10 | 0.6 | 0.3 | 8.65 | 3.40 | 9.30 | 3.75 | 0.240 | 0.270 | — | 20 000 | 27 000 | 7201B | 14.2 | 16.5 | 27.5 | 0.6 | 0.038 |
| | 32 | 10 | 0.6 | 0.3 | 9.90 | 3.85 | 10.6 | 4.30 | 0.300 | 0.330 | 12.5 | 38 000 | 50 000 | 7201C | 7.9 | 16.5 | 27.5 | 0.6 | 0.038 |
| | 37 | 12 | 1 | 0.6 | 12.8 | 4.60 | 14.0 | 5.25 | 0.360 | 0.410 | — | 24 000 | 31 000 | 7301 | 13.1 | 17.5 | 31.5 | 1 | 0.065 |
| 15 | 28 | 7 | 0.3 | 0.15 | 5.95 | 2.65 | — | — | 0.110 | — | 14.5 | 39 000 | 52 000 | 7902C | 6.4 | 17.5 | 25.5 | 0.3 | 0.015 |
| | 32 | 9 | 0.3 | 0.15 | 7.65 | 3.45 | — | — | 0.180 | — | — | 26 000 | 32 000 | 7002 | 11.3 | 17.5 | 29.5 | 0.3 | 0.035 |
| | 32 | 9 | 0.3 | 0.15 | 6.95 | 3.15 | — | — | 0.160 | — | — | 19 000 | 25 000 | 7002B | 14.6 | 17.5 | 29.5 | 0.3 | 0.035 |
| | 32 | 9 | 0.3 | 0.15 | 8.25 | 3.70 | — | — | 0.190 | — | 14.1 | 35 000 | 47 000 | 7002C | 7.6 | 17.5 | 29.5 | 0.3 | 0.035 |
| | 35 | 11 | 0.6 | 0.3 | 10.1 | 4.25 | 10.1 | 4.25 | 0.300 | 0.300 | — | 24 000 | 29 000 | 7202 | 12.9 | 19.5 | 30.5 | 0.6 | 0.048 |
| | 35 | 11 | 0.6 | 0.3 | 9.30 | 3.95 | 9.30 | 3.95 | 0.260 | 0.260 | — | 18 000 | 24 000 | 7202B | 16.2 | 19.5 | 30.5 | 0.6 | 0.048 |
| | 35 | 11 | 0.6 | 0.3 | 10.8 | 4.55 | 10.8 | 4.55 | 0.340 | 0.340 | 13.3 | 33 000 | 43 000 | 7202C | 8.9 | 19.5 | 30.5 | 0.6 | 0.048 |
| | 42 | 13 | 1 | 0.6 | 15.7 | 6.45 | 16.8 | 7.20 | 0.490 | 0.550 | — | 20 000 | 25 000 | 7302 | 15.0 | 20.5 | 36.5 | 1 | 0.088 |
| 17 | 30 | 7 | 0.3 | 0.15 | 6.25 | 2.95 | — | — | 0.120 | — | 14.9 | 36 000 | 47 000 | 7903C | 6.7 | 19.5 | 27.5 | 0.3 | 0.016 |
| | 35 | 10 | 0.3 | 0.15 | 8.40 | 4.15 | — | — | 0.210 | — | — | 23 000 | 28 000 | 7003 | 12.7 | 19.5 | 32.5 | 0.3 | 0.045 |

[Notes]  1) Limiting speeds shown above are applicable to machined cage bearings.
Limiting speeds of pressed cage bearings should be kept to under 80% of this value.
For bearings with 15° contact angle, this figure is applied to the high precision bearings ranked higher than class 5, used with machined cage or molded cage.

2) B, C or no indication after the bearing number indicates nominal contact angle of 40°, 15° and 30° respectively.
[Remark]   Standard cage types used for the above bearings are described earlier in this section.

With machined cage    With pressed cage



| Boundary dimensions (mm) | | | | | Basic load ratings (kN) | | | | Fatigue load limits (kN) $C_u$ | | Factor | Limiting speeds [1] (min⁻¹) | | Bearing No. [2] | Load center (mm) | Mounting dimensions (mm) | | | (Refer.) Mass (kg) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | With machined cage | | With pressed cage | | With machined cage | With pressed cage | | | | | | | | | |
| $d$ | $D$ | $B$ | $r$ min. | $r_1$ min. | $C_r$ | $C_{0r}$ | $C_r$ | $C_{0r}$ | | | $f_0$ | Grease lub. | Oil lub. | | $a$ | $d_a$ min. | $D_a$ max. | $r_a$ max. | |
| 17 | 35 | 10 | 0.3 | 0.15 | 7.60 | 3.75 | — | — | 0.190 | — | — | 17 000 | 23 000 | 7003B | 16.1 | 19.5 | 32.5 | 0.3 | 0.045 |
| | 35 | 10 | 0.3 | 0.15 | 9.15 | 4.45 | — | — | 0.230 | — | 14,6 | 31 000 | 41 000 | 7003C | 8.6 | 19.5 | 32.5 | 0.3 | 0.045 |
| | 40 | 12 | 0.6 | 0.3 | 12.7 | 5.50 | 12.7 | 5.50 | 0.380 | 0.380 | — | 21 000 | 26 000 | 7203 | 14.4 | 21.5 | 35.5 | 0.6 | 0.070 |
| | 40 | 12 | 0.6 | 0.3 | 11.7 | 5.05 | 11.7 | 5.05 | 0.330 | 0.330 | — | 16 000 | 21 000 | 7203B | 18.2 | 21.5 | 35.5 | 0.6 | 0.070 |
| | 40 | 12 | 0.6 | 0.3 | 13.6 | 5.90 | 13.6 | 5.90 | 0.440 | 0.440 | 13,4 | 29 000 | 38 000 | 7203C | 9.9 | 21.5 | 35.5 | 0.6 | 0.070 |
| | 47 | 14 | 1 | 0.6 | 18.7 | 7.90 | 20.0 | 8.75 | 0.590 | 0.660 | — | 18 000 | 23 000 | 7303 | 16.5 | 22.5 | 41.5 | 1 | 0.120 |
| | 47 | 14 | 1 | 0.6 | 17.3 | 7.30 | 18.5 | 8.10 | 0.510 | 0.570 | — | 14 000 | 18 000 | 7303B | 20.8 | 22.5 | 41.5 | 1 | 0.120 |
| | 47 | 14 | 1 | 0.6 | 19.8 | 8.40 | 19.8 | 8.40 | 0.650 | 0.650 | 12,6 | 25 000 | 33 000 | 7303C | 11.4 | 22.5 | 41.5 | 1 | 0.120 |
| 20 | 37 | 9 | 0.3 | 0.15 | 9.10 | 4.55 | — | — | 0.240 | — | 14,9 | 30 000 | 39 000 | 7904C | 8.3 | 22.5 | 34.5 | 0.3 | 0.035 |
| | 42 | 12 | 0.6 | 0.3 | 12.9 | 6.10 | — | — | 0.390 | — | — | 19 000 | 24 000 | 7004 | 15.1 | 24.5 | 37.5 | 0.6 | 0.079 |
| | 42 | 12 | 0.6 | 0.3 | 11.7 | 5.55 | — | — | 0.340 | — | — | 14 000 | 19 000 | 7004B | 19.2 | 24.5 | 37.5 | 0.6 | 0.079 |
| | 42 | 12 | 0.6 | 0.3 | 13.9 | 6.60 | — | — | 0.450 | — | 14,1 | 26 000 | 35 000 | 7004C | 10.2 | 24.5 | 37.5 | 0.6 | 0.079 |
| | 47 | 14 | 1 | 0.6 | 18.1 | 8.40 | 19.2 | 9.15 | 0.580 | 0.640 | — | 17 000 | 22 000 | 7204 | 17.0 | 25.5 | 41.5 | 1 | 0.112 |
| | 47 | 14 | 1 | 0.6 | 16.6 | 7.70 | 17.6 | 8.40 | 0.500 | 0.550 | — | 13 000 | 17 000 | 7204B | 21.5 | 25.5 | 41.5 | 1 | 0.112 |
| | 47 | 14 | 1 | 0.6 | 19.4 | 9.00 | 20.6 | 9.80 | 0.670 | 0.730 | 13,4 | 24 000 | 32 000 | 7204C | 11.6 | 25.5 | 41.5 | 1 | 0.112 |
| | 52 | 15 | 1.1 | 0.6 | 21.8 | 9.40 | 23.4 | 10.4 | 0.710 | 0.790 | — | 17 000 | 21 000 | 7304 | 17.9 | 27 | 45 | 1 | 0.150 |
| | 52 | 15 | 1.1 | 0.6 | 20.2 | 8.70 | 21.7 | 9.65 | 0.610 | 0.680 | — | 13 000 | 17 000 | 7304B | 22.6 | 27 | 45 | 1 | 0.150 |
| | 52 | 15 | 1.1 | 0.6 | 23.1 | 9.95 | 24.8 | 11.1 | 0.780 | 0.860 | 12,6 | 23 000 | 31 000 | 7304C | 12.3 | 27 | 45 | 1 | 0.150 |
| | 72 | 19 | 1.1 | 0.6 | 44.5 | 19.1 | — | — | 1.50 | — | — | 9 600 | 13 000 | 7404 | 23.1 | 27 | 65 | 1 | 0.395 |
| | 72 | 19 | 1.1 | 0.6 | 41.9 | 17.9 | — | — | 1.40 | — | — | 8 500 | 12 000 | 7404B | 29.2 | 27 | 65 | 1 | 0.395 |
| 25 | 42 | 9 | 0.3 | 0.15 | 10.2 | 5.45 | — | — | 0.300 | — | 15,5 | 25 000 | 33 000 | 7905C | 9.1 | 27.5 | 39.5 | 0.3 | 0.041 |
| | 47 | 12 | 0.6 | 0.3 | 14.1 | 7.40 | — | — | 0.450 | — | — | 17 000 | 21 000 | 7005 | 16.4 | 29.5 | 42.5 | 0.6 | 0.091 |
| | 47 | 12 | 0.6 | 0.3 | 12.8 | 6.70 | — | — | 0.390 | — | — | 12 000 | 17 000 | 7005B | 21.1 | 29.5 | 42.5 | 0.6 | 0.091 |
| | 47 | 12 | 0.6 | 0.3 | 15.4 | 8.00 | — | — | 0.510 | — | 14,7 | 23 000 | 30 000 | 7005C | 10.8 | 29.5 | 42.5 | 0.6 | 0.091 |
| | 52 | 15 | 1 | 0.6 | 19.2 | 9.50 | 20.2 | 10.3 | 0.620 | 0.670 | — | 15 000 | 19 000 | 7205 | 18.8 | 30.5 | 46.5 | 1 | 0.135 |
| | 52 | 15 | 1 | 0.6 | 17.5 | 8.70 | 18.4 | 9.40 | 0.530 | 0.580 | — | 12 000 | 15 000 | 7205B | 23.9 | 30.5 | 46.5 | 1 | 0.135 |

[Notes] 1) Limiting speeds shown above are applicable to machined cage bearings.
Limiting speeds of pressed cage bearings should be kept to under 80% of this value.
For bearings with 15° contact angle, this figure is applied to the high precision bearings ranked higher than class 5, used with machined cage or molded cage.

2) B, C or no indication after the bearing number indicates nominal contact angle of 40°, 15° and 30° respectively.
[Remark]    Standard cage types used for the above bearings are described earlier in this section.

# Single-row angular contact ball bearings

## $d$ (25) ~ (35) mm



With machined cage          With pressed cage



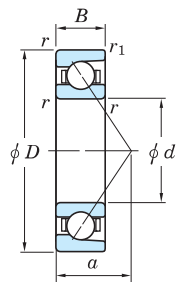| Boundary dimensions (mm) | | | | | Basic load ratings (kN) | | | | Fatigue load limits (kN) $C_u$ | | Factor | Limiting speeds [1] (min$^{-1}$) | | Bearing No. [2] | Load center (mm) | Mounting dimensions (mm) | | | (Refer.) Mass (kg) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | With machined cage | | With pressed cage | | With machined cage | With pressed cage | $f_0$ | Grease lub. | Oil lub. | | $a$ | $d_a$ | $D_a$ | $r_a$ | |
| $d$ | $D$ | $B$ | $r$ min. | $r_1$ min. | $C_r$ | $C_{0r}$ | $C_r$ | $C_{0r}$ | | | | | | | | min. | max. | max. | |
| 25 | 52 | 15 | 1 | 0.6 | 20.7 | 10.2 | 21.9 | 11.1 | 0.710 | 0.770 | 14.0 | 21 000 | 28 000 | 7205C | 12.7 | 30.5 | 46.5 | 1 | 0.135 |
| | 62 | 17 | 1.1 | 0.6 | 31.0 | 14.4 | 33.0 | 15.8 | 1.05 | 1.15 | — | 14 000 | 17 000 | 7305 | 21.1 | 32 | 55 | 1 | 0.243 |
| | 62 | 17 | 1.1 | 0.6 | 28.6 | 13.3 | 30.5 | 14.6 | 0.910 | 1.00 | — | 10 000 | 14 000 | 7305B | 26.8 | 32 | 55 | 1 | 0.243 |
| | 62 | 17 | 1.1 | 0.6 | 33.0 | 15.3 | 35.1 | 16.8 | 1.20 | 1.30 | 12.8 | 19 000 | 25 000 | 7305C | 14.3 | 32 | 55 | 1 | 0.243 |
| | 80 | 21 | 1.5 | 1 | 49.7 | 23.2 | 53.3 | 25.7 | 1.80 | 2.00 | — | 8 200 | 11 000 | 7405 | 26.4 | 33.5 | 71.5 | 1.5 | 0.527 |
| | 80 | 21 | 1.5 | 1 | 46.1 | 21.5 | 49.5 | 23.9 | 1.55 | 1.70 | — | 7 300 | 10 000 | 7405B | 33.6 | 33.5 | 71.5 | 1.5 | 0.527 |
| 30 | 47 | 9 | 0.3 | 0.15 | 10.4 | 6.25 | — | — | 0.320 | — | 15.9 | 22 000 | 29 000 | 7906C | 9.7 | 32.5 | 44.5 | 0.3 | 0.046 |
| | 55 | 13 | 1 | 0.6 | 18.2 | 10.1 | — | — | 0.610 | — | — | 14 000 | 18 000 | 7006 | 18.8 | 35.5 | 49.5 | 1 | 0.133 |
| | 55 | 13 | 1 | 0.6 | 16.4 | 9.20 | — | — | 0.530 | — | — | 11 000 | 14 000 | 7006B | 24.3 | 35.5 | 49.5 | 1 | 0.133 |
| | 55 | 13 | 1 | 0.6 | 19.8 | 11.0 | — | — | 0.690 | — | 14.9 | 20 000 | 26 000 | 7006C | 12.2 | 35.5 | 49.5 | 1 | 0.133 |
| | 62 | 16 | 1 | 0.6 | 26.7 | 13.7 | 28.1 | 14.8 | 0.890 | 0.970 | — | 13 000 | 16 000 | 7206 | 21.5 | 35.5 | 56.5 | 1 | 0.208 |
| | 62 | 16 | 1 | 0.6 | 24.3 | 12.5 | 25.6 | 13.6 | 0.770 | 0.840 | — | 9 600 | 13 000 | 7206B | 27.6 | 35.5 | 56.5 | 1 | 0.208 |
| | 62 | 16 | 1 | 0.6 | 28.8 | 14.7 | 30.4 | 16.0 | 1.00 | 1.10 | 14.0 | 18 000 | 24 000 | 7206C | 14.3 | 35.5 | 56.5 | 1 | 0.208 |
| | 72 | 19 | 1.1 | 0.6 | 37.6 | 18.9 | 39.9 | 20.6 | 1.30 | 1.45 | — | 12 000 | 14 000 | 7306 | 24.5 | 37 | 65 | 1 | 0.362 |
| | 72 | 19 | 1.1 | 0.6 | 34.5 | 17.4 | 36.6 | 19.0 | 1.15 | 1.25 | — | 8 700 | 12 000 | 7306B | 31.3 | 37 | 65 | 1 | 0.362 |
| | 72 | 19 | 1.1 | 0.6 | 40.4 | 20.3 | 42.8 | 22.1 | 1.50 | 1.65 | 13.4 | 16 000 | 21 000 | 7306C | 16.5 | 37 | 65 | 1 | 0.362 |
| | 90 | 23 | 1.5 | 1 | 59.5 | 28.4 | 63.9 | 31.6 | 2.20 | 2.45 | — | 7 300 | 9 700 | 7406 | 29.3 | 38.5 | 81.5 | 1.5 | 0.686 |
| | 90 | 23 | 1.5 | 1 | 55.2 | 26.4 | 59.3 | 29.3 | 1.90 | 2.10 | — | 6 500 | 8 900 | 7406B | 37.3 | 38.5 | 81.5 | 1.5 | 0.686 |
| 35 | 55 | 10 | 0.6 | 0.3 | 15.7 | 9.70 | — | — | 0.550 | — | 15.7 | 19 000 | 25 000 | 7907C | 11.0 | 39.5 | 50.5 | 0.6 | 0.074 |
| | 62 | 14 | 1 | 0.6 | 21.9 | 12.6 | — | — | 0.740 | — | — | 12 000 | 15 000 | 7007 | 21.2 | 40.5 | 56.5 | 1 | 0.170 |
| | 62 | 14 | 1 | 0.6 | 19.7 | 11.4 | — | — | 0.640 | — | — | 9 200 | 12 000 | 7007B | 27.6 | 40.5 | 56.5 | 1 | 0.170 |
| | 62 | 14 | 1 | 0.6 | 23.9 | 13.7 | — | — | 0.840 | — | 15.0 | 17 000 | 22 000 | 7007C | 13.5 | 40.5 | 56.5 | 1 | 0.170 |
| | 72 | 17 | 1.1 | 0.6 | 35.2 | 18.6 | 37.1 | 20.2 | 1.20 | 1.30 | — | 11 000 | 14 000 | 7207 | 24.2 | 42 | 65 | 1 | 0.295 |
| | 72 | 17 | 1.1 | 0.6 | 32.0 | 17.0 | 33.8 | 18.5 | 1.05 | 1.15 | — | 8 300 | 11 000 | 7207B | 31.4 | 42 | 65 | 1 | 0.295 |
| | 72 | 17 | 1.1 | 0.6 | 38.0 | 20.1 | 40.1 | 21.7 | 1.40 | 1.50 | 14.0 | 15 000 | 20 000 | 7207C | 15.8 | 42 | 65 | 1 | 0.295 |
| | 80 | 21 | 1.5 | 1 | 44.2 | 22.0 | 49.9 | 26.4 | 1.55 | 1.85 | — | 10 000 | 13 000 | 7307 | 27.4 | 43.5 | 71.5 | 1.5 | 0.475 |
| | 80 | 21 | 1.5 | 1 | 40.6 | 20.2 | 45.8 | 24.3 | 1.30 | 1.60 | — | 7 700 | 10 000 | 7307B | 35.0 | 43.5 | 71.5 | 1.5 | 0.475 |

[Notes]  1) Limiting speeds shown above are applicable to machined cage bearings.
　　　　　 Limiting speeds of pressed cage bearings should be kept to under 80% of this value.
　　　　　 For bearings with 15° contact angle, this figure is applied to the high precision bearings ranked higher than
　　　　　 class 5, used with machined cage or molded cage.

2) B, C or no indication after the bearing number indicates nominal contact angle of 40°, 15° and
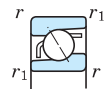　 30° respectively.
[Remark]    Standard cage types used for the above bearings are described earlier in this section.
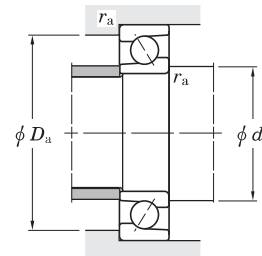
With machined cage　　　　With pressed cage



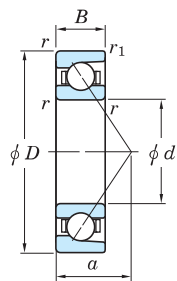| Boundary dimensions (mm) | | | | | Basic load ratings (kN) | | | | Fatigue load limits (kN) $C_u$ | | Factor | Limiting speeds [1] (min$^{-1}$) | | Bearing No. [2] | Load center (mm) | Mounting dimensions (mm) | | | (Refer.) Mass (kg) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | With machined cage | | With pressed cage | | With machined cage | With pressed cage | | | | | | | | | |
| $d$ | $D$ | $B$ | $r$ min. | $r_1$ min. | $C_r$ | $C_{0r}$ | $C_r$ | $C_{0r}$ | | | $f_0$ | Grease lub. | Oil lub. | | $a$ | $d_a$ min. | $D_a$ max. | $r_a$ max. | |
| 35 | 80 | 21 | 1.5 | 1 | 47.4 | 23.6 | 53.5 | 28.3 | 1.75 | 2.10 | 13.4 | 14 000 | 19 000 | 7307C | 18.3 | 43.5 | 71.5 | 1.5 | 0.475 |
| | 100 | 25 | 1.5 | 1 | 75.6 | 37.0 | 81.1 | 41.1 | 2.85 | 3.20 | — | 6 500 | 8 600 | 7407 | 32.6 | 43.5 | 91.5 | 1.5 | 0.950 |
| | 100 | 25 | 1.5 | 1 | 70.2 | 34.3 | 75.3 | 38.1 | 2.45 | 2.75 | — | 5 700 | 7 900 | 7407B | 41.7 | 43.5 | 91.5 | 1.5 | 0.950 |
| 40 | 62 | 12 | 0.6 | 0.3 | 19.7 | 12.4 | — | — | 0.710 | — | 15.7 | 17 000 | 22 000 | 7908C | 12.8 | 44.5 | 57.5 | 0.6 | 0.107 |
| | 68 | 15 | 1 | 0.6 | 23.4 | 14.6 | — | — | 0.830 | — | — | 11 000 | 14 000 | 7008 | 23.2 | 45.5 | 62.5 | 1 | 0.210 |
| | 68 | 15 | 1 | 0.6 | 21.1 | 13.2 | — | — | 0.720 | — | — | 8 300 | 11 000 | 7008B | 30.2 | 45.5 | 62.5 | 1 | 0.210 |
| | 68 | 15 | 1 | 0.6 | 25.7 | 15.9 | — | — | 0.940 | — | 15.4 | 15 000 | 20 000 | 7008C | 14.8 | 45.5 | 62.5 | 1 | 0.210 |
| | 80 | 18 | 1.1 | 0.6 | 42.0 | 23.3 | 44.1 | 25.1 | 1.50 | 1.60 | — | 10 000 | 12 000 | 7208 | 26.3 | 47 | 73 | 1 | 0.382 |
| | 80 | 18 | 1.1 | 0.6 | 38.2 | 21.3 | 40.2 | 23.0 | 1.30 | 1.40 | — | 7 500 | 10 000 | 7208B | 34.2 | 47 | 73 | 1 | 0.382 |
| | 80 | 18 | 1.1 | 0.6 | 45.4 | 25.2 | 47.7 | 27.1 | 1.70 | 1.85 | 14.2 | 14 000 | 18 000 | 7208C | 17.0 | 47 | 73 | 1 | 0.382 |
| | 90 | 23 | 1.5 | 1 | 54.0 | 27.4 | 61.0 | 32.9 | 1.90 | 2.30 | — | 9 200 | 12 000 | 7308 | 30.3 | 48.5 | 81.5 | 1.5 | 0.657 |
| | 90 | 23 | 1.5 | 1 | 49.6 | 25.2 | 56.0 | 30.3 | 1.65 | 2.00 | — | 6 900 | 9 200 | 7308B | 38.8 | 48.5 | 81.5 | 1.5 | 0.657 |
| | 90 | 23 | 1.5 | 1 | 57.9 | 29.4 | 65.4 | 35.3 | 2.20 | 2.65 | 13.4 | 13 000 | 17 000 | 7308C | 20.2 | 48.5 | 81.5 | 1.5 | 0.657 |
| | 110 | 27 | 2 | 1 | 87.4 | 43.5 | 93.8 | 48.4 | 3.35 | 3.70 | — | 5 900 | 7 900 | 7408 | 35.5 | 50 | 100 | 2 | 1.23 |
| | 110 | 27 | 2 | 1 | 81.1 | 40.4 | 87.0 | 44.9 | 2.90 | 3.20 | — | 5 200 | 7 200 | 7408B | 45.4 | 50 | 100 | 2 | 1.23 |
| 45 | 68 | 12 | 0.6 | 0.3 | 20.8 | 14.1 | — | — | 0.770 | — | 16.0 | 15 000 | 20 000 | 7909C | 13.6 | 49.5 | 63.5 | 0.6 | 0.127 |
| | 75 | 16 | 1 | 0.6 | 27.8 | 17.7 | — | — | 1.00 | — | — | 10 000 | 12 000 | 7009 | 25.3 | 50.5 | 69.5 | 1 | 0.260 |
| | 75 | 16 | 1 | 0.6 | 25.0 | 16.0 | — | — | 0.870 | — | — | 7 500 | 10 000 | 7009B | 33.2 | 50.5 | 69.5 | 1 | 0.260 |
| | 75 | 16 | 1 | 0.6 | 30.5 | 19.3 | — | — | 1.15 | — | 15.4 | 14 000 | 18 000 | 7009C | 16.0 | 50.5 | 69.5 | 1 | 0.260 |
| | 85 | 19 | 1.1 | 0.6 | 47.2 | 26.6 | 49.6 | 28.6 | 1.70 | 1.85 | — | 9 400 | 12 000 | 7209 | 28.0 | 52 | 78 | 1 | 0.430 |
| | 85 | 19 | 1.1 | 0.6 | 42.9 | 24.3 | 45.1 | 26.1 | 1.50 | 1.60 | — | 7 000 | 9 400 | 7209B | 36.4 | 52 | 78 | 1 | 0.430 |
| | 85 | 19 | 1.1 | 0.6 | 51.0 | 28.7 | 53.6 | 30.9 | 1.95 | 2.10 | 14.2 | 13 000 | 17 000 | 7209C | 18.1 | 52 | 78 | 1 | 0.430 |
| | 100 | 25 | 1.5 | 1 | 68.9 | 37.1 | 73.1 | 40.4 | 2.55 | 2.80 | — | 8 200 | 10 000 | 7309 | 33.6 | 53.5 | 91.5 | 1.5 | 0.875 |
| | 100 | 25 | 1.5 | 1 | 63.2 | 34.1 | 67.0 | 37.2 | 2.20 | 2.40 | — | 6 200 | 8 200 | 7309B | 43.1 | 53.5 | 91.5 | 1.5 | 0.875 |
| | 100 | 25 | 1.5 | 1 | 74.0 | 39.7 | 78.4 | 43.4 | 2.95 | 3.20 | 13.5 | 11 000 | 15 000 | 7309C | 22.3 | 53.5 | 91.5 | 1.5 | 0.875 |
| | 120 | 29 | 2 | 1 | 106 | 53.8 | 114 | 59.8 | 4.20 | 4.65 | — | 5 400 | 7 100 | 7409 | 38.6 | 55 | 110 | 2 | 1.55 |
| | 120 | 29 | 2 | 1 | 98.7 | 50.0 | 106 | 55.5 | 3.60 | 4.00 | — | 4 800 | 6 600 | 7409B | 49.5 | 55 | 110 | 2 | 1.55 |

[Notes]　1)　Limiting speeds shown above are applicable to machined cage bearings.
　　　　　　Limiting speeds of pressed cage bearings should be kept to under 80% of this value.
　　　　　　For bearings with 15° contact angle, this figure is applied to the high precision bearings ranked higher than
　　　　　　class 5, used with machined cage or molded cage.

2)　B, C or no indication after the bearing number indicates nominal contact angle of 40°, 15° and
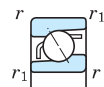　　30° respectively.
[Remark]　Standard cage types used for the above bearings are described earlier in this section.

$d$ 50 ~ (60) mm



With machined cage        With pressed cage



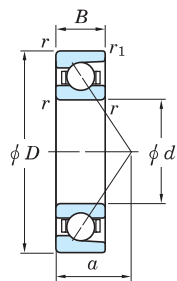| Boundary dimensions (mm) | | | | | Basic load ratings (kN) | | | | Fatigue load limits (kN) $C_u$ | | Factor | Limiting speeds [1] (min$^{-1}$) | | Bearing No. [2] | Load center (mm) | Mounting dimensions (mm) | | | (Refer.) Mass (kg) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | With machined cage | | With pressed cage | | With machined cage | With pressed cage | | | | | | | | | |
| $d$ | $D$ | $B$ | $r$ min. | $r_1$ min. | $C_r$ | $C_{0r}$ | $C_r$ | $C_{0r}$ | | | $f_0$ | Grease lub. | Oil lub. | | $a$ | $d_a$ min. | $D_a$ max. | $r_a$ max. | |
| 50 | 72 | 12 | 0.6 | 0.3 | 21.8 | 15.7 | — | — | 0.840 | — | 16.2 | 14 000 | 18 000 | 7910C | 14.2 | 54.5 | 67.5 | 0.6 | 0.128 |
| | 80 | 16 | 1 | 0.6 | 29.5 | 20.1 | — | — | 1.10 | — | — | 9 200 | 11 000 | 7010 | 26.9 | 55.5 | 74.5 | 1 | 0.290 |
| | 80 | 16 | 1 | 0.6 | 26.5 | 18.1 | — | — | 0.960 | — | — | 6 900 | 9 200 | 7010B | 35.3 | 55.5 | 74.5 | 1 | 0.290 |
| | 80 | 16 | 1 | 0.6 | 32.5 | 21.9 | — | — | 1.25 | — | 15.7 | 13 000 | 17 000 | 7010C | 16.8 | 55.5 | 74.5 | 1 | 0.290 |
| | 90 | 20 | 1.1 | 0.6 | 49.2 | 29.4 | 51.6 | 31.5 | 1.80 | 1.95 | — | 8 500 | 11 000 | 7210 | 30.4 | 57 | 83 | 1 | 0.485 |
| | 90 | 20 | 1.1 | 0.6 | 44.6 | 26.7 | 46.7 | 28.6 | 1.55 | 1.70 | — | 6 400 | 8 500 | 7210B | 39.6 | 57 | 83 | 1 | 0.485 |
| | 90 | 20 | 1.1 | 0.6 | 53.5 | 31.8 | 56.0 | 34.1 | 2.05 | 2.20 | 14.6 | 12 000 | 16 000 | 7210C | 19.4 | 57 | 83 | 1 | 0.485 |
| | 110 | 27 | 2 | 1 | 87.6 | 48.1 | 92.9 | 52.5 | 3.35 | 3.65 | — | 7 300 | 9 100 | 7310 | 37.2 | 60 | 100 | 2 | 1.14 |
| | 110 | 27 | 2 | 1 | 80.5 | 44.3 | 85.3 | 48.3 | 2.90 | 3.15 | — | 5 500 | 7 300 | 7310B | 47.9 | 60 | 100 | 2 | 1.14 |
| | 110 | 27 | 2 | 1 | 93.9 | 51.6 | 99.5 | 56.2 | 3.85 | 4.20 | 13.4 | 10 000 | 13 000 | 7310C | 24.5 | 60 | 100 | 2 | 1.14 |
| | 130 | 31 | 2.1 | 1.1 | 122 | 65.3 | — | — | 4.90 | — | — | 4 900 | 6 600 | 7410 | 41.6 | 62 | 118 | 2 | 1.92 |
| | 130 | 31 | 2.1 | 1.1 | 113 | 60.4 | — | — | 4.20 | — | — | 4 400 | 6 000 | 7410B | 53.5 | 62 | 118 | 2 | 1.92 |
| 55 | 80 | 13 | 1 | 0.6 | 24.6 | 18.5 | — | — | 0.980 | — | 16.3 | 13 000 | 17 000 | 7911C | 15.5 | 60.5 | 74.5 | 1 | 0.178 |
| | 90 | 18 | 1.1 | 0.6 | 38.9 | 26.3 | — | — | 1.50 | — | — | 8 300 | 10 000 | 7011 | 29.9 | 62 | 83 | 1 | 0.420 |
| | 90 | 18 | 1.1 | 0.6 | 34.9 | 23.7 | — | — | 1.30 | — | — | 6 200 | 8 300 | 7011B | 39.4 | 62 | 83 | 1 | 0.420 |
| | 90 | 18 | 1.1 | 0.6 | 42.6 | 28.6 | — | — | 1.65 | — | 15.5 | 11 000 | 15 000 | 7011C | 18.7 | 62 | 83 | 1 | 0.420 |
| | 100 | 21 | 1.5 | 1 | 60.9 | 37.1 | 63.7 | 39.8 | 2.30 | 2.45 | — | 7 600 | 9 500 | 7211 | 33.3 | 63.5 | 91.5 | 1.5 | 0.635 |
| | 100 | 21 | 1.5 | 1 | 55.1 | 33.8 | 57.7 | 36.2 | 2.00 | 2.15 | — | 5 700 | 7 600 | 7211B | 43.6 | 63.5 | 91.5 | 1.5 | 0.635 |
| | 100 | 21 | 1.5 | 1 | 66.1 | 40.2 | 69.2 | 43.1 | 2.60 | 2.80 | 14.6 | 11 000 | 14 000 | 7211C | 21.1 | 63.5 | 91.5 | 1.5 | 0.635 |
| | 120 | 29 | 2 | 1 | 101 | 56.5 | 107 | 61.7 | 3.95 | 4.30 | — | 6 700 | 8 400 | 7311 | 40.2 | 65 | 110 | 2 | 1.45 |
| | 120 | 29 | 2 | 1 | 92.9 | 52.0 | 98.4 | 56.7 | 3.40 | 3.70 | — | 5 000 | 6 700 | 7311B | 51.8 | 65 | 110 | 2 | 1.45 |
| | 120 | 29 | 2 | 1 | 108 | 60.6 | 115 | 66.1 | 4.50 | 4.90 | 13.4 | 9 300 | 12 000 | 7311C | 26.4 | 65 | 110 | 2 | 1.45 |
| | 140 | 33 | 2.1 | 1.1 | 148 | 82.4 | — | — | 6.40 | — | — | 4 500 | 6 000 | 7411 | 45.0 | 67 | 128 | 2 | 2.36 |
| | 140 | 33 | 2.1 | 1.1 | 138 | 76.5 | — | — | 5.50 | — | — | 4 000 | 5 500 | 7411B | 57.8 | 67 | 128 | 2 | 2.36 |
| 60 | 85 | 13 | 1 | 0.6 | 29.0 | 21.8 | — | — | 1.15 | — | 16.3 | 12 000 | 16 000 | 7912C | 16.3 | 65.5 | 79.5 | 1 | 0.187 |
| | 95 | 18 | 1.1 | 0.6 | 39.9 | 28.1 | — | — | 1.55 | — | — | 7 700 | 9 700 | 7012 | 31.4 | 67 | 88 | 1 | 0.450 |
| | 95 | 18 | 1.1 | 0.6 | 35.7 | 25.3 | — | — | 1.35 | — | — | 5 800 | 7 700 | 7012B | 41.5 | 67 | 88 | 1 | 0.450 |

[Notes] 1) Limiting speeds shown above are applicable to machined cage bearings.
Limiting speeds of pressed cage bearings should be kept to under 80% of this value.
For bearings with 15° contact angle, this figure is applied to the high precision bearings ranked higher than class 5, used with machined cage or molded cage.

2) B, C or no indication after the bearing number indicates nominal contact angle of 40°, 15° and 30° respectively.
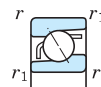[Remark] Standard cage types used for the above bearings are described earlier in this section.
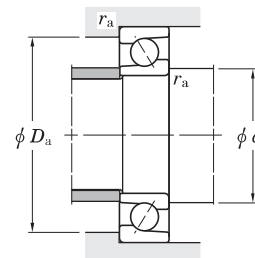
Koyo



With machined cage          With pressed cage



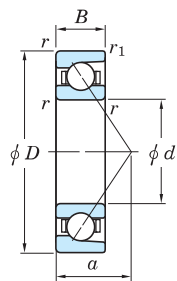| Boundary dimensions (mm) | | | | | Basic load ratings (kN) | | | | Fatigue load limits (kN) $C_u$ | | Factor | Limiting speeds [1] $(min^{-1})$ | | Bearing No. [2] | Load center (mm) | Mounting dimensions (mm) | | | (Refer.) Mass (kg) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | With machined cage | | With pressed cage | | With machined cage | With pressed cage | | | | | | | | | |
| $d$ | $D$ | $B$ | $r$ min. | $r_1$ min. | $C_r$ | $C_{0r}$ | $C_r$ | $C_{0r}$ | | | $f_0$ | Grease lub. | Oil lub. | | $a$ | $d_a$ min. | $D_a$ max. | $r_a$ max. | |
| 60 | 95 | 18 | 1.1 | 0.6 | 43.8 | 30.6 | — | — | 1.75 | — | 15.7 | 11 000 | 14 000 | 7012C | 19.4 | 67 | 88 | 1 | 0.450 |
| | 110 | 22 | 1.5 | 1 | 73.7 | 45.7 | 77.1 | 49.0 | 2.85 | 3.05 | — | 6 900 | 8 600 | 7212 | 36.1 | 68.5 | 101.5 | 1.5 | 0.820 |
| | 110 | 22 | 1.5 | 1 | 66.8 | 41.6 | 69.9 | 44.6 | 2.45 | 2.60 | — | 5 100 | 6 900 | 7212B | 47.5 | 68.5 | 101.5 | 1.5 | 0.820 |
| | 110 | 22 | 1.5 | 1 | 80.0 | 49.5 | 83.8 | 53.0 | 3.20 | 3.45 | 14.5 | 9 500 | 13 000 | 7212C | 22.7 | 68.5 | 101.5 | 1.5 | 0.820 |
| | 130 | 31 | 2.1 | 1.1 | 116 | 65.6 | 123 | 71.6 | 4.55 | 5.00 | — | 6 200 | 7 700 | 7312 | 43.2 | 72 | 118 | 2 | 1.81 |
| | 130 | 31 | 2.1 | 1.1 | 106 | 60.3 | 113 | 65.8 | 3.95 | 4.30 | — | 4 600 | 6 200 | 7312B | 55.8 | 72 | 118 | 2 | 1.81 |
| | 130 | 31 | 2.1 | 1.1 | 124 | 70.3 | 131 | 76.7 | 5.25 | 5.70 | 13.4 | 8 600 | 11 000 | 7312C | 28.4 | 72 | 118 | 2 | 1.81 |
| | 150 | 35 | 2.1 | 1.1 | 161 | 93.6 | — | — | 6.85 | — | — | 4 100 | 5 500 | 7412 | 48.5 | 72 | 138 | 2 | 2.85 |
| | 150 | 35 | 2.1 | 1.1 | 149 | 86.7 | — | — | 5.90 | — | — | 3 700 | 5 100 | 7412B | 62.6 | 72 | 138 | 2 | 2.85 |
| 65 | 90 | 13 | 1 | 0.6 | 25.9 | 21.2 | — | — | 1.10 | — | 16.5 | 11 000 | 15 000 | 7913C | 16.9 | 70.5 | 84.5 | 1 | 0.205 |
| | 100 | 18 | 1.1 | 0.6 | 42.1 | 31.4 | — | — | 1.70 | — | — | 7 200 | 9 000 | 7013 | 33.0 | 72 | 93 | 1 | 0.470 |
| | 100 | 18 | 1.1 | 0.6 | 37.7 | 28.3 | — | — | 1.45 | — | — | 5 400 | 7 200 | 7013B | 43.8 | 72 | 93 | 1 | 0.470 |
| | 100 | 18 | 1.1 | 0.6 | 46.3 | 34.3 | — | — | 1.90 | — | 15.9 | 10 000 | 13 000 | 7013C | 20.1 | 72 | 93 | 1 | 0.470 |
| | 120 | 23 | 1.5 | 1 | 84.1 | 54.2 | 87.8 | 57.8 | 3.35 | 3.55 | — | 6 400 | 8 000 | 7213 | 38.2 | 73.5 | 111.5 | 1.5 | 1.02 |
| | 120 | 23 | 1.5 | 1 | 76.2 | 49.3 | 79.5 | 52.6 | 2.90 | 3.10 | — | 4 800 | 6 400 | 7213B | 50.3 | 73.5 | 111.5 | 1.5 | 1.02 |
| | 120 | 23 | 1.5 | 1 | 91.4 | 58.7 | 95.4 | 62.6 | 3.80 | 4.05 | 14.6 | 8 900 | 12 000 | 7213C | 23.9 | 73.5 | 111.5 | 1.5 | 1.02 |
| | 140 | 33 | 2.1 | 1.1 | 131 | 75.3 | 139 | 82.2 | 5.15 | 5.65 | — | 5 800 | 7 200 | 7313 | 46.3 | 77 | 128 | 2 | 2.22 |
| | 140 | 33 | 2.1 | 1.1 | 120 | 69.3 | 127 | 75.6 | 4.45 | 4.85 | — | 4 300 | 5 800 | 7313B | 59.7 | 77 | 128 | 2 | 2.22 |
| | 140 | 33 | 2.1 | 1.1 | 140 | 80.7 | 149 | 88.1 | 5.90 | 6.45 | 13.4 | 8 000 | 11 000 | 7313C | 30.3 | 77 | 128 | 2 | 2.22 |
| | 160 | 37 | 2.1 | 1.1 | 174 | 104 | — | — | 7.40 | — | — | 3 900 | 5 200 | 7413 | 51.4 | 77 | 148 | 2 | 3.41 |
| | 160 | 37 | 2.1 | 1.1 | 161 | 96.8 | — | — | 6.35 | — | — | 3 500 | 4 800 | 7413B | 66.3 | 77 | 148 | 2 | 3.41 |
| 70 | 100 | 16 | 1 | 0.6 | 36.2 | 29.0 | — | — | 1.55 | — | 16.4 | 10 000 | 12 000 | 7914C | 19.4 | 75.5 | 94.5 | 1 | 0.332 |
| | 110 | 20 | 1.1 | 0.6 | 53.3 | 39.4 | — | — | 2.15 | — | — | 6 600 | 8 300 | 7014 | 36.0 | 77 | 103 | 1 | 0.660 |
| | 110 | 20 | 1.1 | 0.6 | 47.8 | 35.5 | — | — | 1.90 | — | — | 5 000 | 6 600 | 7014B | 47.8 | 77 | 103 | 1 | 0.660 |
| | 110 | 20 | 1.1 | 0.6 | 58.6 | 43.0 | — | — | 2.45 | — | 15.7 | 9 200 | 12 000 | 7014C | 22.1 | 77 | 103 | 1 | 0.660 |
| | 125 | 24 | 1.5 | 1 | 87.3 | 55.6 | 95.4 | 63.5 | 3.40 | 3.90 | — | 6 100 | 7 600 | 7214 | 40.2 | 78.5 | 116.5 | 1.5 | 1.12 |
| | 125 | 24 | 1.5 | 1 | 79.0 | 50.6 | 86.4 | 57.8 | 2.95 | 3.40 | — | 4 600 | 6 100 | 7214B | 52.9 | 78.5 | 116.5 | 1.5 | 1.12 |

[Notes]   1) Limiting speeds shown above are applicable to machined cage bearings.
Limiting speeds of pressed cage bearings should be kept to under 80% of this value.
For bearings with 15° contact angle, this figure is applied to the high precision bearings ranked higher than class 5, used with machined cage or molded cage.

2) B, C or no indication after the bearing number indicates nominal contact angle of 40°, 15° and 30° respectively.
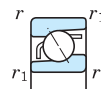[Remark]    Standard cage types used for the above bearings are described earlier in this section.
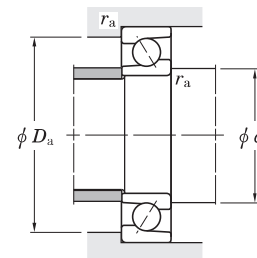
# Single-row angular contact ball bearings

$d$ (70) ~ (80) mm

Koyo

With machined cage      With pressed cage

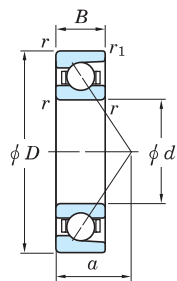| Boundary dimensions (mm) | | | | | Basic load ratings (kN) | | | | Fatigue load limits (kN) $C_u$ | | Factor | Limiting speeds [1] (min⁻¹) | | Bearing No. [2] | Load center (mm) | Mounting dimensions (mm) | | | (Refer.) Mass |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | With machined cage | | With pressed cage | | With machined cage | With pressed cage | | | | | | | | | |
| $d$ | $D$ | $B$ | $r$ min. | $r_1$ min. | $C_r$ | $C_{0r}$ | $C_r$ | $C_{0r}$ | | | $f_0$ | Grease lub. | Oil lub. | | $a$ | $d_a$ min. | $D_a$ max. | $r_a$ max. | (kg) |
| 70 | 125 | 24 | 1.5 | 1 | 94.9 | 60.2 | 104 | 68.8 | 3.90 | 4.45 | 14.6 | 8 400 | 11 000 | 7214C | 25.1 | 78.5 | 116.5 | 1.5 | 1.12 |
| | 150 | 35 | 2.1 | 1.1 | 147 | 85.8 | 156 | 93.6 | 5.70 | 6.20 | — | 5 400 | 6 700 | 7314 | 49.3 | 82 | 138 | 2 | 2.70 |
| | 150 | 35 | 2.1 | 1.1 | 135 | 78.9 | 143 | 86.0 | 4.90 | 5.35 | — | 4 000 | 5 400 | 7314B | 63.7 | 82 | 138 | 2 | 2.70 |
| | 150 | 35 | 2.1 | 1.1 | 158 | 91.9 | 167 | 100 | 6.50 | 7.10 | 13.4 | 7 500 | 9 900 | 7314C | 32.2 | 82 | 138 | 2 | 2.70 |
| | 180 | 42 | 3 | 1.1 | 187 | 115 | — | — | 5.30 | — | — | 3 500 | 4 600 | 7414 | 57.6 | 84 | 166 | 2.5 | 4.99 |
| | 180 | 42 | 3 | 1.1 | 185 | 119 | — | — | 5.45 | — | — | 3 100 | 4 300 | 7414B | 74.2 | 84 | 166 | 2.5 | 4.99 |
| 75 | 105 | 16 | 1 | 0.6 | 36.7 | 30.5 | — | — | 1.60 | — | 16.5 | 9 300 | 12 000 | 7915C | 20.1 | 80.5 | 99.5 | 1 | 0.350 |
| | 115 | 20 | 1.1 | 0.6 | 54.6 | 41.7 | — | — | 2.25 | — | — | 6 300 | 7 800 | 7015 | 37.4 | 82 | 108 | 1 | 0.690 |
| | 115 | 20 | 1.1 | 0.6 | 48.8 | 37.6 | — | — | 1.95 | — | — | 4 700 | 6 300 | 7015B | 49.9 | 82 | 108 | 1 | 0.690 |
| | 115 | 20 | 1.1 | 0.6 | 60.1 | 45.6 | — | — | 2.55 | — | 15.9 | 8 700 | 11 000 | 7015C | 22.7 | 82 | 108 | 1 | 0.690 |
| | 130 | 25 | 1.5 | 1 | 99.0 | 65.2 | 103 | 69.5 | 3.95 | 4.20 | — | 5 800 | 7 200 | 7215 | 42.1 | 83.5 | 121.5 | 1.5 | 1.23 |
| | 130 | 25 | 1.5 | 1 | 89.6 | 59.3 | 93.6 | 63.3 | 3.40 | 3.65 | — | 4 300 | 5 800 | 7215B | 55.5 | 83.5 | 121.5 | 1.5 | 1.23 |
| | 130 | 25 | 1.5 | 1 | 108 | 70.6 | 112 | 75.3 | 4.50 | 4.80 | 14.6 | 8 000 | 11 000 | 7215C | 26.2 | 83.5 | 121.5 | 1.5 | 1.23 |
| | 160 | 37 | 2.1 | 1.1 | 160 | 97.0 | 170 | 106 | 6.20 | 6.75 | — | 5 000 | 6 300 | 7315 | 52.4 | 87 | 148 | 2 | 3.15 |
| | 160 | 37 | 2.1 | 1.1 | 147 | 89.2 | 156 | 97.3 | 5.35 | 5.85 | — | 3 800 | 5 000 | 7315B | 67.8 | 87 | 148 | 2 | 3.15 |
| | 160 | 37 | 2.1 | 1.1 | 172 | 104 | 182 | 113 | 7.10 | 7.75 | 13.4 | 7 000 | 9 200 | 7315C | 34.2 | 87 | 148 | 2 | 3.15 |
| | 190 | 45 | 3 | 1.1 | 214 | 141 | — | — | 6.30 | — | — | 3 300 | 4 400 | 7415 | 61.3 | 89 | 176 | 2.5 | 5.90 |
| | 190 | 45 | 3 | 1.1 | 198 | 131 | — | — | 5.80 | — | — | 2 900 | 4 000 | 7415B | 78.9 | 89 | 176 | 2.5 | 5.90 |
| 80 | 110 | 16 | 1 | 0.6 | 37.3 | 31.6 | — | — | 1.65 | — | 16.5 | 8 800 | 11 000 | 7916C | 20.7 | 85.5 | 104.5 | 1 | 0.368 |
| | 125 | 22 | 1.1 | 0.6 | 66.7 | 50.6 | — | — | 2.75 | — | — | 5 800 | 7 200 | 7016 | 40.6 | 87 | 118 | 1 | 0.930 |
| | 125 | 22 | 1.1 | 0.6 | 59.8 | 45.7 | — | — | 2.40 | — | — | 4 300 | 5 800 | 7016B | 54.0 | 87 | 118 | 1 | 0.930 |
| | 125 | 22 | 1.1 | 0.6 | 73.3 | 55.3 | — | — | 3.10 | — | 15.7 | 8 000 | 11 000 | 7016C | 24.7 | 87 | 118 | 1 | 0.930 |
| | 140 | 26 | 2 | 1 | 107 | 71.5 | 111 | 76.2 | 4.10 | 4.40 | — | 5 400 | 6 700 | 7216 | 44.8 | 90 | 130 | 2 | 1.50 |
| | 140 | 26 | 2 | 1 | 96.4 | 65.0 | 101 | 69.3 | 3.55 | 3.80 | — | 4 000 | 5 400 | 7216B | 59.2 | 90 | 130 | 2 | 1.50 |
| | 140 | 26 | 2 | 1 | 116 | 77.5 | 121 | 82.7 | 4.70 | 5.00 | 14.7 | 7 500 | 9 900 | 7216C | 27.7 | 90 | 130 | 2 | 1.50 |
| | 170 | 39 | 2.1 | 1.1 | 174 | 109 | 184 | 119 | 6.75 | 7.35 | — | 4 700 | 5 900 | 7316 | 55.6 | 92 | 158 | 2 | 3.85 |
| | 170 | 39 | 2.1 | 1.1 | 159 | 100 | 169 | 109 | 5.80 | 6.35 | — | 3 500 | 4 700 | 7316B | 71.9 | 92 | 158 | 2 | 3.85 |

[Notes] 1) Limiting speeds shown above are applicable to machined cage bearings.
Limiting speeds of pressed cage bearings should be kept to under 80% of this value.
For bearings with 15° contact angle, this figure is applied to the high precision bearings ranked higher than class 5, used with machined cage or molded cage.

2) B, C or no indication after the bearing number indicates nominal contact angle of 40°, 15° and 30° respectively.
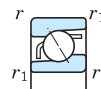[Remark] Standard cage types used for the above bearings are described earlier in this section.
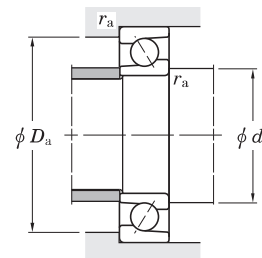
# Single-row angular contact ball bearings

## $d$ (80) ~ 90 mm



With machined cage      With pressed cage



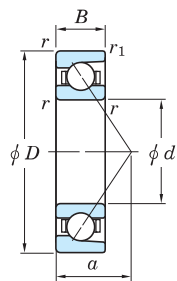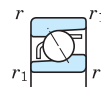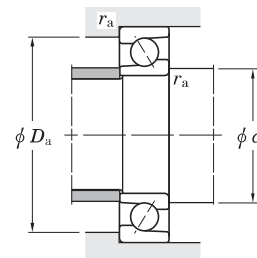| Boundary dimensions (mm) | | | | | Basic load ratings (kN) | | | | Fatigue load limits (kN) $C_u$ | | Factor | Limiting speeds [1] (min⁻¹) | | Bearing No. [2] | Load center (mm) | Mounting dimensions (mm) | | | (Refer.) Mass |
| | | | | | With machined cage | | With pressed cage | | | | | | | | | | | | |
| $d$ | $D$ | $B$ | $r$ min. | $r_1$ min. | $C_r$ | $C_{0r}$ | $C_r$ | $C_{0r}$ | [With machined cage] | [With pressed cage] | $f_0$ | Grease lub. | Oil lub. | | $a$ | $d_a$ min. | $D_a$ max. | $r_a$ max. | (kg) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 80 | 170 | 39 | 2.1 | 1.1 | 186 | 117 | 197 | 127 | 7.70 | 8.40 | 13.5 | 6 500 | 8 600 | 7316C | 36.2 | 92 | 158 | 2 | 3.85 |
| | 200 | 48 | 3 | 1.1 | 241 | 166 | — | — | 7.20 | — | — | 3 100 | 4 100 | 7416 | 65.0 | 94 | 186 | 2.5 | 6.00 |
| | 200 | 48 | 3 | 1.1 | 223 | 154 | — | — | 6.65 | — | — | 2 700 | 3 800 | 7416B | 83.6 | 94 | 186 | 2.5 | 6.00 |
| 85 | 120 | 18 | 1.1 | 0.6 | 48.6 | 40.6 | — | — | 2.10 | — | 16.5 | 8 100 | 11 000 | 7917C | 22.7 | 92 | 113 | 1 | 0.523 |
| | 130 | 22 | 1.1 | 0.6 | 68.2 | 53.7 | — | — | 2.75 | — | — | 5 500 | 6 800 | 7017 | 42.3 | 92 | 123 | 1 | 0.970 |
| | 130 | 22 | 1.1 | 0.6 | 61.0 | 48.4 | — | — | 2.40 | — | — | 4 100 | 5 500 | 7017B | 56.5 | 92 | 123 | 1 | 0.970 |
| | 130 | 22 | 1.1 | 0.6 | 75.1 | 58.7 | — | — | 3.15 | — | 15.9 | 7 600 | 10 000 | 7017C | 25.5 | 92 | 123 | 1 | 0.970 |
| | 150 | 28 | 2 | 1 | 123 | 83.6 | 129 | 89.2 | 4.70 | 5.00 | — | 5 000 | 6 300 | 7217 | 47.9 | 95 | 140 | 2 | 1.87 |
| | 150 | 28 | 2 | 1 | 111 | 76.0 | 116 | 81.1 | 4.05 | 4.35 | — | 3 800 | 5 000 | 7217B | 63.3 | 95 | 140 | 2 | 1.87 |
| | 150 | 28 | 2 | 1 | 134 | 90.6 | 140 | 96.6 | 5.35 | 5.70 | 14.7 | 7 000 | 9 200 | 7217C | 29.7 | 95 | 140 | 2 | 1.87 |
| | 180 | 41 | 3 | 1.1 | 187 | 122 | 198 | 133 | 7.30 | 7.95 | — | 4 400 | 5 500 | 7317 | 58.8 | 99 | 166 | 2.5 | 4.53 |
| | 180 | 41 | 3 | 1.1 | 172 | 112 | 182 | 122 | 6.30 | 6.85 | — | 3 300 | 4 400 | 7317B | 76.1 | 99 | 166 | 2.5 | 4.53 |
| | 180 | 41 | 3 | 1.1 | 201 | 130 | 213 | 142 | 8.35 | 9.10 | 13.5 | 6 100 | 8 100 | 7317C | 38.3 | 99 | 166 | 2.5 | 4.53 |
| | 210 | 52 | 4 | 1.5 | 255 | 180 | — | — | 7.65 | — | — | 3 000 | 3 900 | 7417 | 68.7 | 103 | 192 | 3 | 8.54 |
| | 210 | 52 | 4 | 1.5 | 236 | 167 | — | — | 7.10 | — | — | 2 600 | 3 600 | 7417B | 88.1 | 103 | 192 | 3 | 8.54 |
| 90 | 125 | 18 | 1.1 | 0.6 | 49.5 | 42.6 | — | — | 2.15 | — | 16.6 | 7 800 | 10 000 | 7918C | 23.4 | 97 | 118 | 1 | 0.551 |
| | 140 | 24 | 1.5 | 1 | 81.5 | 63.3 | — | — | 3.25 | — | — | 5 100 | 6 400 | 7018 | 45.2 | 98.5 | 131.5 | 1.5 | 1.26 |
| | 140 | 24 | 1.5 | 1 | 73.0 | 57.1 | — | — | 2.80 | — | — | 3 900 | 5 100 | 7018B | 60.2 | 98.5 | 131.5 | 1.5 | 1.26 |
| | 140 | 24 | 1.5 | 1 | 89.6 | 69.1 | — | — | 3.65 | — | 15.7 | 7 100 | 9 400 | 7018C | 27.4 | 98.5 | 131.5 | 1.5 | 1.26 |
| | 160 | 30 | 2 | 1 | 141 | 96.7 | 147 | 103 | 5.30 | 5.65 | — | 4 700 | 5 900 | 7218 | 51.1 | 100 | 150 | 2 | 2.30 |
| | 160 | 30 | 2 | 1 | 128 | 88.0 | 133 | 93.8 | 4.60 | 4.90 | — | 3 500 | 4 700 | 7218B | 67.4 | 100 | 150 | 2 | 2.30 |
| | 160 | 30 | 2 | 1 | 153 | 105 | 160 | 112 | 6.00 | 6.40 | 14.6 | 6 500 | 8 600 | 7218C | 31.7 | 100 | 150 | 2 | 2.30 |
| | 190 | 43 | 3 | 1.1 | 201 | 135 | 213 | 147 | 5.90 | 6.40 | — | 4 200 | 5 200 | 7318 | 61.9 | 104 | 176 | 2.5 | 5.30 |
| | 190 | 43 | 3 | 1.1 | 184 | 124 | 195 | 135 | 5.40 | 5.90 | — | 3 100 | 4 200 | 7318B | 80.2 | 104 | 176 | 2.5 | 5.30 |
| | 190 | 43 | 3 | 1.1 | 216 | 145 | 229 | 158 | 6.30 | 6.90 | 13.5 | 5 800 | 7 700 | 7318C | 40.3 | 104 | 176 | 2.5 | 5.30 |
| | 225 | 54 | 4 | 1.5 | 270 | 196 | — | — | 8.10 | — | — | 2 800 | 3 700 | 7418 | 72.5 | 108 | 207 | 3 | 11.4 |
| | 225 | 54 | 4 | 1.5 | 250 | 182 | — | — | 7.50 | — | — | 2 500 | 3 400 | 7418B | 93.1 | 108 | 207 | 3 | 11.4 |

[Notes] 1) Limiting speeds shown above are applicable to machined cage bearings.
Limiting speeds of pressed cage bearings should be kept to under 80% of this value.
For bearings with 15° contact angle, this figure is applied to the high precision bearings ranked higher than class 5, used with machined cage or molded cage.

2) B, C or no indication after the bearing number indicates nominal contact angle of 40°, 15° and 30° respectively.
[Remark]　Standard cage types used for the above bearings are described earlier in this section.

# Single-row angular contact ball bearings

## d  95 ~ (105) mm



With machined cage          With pressed cage



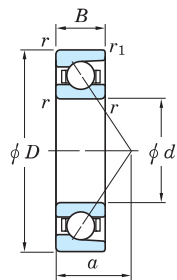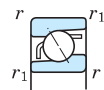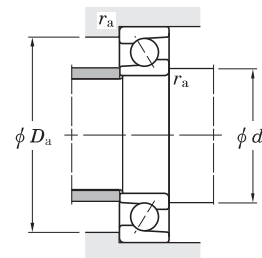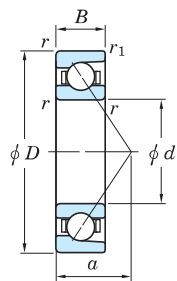| Boundary dimensions (mm) | | | | | Basic load ratings (kN) | | | | Fatigue load limits (kN) $C_u$ | | Factor | | Limiting speeds [1] (min⁻¹) | | Bearing No. [2] | Load center (mm) | Mounting dimensions (mm) | | | (Refer.) Mass |
| | | | | | With machined cage | | With pressed cage | | | | | | | | | | | | | |
| $d$ | $D$ | $B$ | $r$ min. | $r_1$ min. | $C_r$ | $C_{0r}$ | $C_r$ | $C_{0r}$ | [With machined cage] | [With pressed cage] | $f_0$ | | Grease lub. | Oil lub. | | $a$ | $d_a$ min. | $D_a$ max. | $r_a$ max. | (kg) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **95** | 130 | 18 | 1.1 | 0.6 | 50.3 | 44.1 | — | — | 2.15 | — | 16.5 | | 7 400 | 9 800 | **7919C** | 24.1 | 102 | 123 | 1 | 0.574 |
| | 145 | 24 | 1.5 | 1 | 83.3 | 67.1 | — | — | 3.25 | — | — | | 4 800 | 6 000 | **7019** | 47.2 | 103.5 | 136.5 | 1.5 | 1.32 |
| | 145 | 24 | 1.5 | 1 | 74.5 | 60.5 | — | — | 2.85 | — | — | | 3 600 | 4 800 | **7019B** | 63.2 | 103.5 | 136.5 | 1.5 | 1.32 |
| | 145 | 24 | 1.5 | 1 | 91.7 | 73.4 | — | — | 3.70 | — | 15.9 | | 6 700 | 8 900 | **7019C** | 28.3 | 103.5 | 136.5 | 1.5 | 1.32 |
| | 170 | 32 | 2.1 | 1.1 | 153 | 103 | 160 | 111 | 5.50 | 5.90 | — | | 4 400 | 5 500 | **7219** | 54.3 | 107 | 158 | 2 | 2.78 |
| | 170 | 32 | 2.1 | 1.1 | 138 | 94.0 | 145 | 101 | 4.80 | 5.10 | — | | 3 300 | 4 400 | **7219B** | 71.6 | 107 | 158 | 2 | 2.78 |
| | 170 | 32 | 2.1 | 1.1 | 166 | 112 | 174 | 120 | 6.30 | 6.75 | 14.6 | | 6 100 | 8 100 | **7219C** | 33.8 | 107 | 158 | 2 | 2.78 |
| | 200 | 45 | 3 | 1.1 | 215 | 149 | 228 | 162 | 6.35 | 6.90 | — | | 4 000 | 4 900 | **7319** | 65.1 | 109 | 186 | 2.5 | 6.12 |
| | 200 | 45 | 3 | 1.1 | 197 | 137 | 209 | 149 | 5.80 | 6.35 | — | | 3 000 | 4 000 | **7319B** | 84.4 | 109 | 186 | 2.5 | 6.12 |
| | 200 | 45 | 3 | 1.1 | 231 | 160 | 245 | 174 | 6.80 | 7.40 | 13.5 | | 5 500 | 7 300 | **7319C** | 42.3 | 109 | 186 | 2.5 | 6.12 |
| **100** | 140 | 20 | 1.1 | 0.6 | 69.4 | 58.5 | — | — | 2.85 | — | 16.3 | | 7 000 | 9 200 | **7920C** | 26.1 | 107 | 133 | 1 | 0.773 |
| | 150 | 24 | 1.5 | 1 | 85.5 | 70.6 | — | — | 3.35 | — | — | | 4 700 | 5 900 | **7020** | 48.1 | 108.5 | 141.5 | 1.5 | 1.37 |
| | 150 | 24 | 1.5 | 1 | 76.5 | 63.6 | — | — | 2.95 | — | — | | 3 500 | 4 700 | **7020B** | 64.4 | 108.5 | 141.5 | 1.5 | 1.37 |
| | 150 | 24 | 1.5 | 1 | 94.2 | 77.2 | — | — | 3.80 | — | 16.0 | | 6 500 | 8 600 | **7020C** | 28.7 | 108.5 | 141.5 | 1.5 | 1.37 |
| | 180 | 34 | 2.1 | 1.1 | 171 | 117 | 180 | 126 | 6.10 | 6.50 | — | | 4 100 | 5 200 | **7220** | 57.7 | 112 | 168 | 2 | 3.32 |
| | 180 | 34 | 2.1 | 1.1 | 155 | 107 | 163 | 115 | 5.25 | 5.65 | — | | 3 100 | 4 200 | **7220B** | 76.2 | 112 | 168 | 2 | 3.32 |
| | 180 | 34 | 2.1 | 1.1 | 186 | 127 | 195 | 136 | 6.95 | 7.40 | 14.6 | | 5 700 | 7 600 | **7220C** | 35.9 | 112 | 168 | 2 | 3.32 |
| | 215 | 47 | 3 | 1.1 | 229 | 161 | 259 | 194 | 6.60 | 7.95 | — | | 3 600 | 4 600 | **7320** | 69.4 | 114 | 201 | 2.5 | 7.53 |
| | 215 | 47 | 3 | 1.1 | 210 | 148 | 238 | 178 | 6.10 | 7.30 | — | | 2 700 | 3 600 | **7320B** | 90.2 | 114 | 201 | 2.5 | 7.53 |
| | 215 | 47 | 3 | 1.1 | 246 | 173 | 278 | 208 | 7.10 | 8.50 | 13.4 | | 5 000 | 6 700 | **7320C** | 44.8 | 114 | 201 | 2.5 | 7.53 |
| **105** | 145 | 20 | 1.1 | 0.6 | 70.8 | 61.5 | — | — | 2.90 | — | 16.4 | | 6 700 | 8 800 | **7921C** | 26.7 | 112 | 138 | 1 | 0.810 |
| | 160 | 26 | 2 | 1 | 99.7 | 81.9 | — | — | 3.80 | — | — | | 4 400 | 5 500 | **7021** | 51.8 | 115 | 150 | 2 | 1.73 |
| | 160 | 26 | 2 | 1 | 89.2 | 73.8 | — | — | 3.30 | — | — | | 3 300 | 4 400 | **7021B** | 68.6 | 115 | 150 | 2 | 1.73 |
| | 160 | 26 | 2 | 1 | 110 | 89.6 | — | — | 4.30 | — | 15.9 | | 6 000 | 8 000 | **7021C** | 31.0 | 115 | 150 | 2 | 1.73 |
| | 190 | 36 | 2.1 | 1.1 | 187 | 132 | — | — | 6.70 | — | — | | 3 900 | 4 900 | **7221** | 61.0 | 117 | 178 | 2 | 3.95 |
| | 190 | 36 | 2.1 | 1.1 | 169 | 121 | — | — | 5.80 | — | — | | 2 900 | 3 900 | **7221B** | 80.5 | 117 | 178 | 2 | 3.95 |

[Notes]  1) Limiting speeds shown above are applicable to machined cage bearings.
Limiting speeds of pressed cage bearings should be kept to under 80% of this value.
For bearings with 15° contact angle, this figure is applied to the high precision bearings ranked higher than class 5, used with machined cage or molded cage.

2) B, C or no indication after the bearing number indicates nominal contact angle of 40°, 15° and 30° respectively.
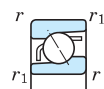
[Remark]   Standard cage types used for the above bearings are described earlier in this section.
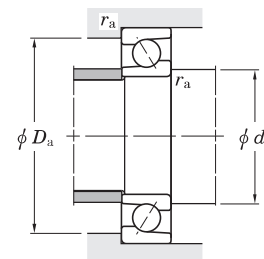
With machined cage     With pressed cage



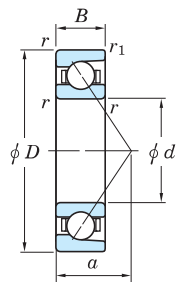| Boundary dimensions (mm) | | | | | Basic load ratings (kN) | | | | Fatigue load limits (kN) $C_u$ | | Factor | | Limiting speeds [1] (min$^{-1}$) | | Bearing No. [2] | Load center (mm) | Mounting dimensions (mm) | | | (Refer.) Mass |
| | | | | | With machined cage | | With pressed cage | | | | | | | | | | | | | |
| $d$ | $D$ | $B$ | $r$ min. | $r_1$ min. | $C_r$ | $C_{0r}$ | $C_r$ | $C_{0r}$ | With machined cage | With pressed cage | $f_0$ | | Grease lub. | Oil lub. | | $a$ | $d_a$ min. | $D_a$ max. | $r_a$ max. | (kg) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 105 | 190 | 36 | 2.1 | 1.1 | 203 | 143 | — | — | 7.60 | — | 14.6 | | 5 400 | 7 200 | 7221C | 38.0 | 117 | 178 | 2 | 3.95 |
| | 225 | 49 | 3 | 1.1 | 260 | 193 | — | — | 7.75 | — | — | | 3 500 | 4 400 | 7321 | 72.1 | 119 | 211 | 2.5 | 8.62 |
| | 225 | 49 | 3 | 1.1 | 238 | 177 | — | — | 7.15 | — | — | | 2 600 | 3 500 | 7321B | 93.7 | 119 | 211 | 2.5 | 8.62 |
| | 225 | 49 | 3 | 1.1 | 278 | 207 | — | — | 8.30 | — | 13.4 | | 4 800 | 6 400 | 7321C | 46.6 | 119 | 211 | 2.5 | 8.62 |
| 110 | 150 | 20 | 1.1 | 0.6 | 72.2 | 64.4 | — | — | 2.95 | — | 16.5 | | 6 400 | 8 500 | 7922C | 27.4 | 117 | 143 | 1 | 0.840 |
| | 170 | 28 | 2 | 1 | 115 | 92.8 | — | — | 4.30 | — | — | | 4 200 | 5 200 | 7022 | 54.4 | 120 | 160 | 2 | 2.14 |
| | 170 | 28 | 2 | 1 | 103 | 83.7 | — | — | 3.75 | — | — | | 3 100 | 4 200 | 7022B | 72.7 | 120 | 160 | 2 | 2.14 |
| | 170 | 28 | 2 | 1 | 126 | 101 | — | — | 4.85 | — | 15.7 | | 5 800 | 7 700 | 7022C | 32.8 | 120 | 160 | 2 | 2.14 |
| | 200 | 38 | 2.1 | 1.1 | 202 | 148 | — | — | 7.30 | — | — | | 3 700 | 4 600 | 7222 | 64.3 | 122 | 188 | 2 | 4.65 |
| | 200 | 38 | 2.1 | 1.1 | 183 | 135 | — | — | 6.35 | — | — | | 2 800 | 3 700 | 7222B | 84.9 | 122 | 188 | 2 | 4.65 |
| | 200 | 38 | 2.1 | 1.1 | 220 | 160 | — | — | 8.35 | — | 14.5 | | 5 100 | 6 800 | 7222C | 40.0 | 122 | 188 | 2 | 4.65 |
| | 240 | 50 | 3 | 1.1 | 290 | 226 | — | — | 8.75 | — | — | | 3 200 | 4 000 | 7322 | 76.4 | 124 | 226 | 2.5 | 10.1 |
| | 240 | 50 | 3 | 1.1 | 266 | 208 | — | — | 8.05 | — | — | | 2 400 | 3 200 | 7322B | 99.6 | 124 | 226 | 2.5 | 10.1 |
| | 240 | 50 | 3 | 1.1 | 311 | 242 | — | — | 9.40 | — | 13.4 | | 4 500 | 5 900 | 7322C | 48.8 | 124 | 226 | 2.5 | 10.1 |
| 120 | 165 | 22 | 1.1 | 0.6 | 89.7 | 81.2 | — | — | 3.55 | — | 16.5 | | 5 900 | 7 800 | 7924C | 30.1 | 127 | 158 | 1 | 1.15 |
| | 180 | 28 | 2 | 1 | 121 | 103 | — | — | 4.50 | — | — | | 3 900 | 4 900 | 7024 | 57.3 | 130 | 170 | 2 | 2.27 |
| | 180 | 28 | 2 | 1 | 108 | 93.0 | — | — | 3.95 | — | — | | 2 900 | 3 900 | 7024B | 76.9 | 130 | 170 | 2 | 2.27 |
| | 180 | 28 | 2 | 1 | 133 | 113 | — | — | 5.10 | — | 16.0 | | 5 400 | 7 100 | 7024C | 34.1 | 130 | 170 | 2 | 2.27 |
| | 215 | 40 | 2.1 | 1.1 | 218 | 166 | — | — | 7.85 | — | — | | 3 400 | 4 300 | 7224 | 68.5 | 132 | 203 | 2 | 5.49 |
| | 215 | 40 | 2.1 | 1.1 | 197 | 151 | — | — | 6.80 | — | — | | 2 600 | 3 400 | 7224B | 90.3 | 132 | 203 | 2 | 5.49 |
| | 215 | 40 | 2.1 | 1.1 | 237 | 180 | — | — | 8.95 | — | 14.6 | | 4 800 | 6 300 | 7224C | 42.5 | 132 | 203 | 2 | 5.49 |
| | 260 | 55 | 3 | 1.1 | 308 | 252 | — | — | 9.45 | — | — | | 3 000 | 3 700 | 7324 | 82.3 | 134 | 246 | 2.5 | 12.6 |
| | 260 | 55 | 3 | 1.1 | 282 | 231 | — | — | 8.65 | — | — | | 2 200 | 3 000 | 7324B | 107.2 | 134 | 246 | 2.5 | 12.6 |
| | 260 | 55 | 3 | 1.1 | 331 | 271 | — | — | 10.2 | — | 13.7 | | 4 100 | 5 500 | 7324C | 53.0 | 134 | 246 | 2.5 | 12.6 |
| 130 | 180 | 24 | 1.5 | 1 | 109 | 99.9 | — | — | 4.20 | — | 16.4 | | 5 400 | 7 100 | 7926C | 32.8 | 138.5 | 171.5 | 1.5 | 1.50 |
| | 200 | 33 | 2 | 1 | 147 | 125 | — | — | 5.25 | — | — | | 3 500 | 4 400 | 7026 | 64.1 | 140 | 190 | 2 | 3.43 |

[Notes] 1) Limiting speeds shown above are applicable to machined cage bearings.
Limiting speeds of pressed cage bearings should be kept to under 80% of this value.
For bearings with 15° contact angle, this figure is applied to the high precision bearings ranked higher than class 5, used with machined cage or molded cage.

2) B, C or no indication after the bearing number indicates nominal contact angle of 40°, 15° and 30° respectively.
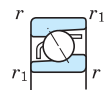
[Remark] Standard cage types used for the above bearings are described earlier in this section.
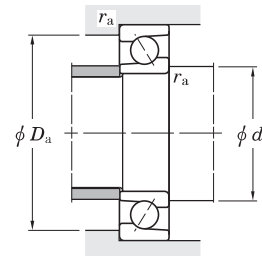
With machined cage        With pressed cage



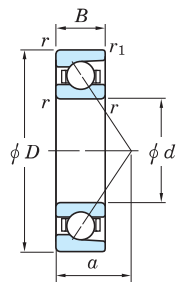| Boundary dimensions (mm) | | | | | Basic load ratings (kN) | | | | Fatigue load limits (kN) $C_u$ | | Factor | Limiting speeds [1] (min⁻¹) | | Bearing No. [2] | Load center (mm) | Mounting dimensions (mm) | | | (Refer.) Mass |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | With machined cage | | With pressed cage | | With machined cage | With pressed cage | | | | | | | | | |
| $d$ | $D$ | $B$ | $r$ min. | $r_1$ min. | $C_r$ | $C_{0r}$ | $C_r$ | $C_{0r}$ | | | $f_0$ | Grease lub. | Oil lub. | | $a$ | $d_a$ min. | $D_a$ max. | $r_a$ max. | (kg) |
| 130 | 200 | 33 | 2 | 1 | 131 | 113 | — | — | 4.60 | — | — | 2 600 | 3 500 | 7026B | 85.7 | 140 | 190 | 2 | 3.43 |
| | 200 | 33 | 2 | 1 | 161 | 137 | — | — | 5.95 | — | 15.9 | 4 800 | 6 400 | 7026C | 38.6 | 140 | 190 | 2 | 3.43 |
| | 230 | 40 | 3 | 1.1 | 245 | 198 | — | — | 7.60 | — | — | 3 200 | 4 000 | 7226 | 72.0 | 144 | 216 | 2.5 | 6.21 |
| | 230 | 40 | 3 | 1.1 | 222 | 180 | — | — | 6.95 | — | — | 2 400 | 3 200 | 7226B | 95.5 | 144 | 216 | 2.5 | 6.21 |
| | 230 | 40 | 3 | 1.1 | 266 | 214 | — | — | 8.25 | — | 14.7 | 4 400 | 5 800 | 7226C | 44.1 | 144 | 216 | 2.5 | 6.21 |
| | 280 | 58 | 4 | 1.5 | 376 | 329 | — | — | 11.8 | — | — | 2 700 | 3 400 | 7326 | 88.8 | 148 | 262 | 3 | 15.4 |
| | 280 | 58 | 4 | 1.5 | 312 | 268 | — | — | 9.70 | — | — | 2 100 | 2 700 | 7326B | 115.0 | 148 | 262 | 3 | 15.4 |
| | 280 | 58 | 4 | 1.5 | 368 | 314 | — | — | 11.3 | — | 13.7 | 3 800 | 5 000 | 7326C | 56.5 | 148 | 262 | 3 | 15.4 |
| 140 | 190 | 24 | 1.5 | 1 | 110 | 105 | — | — | 4.20 | — | 16.6 | 5 100 | 6 700 | 7928C | 34.1 | 148.5 | 181.5 | 1.5 | 1.59 |
| | 210 | 33 | 2 | 1 | 150 | 133 | — | — | 5.30 | — | — | 3 300 | 4 100 | 7028 | 67.0 | 150 | 200 | 2 | 3.64 |
| | 210 | 33 | 2 | 1 | 134 | 119 | — | — | 4.65 | — | — | 2 500 | 3 300 | 7028B | 89.9 | 150 | 200 | 2 | 3.64 |
| | 210 | 33 | 2 | 1 | 165 | 145 | — | — | 6.00 | — | 16.0 | 4 500 | 6 000 | 7028C | 39.9 | 150 | 200 | 2 | 3.64 |
| | 250 | 42 | 3 | 1.1 | 273 | 234 | — | — | 8.65 | — | — | 2 900 | 3 600 | 7228 | 77.3 | 154 | 236 | 2.5 | 7.76 |
| | 250 | 42 | 3 | 1.1 | 247 | 213 | — | — | 7.85 | — | — | 2 200 | 2 900 | 7228B | 102.8 | 154 | 236 | 2.5 | 7.76 |
| | 250 | 42 | 3 | 1.1 | 297 | 254 | — | — | 9.40 | — | 14.8 | 4 000 | 5 300 | 7228C | 47.1 | 154 | 236 | 2.5 | 7.76 |
| | 300 | 62 | 4 | 1.5 | 411 | 374 | — | — | 13.0 | — | — | 2 500 | 3 200 | 7328 | 94.5 | 158 | 282 | 3 | 18.8 |
| | 300 | 62 | 4 | 1.5 | 378 | 344 | — | — | 12.0 | — | — | 1 900 | 2 500 | 7328B | 123.3 | 158 | 282 | 3 | 18.8 |
| | 300 | 62 | 4 | 1.5 | 441 | 401 | — | — | 14.0 | — | 13.4 | 3 500 | 4 600 | 7328C | 60.5 | 158 | 282 | 3 | 18.8 |
| 150 | 210 | 28 | 2 | 1 | 148 | 132 | — | — | 5.45 | — | 16.3 | 4 700 | 6 200 | 7930C | 38.1 | 160 | 200 | 2 | 2.47 |
| | 225 | 35 | 2.1 | 1.1 | 171 | 154 | — | — | 5.95 | — | — | 3 000 | 3 800 | 7030 | 72.1 | 162 | 213 | 2 | 4.43 |
| | 225 | 35 | 2.1 | 1.1 | 153 | 138 | — | — | 5.20 | — | — | 2 300 | 3 000 | 7030B | 96.2 | 162 | 213 | 2 | 4.43 |
| | 225 | 35 | 2.1 | 1.1 | 188 | 169 | — | — | 6.70 | — | 16.1 | 4 200 | 5 500 | 7030C | 42.8 | 162 | 213 | 2 | 4.43 |
| | 270 | 45 | 3 | 1.1 | 310 | 280 | — | — | 9.95 | — | — | 2 700 | 3 300 | 7230 | 83.1 | 164 | 256 | 2.5 | 9.75 |
| | 270 | 45 | 3 | 1.1 | 281 | 254 | — | — | 9.05 | — | — | 2 000 | 2 700 | 7230B | 110.6 | 164 | 256 | 2.5 | 9.75 |
| | 270 | 45 | 3 | 1.1 | 338 | 303 | — | — | 10.8 | — | 14.7 | 3 700 | 4 900 | 7230C | 50.6 | 164 | 256 | 2.5 | 9.75 |
| | 320 | 65 | 4 | 1.5 | 434 | 414 | — | — | 14.0 | — | — | 2 300 | 2 900 | 7330 | 100.3 | 168 | 302 | 3 | 22.4 |
| | 320 | 65 | 4 | 1.5 | 397 | 380 | — | — | 12.8 | — | — | 1 800 | 2 300 | 7330B | 131.1 | 168 | 302 | 3 | 22.4 |

[Notes]  1) Limiting speeds shown above are applicable to machined cage bearings.
Limiting speeds of pressed cage bearings should be kept to under 80% of this value.
For bearings with 15° contact angle, this figure is applied to the high precision bearings ranked higher than class 5, used with machined cage or molded cage.

2) B, C or no indication after the bearing number indicates nominal contact angle of 40°, 15° and 30° respectively.
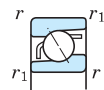
[Remark]   Standard cage types used for the above bearings are described earlier in this section.
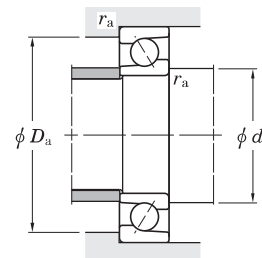
# Single-row angular contact ball bearings

## $d$ (150) ~ (180) mm



With machined cage          With pressed cage



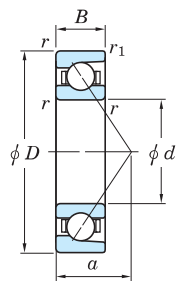| Boundary dimensions (mm) | | | | | Basic load ratings (kN) With machined cage | | With pressed cage | | Fatigue load limits (kN) $C_u$ | | Factor | Limiting speeds [1] (min$^{-1}$) | | Bearing No. [2] | Load center (mm) | Mounting dimensions (mm) | | | (Refer.) Mass |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| $d$ | $D$ | $B$ | $r$ min. | $r_1$ min. | $C_r$ | $C_{0r}$ | $C_r$ | $C_{0r}$ | [With machined cage] | [With pressed cage] | $f_0$ | Grease lub. | Oil lub. | | $a$ | $d_a$ min. | $D_a$ max. | $r_a$ max. | (kg) |
| **150** | 320 | 65 | 4 | 1.5 | 468 | 445 | — | — | 15.0 | — | 13.7 | 3 200 | 4 300 | **7330C** | 64.0 | 168 | 302 | 3 | 22.4 |
| **160** | 220 | 28 | 2 | 1 | 151 | 144 | — | — | 5.45 | — | 16.5 | 4 400 | 5 800 | **7932C** | 39.5 | 170 | 210 | 2 | 2.60 |
| | 240 | 38 | 2.1 | 1.1 | 194 | 176 | — | — | 6.65 | — | — | 2 800 | 3 500 | **7032** | 76.8 | 172 | 228 | 2 | 5.45 |
| | 240 | 38 | 2.1 | 1.1 | 173 | 158 | — | — | 5.80 | — | — | 2 100 | 2 800 | **7032B** | 102.9 | 172 | 228 | 2 | 5.45 |
| | 240 | 38 | 2.1 | 1.1 | 214 | 193 | — | — | 7.50 | — | 16.0 | 3 900 | 5 200 | **7032C** | 45.8 | 172 | 228 | 2 | 5.45 |
| | 290 | 48 | 3 | 1.1 | 288 | 263 | — | — | 9.05 | — | — | 2 500 | 3 100 | **7232** | 89.0 | 174 | 276 | 2.5 | 12.1 |
| | 290 | 48 | 3 | 1.1 | 297 | 279 | — | — | 9.60 | — | — | 1 800 | 2 500 | **7232B** | 118.4 | 174 | 276 | 2.5 | 12.1 |
| | 290 | 48 | 3 | 1.1 | 315 | 333 | — | — | 9.85 | — | 15.2 | 3 400 | 4 500 | **7232C** | 54.1 | 174 | 276 | 2.5 | 12.1 |
| | 340 | 68 | 4 | 1.5 | 456 | 455 | — | — | 14.9 | — | — | 2 200 | 2 700 | **7332** | 106.2 | 178 | 322 | 3 | 26.4 |
| | 340 | 68 | 4 | 1.5 | 415 | 416 | — | — | 13.6 | — | — | 1 600 | 2 200 | **7332B** | 138.9 | 178 | 322 | 3 | 26.4 |
| | 340 | 68 | 4 | 1.5 | 492 | 490 | — | — | 16.0 | — | 14.0 | 3 000 | 4 000 | **7332C** | 67.5 | 168.5 | 322 | 3 | 26.4 |
| **170** | 230 | 28 | 2 | 1 | 157 | 151 | — | — | 5.75 | — | 16.6 | 3 900 | 5 100 | **7934C** | 40.8 | 180 | 220 | 2 | 3.21 |
| | 260 | 42 | 2.1 | 1.1 | 232 | 214 | — | — | 7.90 | — | — | 2 600 | 3 200 | **7034** | 83.1 | 182 | 248 | 2 | 7.58 |
| | 260 | 42 | 2.1 | 1.1 | 208 | 193 | — | — | 6.90 | — | — | 1 900 | 2 600 | **7034B** | 111.2 | 182 | 248 | 2 | 7.77 |
| | 260 | 42 | 2.1 | 1.1 | 256 | 234 | — | — | 8.95 | — | 15.9 | 3 600 | 4 800 | **7034C** | 49.8 | 182 | 248 | 2 | 7.57 |
| | 310 | 52 | 4 | 1.5 | 340 | 331 | — | — | 11.0 | — | — | 2 300 | 2 800 | **7234** | 95.3 | 188 | 292 | 3 | 15.1 |
| | 310 | 52 | 4 | 1.5 | 306 | 300 | — | — | 10.0 | — | — | 1 700 | 2 300 | **7234B** | 126.7 | 188 | 292 | 3 | 15.1 |
| | 310 | 52 | 4 | 1.5 | 371 | 359 | — | — | 12.0 | — | 15.1 | 3 100 | 4 200 | **7234C** | 58.2 | 188 | 292 | 3 | 15.1 |
| | 360 | 72 | 4 | 1.5 | 486 | 485 | — | — | 15.4 | — | — | 2 000 | 2 500 | **7334** | 112.5 | 188 | 342 | 3 | 31.2 |
| | 360 | 72 | 4 | 1.5 | 444 | 444 | — | — | 14.1 | — | — | 1 500 | 2 000 | **7334B** | 147.2 | 188 | 342 | 3 | 31.2 |
| | 360 | 72 | 4 | 1.5 | 523 | 521 | — | — | 16.5 | — | 13.8 | 2 800 | 3 700 | **7334C** | 71.5 | 188 | 342 | 3 | 31.2 |
| **180** | 250 | 33 | 2 | 1 | 200 | 188 | — | — | 7.05 | — | 16.4 | 3 600 | 4 700 | **7936C** | 45.3 | 190 | 240 | 2 | 4.68 |
| | 280 | 46 | 2.1 | 1.1 | 265 | 253 | — | — | 9.15 | — | — | 2 400 | 3 000 | **7036** | 89.4 | 192 | 268 | 2 | 10.1 |
| | 280 | 46 | 2.1 | 1.1 | 237 | 228 | — | — | 7.95 | — | — | 1 800 | 2 400 | **7036B** | 119.5 | 192 | 268 | 2 | 10.2 |
| | 280 | 46 | 2.1 | 1.1 | 291 | 276 | — | — | 10.4 | — | 15.7 | 3 300 | 4 400 | **7036C** | 53.8 | 192 | 268 | 2 | 9.96 |
| | 320 | 52 | 4 | 1.5 | 367 | 362 | — | — | 11.8 | — | — | 2 200 | 2 700 | **7236** | 98.2 | 198 | 302 | 3 | 15.7 |

[Notes]  1) Limiting speeds shown above are applicable to machined cage bearings.
Limiting speeds of pressed cage bearings should be kept to under 80% of this value.
For bearings with 15° contact angle, this figure is applied to the high precision bearings ranked higher than class 5, used with machined cage or molded cage.

2) B, C or no indication after the bearing number indicates nominal contact angle of 40°, 15° and 30° respectively.
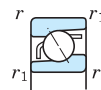
[Remark]  Standard cage types used for the above bearings are described earlier in this section.
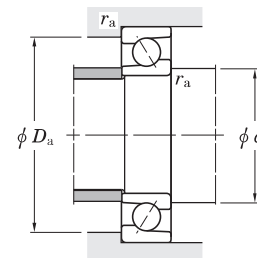
# Single-row angular contact ball bearings

$d$  (180) ~ (240) mm



With machined cage          With pressed cage



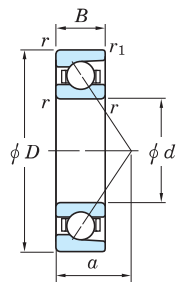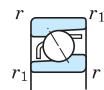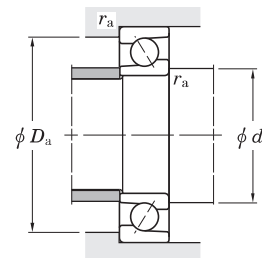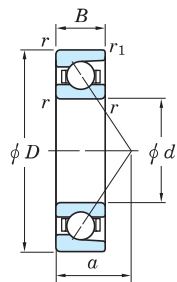| Boundary dimensions (mm) | | | | | Basic load ratings (kN) | | | | Fatigue load limits (kN) $C_u$ | | Factor | Limiting speeds [1] (min$^{-1}$) | | Bearing No. [2] | Load center (mm) | Mounting dimensions (mm) | | | (Refer.) Mass |
| | | | | | With machined cage | | With pressed cage | | | | | | | | | | | | |
| $d$ | $D$ | $B$ | $r$ min. | $r_1$ min. | $C_r$ | $C_{0r}$ | $C_r$ | $C_{0r}$ | With machined cage | With pressed cage | $f_0$ | Grease lub. | Oil lub. | | $a$ | $d_a$ min. | $D_a$ max. | $r_a$ max. | (kg) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 180 | 320 | 52 | 4 | 1.5 | 331 | 329 | — | — | 10.7 | — | — | 1 600 | 2 200 | 7236B | 130.9 | 198 | 302 | 3 | 15.7 |
| | 320 | 52 | 4 | 1.5 | 400 | 393 | — | — | 12.8 | — | 14.9 | 3 000 | 4 000 | 7236C | 59.5 | 198 | 302 | 3 | 15.7 |
| | 380 | 75 | 4 | 1.5 | 512 | 534 | — | — | 16.5 | — | — | 1 900 | 2 400 | 7336 | 118.3 | 198 | 362 | 3 | 40.0 |
| | 380 | 75 | 4 | 1.5 | 466 | 488 | — | — | 15.1 | — | — | 1 400 | 1 900 | 7336B | 155.0 | 198 | 362 | 3 | 40.0 |
| 190 | 260 | 33 | 2 | 1 | 198 | 197 | — | — | 6.85 | — | 16.5 | 3 300 | 4 500 | 7938C | 46.6 | 200 | 250 | 2 | 4.83 |
| | 290 | 46 | 2.1 | 1.1 | 271 | 268 | — | — | 9.35 | — | — | 2 300 | 2 800 | 7038 | 92.3 | 202 | 278 | 2 | 10.8 |
| | 290 | 46 | 2.1 | 1.1 | 243 | 241 | — | — | 8.15 | — | — | 1 700 | 2 300 | 7038B | 123.7 | 202 | 278 | 2 | 10.8 |
| | 290 | 46 | 2.1 | 1.1 | 299 | 293 | — | — | 10.6 | — | 15.9 | 3 100 | 4 200 | 7038C | 55.2 | 202 | 278 | 2 | 10.8 |
| | 340 | 55 | 4 | 1.5 | 379 | 390 | — | — | 12.4 | — | — | 2 000 | 2 500 | 7238 | 104.0 | 208 | 322 | 3 | 18.8 |
| | 340 | 55 | 4 | 1.5 | 341 | 353 | — | — | 11.2 | — | — | 1 500 | 2 000 | 7238B | 138.7 | 208 | 322 | 3 | 18.8 |
| | 340 | 55 | 4 | 1.5 | 414 | 424 | — | — | 13.5 | — | 15.1 | 2 800 | 3 700 | 7238C | 63.0 | 208 | 322 | 3 | 18.8 |
| | 400 | 78 | 5 | 2 | 563 | 598 | — | — | 18.0 | — | — | 1 800 | 2 200 | 7338 | 124.2 | 212 | 378 | 4 | 45.5 |
| | 400 | 78 | 5 | 2 | 514 | 548 | — | — | 16.5 | — | — | 1 300 | 1 800 | 7338B | 162.8 | 212 | 378 | 4 | 45.5 |
| 200 | 280 | 38 | 2.1 | 1.1 | 256 | 255 | — | — | 8.70 | — | 16.3 | 3 100 | 4 100 | 7940C | 51.2 | 212 | 268 | 2 | 6.85 |
| | 310 | 51 | 2.1 | 1.1 | 304 | 309 | — | — | 10.0 | — | — | 2 100 | 2 600 | 7040 | 99.1 | 212 | 298 | 2 | 12.7 |
| | 310 | 51 | 2.1 | 1.1 | 273 | 279 | — | — | 9.05 | — | — | 1 600 | 2 100 | 7040B | 132.5 | 212 | 298 | 2 | 12.7 |
| | 310 | 51 | 2.1 | 1.1 | 335 | 338 | — | — | 10.9 | — | 15.7 | 2 900 | 3 900 | 7040C | 59.7 | 212 | 298 | 2 | 12.7 |
| | 360 | 58 | 4 | 1.5 | 405 | 423 | — | — | 13.1 | — | — | 1 900 | 2 400 | 7240 | 109.8 | 218 | 342 | 3 | 22.4 |
| | 360 | 58 | 4 | 1.5 | 365 | 384 | — | — | 11.9 | — | — | 1 400 | 1 900 | 7240B | 146.5 | 218 | 342 | 3 | 22.4 |
| | 360 | 58 | 4 | 1.5 | 442 | 460 | — | — | 14.2 | — | 15.1 | 2 600 | 3 500 | 7240C | 66.5 | 218 | 342 | 3 | 22.4 |
| | 420 | 80 | 5 | 2 | 593 | 658 | — | — | 19.3 | — | — | 1 700 | 2 100 | 7340 | 129.5 | 222 | 398 | 4 | 52.0 |
| | 420 | 80 | 5 | 2 | 541 | 602 | — | — | 17.7 | — | — | 1 200 | 1 700 | 7340B | 170.1 | 222 | 398 | 4 | 52.0 |
| 220 | 340 | 56 | 3 | 1.1 | 334 | 353 | — | — | 10.9 | — | — | 1 900 | 2 400 | 7044 | 108.9 | 234 | 326 | 2.5 | 18.5 |
| | 340 | 56 | 3 | 1.1 | 299 | 318 | — | — | 9.80 | — | — | 1 400 | 1 900 | 7044B | 145.5 | 234 | 326 | 2.5 | 18.9 |
| 240 | 360 | 56 | 3 | 1.1 | 364 | 375 | — | — | 12.3 | — | — | 1 700 | 2 200 | 7048 | 114.6 | 254 | 346 | 2.5 | 19.7 |
| | 360 | 56 | 3 | 1.1 | 325 | 338 | — | — | 11.1 | — | — | 1 300 | 1 700 | 7048B | 153.9 | 254 | 346 | 2.5 | 20.1 |

[Notes]  1) Limiting speeds shown above are applicable to machined cage bearings.
Limiting speeds of pressed cage bearings should be kept to under 80% of this value.
For bearings with 15° contact angle, this figure is applied to the high precision bearings ranked higher than class 5, used with machined cage or molded cage.

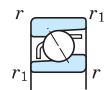2) B, C or no indication after the bearing number indicates nominal contact angle of 40°, 15° and 30° respectively.

[Remark]  Standard cage types used for the above bearings are described earlier in this section.
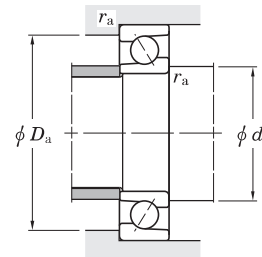
With machined cage    With pressed cage



| Boundary dimensions (mm) | | | | | Basic load ratings (kN) | | | | Fatigue load limits (kN) $C_u$ | | Factor | Limiting speeds [1] $(min^{-1})$ | | Bearing No. [2] | Load center (mm) | Mounting dimensions (mm) | | | (Refer.) Mass |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | With machined cage | | With pressed cage | | | | | | | | | | | | |
| $d$ | $D$ | $B$ | $r$ min. | $r_1$ min. | $C_r$ | $C_{0r}$ | $C_r$ | $C_{0r}$ | With machined cage | With pressed cage | $f_0$ | Grease lub. | Oil lub. | | $a$ | $d_a$ min. | $D_a$ max. | $r_a$ max. | (kg) |
| 240 | 440 | 72 | 4 | 1.5 | 504 | 595 | — | — | 16.7 | — | — | 1 500 | 1 800 | 7248 | 134.2 | 258 | 422 | 3 | 51.8 |
| | 440 | 72 | 4 | 1.5 | 453 | 539 | — | — | 15.1 | — | — | 1 100 | 1 500 | 7248B | 178.6 | 258 | 422 | 3 | 52.8 |
| 260 | 400 | 65 | 4 | 1.5 | 407 | 478 | — | — | 13.6 | — | — | 1 500 | 1 900 | 7052 | 128.4 | 278 | 382 | 3 | 28.7 |
| | 400 | 65 | 4 | 1.5 | 364 | 431 | — | — | 12.2 | — | — | 1 100 | 1 500 | 7052B | 171.0 | 278 | 382 | 3 | 29.3 |
| 280 | 420 | 65 | 4 | 1.5 | 415 | 507 | — | — | 14.0 | — | — | 1 400 | 1 800 | 7056 | 133.5 | 298 | 402 | 3 | 30.4 |
| | 420 | 65 | 4 | 1.5 | 384 | 453 | — | — | 13.1 | — | — | 1 100 | 1 400 | 7056B | 179.3 | 298 | 402 | 3 | 31.0 |
| 300 | 460 | 74 | 4 | 1.5 | 533 | 680 | — | — | 18.0 | — | — | 1 300 | 1 600 | 7060 | 146.7 | 318 | 442 | 3 | 43.7 |
| | 460 | 74 | 4 | 1.5 | 478 | 613 | — | — | 16.3 | — | — | 960 | 1 300 | 7060B | 196.4 | 318 | 442 | 3 | 44.9 |
| 320 | 480 | 74 | 4 | 1.5 | 546 | 722 | — | — | 18.6 | — | — | 1 200 | 1 500 | 7064 | 152.5 | 338 | 462 | 3 | 46.0 |
| | 480 | 74 | 4 | 1.5 | 489 | 651 | — | — | 16.8 | — | — | 890 | 1 200 | 7064B | 204.8 | 338 | 462 | 3 | 47.2 |
| 340 | 520 | 82 | 5 | 2 | 628 | 861 | — | — | 21.4 | — | — | 1 100 | 1 300 | 7068 | 165.1 | 362 | 498 | 4 | 61.8 |
| | 520 | 82 | 5 | 2 | 563 | 777 | — | — | 19.4 | — | — | 800 | 1 100 | 7068B | 221.4 | 362 | 498 | 4 | 63.3 |
| 360 | 540 | 82 | 5 | 2 | 644 | 913 | — | — | 22.2 | — | — | 1 000 | 1 300 | 7072 | 170.9 | 382 | 518 | 4 | 64.6 |
| | 540 | 82 | 5 | 2 | 577 | 824 | — | — | 20.1 | — | — | 750 | 1 000 | 7072B | 229.8 | 382 | 518 | 4 | 66.2 |
| 380 | 560 | 82 | 5 | 2 | 660 | 966 | — | — | 23.0 | — | — | 940 | 1 200 | 7076 | 176.7 | 402 | 538 | 4 | 67.2 |
| | 560 | 82 | 5 | 2 | 590 | 870 | — | — | 20.7 | — | — | 700 | 940 | 7076B | 238.2 | 402 | 538 | 4 | 69.1 |

[Notes]  1)  Limiting speeds shown above are applicable to machined cage bearings.
Limiting speeds of pressed cage bearings should be kept to under 80% of this value.
For bearings with 15° contact angle, this figure is applied to the high precision bearings ranked higher than class 5, used with machined cage or molded cage.

2)  B or no indication after the bearing number indicates nominal contact angle of 15° and 30° respectively.
[Remark]  Standard cage types used for the above bearings are described earlier in this section.