

For New Technology Network

NTN®

NTNcorporation

Ball Bearings

Shield and Seal Types

CAT. No. 3015-III/E



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NTN warrants, to the original purchaser only, that the delivered product which is the subject of this sale (a) will conform to drawings and specifications mutually established in writing as applicable to the contract, and (b) be free from defects in material or fabrication. The duration of this warranty is one year from date of delivery. If the buyer discovers within this period a failure of the product to conform to drawings or specifications, or a defect in material or fabrication, it must promptly notify NTN in writing. In no event shall such notification be received by NTN later than 13 months from the date of delivery. Within a reasonable time after such notification, NTN will, at its option, (a) correct any failure of the product to conform to drawings, specifications or any defect in material or workmanship, with either replacement or repair of the product, or (b) refund, in part or in whole, the purchase price. Such replacement and repair, excluding charges for labor, is at NTN's expense. All warranty service will be performed at service centers designated by NTN. These remedies are the purchaser's exclusive remedies for breach of warranty.

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Any action for breach of warranty or any other legal theory must be commenced within 15 months following delivery of the goods.

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This agreement allocates the risks of product failure between NTN and the purchaser. This allocation is recognized by both parties and is reflected in the price of the goods. The purchaser acknowledges that it has read this agreement, understands it, and is bound by its terms.

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NTN Ball Bearings

Shield and Seal Types

Machinery is being made smaller and more compact; the same is demanded of bearings.

NTN seal and shield type ball bearings are built to meet these trends.

They simplify shaft design, are maintenance-free, and are the bearing of choice for an increasing number of applications.

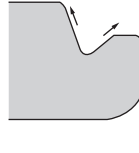


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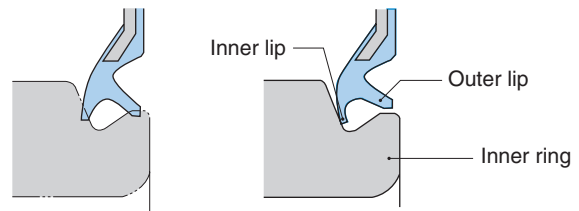
1 Grooved Type Sealing figure for Excellent Performance [all models]

A v-shaped groove is cut around the inner ring. Under centrifugal force, the outer surface of the v acts to keep out dirt; the inner surface of the v acts to seal in the grease.



3 Double-lip Seal Adjusts for Wear [LLU spec]

The inner lip of a double-lip seal is pressed against the inside surface of the V-groove; the outer lip is spread open by the elastic force of rubber to create a small gap between the outer lip and the inner ring. Should the inner lip wear, the contact pressure will decrease; however, the outer lip will get closer to the inner ring. In effect, a constant degree of sealing will be maintained; and, as a result, bearing service life will be noticeably lengthened.

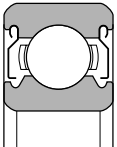
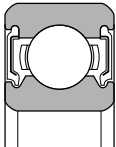
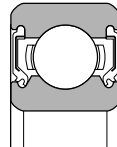
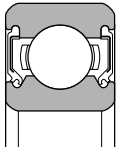


2 Rust Resistant Shield [ZZ spec]

In order to obtain rust resistant properties, the shield is made of a strip steel covered by a hard surface-coating. This assures long bearing service life and minimal noise levels.

1. Bearing Design and Features, Seal/Shield Bearing Types and Selection

Table 1 Bearing design and features

| Type, code no. | Shield type | Seal type | | | |
|------------------------|--|---|---|---|----------------------|
| | Non-contact type ZZ | Non-contact type LLB | Contact type LLU | Low torque type LLH | |
| Construction |  |  |  |  | |
| | <ul style="list-style-type: none"> • Metal shield plate is affixed to outside ring; inner ring incorporates a V-groove and labyrinth clearance. | <ul style="list-style-type: none"> • Outer ring incorporates synthetic rubber molded to a steel plate; seal edge is aligned with V-groove along inner ring surface with labyrinth clearance. | <ul style="list-style-type: none"> • Outer ring incorporates synthetic rubber molded to a steel plate; seal edge contacts V-groove along inner ring surface. | <ul style="list-style-type: none"> • Basic construction the same as LU type, but specially designed lip on edge of seal prevents penetration by foreign matter; low torque construction. | |
| Performance comparison | Torque | Very Low | Very Low | Medium | Low |
| | Dust proofing | Good | Very Good | Best | Excellent |
| | Water proofing | Poor | Poor | Very good | Good |
| | High speed capacity | Same as open type | Same as open type | Limited by contact seals | Better than LLU-type |
| | Allowable temp.range ① | Depends on lubricant | -25 °C ~ 120 °C | -25 °C ~ 110 °C | -25 °C ~ 120 °C |

① Please consult NTN Engineering about applications which exceed the allowable temperature range of products listed on this table.
 Note : This chart lists double shielded and double sealed bearings, but single shielded (Z) and single sealed (LB, LU, LH) are also available.
 Grease lubrication should be used with single shielded and single sealed bearings.

2. Test Data for Seal Performance

Friction torque and temperature rise test

Test Conditions

Bearings :6305
 Grease :Shell Alvania 3,3.5g packed
 Revolution :1800 r/min
 Time :20 minutes
 Load :radial load 29 N
 Quantity tested :5 pcs. each

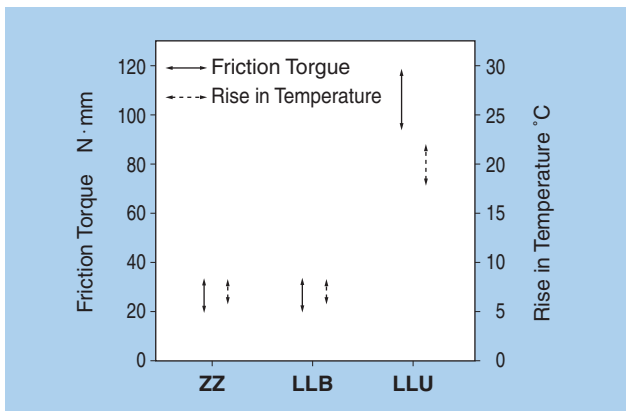
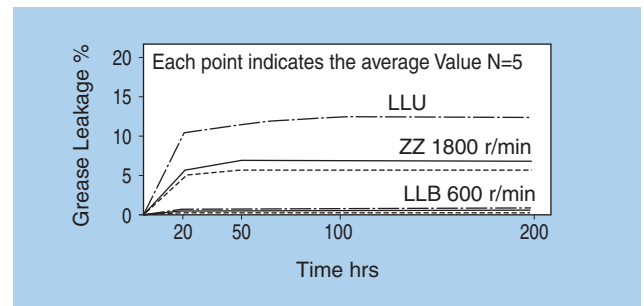


Figure 1. Friction torque and temperature rise test data

Grease leakage test

Test Conditions

Bearings :6305
 Grease :Shell Alvania 3,3.5g packed
 Revolution :1800 r/min, 600 r/min
 Atmospheric temperature :80°C
 Time :200 hrs
 Quantity tested :5 pcs. each



The larger grease leakage with the LLU at 1800 rpm is due to bearing temperature rise.

Figure 2. Grease leakage test data

Dust test

Test Conditions

Bearings :6305
 Grease :Shell Alvania 3,3.5g packed
 Revolution :1800 r/min
 Load :radial load 29 N
 Volume of testing machine :40 liter
 Dust :Oxidized ferrous powder (2kg) + lime (1.0kg) mixture
 Time :1 hour

Table 3 Dust resistance test data

| Type | 1 | 2 | 3 | 4 | average |
|------|-----|---|-----|-----|---------|
| ZZ | 2.5 | 2 | 2 | 2.5 | 2.25 |
| LLB | 2.5 | 3 | 2.5 | 2.5 | 2.62 |
| LLU | 3 | 3 | 3 | 3 | 3.00 |

Ratings 3 : Complete absence of dust
 2 : Slight presence of dust observed
 1 : Presence of dust clearly observed

Muddy water splash test

Test Conditions

Bearings :6304
 Grease :Shell Alvania 3,2g packed
 Revolution :3000 r/min
 Muddy water :5 wt% of class 8 of JIS Z 8901 Kanto loam powder
 Muddy water flow :30 cc/min
 Test time :10 cycles over 240 hrs (Each cycle consists of 3 hours of spraying and 21 hours of drying)

Table 4 Muddy water splash test data

| Type | 1 | 2 | 3 | 4 | 5 | average |
|------|---|---|---|---|---|---------|
| LLU | 3 | 2 | 2 | 4 | 3 | 2.8 |
| LLB | 2 | 1 | 1 | 2 | 2 | 1.6 |

Ratings 4 : No penetration whatsoever
 3 : Very slight penetration of muddy water is apparent
 2 : Some penetration of muddy water is apparent
 1 : Considerable penetration of muddy water is apparent

3. Service Life of Prelubricating Grease

The service life of filled grease is influenced by many factors: operating conditions, temperature, atmosphere, etc. There is even a considerable difference by grease brands. Keeping this in mind, **Figure 3** presents a scale for determining grease service life. It is based on actual and experimental data; and applies to high-quality grease used in ball bearings under normal operating conditions. As the working temperature increases, the grease life, of course, becomes shorter. Although not accurate for all greases, **Figure 3** is valid, in general, for working temperatures up to 80°C; for working temperatures over 80°C, service life decreases to about two-thirds for every 10° over 80°C. (Please note that this does not apply to calcium-soap and aluminum-soap greases.)

Example

The following method is used to obtain the grease life of deep groove ball bearing 6206ZZ at a radial load of 1520 N and a operating speed, n , of 3600 r/min. From the appropriate Dimension Table we find that the standard load rating, C_r , for a 6206ZZ bearings is 19500 N and the

limiting speed is 11000 r/min. (Use the value for ZZ or LLB even if the bearings of LLU specifications). Divide C_r by the equivalent radial load, P_r . You will obtain 12.8 (19500/1520≈12.8). Next go to **Figure 4** to determine the value for f_L . (For $C_r/P_r=12.8$, $f_L=1$). Find $f_L \cdot n_o/n$. (1.0 · 11000/3600≈3.1). With your value of $f_L \cdot n_o/n'$ (3.1 in this example) go to **Figure 3** and find this value on Scale II. Call this point B. The bore diameter, d , of the bearing is 30. Find this value on Scale I and call this point A. Draw a straight line between Points A and B. The line will intersect Scale III at some point which will be Called Point C. In this example, Point C is 17000 hours. This is the expected grease life of the bearing which is what we were looking for.

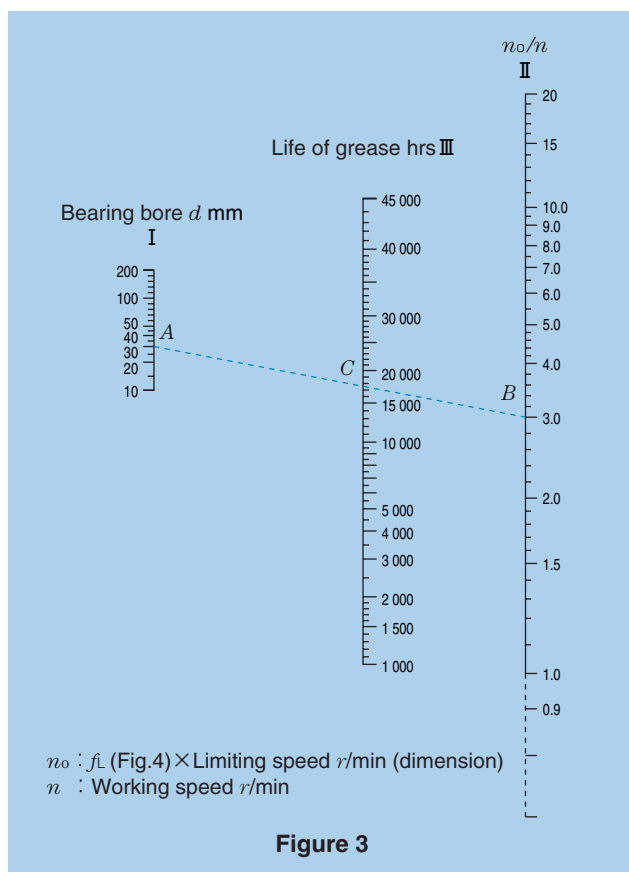


Figure 3

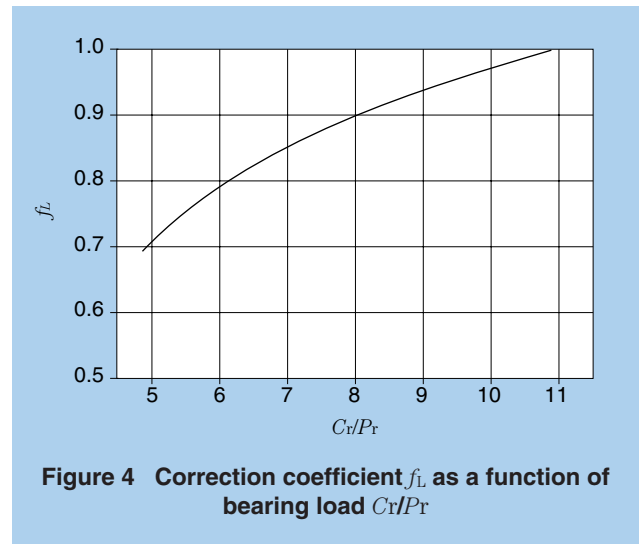


Figure 4 Correction coefficient f_L as a function of bearing load C_r/P_r

Note that NTN can also manufacture shield and seal type small diameter ball bearings of dimensions other than those shown on the subsequent dimension tables. Contact NTN for more information.

- Use under high or low temperature
- Low torque is required
- High speeds are required
- Grease leakage must be avoided
- Use under other special conditions

Also note that the performance of prelubricated ball bearings is affected by operating conditions and grease type. For information on performance under special conditions, please contact NTN.

4. Bearing Precision

Inner ring

- d = Nominal bore diameter
- Δd_{mp} = Single plane mean bore diameter deviation
- V_{dp} = Single radial plane bore diameter variation
- V_{dmp} = Mean single plane bore diameter variation
- K_{ia} = Inner ring radial runout
- S_d = Face runout with bore
- S_{ia} = Inner ring axial runout (with side)
- ΔB_s = Inner ring width deviation
- V_{Bs} = Inner ring width variation

Outer ring

- D = Nominal outside diameter
- ΔD_{mp} = Single plane mean outside diameter deviation
- V_{Dp} = Single radial plane outside diameter variation
- V_{Dmp} = Mean single plane outside diameter variation
- K_{ea} = Outer ring radial runout
- S_D = Outside surface inclination
- S_{ea} = Outside ring axial runout
- ΔC_s = Outer ring width deviation
- V_{Cs} = Outer ring width variation

(1) Inner ring tolerance

Unit μm

| d (mm) | Δd_{mp} | | | | V_{dp} | | | | | | | | | | | | V_{dmp} | K_{ia} | | | | S_d | S_{ia} | ΔB_s | | V_{Bs} | | | | | | | | |
|-------------|-----------------|----------|----------|----------|-----------------------|---------|---------|---------|-------------------|---------|---------|---------|-----------------------|---------|---------|---------|-----------|----------|---------|---------|---------|-------|----------|--------------|---------|----------|---------|---------|---------|---------|---------|---------|---------|---------|
| | | | | | Bearing series 68, 69 | | | | Bearing series 60 | | | | Bearing series 62, 63 | | | | | | | | | | | | | | | | | | | | | |
| | Class 0 | Class 6 | Class 5 | Class 4 | Class 0 | Class 6 | Class 5 | Class 4 | Class 0 | Class 6 | Class 5 | Class 4 | Class 0 | Class 6 | Class 5 | Class 4 | | Class 0 | Class 6 | Class 5 | Class 4 | | | Class 0 | Class 6 | Class 5 | Class 4 | Class 0 | Class 6 | Class 5 | Class 4 | Class 0 | Class 6 | Class 5 |
| over incl. | high low | high low | high low | high low | max | | | | max | | | | max | | | | max | max | | | | max | high low | high low | max | | | | | | | | | |
| 2.5 10 | 0 - 8 | 0 - 7 | 0 - 5 | 0 - 4 | 10 | 9 | 5 | 4 | 8 | 7 | 4 | 3 | 6 | 5 | 4 | 3 | 6 | 5 | 3 | 2 | 10 | 6 | 4 | 2.5 | 7 | 3 | 7 | 3 | 0 - 120 | 0 - 40 | 15 | 15 | 5 | 2.5 |
| 10 18 | 0 - 8 | 0 - 7 | 0 - 5 | 0 - 4 | 10 | 9 | 5 | 4 | 8 | 7 | 4 | 3 | 6 | 5 | 4 | 3 | 6 | 5 | 3 | 2 | 10 | 7 | 4 | 2.5 | 7 | 3 | 7 | 3 | 0 - 120 | 0 - 80 | 20 | 20 | 5 | 2.5 |
| 18 30 | 0 - 10 | 0 - 8 | 0 - 6 | 0 - 5 | 13 | 10 | 6 | 5 | 10 | 8 | 5 | 4 | 8 | 6 | 5 | 4 | 8 | 6 | 3 | 2.5 | 13 | 8 | 4 | 3 | 8 | 4 | 8 | 4 | 0 - 120 | 0 - 120 | 20 | 20 | 5 | 2.5 |
| 30 50 | 0 - 12 | 0 - 10 | 0 - 8 | 0 - 6 | 15 | 13 | 8 | 6 | 12 | 10 | 6 | 5 | 9 | 8 | 6 | 5 | 9 | 8 | 4 | 3 | 15 | 10 | 5 | 4 | 8 | 4 | 8 | 4 | 0 - 120 | 0 - 120 | 20 | 20 | 5 | 3 |
| 50 80 | 0 - 15 | 0 - 12 | 0 - 9 | 0 - 7 | 19 | 15 | 9 | 7 | 19 | 15 | 7 | 5 | 11 | 9 | 7 | 5 | 11 | 9 | 5 | 3.5 | 20 | 10 | 5 | 4 | 8 | 5 | 8 | 5 | 0 - 150 | 0 - 150 | 25 | 25 | 6 | 4 |
| 80 120 | 0 - 20 | 0 - 15 | 0 - 10 | 0 - 8 | 25 | 19 | 10 | 8 | 25 | 19 | 8 | 6 | 15 | 11 | 8 | 6 | 15 | 11 | 5 | 4 | 25 | 13 | 6 | 5 | 9 | 5 | 9 | 5 | 0 - 200 | 0 - 200 | 25 | 25 | 7 | 4 |
| 120 180 | 0 - 25 | 0 - 18 | 0 - 13 | 0 - 10 | 31 | 23 | 13 | 10 | 31 | 23 | 10 | 8 | 19 | 14 | 10 | 8 | 19 | 14 | 7 | 5 | 30 | 18 | 8 | 6 | 10 | 6 | 10 | 7 | 0 - 250 | 0 - 250 | 30 | 30 | 8 | 5 |

① The dimensional difference $\Delta_{i/s}$ of bore diameter to be applied for class 4 and 2 is the same as the tolerance of dimensional difference Δ_{imp} of average bore diameter. However, the dimensional difference is applied to diameter series 0, 1, 2, 3 and 4 against Class 4, and to all the diameter series against Class 2.

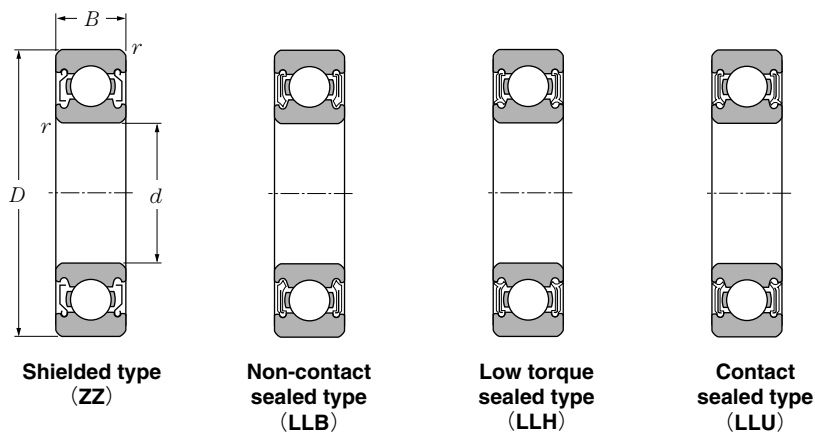
(2) Outer ring tolerance

Unit μm

| D (mm) | ΔD_{mp} | | | | V_{Dp} | | V_{Dmp} | | | | K_{ea} | | | | S_D | S_{ea} | ΔC_s | V_{Cs} | | | | |
|-------------|-----------------|----------|----------|----------|-----------------------|---------------------------|-----------|---------|---------|---------|----------|---------|---------|---------|-------|----------|--------------|----------|---|--|---------|----------|
| | | | | | Bearing series 62, 63 | Bearing series 60, 62, 63 | | | | | | | | | | | | | | | | |
| | Class 0 | Class 6 | Class 5 | Class 4 | Class 0 | Class 6 | Class 0 | Class 6 | Class 5 | Class 4 | Class 0 | Class 6 | Class 5 | Class 4 | | | | Class 5 | Class 4 | Class 5 | Class 4 | all type |
| over incl. | high low | high low | high low | high low | max | | max | | | | max | | | | max | max | high low | max | | | | |
| 18 30 | 0 - 9 | 0 - 8 | 0 - 6 | 0 - 5 | 12 | 10 | 7 | 6 | 3 | 2.5 | 15 | 9 | 6 | 4 | 8 | 4 | 8 | 5 | Identical to $\Delta_{i/s}$ of inner ring of same bearing | Identical to $\Delta_{i/s}$ and V_{Bs} of inner ring of same bearing | 5 | 2.5 |
| 30 50 | 0 - 11 | 0 - 9 | 0 - 7 | 0 - 6 | 16 | 13 | 8 | 7 | 4 | 3 | 20 | 10 | 7 | 5 | 8 | 4 | 8 | 5 | | | 5 | 2.5 |
| 50 80 | 0 - 13 | 0 - 11 | 0 - 9 | 0 - 7 | 20 | 16 | 10 | 8 | 5 | 3.5 | 25 | 13 | 8 | 5 | 8 | 4 | 10 | 5 | | | 6 | 3 |
| 80 120 | 0 - 15 | 0 - 13 | 0 - 10 | 0 - 8 | 26 | 20 | 11 | 10 | 5 | 4 | 35 | 18 | 10 | 6 | 9 | 5 | 11 | 6 | | | 8 | 4 |
| 120 150 | 0 - 18 | 0 - 15 | 0 - 11 | 0 - 9 | 30 | 25 | 14 | 11 | 6 | 5 | 40 | 20 | 11 | 7 | 10 | 5 | 13 | 7 | | | 8 | 5 |
| 150 180 | 0 - 25 | 0 - 18 | 0 - 13 | 0 - 10 | 38 | 30 | 19 | 14 | 7 | 5 | 45 | 23 | 13 | 8 | 10 | 5 | 14 | 8 | | | 8 | 5 |
| 180 250 | 0 - 30 | 0 - 20 | 0 - 15 | 0 - 11 | 45 | 35 | 23 | 15 | 8 | 6 | 50 | 25 | 15 | 10 | 11 | 7 | 15 | 10 | | | 10 | 7 |

② Same as ① but $\Delta_{i/s} + \Delta_{imp}$ rather than $\Delta_{i/s} + \Delta_{imp}$

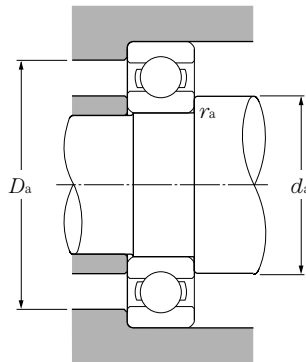
5. Dimension Tables



d 10~25mm

| d | Boundary dimensions | | | Basic load ratings | | | | Limiting speeds | | |
|----|---------------------|----|----------------------|--------------------|-----------------|----------------|-----------------|------------------|--------|--------|
| | mm | | | dynamic | static | dynamic | static | rpm | | |
| | D | B | r's min ^① | C _r | C _{or} | C _r | C _{or} | grease ZZ LLB | LLH | LLU |
| 10 | 19 | 5 | 0.3 | 1.83 | 0.925 | 187 | 94 | 32 000 | — | 24 000 |
| | 22 | 6 | 0.3 | 2.7 | 1.27 | 275 | 129 | 30 000 | — | 21 000 |
| | 26 | 8 | 0.3 | 4.55 | 1.96 | 465 | 200 | 29 000 | 25 000 | 21 000 |
| | 30 | 9 | 0.6 | 5.10 | 2.39 | 520 | 244 | 25 000 | 21 000 | 18 000 |
| | 35 | 11 | 0.6 | 8.20 | 3.50 | 835 | 355 | 23 000 | 20 000 | 16 000 |
| 12 | 21 | 5 | 0.3 | 1.92 | 1.04 | 195 | 106 | 29 000 | — | 20 000 |
| | 24 | 6 | 0.3 | 2.89 | 1.46 | 295 | 149 | 27 000 | — | 19 000 |
| | 28 | 8 | 0.3 | 5.10 | 2.39 | 520 | 244 | 26 000 | 21 000 | 18 000 |
| | 32 | 10 | 0.6 | 6.10 | 2.75 | 620 | 280 | 22 000 | 20 000 | 16 000 |
| | 37 | 12 | 1 | 9.70 | 4.20 | 990 | 425 | 20 000 | 19 000 | 15 000 |
| 15 | 24 | 5 | 0.3 | 2.08 | 1.26 | 212 | 128 | 26 000 | — | 17 000 |
| | 28 | 7 | 0.3 | 3.65 | 2.00 | 375 | 204 | 24 000 | — | 16 000 |
| | 32 | 9 | 0.3 | 5.60 | 2.84 | 570 | 289 | 22 000 | 18 000 | 15 000 |
| | 35 | 11 | 0.6 | 7.75 | 3.60 | 790 | 365 | 19 000 | 18 000 | 15 000 |
| | 42 | 13 | 1 | 11.4 | 5.45 | 1 170 | 555 | 17 000 | 15 000 | 12 000 |
| 17 | 26 | 5 | 0.3 | 2.23 | 1.46 | 227 | 149 | 24 000 | — | 15 000 |
| | 30 | 7 | 0.3 | 4.65 | 2.58 | 475 | 263 | 22 000 | — | 14 000 |
| | 35 | 10 | 0.3 | 6.80 | 3.35 | 695 | 345 | 20 000 | 16 000 | 14 000 |
| | 40 | 12 | 0.6 | 9.60 | 4.60 | 980 | 465 | 18 000 | 15 000 | 12 000 |
| | 47 | 14 | 1 | 13.5 | 6.55 | 1 380 | 665 | 16 000 | 14 000 | 11 000 |
| 20 | 32 | 7 | 0.3 | 4.00 | 2.47 | 410 | 252 | 21 000 | — | 13 000 |
| | 37 | 9 | 0.3 | 6.40 | 3.70 | 650 | 375 | 19 000 | — | 12 000 |
| | 42 | 12 | 0.6 | 9.40 | 5.05 | 955 | 515 | 18 000 | 13 000 | 11 000 |
| | 47 | 14 | 1 | 12.8 | 6.65 | 1 310 | 680 | 16 000 | 12 000 | 10 000 |
| | 52 | 15 | 1.1 | 15.9 | 7.90 | 1 620 | 805 | 14 000 | 12 000 | 10 000 |
| 22 | 44 | 12 | 0.6 | 9.40 | 5.05 | 955 | 515 | 17 000 | 13 000 | 10 000 |
| | 50 | 14 | 1 | 12.9 | 6.80 | 1 320 | 690 | 14 000 | 12 000 | 9 700 |
| | 56 | 16 | 1.1 | 18.4 | 9.25 | 1 880 | 945 | 13 000 | 11 000 | 9 200 |
| 25 | 37 | 7 | 0.3 | 4.30 | 2.95 | 435 | 300 | 18 000 | — | 10 000 |
| | 42 | 9 | 0.3 | 7.05 | 4.55 | 715 | 460 | 16 000 | — | 9 800 |
| | 47 | 12 | 0.6 | 10.1 | 5.85 | 1 030 | 595 | 15 000 | 11 000 | 9 400 |
| | 52 | 15 | 1 | 14.0 | 7.85 | 1 430 | 800 | 13 000 | 11 000 | 8 900 |
| | 62 | 17 | 1.1 | 21.2 | 10.9 | 2 160 | 1 110 | 12 000 | 9 700 | 8 100 |

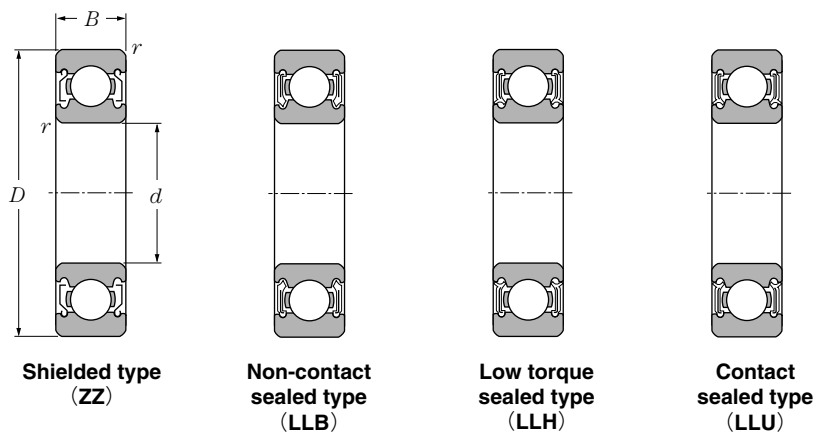
① Smallest allowable dimension for chamfer dimension r.



| Bearing numbers ^② | | | | Abutment and fillet dimensions | | | | Mass |
|------------------------------|------------------|-----------------|--------------|--------------------------------|------------------------|--------------------|--------------|--------------|
| Sealed type | Non-contact type | Low torque type | Contact type | mm | | D_a ^③ | r_{as} max | kg (approx.) |
| | | | | d_a ^③ min | d_a ^③ max | | | |
| 6800ZZ | 6800LLB | — | 6800LLU | 12 | 12.5 | 17 | 0.3 | 0.005 |
| 6900ZZ | 6900LLB | — | 6900LLU | 12 | 13 | 20 | 0.3 | 0.009 |
| 6000ZZ | 6000LLB | 6000LLH | 6000LLU | 12 | 13.5 | 24 | 0.3 | 0.019 |
| 6200ZZ | 6200LLB | 6200LLH | 6200LLU | 14 | 16 | 26 | 0.6 | 0.032 |
| 6300ZZ | 6300LLB | 6300LLH | 6300LLU | 14 | 17 | 31 | 0.6 | 0.053 |
| 6801ZZ | 6801LLB | — | 6801LLU | 14 | 14.5 | 19 | 0.3 | 0.006 |
| 6901ZZ | 6901LLB | — | 6901LLU | 14 | 15 | 22 | 0.3 | 0.011 |
| 6001ZZ | 6001LLB | 6001LLH | 6001LLU | 14 | 16 | 26 | 0.3 | 0.021 |
| 6201ZZ | 6201LLB | 6201LLH | 6201LLU | 16 | 17 | 28 | 0.6 | 0.037 |
| 6301ZZ | 6301LLB | 6301LLH | 6301LLU | 17 | 18.5 | 32 | 1 | 0.06 |
| 6802ZZ | 6802LLB | — | 6802LLU | 17 | 17.5 | 22 | 0.3 | 0.007 |
| 6902ZZ | 6902LLB | — | 6902LLU | 17 | 17.5 | 26 | 0.3 | 0.016 |
| 6002ZZ | 6002LLB | 6002LLH | 6002LLU | 17 | 19 | 30 | 0.3 | 0.03 |
| 6202ZZ | 6202LLB | 6202LLH | 6202LLU | 19 | 20 | 31 | 0.6 | 0.045 |
| 6302ZZ | 6302LLB | 6302LLH | 6302LLU | 20 | 23 | 37 | 1 | 0.082 |
| 6803ZZ | 6803LLB | — | 6803LLU | 19 | 19.5 | 24 | 0.3 | 0.008 |
| 6903ZZ | 6903LLB | — | 6903LLU | 19 | 20 | 28 | 0.3 | 0.018 |
| 6003ZZ | 6003LLB | 6003LLH | 6003LLU | 19 | 21 | 33 | 0.3 | 0.039 |
| 6203ZZ | 6203LLB | 6203LLH | 6203LLU | 21 | 23 | 36 | 0.6 | 0.066 |
| 6303ZZ | 6303LLB | 6303LLH | 6303LLU | 22 | 25 | 42 | 1 | 0.115 |
| 6804ZZ | 6804LLB | — | 6804LLU | 22 | 22.5 | 30 | 0.3 | 0.019 |
| 6904ZZ | 6904LLB | — | 6904LLU | 22 | 24 | 35 | 0.3 | 0.036 |
| 6004ZZ | 6004LLB | 6004LLH | 6004LLU | 24 | 26 | 38 | 0.6 | 0.069 |
| 6204ZZ | 6204LLB | 6204LLH | 6204LLU | 25 | 28 | 42 | 1 | 0.106 |
| 6304ZZ | 6304LLB | 6304LLH | 6304LLU | 26.5 | 28.5 | 45.5 | 1 | 0.144 |
| 60/22ZZ | 60/22LLB | 60/22LLH | 60/22LLU | 26 | 26.5 | 40 | 0.6 | 0.074 |
| 62/22ZZ | 62/22LLB | 62/22LLH | 62/22LLU | 27 | 29.5 | 45 | 1 | 0.117 |
| 63/22ZZ | 63/22LLB | 63/22LLH | 63/22LLU | 28.5 | 31 | 49.5 | 1 | 0.176 |
| 6805ZZ | 6805LLB | — | 6805LLU | 27 | 28 | 35 | 0.3 | 0.022 |
| 6905ZZ | 6905LLB | — | 6905LLU | 27 | 29 | 40 | 0.3 | 0.042 |
| 6005ZZ | 6005LLB | 6005LLH | 6005LLU | 29 | 30.5 | 43 | 0.6 | 0.08 |
| 6205ZZ | 6205LLB | 6205LLH | 6205LLU | 30 | 32 | 47 | 1 | 0.128 |
| 6305ZZ | 6305LLB | 6305LLH | 6305LLU | 31.5 | 35 | 55.5 | 1 | 0.232 |

^② Single sealed and shielded bearings are also available.
^③ This dimension applies to sealed and shielded bearings.

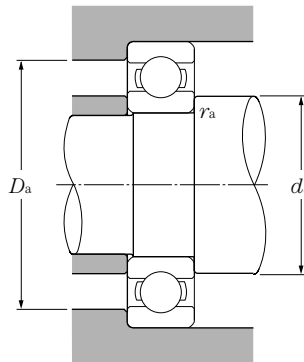
NTN Ball Bearings Shield and Seal Types



d 28~55mm

| d | Boundary dimensions | | | Basic load ratings | | | | Limiting speeds | | |
|----|---------------------|----|----------------------|--------------------|-----------------|----------------|-----------------|------------------|--------|-------|
| | mm | | | dynamic | static | dynamic | static | rpm | | |
| | D | B | r's min ^① | C _r | C _{or} | C _r | C _{or} | grease ZZ LLB | LLH | LLU |
| 28 | 52 | 12 | 0.6 | 12.5 | 7.40 | 1 270 | 755 | 14 000 | 10 000 | 8 400 |
| | 58 | 16 | 1 | 17.9 | 9.75 | 1 830 | 995 | 12 000 | 9 700 | 8 100 |
| | 68 | 18 | 1.1 | 26.7 | 14.0 | 2 730 | 1 430 | 11 000 | 8 900 | 7 400 |
| 30 | 42 | 7 | 0.3 | 4.70 | 3.65 | 480 | 370 | 15 000 | — | 8 800 |
| | 47 | 9 | 0.3 | 7.25 | 5.00 | 740 | 510 | 14 000 | — | 8 400 |
| | 55 | 13 | 1 | 13.2 | 8.3 | 1 350 | 845 | 13 000 | 9 200 | 7 700 |
| | 62 | 16 | 1 | 19.5 | 11.3 | 1 980 | 1 150 | 11 000 | 8 800 | 7 300 |
| | 72 | 19 | 1.1 | 26.7 | 15.0 | 2 720 | 1 530 | 10 000 | 7 900 | 6 600 |
| 32 | 58 | 13 | 1 | 11.8 | 8.05 | 1 200 | 820 | 12 000 | 8 700 | 7 200 |
| | 65 | 17 | 1 | 20.7 | 11.6 | 2 110 | 1 190 | 11 000 | 8 400 | 7 100 |
| | 75 | 20 | 1.1 | 29.8 | 16.9 | 3 050 | 1 730 | 9 500 | 7 700 | 6 500 |
| 35 | 47 | 7 | 0.3 | 4.90 | 4.05 | 500 | 410 | 13 000 | — | 7 600 |
| | 55 | 10 | 0.6 | 9.55 | 6.85 | 975 | 695 | 12 000 | — | 7 100 |
| | 62 | 14 | 1 | 16.0 | 10.3 | 1 630 | 1 050 | 12 000 | 8 200 | 6 800 |
| | 72 | 17 | 1.1 | 25.7 | 15.3 | 2 620 | 1 560 | 9 800 | 7 600 | 6 300 |
| | 80 | 21 | 1.5 | 33.5 | 19.1 | 3 400 | 1 950 | 8 800 | 7 300 | 6 000 |
| 40 | 52 | 7 | 0.3 | 5.10 | 4.40 | 520 | 445 | 12 000 | — | 6 700 |
| | 62 | 12 | 0.6 | 12.2 | 8.90 | 1 240 | 910 | 11 000 | — | 6 300 |
| | 68 | 15 | 1 | 16.8 | 11.5 | 1 710 | 1 170 | 10 000 | 7 300 | 6 100 |
| | 80 | 18 | 1.1 | 29.1 | 17.8 | 2 970 | 1 820 | 8 700 | 6 700 | 5 600 |
| | 90 | 23 | 1.5 | 40.5 | 24.0 | 4 150 | 2 450 | 7 800 | 6 400 | 5 300 |
| 45 | 58 | 7 | 0.3 | 5.35 | 4.95 | 550 | 500 | 11 000 | — | 5 900 |
| | 68 | 12 | 0.6 | 13.1 | 10.4 | 1 330 | 1 060 | 9 800 | — | 5 600 |
| | 75 | 16 | 1 | 21.0 | 15.1 | 2 140 | 1 540 | 9 200 | 6 500 | 5 400 |
| | 85 | 19 | 1.1 | 32.5 | 20.4 | 3 350 | 2 080 | 7 800 | 6 200 | 5 200 |
| | 100 | 25 | 1.5 | 53.0 | 32.0 | 5 400 | 3 250 | 7 000 | 5 600 | 4 700 |
| 50 | 65 | 7 | 0.3 | 6.60 | 6.10 | 670 | 620 | 9 600 | — | 5 300 |
| | 72 | 12 | 0.6 | 13.4 | 11.2 | 1 370 | 1 140 | 8 900 | — | 5 100 |
| | 80 | 16 | 1 | 21.8 | 16.6 | 2 230 | 1 690 | 8 400 | 6 000 | 5 000 |
| | 90 | 20 | 1.1 | 35.0 | 23.2 | 3 600 | 2 370 | 7 100 | 5 700 | 4 700 |
| | 110 | 27 | 2 | 62.0 | 38.5 | 6 300 | 3 900 | 6 400 | 5 000 | 4 200 |
| 55 | 72 | 9 | 0.3 | 8.80 | 8.10 | 900 | 825 | 8 700 | — | 4 800 |

① Smallest allowable dimension for chamfer dimension r.

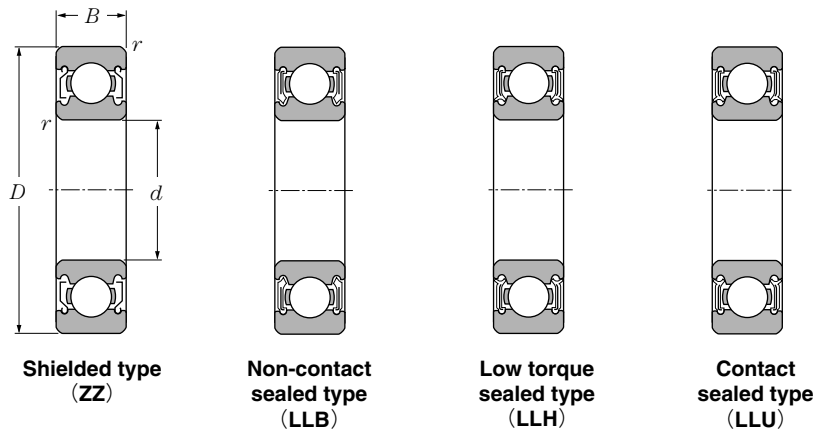


| Bearing numbers ^② | | | | Abutment and fillet dimensions | | | | Mass |
|------------------------------|------------------|-----------------|--------------|--------------------------------|------------------------|--------------------|--------------|--------------|
| Sealed type | Non-contact type | Low torque type | Contact type | mm | | D_a ^③ | r_{as} max | kg (approx.) |
| | | | | d_a ^③ min | d_a ^③ max | | | |
| 60/28ZZ | 60/28LLB | 60/28LLH | 60/28LLU | 32 | 34 | 48 | 0.6 | 0.098 |
| 62/28ZZ | 62/28LLB | 62/28LLH | 62/28LLU | 33 | 35.5 | 53 | 1 | 0.171 |
| 63/28ZZ | 63/28LLB | 63/28LLH | 63/28LLU | 34.5 | 38.5 | 61.5 | 1 | 0.284 |
| 6806ZZ | 6806LLB | — | 6806LLU | 32 | 33 | 40 | 0.3 | 0.026 |
| 6906ZZ | 6906LLB | — | 6906LLU | 32 | 34 | 45 | 0.3 | 0.048 |
| 6006ZZ | 6006LLB | 6006LLH | 6006LLU | 35 | 37 | 50 | 1 | 0.116 |
| 6206ZZ | 6206LLB | 6206LLH | 6206LLU | 35 | 39 | 57 | 1 | 0.199 |
| 6306ZZ | 6306LLB | 6306LLH | 6306LLU | 36.5 | 43 | 65.5 | 1 | 0.36 |
| 60/32ZZ | 60/32LLB | 60/32LLH | 60/32LLU | 37 | 39 | 53 | 1 | 0.129 |
| 62/32ZZ | 62/32LLB | 62/32LLH | 62/32LLU | 37 | 40 | 60 | 1 | 0.226 |
| 63/32ZZ | 63/32LLB | 63/32LLH | 63/32LLU | 38.5 | 43.5 | 68.5 | 1 | 0.382 |
| 6807ZZ | 6807LLB | — | 6807LLU | 37 | 38 | 45 | 0.3 | 0.029 |
| 6907ZZ | 6907LLB | — | 6907LLU | 39 | 40 | 51 | 0.6 | 0.074 |
| 6007ZZ | 6007LLB | 6007LLH | 6007LLU | 40 | 42 | 57 | 1 | 0.155 |
| 6207ZZ | 6207LLB | 6207LLH | 6207LLU | 41.5 | 45 | 65.5 | 1 | 0.288 |
| 6307ZZ | 6307LLB | 6307LLH | 6307LLU | 43 | 47 | 72 | 1.5 | 0.457 |
| 6808ZZ | 6808LLB | — | 6808LLU | 42 | 43 | 50 | 0.3 | 0.033 |
| 6908ZZ | 6908LLB | — | 6908LLU | 44 | 45 | 58 | 0.6 | 0.11 |
| 6008ZZ | 6008LLB | 6008LLH | 6008LLU | 45 | 47 | 63 | 1 | 0.19 |
| 6208ZZ | 6208LLB | 6208LLH | 6208LLU | 46.5 | 51 | 73.5 | 1 | 0.366 |
| 6308ZZ | 6308LLB | 6308LLH | 6308LLU | 48 | 54 | 82 | 1.5 | 0.63 |
| 6809ZZ | 6809LLB | — | 6809LLU | 47 | 48 | 56 | 0.3 | 0.04 |
| 6909ZZ | 6909LLB | — | 6909LLU | 49 | 51 | 64 | 0.6 | 0.128 |
| 6009ZZ | 6009LLB | 6009LLH | 6009LLU | 50 | 52.5 | 70 | 1 | 0.237 |
| 6209ZZ | 6209LLB | 6209LLH | 6209LLU | 51.5 | 55.5 | 78.5 | 1 | 0.398 |
| 6309ZZ | 6309LLB | 6309LLH | 6309LLU | 53 | 61.5 | 92 | 1.5 | 0.814 |
| 6810ZZ | 6810LLB | — | 6810LLU | 52 | 54 | 63 | 0.3 | 0.052 |
| 6910ZZ | 6910LLB | — | 6910LLU | 54 | 55.5 | 68 | 0.6 | 0.132 |
| 6010ZZ | 6010LLB | 6010LLH | 6010LLU | 55 | 57.5 | 75 | 1 | 0.261 |
| 6210ZZ | 6210LLB | 6210LLH | 6210LLU | 56.5 | 60 | 83.5 | 1 | 0.454 |
| 6310ZZ | 6310LLB | 6310LLH | 6310LLU | 59 | 68.5 | 101 | 2 | 1.07 |
| 6811ZZ | 6811LLB | — | 6811LLU | 57 | 59 | 70 | 0.3 | 0.083 |

^② Single sealed and shielded bearings are also available.

^③ This dimension applies to sealed and shielded bearings.

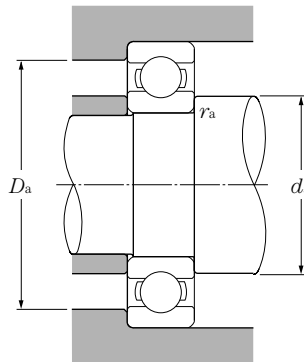
NTN Ball Bearings Shield and Seal Types



d 55~85mm

| d | Boundary dimensions | | | Basic load ratings | | | | Limiting speeds | | |
|----|---------------------|----|----------------------|--------------------|-----------------|----------------|-----------------|-----------------|-----|-------|
| | mm | | | dynamic | static | dynamic | static | grease | rpm | |
| | D | B | r's min ^① | C _r | C _{or} | C _r | C _{or} | ZZ LLB | LLH | LLU |
| 55 | 80 | 13 | 1 | 16.0 | 13.3 | 1 630 | 1 350 | 8 200 | — | 4 600 |
| | 90 | 18 | 1.1 | 28.3 | 21.2 | 2 880 | 2 170 | 7 700 | — | 4 500 |
| | 100 | 21 | 1.5 | 43.5 | 29.2 | 4 450 | 2 980 | 6 400 | — | 4 300 |
| | 120 | 29 | 2 | 71.5 | 45.0 | 7 300 | 4 600 | 5 800 | — | 3 900 |
| 60 | 78 | 10 | 0.3 | 11.5 | 10.6 | 1 170 | 1 080 | 8 000 | — | 4 400 |
| | 85 | 13 | 1 | 16.4 | 14.3 | 1 670 | 1 450 | 7 600 | — | 4 300 |
| | 95 | 18 | 1.1 | 29.5 | 23.2 | 3 000 | 2 370 | 7 000 | — | 4 100 |
| | 110 | 22 | 1.5 | 52.5 | 36.0 | 5 350 | 3 700 | 6 000 | — | 3 800 |
| | 130 | 31 | 2.1 | 82.0 | 52.0 | 8 350 | 5 300 | 5 400 | — | 3 600 |
| 65 | 85 | 10 | 0.6 | 11.6 | 11.0 | 1 180 | 1 120 | 7 400 | — | 4 100 |
| | 90 | 13 | 1 | 17.4 | 16.1 | 1 770 | 1 640 | 7 000 | — | 4 000 |
| | 100 | 18 | 1.1 | 30.5 | 25.2 | 3 100 | 2 570 | 6 500 | — | 3 900 |
| | 120 | 23 | 1.5 | 57.5 | 40.0 | 5 850 | 4 100 | 5 500 | — | 3 600 |
| | 140 | 33 | 2.1 | 92.5 | 60.0 | 9 450 | 6 100 | 4 900 | — | 3 300 |
| 70 | 90 | 10 | 0.6 | 12.1 | 11.9 | 1 230 | 1 220 | 6 900 | — | 3 800 |
| | 100 | 16 | 1 | 23.7 | 21.2 | 2 420 | 2 160 | 6 500 | — | 3 700 |
| | 110 | 20 | 1.1 | 38.0 | 31.0 | 3 900 | 3 150 | 6 100 | — | 3 600 |
| | 125 | 24 | 1.5 | 62.0 | 44.0 | 6 350 | 4 500 | 5 100 | — | 3 400 |
| | 150 | 35 | 2.1 | 104 | 68.0 | 10 600 | 6 950 | 4 600 | — | 3 100 |
| 75 | 95 | 10 | 0.6 | 12.5 | 12.9 | 1 280 | 1 310 | 6 400 | — | 3 600 |
| | 105 | 16 | 1 | 24.4 | 22.6 | 2 480 | 2 300 | 6 100 | — | 3 500 |
| | 115 | 20 | 1.1 | 39.5 | 33.5 | 4 050 | 3 400 | 5 700 | — | 3 300 |
| | 130 | 25 | 1.5 | 66.0 | 49.5 | 6 750 | 5 050 | 4 800 | — | 3 200 |
| | 160 | 37 | 2.1 | 113 | 77.0 | 11 600 | 7 850 | 4 300 | — | 2 900 |
| 80 | 100 | 10 | 0.6 | 12.7 | 13.3 | 1 290 | 1 360 | 6 000 | — | 3 400 |
| | 110 | 16 | 1 | 24.9 | 24.0 | 2 540 | 2 450 | 5 700 | — | 3 200 |
| | 125 | 22 | 1.1 | 47.5 | 40.0 | 4 850 | 4 050 | 5 300 | — | 3 100 |
| | 140 | 26 | 2 | 72.5 | 53.0 | 7 400 | 5 400 | 4 500 | — | 3 000 |
| | 170 | 39 | 2.1 | 123 | 86.5 | 12 500 | 8 850 | 4 000 | — | 2 700 |
| 85 | 110 | 13 | 1 | 18.7 | 19.0 | 1 910 | 1 940 | 5 700 | — | 3 100 |
| | 120 | 18 | 1.1 | 32.0 | 29.6 | 3 250 | 3 000 | 5 400 | — | 3 000 |
| | 130 | 22 | 1.1 | 49.5 | 43.0 | 5 050 | 4 400 | 5 000 | — | 2 900 |
| | 150 | 28 | 2 | 83.5 | 64.0 | 8 500 | 6 500 | 4 200 | — | 2 800 |

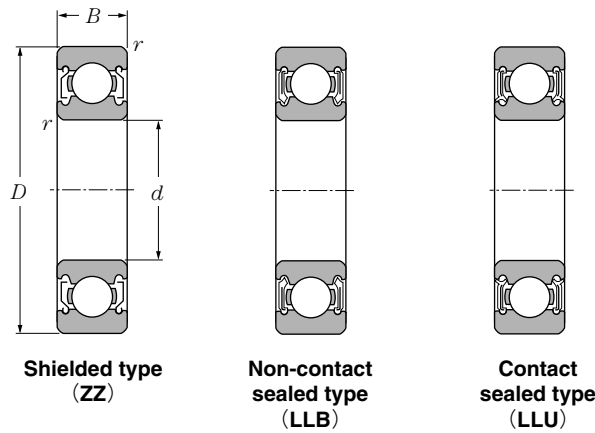
① Smallest allowable dimension for chamfer dimension r .



| Bearing numbers ^② | | | | Abutment and fillet dimensions | | | | Mass |
|------------------------------|------------------|-----------------|--------------|--------------------------------|------------------------|--------------------|----------|--------------|
| Sealed type | Non-contact type | Low torque type | Contact type | mm | | D_a ^③ | r_{as} | kg (approx.) |
| | | | | d_a ^③ min | d_a ^③ max | | | |
| 6911ZZ | 6911LLB | — | 6911LLU | 60 | 61.5 | 75 | 1 | 0.18 |
| 6011ZZ | 6011LLB | — | 6011LLU | 61.5 | 64 | 83.5 | 1 | 0.388 |
| 6211ZZ | 6211LLB | — | 6211LLU | 63 | 67 | 92 | 1.5 | 0.601 |
| 6311ZZ | 6311LLB | — | 6311LLU | 64 | 74 | 111 | 2 | 1.37 |
| 6812ZZ | 6812LLB | — | 6812LLU | 62 | 64.5 | 76 | 0.3 | 0.106 |
| 6912ZZ | 6912LLB | — | 6912LLU | 65 | 66.5 | 80 | 1 | 0.193 |
| 6012ZZ | 6012LLB | — | 6012LLU | 66.5 | 69 | 88.5 | 1 | 0.414 |
| 6212ZZ | 6212LLB | — | 6212LLU | 68 | 75 | 102 | 1.5 | 0.783 |
| 6312ZZ | 6312LLB | — | 6312LLU | 71 | 80.5 | 119 | 2 | 1.73 |
| 6813ZZ | 6813LLB | — | 6813LLU | 69 | 70 | 81 | 0.6 | 0.128 |
| 6913ZZ | 6913LLB | — | 6913LLU | 70 | 71.5 | 85 | 1 | 0.206 |
| 6013ZZ | 6013LLB | — | 6013LLU | 71.5 | 73 | 93.5 | 1 | 0.421 |
| 6213ZZ | 6213LLB | — | 6213LLU | 73 | 80.5 | 112 | 1.5 | 0.99 |
| 6313ZZ | 6313LLB | — | 6313LLU | 76 | 86 | 129 | 2 | 2.08 |
| 6814ZZ | 6814LLB | — | 6814LLU | 74 | 75.5 | 86 | 0.6 | 0.137 |
| 6914ZZ | 6914LLB | — | 6914LLU | 75 | 77.5 | 95 | 1 | 0.334 |
| 6014ZZ | 6014LLB | — | 6014LLU | 76.5 | 80.5 | 103.5 | 1 | 0.604 |
| 6214ZZ | 6214LLB | — | 6214LLU | 78 | 85 | 117 | 1.5 | 1.07 |
| 6314ZZ | 6314LLB | — | 6314LLU | 81 | 92.5 | 139 | 2 | 2.52 |
| 6815ZZ | 6815LLB | — | 6815LLU | 79 | 80 | 91 | 0.6 | 0.145 |
| 6915ZZ | 6915LLB | — | 6915LLU | 80 | 82.5 | 100 | 1 | 0.353 |
| 6015ZZ | 6015LLB | — | 6015LLU | 81.5 | 85.5 | 108.5 | 1 | 0.649 |
| 6215ZZ | 6215LLB | — | 6215LLU | 83 | 90.5 | 122 | 1.5 | 1.18 |
| 6315ZZ | 6315LLB | — | 6315LLU | 86 | 99 | 149 | 2 | 3.02 |
| 6816ZZ | 6816LLB | — | 6816LLU | 84 | 85 | 96 | 0.6 | 0.154 |
| 6916ZZ | 6916LLB | — | 6916LLU | 85 | 88 | 105 | 1 | 0.373 |
| 6016ZZ | 6016LLB | — | 6016LLU | 86.5 | 91.5 | 118.5 | 1 | 0.854 |
| 6216ZZ | 6216LLB | — | 6216LLU | 89 | 95.5 | 131 | 2 | 1.4 |
| 6316ZZ | 6316LLB | — | 6316LLU | 91 | 105 | 159 | 2 | 3.59 |
| 6817ZZ | 6817LLB | — | 6817LLU | 90 | 91 | 105 | 1 | 0.27 |
| 6917ZZ | 6917LLB | — | 6917LLU | 91.5 | 94 | 113.5 | 1 | 0.536 |
| 6017ZZ | 6017LLB | — | 6017LLU | 91.5 | 97 | 123.5 | 1 | 0.89 |
| 6217ZZ | 6217LLB | — | 6217LLU | 94 | 103 | 141 | 2 | 1.79 |

^② Single sealed and shielded bearings are also available.
^③ This dimension applies to sealed and shielded bearings.

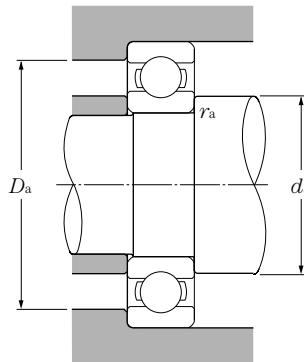
NTN Ball Bearings Shield and Seal Types



d 85~160mm

| d | Boundary dimensions | | | Basic load ratings | | | | Limiting speeds | |
|-----|---------------------|----|---------------------------------|---------------------------|---------------------------|---------------------------|---------------------------|-------------------------|------------|
| | D | B | r _s min ^① | dynamic C _r | static C _{0r} | dynamic C _r | static C _{0r} | rpm grease ZZ LLB | rpm LLU |
| 85 | 180 | 41 | 3 | 133 | 97.0 | 13 500 | 9 850 | 3 800 | 2 600 |
| | 115 | 13 | 1 | 19.0 | 19.7 | 1 940 | 2 010 | 5 400 | 3 000 |
| 90 | 125 | 18 | 1.1 | 33.0 | 31.5 | 3 350 | 3 200 | 5 100 | 2 900 |
| | 140 | 24 | 1.5 | 58.0 | 49.5 | 5 950 | 5 050 | 4 700 | 2 800 |
| | 160 | 30 | 2 | 96.0 | 71.5 | 9 800 | 7 300 | 4 000 | 2 600 |
| | 190 | 43 | 3 | 143 | 107 | 14 500 | 10 900 | 3 600 | 2 400 |
| 95 | 120 | 13 | 1 | 19.3 | 20.5 | 1 970 | 2 090 | 5 000 | 2 800 |
| | 130 | 18 | 1.1 | 33.5 | 33.5 | 3 450 | 3 400 | 4 800 | 2 800 |
| | 145 | 24 | 1.5 | 60.5 | 54.0 | 6 150 | 5 500 | 4 500 | 2 600 |
| | 170 | 32 | 2.1 | 109 | 82.0 | 11 100 | 8 350 | 3 700 | 2 500 |
| | 200 | 45 | 3 | 153 | 119 | 15 600 | 12 100 | 3 300 | 2 300 |
| 100 | 125 | 13 | 1 | 19.6 | 21.2 | 2 000 | 2 160 | 4 800 | 2 700 |
| | 140 | 20 | 1.1 | 41.0 | 39.5 | 4 200 | 4 050 | 4 500 | 2 600 |
| | 150 | 24 | 1.5 | 60.0 | 54.0 | 6 150 | 5 500 | 4 200 | 2 600 |
| | 180 | 34 | 2.1 | 122 | 93.0 | 12 500 | 9 450 | 3 500 | 2 300 |
| | 215 | 47 | 3 | 173 | 141 | 17 600 | 14 400 | 3 200 | 2 200 |
| 105 | 145 | 20 | 1.1 | 42.5 | 42.0 | 4 300 | 4 300 | 4 300 | 2 500 |
| | 160 | 26 | 2 | 72.5 | 65.5 | 7 400 | 6 700 | 4 000 | 2 400 |
| | 190 | 36 | 2.1 | 133 | 105 | 13 600 | 10 700 | 3 400 | 2 300 |
| | 225 | 49 | 3 | 184 | 153 | 18 700 | 15 700 | 3 000 | 2 100 |
| 110 | 150 | 20 | 1.1 | 43.5 | 44.5 | 4 450 | 4 550 | 4 100 | 2 400 |
| | 170 | 28 | 2 | 82.0 | 73.0 | 8 350 | 7 450 | 3 800 | 2 300 |
| | 200 | 38 | 2.1 | 144 | 117 | 14 700 | 11 900 | 3 200 | 2 200 |
| | 240 | 50 | 3 | 205 | 179 | 20 900 | 18 300 | 2 900 | 1 900 |
| 120 | 180 | 28 | 2 | 85.0 | 79.5 | 8 650 | 8 100 | 3 500 | 2 100 |
| | 215 | 40 | 2.1 | 155 | 131 | 15 900 | 13 400 | 2 900 | 2 000 |
| 130 | 200 | 33 | 2 | 106 | 101 | 10 800 | 10 300 | 3 200 | 1 900 |
| 140 | 210 | 33 | 2 | 110 | 109 | 11 200 | 11 100 | 3 000 | 1 800 |
| 150 | 225 | 35 | 2.1 | 126 | 126 | 12 800 | 12 800 | 2 800 | 1 700 |
| 160 | 240 | 38 | 2.1 | 143 | 144 | 14 500 | 14 700 | 2 600 | 1 600 |

① Smallest allowable dimension for chamfer dimension r.



| Bearing numbers ^② | | | Abutment and fillet dimensions | | | | Mass |
|------------------------------|------------------|--------------|--------------------------------|---------------------------|---------------------------|-----------------|-----------------|
| Sealed type | Non-contact type | Contact type | mm | | | | kg (approx.) |
| | | | d_a ^③ min | d_a ^③ max | D_a ^③ max | r_{as} max | |
| 6317ZZ | 6317LLB | 6317LLU | 98 | 112 | 167 | 2.5 | 4.23 |
| 6818ZZ | 6818LLB | 6818LLU | 95 | 96 | 110 | 1 | 0.285 |
| 6918ZZ | 6918LLB | 6918LLU | 96.5 | 99 | 118.5 | 1 | 0.554 |
| 6018ZZ | 6018LLB | 6018LLU | 98 | 102 | 132 | 1.5 | 1.02 |
| 6218ZZ | 6218LLB | 6218LLU | 99 | 109 | 151 | 2 | 2.15 |
| 6318ZZ | 6318LLB | 6318LLU | 103 | 118 | 177 | 2.5 | 4.91 |
| 6819ZZ | 6819LLB | 6819LLU | 100 | 101 | 115 | 1 | 0.3 |
| 6919ZZ | 6919LLB | 6919LLU | 101.5 | 104 | 123.5 | 1 | 0.579 |
| 6019ZZ | 6019LLB | 6019LLU | 103 | 109 | 137 | 1.5 | 1.08 |
| 6219ZZ | 6219LLB | 6219LLU | 106 | 116 | 159 | 2 | 2.62 |
| 6319ZZ | — | 6319LLU | 108 | 125 | 187 | 2.5 | 5.67 |
| 6820ZZ | 6820LLB | 6820LLU | 105 | 106 | 120 | 1 | 0.313 |
| 6920ZZ | 6920LLB | 6920LLU | 106.5 | 110 | 133.5 | 1 | 0.785 |
| 6020ZZ | 6020LLB | 6020LLU | 108 | 110 | 142 | 1.5 | 1.15 |
| 6220ZZ | 6220LLB | 6220LLU | 111 | 122 | 169 | 2 | 3.14 |
| 6320ZZ | — | 6320LLU | 113 | 133 | 202 | 2.5 | 7 |
| 6921ZZ | 6921LLB | 6921LLU | 111.5 | 115 | 138.5 | 1 | 0.816 |
| 6021ZZ | 6021LLB | 6021LLU | 114 | 119 | 151 | 2 | 1.59 |
| 6221ZZ | — | 6221LLU | 116 | 125 | 179 | 2 | 3.7 |
| 6321ZZ | — | 6321LLU | 118 | 134 | 212 | 2.5 | 8.05 |
| 6922ZZ | 6922LLB | 6922LLU | 116.5 | 120 | 143.5 | 1 | 0.849 |
| 6022ZZ | 6022LLB | 6022LLU | 119 | 126 | 161 | 2 | 1.96 |
| 6222ZZ | — | 6222LLU | 121 | 132 | 189 | 2 | 4.36 |
| 6322ZZ | — | 6322LLU | 123 | 149 | 227 | 2.5 | 9.54 |
| 6024ZZ | 6024LLB | 6024LLU | 129 | 136 | 171 | 2 | 2.07 |
| 6224ZZ | — | 6224LLU | 131 | 143 | 204 | 2 | 5.15 |
| 6026ZZ | — | 6026LLU | 139 | 148 | 191 | 2 | 3.16 |
| 6028ZZ | — | 6028LLU | 149 | 158 | 201 | 2 | 3.35 |
| 6030ZZ | — | 6030LLU | 161 | 169 | 214 | 2 | 4.08 |
| 6032ZZ | — | 6032LLU | 171 | 183 | 229 | 2 | 5.05 |

^② Single sealed and shielded bearings are also available.
^③ This dimension applies to sealed and shielded bearings.