

**Koyo**<sup>®</sup>

Slim Series  
**DEEP GROOVE BALL BEARINGS**



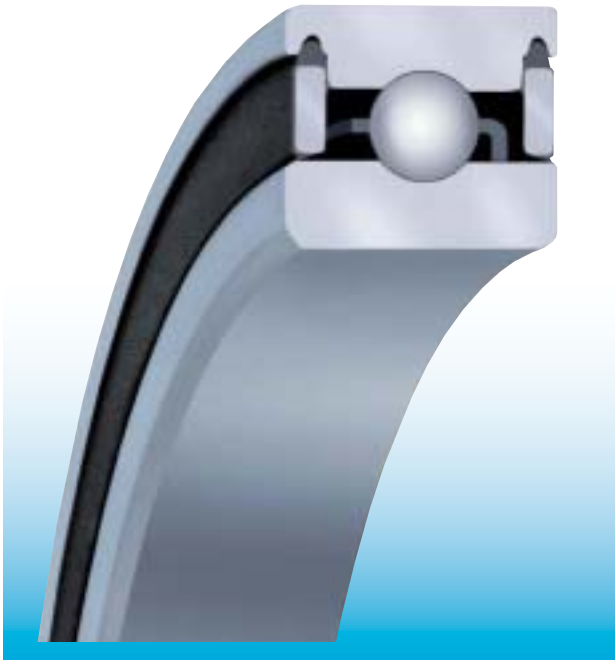
**KOYO SEIKO CO., LTD.**

CAT. NO.172E

# Slim Series DEEP GROOVE BALL BEARINGS

For size and weight reduction of equipment of OA facilities and various other machines. Series of slim type deep groove ball bearings to ISO standards.

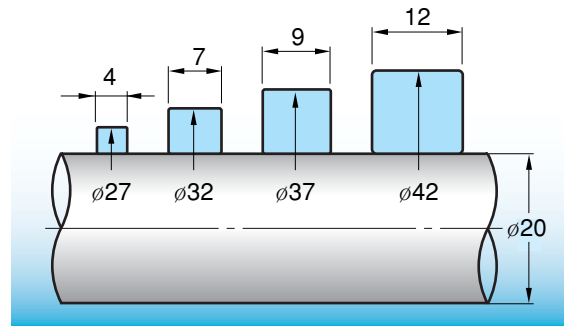
## Structures



Line-up of slim type ball bearings based on Koyo's reliable technologies and past experience.

### ■ Comparison of bearing sizes

Bearing No.: 6704 6804 6904 6004



## Features

### ■ Small size and light weight

In the most popular type of bearings, the 6000 series, the required space for their installation will be reduced to about 1/3.

### ■ Low torque

Small cross-sectional area indicate that these bearings require low running torque. In addition, the 6700 bearing series incorporates particularly low-friction contact seals.

### ■ Various sealing types

Wide choices are available in mounting methods and lubrication system, for shielded type, non-contact type sealed and contact type sealed bearing are provided.

### ■ Grease packed to meet your specific needs

The required quantity of general-purpose grease is packed in sealed bearings. Various types of grease are also available to meet the conditions of your specific applications.

Representative types of grease and their applications are listed in Table 2.

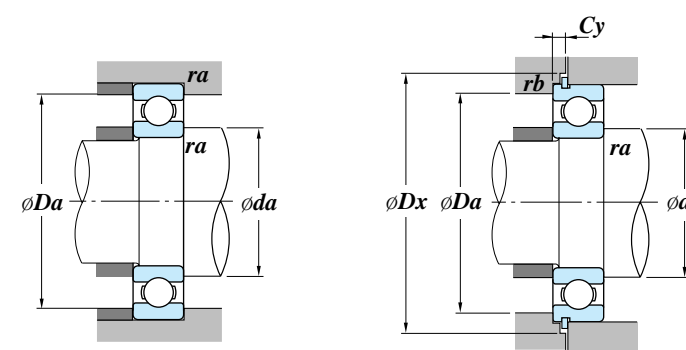
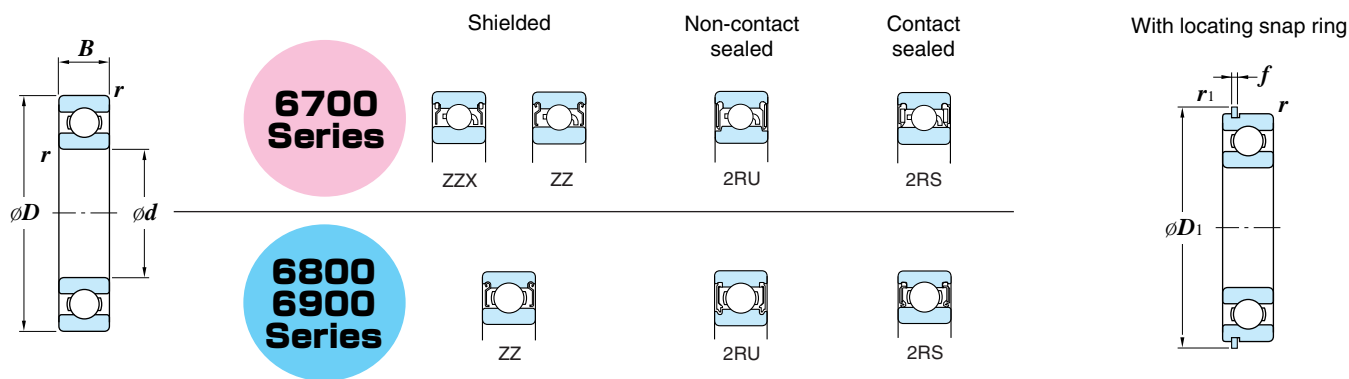
# Dimension Table

■ Boundary dimension

■ Series variation

■ Installation

■ Equivalent radial load



Dynamic equivalent radial load :  $P_r = X F_r + Y F_a$  (For X and Y, see the Table below.)  
 Static equivalent radial load :  $P_{0r} = 0.6 F_r + 0.5 F_a$   
 (when  $P_{0r} < F_r$ ,  $P_{0r} = F_r$ )

| Fa/Cor | e    | Fa/Fr ≤ e |   | Fa/Fr > e |      |
|--------|------|-----------|---|-----------|------|
|        |      | X         | Y | X         | Y    |
| 0.014  | 0.19 | 1         | 0 | 0.56      | 2.30 |
| 0.028  | 0.22 |           |   |           | 1.99 |
| 0.056  | 0.26 |           |   |           | 1.71 |
| 0.084  | 0.28 |           |   |           | 1.55 |
| 0.11   | 0.30 |           |   |           | 1.45 |
| 0.17   | 0.34 |           |   |           | 1.31 |
| 0.28   | 0.38 |           |   |           | 1.15 |
| 0.42   | 0.42 |           |   |           | 1.04 |
| 0.56   | 0.44 |           |   |           | 1.00 |

| Boundary Dimensions (mm) |    |    |     |                | Basic Load Ratings (kN) |      | Limiting Speeds (rpm)                         |                          |                                   | Bearing No. |                 |                    |                 |                         | Dimensions of Locating Snap Ring (mm) |            | Mounting Dimensions (mm) |              |              |              |              |              | (Ref.) Mass (kg) |
|--------------------------|----|----|-----|----------------|-------------------------|------|---|--------------------------|-----------------------------------|-------------|-----------------|--------------------|-----------------|-------------------------|---------------------------------------|------------|--------------------------|--------------|--------------|--------------|--------------|--------------|------------------|
| d                        | D  | B  | r   | r <sub>1</sub> | Cr                      | Cor  | Grease lubrication<br>(Open type ZZ, ZZ, 2RU) | Oil lubrication<br>(2RS) | Oil lubrication<br>(Open type ZZ) | Open type   | Shielded        | Non-contact sealed | Contact sealed  | With locating snap ring | D <sub>1</sub><br>(max.)              | f<br>±0.05 | da<br>(min.)             | Da<br>(max.) | Dx<br>(min.) | Cy<br>(max.) | ra<br>(max.) | rb<br>(max.) | (Open type)      |
| 10                       | 15 | 3  | 0.1 | -              | 0.85                    | 0.44 | 39000   | 25000                    | 47000                             | <b>6700</b> | -               | -                  | -               | -                       | -                                     | -          | 10.8                     | 14.2         | -            | -            | 0.1          | -            | 0.0015           |
|                          | 19 | 5  | 0.3 | -              | 1.70                    | 0.84 | 37000   | 22000                    | 43000                             | <b>6800</b> | <b>6800 ZZ</b>  | <b>6800 2RU</b>    | <b>6800 2RS</b> | -                       | -                                     | -          | 12                       | 17           | -            | -            | 0.3          | 0.3          | 0.005            |
|                          | 22 | 6  | 0.3 | 0.3            | 2.70                    | 1.25 | 34000   | 21000                    | 41000                             | <b>6900</b> | <b>6900 ZZ</b>  | <b>6900 2RU</b>    | <b>6900 2RS</b> | <b>6900 NR</b>          | 24.8                                  | 0.65       | 12                       | 20           | 25.5         | 1.5          | 0.3          | 0.3          | 0.010            |
| 12                       | 18 | 4  | 0.2 | -              | 0.92                    | 0.53 | 34000   | 20000                    | 41000                             | <b>6701</b> | <b>6701 ZZX</b> | <b>6701 2RU</b>    | <b>6701 2RS</b> | -                       | -                                     | -          | 13.6                     | 16.4         | -            | -            | 0.2          | -            | 0.003            |
|                          | 21 | 5  | 0.3 | -              | 1.90                    | 1.05 | 33000   | 20000                    | 39000                             | <b>6801</b> | <b>6801 ZZ</b>  | <b>6801 2RU</b>    | <b>6801 2RS</b> | -                       | -                                     | -          | 14                       | 19           | -            | -            | 0.3          | 0.3          | 0.006            |
|                          | 24 | 6  | 0.3 | 0.3            | 2.90                    | 1.45 | 31000   | 18000                    | 36000                             | <b>6901</b> | <b>6901 ZZ</b>  | <b>6901 2RU</b>    | <b>6901 2RS</b> | <b>6901 NR</b>          | 26.8                                  | 0.65       | 14                       | 22           | 27.5         | 1.5          | 0.3          | 0.3          | 0.011            |
| 15                       | 21 | 4  | 0.2 | -              | 0.93                    | 0.58 | 29000   | 16000                    | 35000                             | <b>6702</b> | <b>6702 ZZX</b> | <b>6702 2RU</b>    | <b>6702 2RS</b> | -                       | -                                     | -          | 16.6                     | 19.4         | -            | -            | 0.2          | -            | 0.004            |
|                          | 24 | 5  | 0.3 | -              | 2.10                    | 1.25 | 28000   | 16000                    | 33000                             | <b>6802</b> | <b>6802 ZZ</b>  | <b>6802 2RU</b>    | <b>6802 2RS</b> | -                       | -                                     | -          | 17                       | 22           | -            | -            | 0.3          | 0.3          | 0.007            |
|                          | 28 | 7  | 0.3 | 0.3            | 4.30                    | 2.25 | 26000   | 15000                    | 30000                             | <b>6902</b> | <b>6902 ZZ</b>  | <b>6902 2RU</b>    | <b>6902 2RS</b> | <b>6902 NR</b>          | 30.8                                  | 0.8        | 17                       | 26           | 31.5         | 1.9          | 0.3          | 0.3          | 0.017            |
| 17                       | 23 | 4  | 0.2 | -              | 0.99                    | 0.66 | 27000   | 15000                    | 32000                             | <b>6703</b> | <b>6703 ZZ</b>  | <b>6703 2RU</b>    | <b>6703 2RS</b> | -                       | -                                     | -          | 18.6                     | 21.4         | -            | -            | 0.2          | -            | 0.005            |
|                          | 26 | 5  | 0.3 | -              | 2.60                    | 1.55 | 26000   | 14000                    | 30000                             | <b>6803</b> | <b>6803 ZZ</b>  | <b>6803 2RU</b>    | <b>6803 2RS</b> | -                       | -                                     | -          | 19                       | 24           | -            | -            | 0.3          | 0.3          | 0.008            |
|                          | 30 | 7  | 0.3 | 0.3            | 4.60                    | 2.55 | 23000   | 13000                    | 28000                             | <b>6903</b> | <b>6903 ZZ</b>  | <b>6903 2RU</b>    | <b>6903 2RS</b> | <b>6903 NR</b>          | 33.2                                  | 0.8        | 19                       | 28           | 33.5         | 1.9          | 0.3          | 0.3          | 0.018            |
| 20                       | 27 | 4  | 0.2 | -              | 1.05                    | 0.73 | 23000   | 12000                    | 27000                             | <b>6704</b> | <b>6704 ZZ</b>  | <b>6704 2RU</b>    | <b>6704 2RS</b> | -                       | -                                     | -          | 21.6                     | 25.4         | -            | -            | 0.2          | -            | 0.006            |
|                          | 32 | 7  | 0.3 | 0.3            | 4.00                    | 2.45 | 21000   | 12000                    | 25000                             | <b>6804</b> | <b>6804 ZZ</b>  | <b>6804 2RU</b>    | <b>6804 2RS</b> | <b>6804 NR</b>          | 34.8                                  | 0.8        | 22                       | 30           | 35.5         | 1.9          | 0.3          | 0.3          | 0.018            |
|                          | 37 | 9  | 0.3 | 0.3            | 6.35                    | 3.70 | 19000   | 11000                    | 23000                             | <b>6904</b> | <b>6904 ZZ</b>  | <b>6904 2RU</b>    | <b>6904 2RS</b> | <b>6904 NR</b>          | 39.8                                  | 0.8        | 22                       | 35           | 40.5         | 2.3          | 0.3          | 0.3          | 0.036            |
| 25                       | 32 | 4  | 0.2 | -              | 1.10                    | 0.84 | 19000   | 10000                    | 22000                             | <b>6705</b> | <b>6705 ZZ</b>  | <b>6705 2RU</b>    | <b>6705 2RS</b> | -                       | -                                     | -          | 26.6                     | 30.4         | -            | -            | 0.2          | -            | 0.006            |
|                          | 37 | 7  | 0.3 | 0.3            | 4.30                    | 2.95 | 18000   | 10000                    | 21000                             | <b>6805</b> | <b>6805 ZZ</b>  | <b>6805 2RU</b>    | <b>6805 2RS</b> | <b>6805 NR</b>          | 39.8                                  | 0.8        | 27                       | 35           | 40.5         | 1.9          | 0.3          | 0.3          | 0.022            |
|                          | 42 | 9  | 0.3 | 0.3            | 7.00                    | 4.55 | 16000   | 9300                     | 19000                             | <b>6905</b> | <b>6905 ZZ</b>  | <b>6905 2RU</b>    | <b>6905 2RS</b> | <b>6905 NR</b>          | 44.8                                  | 0.8        | 27                       | 40           | 45.5         | 2.3          | 0.3          | 0.3          | 0.041            |
| 30                       | 37 | 4  | 0.2 | -              | 1.15                    | 0.95 | 16000   | 8800                     | 19000                             | <b>6706</b> | <b>6706 ZZ</b>  | <b>6706 2RU</b>    | <b>6706 2RS</b> | -                       | -                                     | -          | 31.6                     | 35.4         | -            | -            | 0.2          | -            | 0.008            |
|                          | 42 | 7  | 0.3 | 0.3            | 4.55                    | 3.40 | 15000   | 8600                     | 18000                             | <b>6806</b> | <b>6806 ZZ</b>  | <b>6806 2RU</b>    | <b>6806 2RS</b> | <b>6806 NR</b>          | 44.8                                  | 0.8        | 32                       | 40           | 45.5         | 1.9          | 0.3          | 0.3          | 0.026            |
|                          | 47 | 9  | 0.3 | 0.3            | 7.25                    | 5.00 | 14000   | 8200                     | 17000                             | <b>6906</b> | <b>6906 ZZ</b>  | <b>6906 2RU</b>    | <b>6906 2RS</b> | <b>6906 NR</b>          | 49.8                                  | 0.8        | 32                       | 45           | 50.5         | 2.3          | 0.3          | 0.3          | 0.045            |
| 35                       | 47 | 7  | 0.3 | 0.3            | 4.75                    | 3.85 | 13000   | 7400                     | 16000                             | <b>6807</b> | <b>6807 ZZ</b>  | <b>6807 2RU</b>    | <b>6807 2RS</b> | <b>6807 NR</b>          | 49.8                                  | 0.8        | 37                       | 45           | 50.5         | 1.9          | 0.3          | 0.3          | 0.030            |
|                          | 55 | 10 | 0.6 | 0.6            | 10.9                    | 7.75 | 12000   | 6800                     | 14000                             | <b>6907</b> | <b>6907 ZZ</b>  | <b>6907 2RU</b>    | <b>6907 2RS</b> | <b>6907 NR</b>          | 57.8                                  | 0.8        | 39                       | 51           | 58.5         | 2.3          | 0.6          | 0.6          | 0.073            |
| 40                       | 52 | 7  | 0.3 | 0.3            | 4.95                    | 4.20 | 12000   | 6700                     | 14000                             | <b>6808</b> | <b>6808 ZZ</b>  | <b>6808 2RU</b>    | <b>6808 2RS</b> | <b>6808 NR</b>          | 54.8                                  | 0.8        | 42                       | 50           | 55.5         | 1.9          | 0.3          | 0.3          | 0.033            |
|                          | 62 | 12 | 0.6 | 0.6            | 13.7                    | 9.95 | 11000   | 6100                     | 13000                             | <b>6908</b> | <b>6908 ZZ</b>  | <b>6908 2RU</b>    | <b>6908 2RS</b> | <b>6908 NR</b>          | 64.8                                  | 0.8        | 44                       | 58           | 65.5         | 2.3          | 0.6          | 0.6          | 0.112            |
| 45                       | 58 | 7  | 0.3 | 0.3            | 6.20                    | 5.40 | 11000   | 5900                     | 13000                             | <b>6809</b> | <b>6809 ZZ</b>  | <b>6809 2RU</b>    | <b>6809 2RS</b> | <b>6809 NR</b>          | 60.8                                  | 0.8        | 47                       | 56           | 61.5         | 1.9          | 0.3          | 0.3          | 0.040            |
|                          | 68 | 12 | 0.6 | 0.6            | 14.1                    | 10.9 | 9700  | 5500                     | 11000                             | <b>6909</b> | <b>6909 ZZ</b>  | <b>6909 2RU</b>    | <b>6909 2RS</b> | <b>6909 NR</b>          | 70.8                                  | 0.8        | 49                       | 64           | 72           | 2.3          | 0.6          | 0.6          | 0.132            |
| 50                       | 65 | 7  | 0.3 | 0.3            | 6.60                    | 6.10 | 9600  | 5200                     | 11000                             | <b>6810</b> | <b>6810 ZZ</b>  | <b>6810 2RU</b>    | <b>6810 2RS</b> | <b>6810 NR</b>          | 67.8                                  | 0.8        | 52                       | 63           | 68.5         | 1.9          | 0.3          | 0.3          | 0.052            |
|                          | 72 | 12 | 0.6 | 0.6            | 14.5                    | 11.7 | 9000  | 5000                     | 11000                             | <b>6910</b> | <b>6910 ZZ</b>  | <b>6910 2RU</b>    | <b>6910 2RS</b> | <b>6910 NR</b>          | 74.8                                  | 0.8        | 54                       | 68           | 76           | 2.3          | 0.6          | 0.6          | 0.133            |

## ■ Dimension Stabilizing Treatment

When operating bearing over a long time at a temperature of over 120°C, normal heat treatment is insufficient to prevent dimension change. Special heat treatment is required for stabilization of dimensions.

Table 1 shows codes and operating temperature range for special heat treatment.

Table 1 Dimension Stabilizing Treatment

| Code | Operating Temperature Range |
|------|-----------------------------|
| S0   | Over 100°C up to 150°C      |
| S1   | Over 150°C up to 200°C      |
| S2   | Over 200°C up to 250°C      |

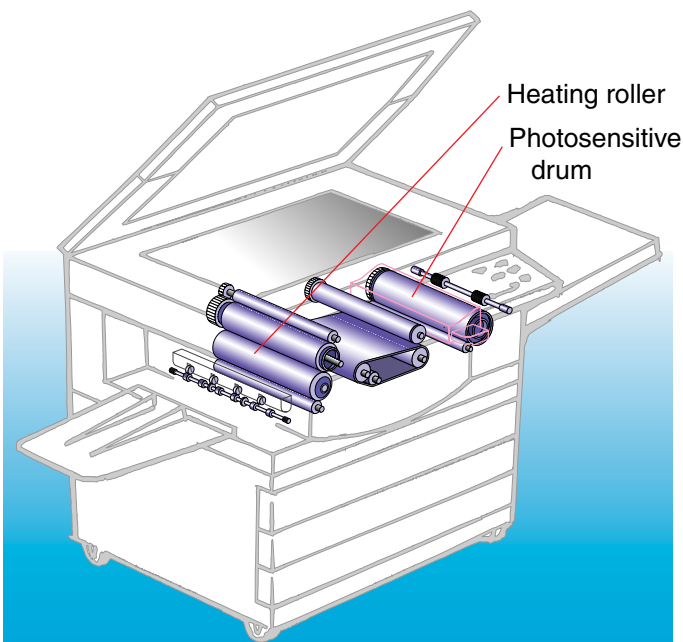
## ■ Grease

Table 2 shows typical grease for sealed or shielded bearings. If bearings are to be operated under special conditions, please contact Koyo.

Table 2 Characteristics of Usual Grease and Its Application

| Name of Grease   | Maker                      | Thickener           | Base Oil        | Operating Temperature Range(°C) | Example of Application            |
|------------------|----------------------------|---------------------|-----------------|---------------------------------|-----------------------------------|
| ALVANIA 1        | Showa Shell Sekiyu         | Lithium soap        | Mineral oil     | -20 to 80                       | Fishing reel                      |
| ALVANIA 2        | Showa Shell Sekiyu         | Lithium soap        | Mineral oil     | -10 to 100                      | General purpose                   |
| MULTEMP SRL      | Kyodo Yushi                | Lithium soap        | Ester oil       | -40 to 130                      | Wide operating temperature range  |
| MOLYKOTE 44M     | Dow Corning Toray Silicone | Lithium soap        | Silicone oil    | -30 to 180                      | Heating roller of copying machine |
| BARRIERTA JFE552 | NOK Clüber                 | Fluorinated polymer | Fluorinated oil | -30 to 250                      |                                   |

## ■ Application Example in Copying Machine



Slim series bearings are suitable for photosensitive drums, heating roller support, and other parts that require space-saving designs.



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Value & Technology

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