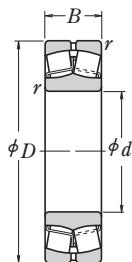
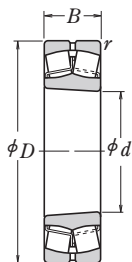


Bore Diameter 20 – 55 mm



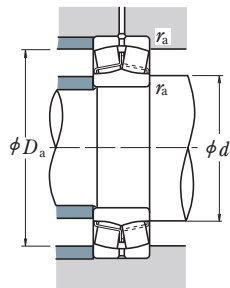
Cylindrical Bore



Tapered Bore



Without an Oil Groove or Holes



**Dynamic Equivalent Load**

$$P = XF_r + YF_a$$

| $F_a/F_r \leq e$ |       | $F_a/F_r > e$ |       |
|------------------|-------|---------------|-------|
| X                | Y     | X             | Y     |
| 1                | $Y_3$ | 0.67          | $Y_2$ |

**Static Equivalent Load**

$$P_0 = F_r + Y_0 F_a$$

The values of  $e$ ,  $Y_2$ ,  $Y_3$ , and  $Y_0$  are given in the table below.

| Boundary Dimensions<br>(mm) |                   |                |                   | Basic Load Ratings<br>(N)     |                               | Speeds( $\text{min}^{-1}$ )<br>Limiting Speeds |                                           |                         |                         | Bearing Designations                   |                                           | Abutment and Fillet Dimensions<br>(mm) |                |                  |                 |                 | Constant             | Axial Load Factors |                   |                   |  | Mass<br>(kg)         |
|-----------------------------|-------------------|----------------|-------------------|-------------------------------|-------------------------------|------------------------------------------------|-------------------------------------------|-------------------------|-------------------------|----------------------------------------|-------------------------------------------|----------------------------------------|----------------|------------------|-----------------|-----------------|----------------------|--------------------|-------------------|-------------------|--|----------------------|
| $d$                         | $D$               | $B$            | $r$<br>min.       | $C_r$                         | $C_{0r}$                      | Thermal<br>Speed Rating<br>(Oil Bath)          | Mechanical<br>(Forced Oil<br>Circulation) | Grease                  | Oil<br>(Oil Bath)       | Cylindrical Bore                       | Tapered Bore <sup>(1)</sup>               | $d_a$<br>min.                          | $d_a$<br>max.  | $D_a$<br>max.    | $D_a$<br>min.   | $r_a$<br>max.   | $e$                  | $Y_2$              | $Y_3$             | $Y_0$             |  | approx.              |
| 20                          | 52                | 15             | 1.1               | 29 300                        | 26 900                        | 10 000                                         | —                                         | 6 300                   | 8 200                   | 21304CDE4                              | 21304CDKE4                                | 27                                     | 28             | 45               | 42              | 1               | 0.31                 | 3.2                | 2.1               | 2.1               |  | 0.17                 |
| 25                          | 52<br>62          | 18<br>17       | 1<br>1.1          | 37 500<br>43 000              | 37 000<br>40 500              | 10 000<br>9 000                                | —<br>—                                    | 7 100<br>5 300          | 9 000<br>6 700          | 22205CE4<br>21305CDE4                  | 22205CKE4<br>21305CDKE4                   | 31<br>32                               | 31<br>34       | 46<br>55         | 45<br>51        | 1<br>1          | 0.35<br>0.29         | 2.9<br>3.4         | 1.9<br>2.3        | 1.9<br>2.3        |  | 0.17<br>0.26         |
| 30                          | 62<br>72          | 20<br>19       | 1<br>1.1          | 50 000<br>55 000              | 50 000<br>54 000              | 8 500<br>7 500                                 | —<br>—                                    | 6 000<br>4 500          | 7 500<br>6 000          | 22206CE4<br>21306CDE4                  | 22206CKE4<br>21306CDKE4                   | 36<br>37                               | 37<br>40       | 56<br>65         | 54<br>59        | 1<br>1          | 0.33<br>0.28         | 3.1<br>3.6         | 2.1<br>2.4        | 2.0<br>2.3        |  | 0.27<br>0.39         |
| 35                          | 72<br>80          | 23<br>21       | 1.1<br>1.5        | 69 000<br>71 500              | 71 000<br>76 000              | 7 500<br>7 100                                 | —<br>—                                    | 5 300<br>4 000          | 6 700<br>5 300          | 22207CE4<br>21307CDE4                  | 22207CKE4<br>21307CDKE4                   | 42<br>44                               | 43<br>47       | 65<br>71         | 63<br>67        | 1<br>1.5        | 0.32<br>0.28         | 3.1<br>3.6         | 2.1<br>2.4        | 2.0<br>2.4        |  | 0.42<br>0.53         |
| 40                          | 80<br>90<br>90    | 23<br>23<br>33 | 1.1<br>1.5<br>1.5 | 113 000<br>118 000<br>170 000 | 99 500<br>111 000<br>153 000  | 7 100<br>6 700<br>5 600                        | 12 000<br>11 000<br>9 000                 | 6 700<br>6 000<br>5 300 | 8 500<br>7 500<br>6 700 | *22208EAE4<br>*21308EAE4<br>*22308EAE4 | *22208EAKE4<br>*21308EAKE4<br>*22308EAKE4 | 47<br>49<br>49                         | 49<br>55<br>52 | 73<br>81<br>81   | 70<br>75<br>77  | 1<br>1.5<br>1.5 | 0.28<br>0.25<br>0.35 | 3.6<br>3.9<br>2.8  | 2.4<br>2.7<br>1.9 | 2.4<br>2.6<br>1.9 |  | 0.50<br>0.73<br>0.98 |
| 45                          | 85<br>100<br>100  | 23<br>25<br>36 | 1.1<br>1.5<br>1.5 | 118 000<br>149 000<br>207 000 | 111 000<br>144 000<br>195 000 | 6 300<br>6 000<br>5 000                        | 11 000<br>9 000<br>8 000                  | 6 000<br>5 000<br>4 500 | 7 500<br>6 300<br>5 600 | *22209EAE4<br>*21309EAE4<br>*22309EAE4 | *22209EAKE4<br>*21309EAKE4<br>*22309EAKE4 | 52<br>54<br>54                         | 55<br>65<br>60 | 78<br>91<br>91   | 75<br>89<br>86  | 1<br>1.5<br>1.5 | 0.26<br>0.23<br>0.34 | 3.9<br>4.3<br>2.9  | 2.7<br>2.9<br>2.0 | 2.6<br>2.8<br>1.9 |  | 0.55<br>0.96<br>1.34 |
| 50                          | 90<br>110<br>110  | 23<br>27<br>40 | 1.1<br>2<br>2     | 124 000<br>178 000<br>246 000 | 119 000<br>174 000<br>234 000 | 6 000<br>5 300<br>4 800                        | 9 500<br>8 000<br>7 100                   | 5 600<br>4 500<br>4 300 | 7 100<br>5 600<br>5 300 | *22210EAE4<br>*21310EAE4<br>*22310EAE4 | *22210EAKE4<br>*21310EAKE4<br>*22310EAKE4 | 57<br>60<br>60                         | 60<br>72<br>64 | 83<br>100<br>100 | 81<br>98<br>93  | 1<br>2<br>2     | 0.24<br>0.23<br>0.36 | 4.3<br>4.4<br>2.8  | 2.9<br>3.0<br>1.9 | 2.8<br>2.9<br>1.9 |  | 0.61<br>1.21<br>1.78 |
| 55                          | 100<br>120<br>120 | 25<br>29<br>43 | 1.5<br>2<br>2     | 149 000<br>178 000<br>292 000 | 144 000<br>174 000<br>292 000 | 5 300<br>5 300<br>4 300                        | 9 000<br>8 000<br>6 000                   | 5 300<br>4 500<br>3 800 | 6 700<br>5 600<br>4 800 | *22211EAE4<br>*21311EAE4<br>*22311EAE4 | *22211EAKE4<br>*21311EAKE4<br>*22311EAKE4 | 64<br>65<br>65                         | 65<br>72<br>73 | 91<br>110<br>110 | 89<br>98<br>103 | 1.5<br>2<br>2   | 0.23<br>0.23<br>0.34 | 4.3<br>4.4<br>2.9  | 2.9<br>3.0<br>2.0 | 2.8<br>2.9<br>1.9 |  | 0.81<br>1.58<br>2.3  |

**Note** <sup>(1)</sup> Suffix K represents bearings with tapered bores (taper 1:12).

- Remarks**
- Bearings denoted by an asterisk (\*) are NSKHPs bearings; they come standard with an oil groove and holes.
  - The recommended fits (shaft tolerances) on Page A164 are different for NSKHPs bearings, with light loads defined as  $\leq 0.05C_r$ , normal loads as  $0.05$  to  $0.10C_r$ , and heavy loads as  $> 0.10C_r$ .
  - For the dimensions of adapters and withdrawal sleeves, refer to Pages C348 – C349 and C356.