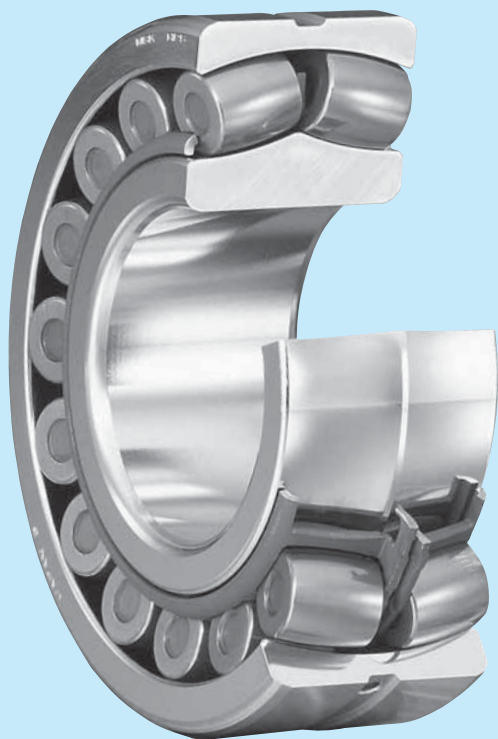


# SPHERICAL ROLLER BEARINGS

## SPHERICAL ROLLER BEARINGS

Cylindrical Bores, Tapered Bores	Bore Diameter	20 – 150mm	.....	B184
	Bore Diameter	160 – 560mm	.....	B192
	Bore Diameter	600 – 1400mm	.....	B202



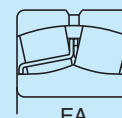
## DESIGN, TYPES, AND FEATURES

Shown in the figures, types EA, C, CD, CA, which are designed for high load capacity, are available. Types EA, C and CD have pressed steel cages, and type CA has machined brass cages. The EA type bearings listed here are classified as NSKHPS bearings, which offer particularly high load-carrying capacity, high limiting speeds, and are highly functional under high-temperature operating conditions of up to 200°C.

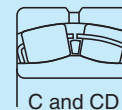
An oil groove and holes are provided in the outer ring to supply lubricant and the bearing numbers are suffixed with E4.

To use bearings with oil grooves and holes, it is recommended to provide an oil groove in the housing bore, since the depth of the groove in the bearing is limited. The number and dimensions of the oil groove and holes are shown in Tables 1 and 2.

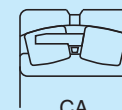
When bearings with a hole for a locking pin to prevent outer ring rotation are required, please inform NSK.



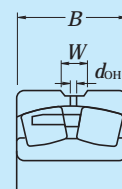
EA



C and CD



CA



TOLERANCES AND RUNNING ACCURACY	.....	Table 8.2 (Pages A60 to A63)
RECOMMENDED FITS	.....	Table 9.2 (Page A84) Table 9.4 (Page A85)
INTERNAL CLEARANCE	.....	Table 9.15 (Page A92)

## PERMISSIBLE MISALIGNMENT

The permissible misalignment of spherical roller bearings varies depending on the size and load, but it is approximately 0.018 to 0.045 radian (1° to 2.5°) with normal loads.

## LIMITING SPEEDS

The limiting speeds listed in the bearing tables should be adjusted depending on the bearing load conditions. Also, higher speeds are attainable by making changes in the lubrication method, cage design, etc. Refer to Page A37 for detailed information.

Table 1 Dimensions of Oil Grooves and Holes Units : mm

Nominal Width <i>B</i>		Oil Groove Width <i>W</i>	Hole Diameter	
over	incl.		<i>d<sub>OH</sub></i>	
18	30	5	2.5	
30	40	6	3	
40	50	7	4	
50	65	8	5	
65	80	10	6	
80	100	12	8	
100	120	15	10	
120	160	20	12	
160	200	25	15	
200	250	30	20	
250	315	35	20	
315	400	40	25	
400	—	40	25	

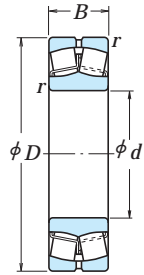
Table 2 Number of Oil Holes

Nominal Outer Ring Dia <i>D</i> (mm)		Number of Holes
over	incl.	
—	180	4
180	250	6
250	315	6
315	400	6
400	500	6
500	630	8
630	800	8
800	1000	8
1000	1250	8
1250	1600	8
1600	2000	8

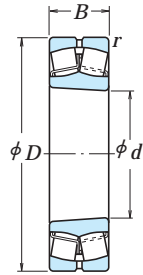
And if the load on spherical roller bearings becomes too small during operation or if the ratio of axial and radial loads is larger than the value of 'e' (listed in the bearing tables), slippage occurs between the rollers and raceways, which may result in smearing. The higher the weight of the rollers and cage, the higher this tendency becomes, especially for large spherical roller bearings.

If very small bearing loads are expected, please contact NSK for selection of an appropriate bearing.

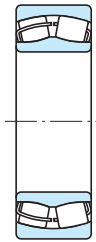
Bore Diameter 20 – 55 mm



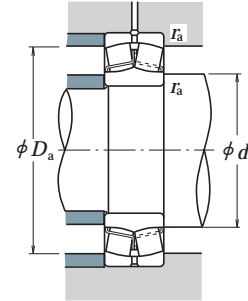
Cylindrical Bore



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.

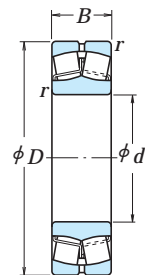
Boundary Dimensions (mm)				Basic Load Ratings				Limiting Speeds		Bearing
$d$	$D$	$B$	$r_{min.}$	$C_r$ (N)	$C_{0r}$	$\{kgf\}$		$(min^{-1})$		
						$C_r$	$C_{0r}$	Grease	Oil	Cylindrical Bore
20	52	15	1.1	29 300	26 900	2 980	2 740	6 300	8 200	21304CDE4
25	52	18	1	37 500	37 000	3 850	3 800	7 100	9 000	22205CE4
	62	17	1.1	43 000	40 500	4 350	4 150	5 300	6 700	21305CDE4
30	62	20	1	50 000	50 000	5 100	5 100	6 000	7 500	22206CE4
	72	19	1.1	55 000	54 000	5 600	5 500	4 500	6 000	21306CDE4
35	72	23	1.1	69 000	71 000	7 050	7 200	5 300	6 700	22207CE4
	80	21	1.5	71 500	76 000	7 250	7 750	4 000	5 300	21307CDE4
40	80	23	1.1	113 000	99 500	11 500	10 100	6 700	8 500	*22208EAE4
	90	23	1.5	118 000	111 000	12 000	11 300	6 000	7 500	*21308EAE4
	90	33	1.5	170 000	153 000	17 300	15 600	5 300	6 700	*22308EAE4
45	85	23	1.1	118 000	111 000	12 000	11 300	6 000	7 500	*22209EAE4
	100	25	1.5	149 000	144 000	15 200	14 600	5 000	6 300	*21309EAE4
	100	36	1.5	207 000	195 000	21 100	19 900	4 500	5 600	*22309EAE4
50	90	23	1.1	124 000	119 000	12 600	12 100	5 600	7 100	*22210EAE4
	110	27	2	178 000	174 000	18 100	17 800	4 500	5 600	*21310EAE4
	110	40	2	246 000	234 000	25 100	23 900	4 300	5 300	*22310EAE4
55	100	25	1.5	149 000	144 000	15 200	14 600	5 300	6 700	*22211EAE4
	120	29	2	178 000	174 000	18 100	17 800	4 500	5 600	*21311EAE4
	120	43	2	292 000	292 000	29 800	29 800	3 800	4 800	*22311EAE4

Note (1) The suffix K represents bearings with tapered bores (taper 1 : 12).

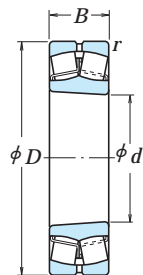
Numbers	Abutment and Fillet Dimensions (mm)					Constant	Axial Load Factors			Mass (kg)
	$d_a$		$D_a$		$r_a$		$e$	$Y_2$	$Y_3$	
Tapered Bore(1)	min.	max.	max.	min.	max.					approx.
21304CDKE4	27	28	45	42	1	0.31	3.2	2.1	2.1	0.17
22205CKE4 21305CDKE4	31	31	46	45	1	0.35	2.9	1.9	1.9	0.17
	32	34	55	51	1	0.29	3.4	2.3	2.3	0.26
22206CKE4 21306CDKE4	36	37	56	54	1	0.33	3.1	2.1	2.0	0.27
	37	40	65	59	1	0.28	3.6	2.4	2.3	0.39
22207CKE4 21307CDKE4	42	43	65	63	1	0.32	3.1	2.1	2.0	0.42
	44	47	71	67	1.5	0.28	3.6	2.4	2.4	0.53
*22208EAKE4 *21308EAKE4 *22308EAKE4	47	49	73	70	1	0.28	3.6	2.4	2.4	0.50
	49	54	81	75	1.5	0.25	3.9	2.7	2.6	0.73
	49	52	81	77	1.5	0.35	2.8	1.9	1.9	0.98
*22209EAKE4 *21309EAKE4 *22309EAKE4	52	54	78	75	1	0.25	3.9	2.7	2.6	0.55
	54	65	91	89	1.5	0.23	4.3	2.9	2.8	0.96
	54	59	91	86	1.5	0.34	2.9	2.0	1.9	1.34
*22210EAKE4 *21310EAKE4 *22310EAKE4	57	60	83	81	1	0.24	4.3	2.9	2.8	0.61
	60	72	100	98	2	0.23	4.4	3.0	2.9	1.21
	60	64	100	93	2	0.35	2.8	1.9	1.9	1.78
*22211EAKE4 *21311EAKE4 *22311EAKE4	64	65	91	89	1.5	0.23	4.3	2.9	2.8	0.81
	65	72	110	98	2	0.23	4.4	3.0	2.9	1.58
	65	73	110	103	2	0.34	2.9	2.0	1.9	2.3

Remarks 1. The bearings denoted by an asterisk (\*) are NSKHPS bearings and an oil groove and holes are standard for them.  
 2. When making a selection of the recommended fit (Tolerance of Shaft) on Page A84 of the NSK Rolling Bearings catalog, in case of NSKHPS bearings, the conditions are different.  
 The segmentations are: Light Loads ( $\leq 0.05C_r$ ); Normal Loads (0.05 to 0.10 $C_r$ ); and Heavy Loads (>0.10 $C_r$ ).  
 3. For the dimensions of adapters and withdrawal sleeves, refer to Pages B358 – B359, and B366.

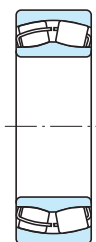
Bore Diameter 60 – 85 mm



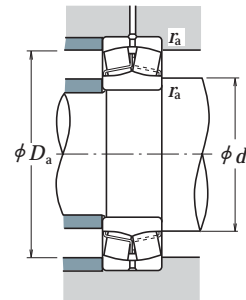
Cylindrical Bore



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.

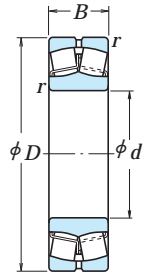
Boundary Dimensions (mm)				Basic Load Ratings (N)				Limiting Speeds (min <sup>-1</sup> )		Bearing Cylindrical Bore
d	D	B	r min.	C <sub>r</sub>	C <sub>0r</sub>	C <sub>r</sub> (kgf)	C <sub>0r</sub> (kgf)	Grease	Oil	
60	95	26	1.1	98 000	141 000	10 000	14 400	3 600	4 500	<b>23012CE4</b>
	110	28	1.5	178 000	174 000	18 100	17 800	4 800	6 000	<b>*22212EAE4</b>
	130	31	2.1	238 000	244 000	24 200	24 900	3 800	4 800	<b>*21312EAE4</b>
	130	46	2.1	340 000	340 000	34 500	35 000	3 600	4 500	<b>*22312EAE4</b>
65	120	31	1.5	221 000	230 000	22 500	23 500	4 300	5 300	<b>*22213EAE4</b>
	140	33	2.1	264 000	275 000	27 000	28 000	3 600	4 500	<b>*21313EAE4</b>
	140	48	2.1	375 000	380 000	38 000	38 500	3 200	4 000	<b>*22313EAE4</b>
70	125	31	1.5	225 000	232 000	22 900	23 600	4 000	5 300	<b>*22214EAE4</b>
	150	35	2.1	310 000	325 000	32 000	33 500	3 200	4 000	<b>*21314EAE4</b>
	150	51	2.1	425 000	435 000	43 500	44 000	3 000	3 800	<b>*22314EAE4</b>
75	130	31	1.5	238 000	244 000	24 200	24 900	4 000	5 000	<b>*22215EAE4</b>
	160	37	2.1	310 000	325 000	32 000	33 500	3 200	4 000	<b>*21315EAE4</b>
	160	55	2.1	485 000	505 000	49 500	51 500	2 800	3 600	<b>*22315EAE4</b>
80	140	33	2	264 000	275 000	27 000	28 000	3 600	4 500	<b>*22216EAE4</b>
	170	39	2.1	355 000	375 000	36 000	38 000	3 000	3 800	<b>*21316EAE4</b>
	170	58	2.1	540 000	565 000	55 000	58 000	2 600	3 400	<b>*22316EAE4</b>
85	150	36	2	310 000	325 000	32 000	33 500	3 400	4 300	<b>*22217EAE4</b>
	180	41	3	360 000	395 000	37 000	40 000	3 000	4 000	<b>*21317EAE4</b>
	180	60	3	600 000	630 000	61 000	64 000	2 400	3 200	<b>*22317EAE4</b>

Note (1) The suffix K represents bearings with tapered bores (taper 1 : 12).

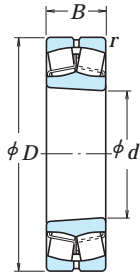
Numbers Tapered Bore <sup>(1)</sup>	Abutment and Fillet Dimensions (mm)					Constant <b>e</b>	Axial Load Factors			Mass (kg) approx.
	min. <b>d<sub>a</sub></b>	max.	max. <b>D<sub>a</sub></b>	min.	max. <b>r<sub>a</sub></b>		<b>Y<sub>2</sub></b>	<b>Y<sub>3</sub></b>	<b>Y<sub>0</sub></b>	
<b>23012CKE4</b>	67	68	88	85	1	0.26	3.9	2.6	2.5	0.68
<b>*22212EAKE4</b>	69	72	101	98	1.5	0.23	4.4	3.0	2.9	1.1
<b>*21312EAKE4</b>	72	87	118	117	2	0.22	4.5	3.0	3.0	1.98
<b>*22312EAKE4</b>	72	79	118	111	2	0.34	3.0	2.0	1.9	2.89
<b>*22213EAKE4</b>	74	80	111	107	1.5	0.24	4.2	2.8	2.7	1.51
<b>*21313EAKE4</b>	77	94	128	126	2	0.22	4.6	3.1	3.0	2.45
<b>*22313EAKE4</b>	77	84	128	119	2	0.33	3.0	2.0	2.0	3.52
<b>*22214EAKE4</b>	79	84	116	111	1.5	0.23	4.3	2.9	2.8	1.58
<b>*21314EAKE4</b>	82	101	138	135	2	0.22	4.6	3.1	3.0	3.0
<b>*22314EAKE4</b>	82	91	138	129	2	0.33	3.0	2.0	2.0	4.28
<b>*22215EAKE4</b>	84	87	121	117	1.5	0.22	4.5	3.0	3.0	1.64
<b>*21315EAKE4</b>	87	101	148	134	2	0.22	4.6	3.1	3.0	3.64
<b>*22315EAKE4</b>	87	97	148	137	2	0.33	3.0	2.0	2.0	5.26
<b>*22216EAKE4</b>	90	94	130	126	2	0.22	4.6	3.1	3.0	2.01
<b>*21316EAKE4</b>	92	109	158	146	2	0.23	4.4	3.0	2.9	4.32
<b>*22316EAKE4</b>	92	103	158	145	2	0.33	3.0	2.0	2.0	6.23
<b>*22217EAKE4</b>	95	101	140	135	2	0.22	4.6	3.1	3.0	2.54
<b>*21317EAKE4</b>	99	108	166	142	2.5	0.24	4.3	2.9	2.8	5.2
<b>*22317EAKE4</b>	99	110	166	155	2.5	0.33	3.1	2.1	2.0	7.23

- Remarks
- The bearings denoted by an asterisk (\*) are NSKHPS bearings and an oil groove and holes are standard for them.
  - When making a selection of the recommended fit (Tolerance of Shaft) on Page A84 of the NSK Rolling Bearings catalog, in case of NSKHPS bearings, the conditions are different.  
The segmentations are: Light Loads ( $\leq 0.05C_r$ ); Normal Loads (0.05 to 0.10 $C_r$ ); and Heavy Loads (>0.10 $C_r$ ).
  - For the dimensions of adapters and withdrawal sleeves, refer to Pages B359 – B361, and B366.

Bore Diameter 90 – 110 mm



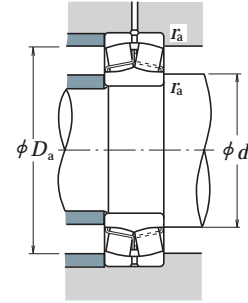
Cylindrical Bore



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.

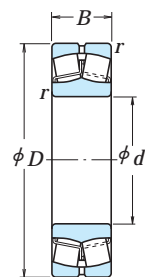
Boundary Dimensions (mm)	Basic Load Ratings				Limiting Speeds		Bearing
	$C_r$	$C_{0r}$	$C_r$	$C_{0r}$	Grease	Oil	
$d$ $D$ $B$ $r_{min.}$	(N)	(kgf)	(min <sup>-1</sup> )	Cylindrical Bore			
<b>90</b>	160 40 2	360 000 395 000	37 000 40 000	3 200 4 000	<b>*22218EAE4</b>		
	160 52.4 2	340 000 490 000	34 500 50 000	1 800 2 400	<b>23218CE4</b>		
	190 43 3	415 000 450 000	42 000 46 000	2 800 3 600	<b>*21318EAE4</b>		
	190 64 3	665 000 705 000	68 000 72 000	2 400 3 000	<b>*22318EAE4</b>		
<b>95</b>	170 43 2.1	415 000 450 000	42 000 46 000	3 000 3 800	<b>*22219EAE4</b>		
	170 55.6 2.1	370 000 525 000	37 500 53 500	1 700 2 200	<b>23219CAE4</b>		
	200 45 3	345 000 435 000	35 000 44 500	1 500 2 000	<b>21319CE4</b>		
	200 67 3	735 000 780 000	75 000 79 500	2 200 2 800	<b>*22319EAE4</b>		
<b>100</b>	150 37 1.5	212 000 335 000	21 600 34 500	2 200 2 800	<b>23020CDE4</b>		
	150 50 1.5	276 000 470 000	28 100 48 000	1 800 2 400	<b>24020CE4</b>		
	165 52 2	345 000 530 000	35 500 54 000	1 700 2 200	<b>23120CE4</b>		
	165 65 2	345 000 535 000	35 000 55 000	1 700 2 200	<b>24120CAE4</b>		
	180 46 2.1	455 000 490 000	46 500 50 000	2 800 3 600	<b>*22220EAE4</b>		
	180 60.3 2.1	420 000 605 000	42 500 61 500	1 600 2 200	<b>23220CE4</b>		
	215 47 3	395 000 485 000	40 500 49 500	1 400 1 900	<b>21320CE4</b>		
	215 73 3	860 000 930 000	88 000 94 500	2 000 2 600	<b>*22320EAE4</b>		
<b>110</b>	170 45 2	293 000 465 000	29 900 47 500	2 000 2 400	<b>23022CDE4</b>		
	170 60 2	380 000 645 000	38 500 66 000	1 600 2 200	<b>24022CE4</b>		
	180 56 2	385 000 630 000	39 500 64 000	1 600 2 000	<b>23122CE4</b>		
	180 69 2	460 000 750 000	47 000 76 500	1 600 2 000	<b>24122CE4</b>		
	200 53 2.1	605 000 645 000	61 500 66 000	2 600 3 200	<b>*22222EAE4</b>		
	200 69.8 2.1	515 000 760 000	52 500 77 500	1 500 1 900	<b>23222CE4</b>		
	240 50 3	450 000 545 000	46 000 55 500	1 300 1 700	<b>21322CAE4</b>		
	240 80 3	1030 000 1 120 000	105 000 115 000	1 900 2 400	<b>*22322EAE4</b>		

Note (1) The suffix K or K30 represents bearings with tapered bores (taper 1 : 12 or 1 : 30).

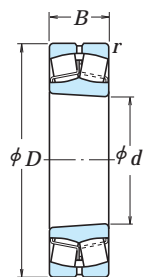
Numbers	Abutment and Fillet Dimensions (mm)					Constant	Axial Load Factors			Mass (kg)
	$d_a$		$D_a$	$r_a$			$e$	$Y_2$	$Y_3$	
Tapered Bore(1)	min.	max.	max.	min.	max.					approx.
<b>*22218EAKE4</b>	100	108	150	142	2	0.24	4.3	2.9	2.8	3.3
<b>23218CKE4</b>	100	105	150	138	2	0.32	3.2	2.1	2.1	4.51
<b>*21318EAKE4</b>	104	115	176	152	2.5	0.24	4.3	2.9	2.8	6.1
<b>*22318EAKE4</b>	104	115	176	163	2.5	0.33	3.1	2.1	2.0	8.56
<b>*22219EAKE4</b>	107	115	158	152	2	0.24	4.3	2.9	2.8	4.04
<b>23219CAKE4</b>	107	—	158	146	2	0.32	3.1	2.1	2.0	5.33
<b>21319CKE4</b>	109	127	186	172	2.5	0.22	4.6	3.1	3.0	6.92
<b>*22319EAKE4</b>	109	121	186	172	2.5	0.33	3.1	2.1	2.0	9.91
<b>23020CDKE4</b>	109	112	141	136	1.5	0.22	4.6	3.1	3.0	2.31
<b>24020CK30E4</b>	109	110	141	132	1.5	0.30	3.4	2.3	2.2	3.08
<b>23120CKE4</b>	110	113	155	144	2	0.30	3.4	2.3	2.2	4.38
<b>24120CAK30E4</b>	110	—	155	143	2	0.35	2.9	1.9	1.9	5.42
<b>*22220EAKE4</b>	112	119	168	160	2	0.24	4.3	2.9	2.8	4.84
<b>23220CKE4</b>	112	118	168	155	2	0.32	3.2	2.1	2.1	6.6
<b>21320CKE4</b>	114	133	201	184	2.5	0.21	4.7	3.2	3.1	8.46
<b>*22320EAKE4</b>	114	130	201	184	2.5	0.33	3.0	2.0	2.0	12.7
<b>23022CDKE4</b>	120	124	160	153	2	0.24	4.2	2.8	2.8	3.76
<b>24022CK30E4</b>	120	121	160	148	2	0.32	3.1	2.1	2.1	4.96
<b>23122CKE4</b>	120	127	170	158	2	0.28	3.5	2.4	2.3	5.7
<b>24122CK30E4</b>	120	123	170	154	2	0.36	2.8	1.9	1.8	6.84
<b>*22222EAKE4</b>	122	129	188	178	2	0.25	4.0	2.7	2.6	6.99
<b>23222CKE4</b>	122	130	188	170	2	0.34	3.0	2.0	1.9	9.54
<b>21322CAKE4</b>	124	—	226	206	2.5	0.22	4.6	3.1	3.0	11.2
<b>*22322EAKE4</b>	124	145	226	206	2.5	0.33	3.1	2.1	2.0	17.6

Remarks 1. The bearings denoted by an asterisk (\*) are NSKHPS bearings and an oil groove and holes are standard for them.  
 2. When making a selection of the recommended fit (Tolerance of Shaft) on Page A84 of the NSK Rolling Bearings catalog, in case of NSKHPS bearings, the conditions are different.  
 The segmentations are: Light Loads ( $\leq 0.05C_r$ ); Normal Loads (0.05 to 0.10 $C_r$ ); and Heavy Loads (>0.10 $C_r$ ).  
 3. For the dimensions of adapters and withdrawal sleeves, refer to Pages B360 – B361, and B366 – B367.

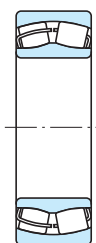
Bore Diameter 120 – 150 mm



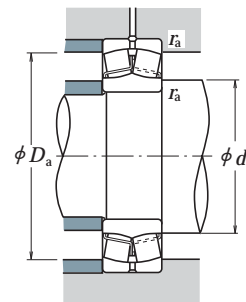
Cylindrical Bore



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 (mm)	Basic Load Ratings				Limiting Speeds		Bearing			
	$d$	$D$	$B$	$r_{min.}$	(N)	(kgf)		(min <sup>-1</sup> )		
				$C_r$	$C_{0r}$	$C_r$	$C_{0r}$	Grease	Oil	Cylindrical Bore
120	180	46	2	315 000	525 000	32 000	53 500	1 800	2 200	23024CDE4
	180	60	2	395 000	705 000	40 500	72 000	1 500	2 000	24024CE4
	200	62	2	465 000	720 000	47 500	73 500	1 400	1 800	23124CE4
	200	80	2	575 000	950 000	58 500	96 500	1 400	1 800	24124CE4
	215	58	2.1	685 000	765 000	70 000	78 000	2 400	3 000	*22224EAE4
	215	76	2.1	630 000	970 000	64 500	99 000	1 300	1 700	23224CE4
260	86	3	1190 000	1 320 000	122 000	134 000	1 700	2 200	*22324EAE4	
130	200	52	2	400 000	655 000	40 500	67 000	1 700	2 000	23026CDE4
	200	69	2	495 000	865 000	50 500	88 000	1 400	1 800	24026CE4
	210	64	2	505 000	825 000	51 500	84 500	1 300	1 700	23126CE4
	210	80	2	590 000	1 010 000	60 000	103 000	1 300	1 700	24126CE4
	230	64	3	820 000	940 000	83 500	96 000	2 200	2 600	*22226EAE4
	230	80	3	700 000	1 080 000	71 500	110 000	1 200	1 600	23226CE4
280	93	4	995 000	1 350 000	101 000	137 000	1 300	1 600	22326CE4	
140	210	53	2	420 000	715 000	43 000	73 000	1 600	1 900	23028CDE4
	210	69	2	525 000	945 000	53 500	96 500	1 300	1 700	24028CE4
	225	68	2.1	580 000	945 000	59 000	96 500	1 200	1 600	23128CE4
	225	85	2.1	670 000	1 160 000	68 500	118 000	1 200	1 600	24128CE4
	250	68	3	645 000	930 000	65 500	95 000	1 400	1 700	22228CDE4
	250	88	3	835 000	1 300 000	85 000	133 000	1 100	1 500	23228CE4
300	102	4	1 160 000	1 590 000	118 000	162 000	1 200	1 500	22328CE4	
150	225	56	2.1	470 000	815 000	48 000	83 000	1 400	1 800	23030CDE4
	225	75	2.1	590 000	1 090 000	60 500	111 000	1 200	1 500	24030CE4
	250	80	2.1	725 000	1 180 000	74 000	121 000	1 100	1 400	23130CE4
	250	100	2.1	890 000	1 530 000	91 000	156 000	1 100	1 400	24130CE4
	270	73	3	765 000	1 120 000	78 000	114 000	1 300	1 600	22230CDE4
	270	96	3	975 000	1 560 000	99 500	159 000	1 100	1 400	23230CE4
320	108	4	1 220 000	1 690 000	125 000	172 000	1 100	1 400	22330CAE4	

Note (1) The suffix K or K30 represents bearings with tapered bores (taper 1 : 12 or 1 : 30).

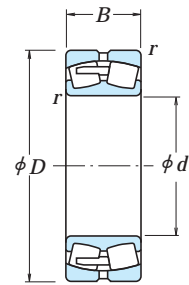
Numbers	Abutment and Fillet Dimensions (mm)					Constant	Axial Load Factors			Mass (kg)
	Tapered Bore(1)		$d_a$	$D_a$	$r_a$		$e$	$Y_2$	$Y_3$	
	min.	max.	max.	min.	max.					approx.
23024CDKE4 24024CK30E4 23124CKE4	130	134	170	163	2	0.22	4.5	3.0	2.9	4.11
	130	131	170	158	2	0.32	3.2	2.1	2.1	5.33
	130	138	190	175	2	0.29	3.5	2.4	2.3	7.85
24124CK30E4 *22224EAKE4 23224CKE4 *22324EAKE4	130	136	190	171	2	0.37	2.7	1.8	1.8	10
	132	142	203	190	2	0.25	3.9	2.7	2.6	8.8
	132	140	203	182	2	0.34	2.9	2.0	1.9	12.1
	134	157	246	222	2.5	0.32	3.1	2.1	2.0	22.2
23026CDKE4 24026CK30E4 23126CKE4	140	147	190	180	2	0.23	4.3	2.9	2.8	5.98
	140	143	190	175	2	0.31	3.2	2.2	2.1	7.84
	140	149	200	184	2	0.28	3.6	2.4	2.4	8.69
24126CK30E4 *22226EAKE4 23226CKE4 22326CKE4	140	146	200	180	2	0.35	2.9	1.9	1.9	10.7
	144	152	216	204	2.5	0.26	3.8	2.6	2.5	11
	144	150	216	196	2.5	0.34	2.9	2.0	1.9	14.3
	148	166	262	236	3	0.34	2.9	2.0	1.9	28.1
23028CDKE4 24028CK30E4 23128CKE4	150	157	200	190	2	0.22	4.5	3.0	2.9	6.49
	150	154	200	186	2	0.29	3.4	2.3	2.2	8.37
	152	158	213	198	2	0.28	3.6	2.4	2.3	10.5
24128CK30E4 22228CDE4 23228CKE4 22328CKE4	152	156	213	193	2	0.35	2.9	1.9	1.9	13
	154	167	236	219	2.5	0.25	4.0	2.7	2.6	14.5
	154	163	236	213	2.5	0.35	2.9	1.9	1.9	18.8
	158	177	282	253	3	0.35	2.9	1.9	1.9	35.4
23030CDKE4 24030CK30E4 23130CKE4	162	168	213	203	2	0.22	4.6	3.1	3.0	7.9
	162	165	213	198	2	0.30	3.4	2.3	2.2	10.5
	162	174	238	218	2	0.30	3.4	2.3	2.2	15.8
24130CK30E4 22230CDE4 23230CKE4 22330CAE4	162	169	238	212	2	0.38	2.6	1.8	1.7	19.8
	164	179	256	236	2.5	0.26	3.9	2.6	2.5	18.4
	164	176	256	230	2.5	0.35	2.9	1.9	1.9	24.2
	168	—	302	270	3	0.35	2.9	1.9	1.9	41.5

Remarks 1. The bearings denoted by an asterisk (\*) are NSKHPS bearings and an oil groove and holes are standard for them.  
 2. When making a selection of the recommended fit (Tolerance of Shaft) on Page A84 of the NSK Rolling Bearings catalog, in case of NSKHPS bearings, the conditions are different.  
 The segmentations are: Light Loads ( $\leq 0.05C_r$ ); Normal Loads (0.05 to 0.10 $C_r$ ); and Heavy Loads (>0.10 $C_r$ ).  
 3. For the dimensions of adapters and withdrawal sleeves, refer to Pages B361 – B362, and B367 – B368.

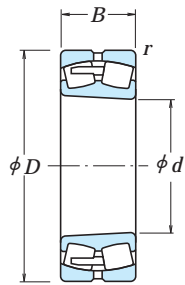




Bore Diameter 280 – 340 mm



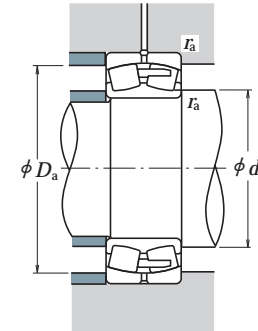
Cylindrical Bore



Tapered Bore



Without an Oil Groove and 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 (mm)	Basic Load Ratings				Limiting Speeds		Bearing
	$C_r$	$C_{0r}$	$C_r$	$C_{0r}$	Grease	Oil	
$d$ $D$ $B$ $r_{min.}$	(N)	(kgf)	(min <sup>-1</sup> )	Cylindrical Bore			
<b>280</b>	380 75 2.1	925 000 1 950 000	94 500 199 000	800 950	<b>23956CAE4</b>		
	420 106 4	1 540 000 2 950 000	157 000 300 000	710 900	<b>23056CAE4</b>		
	420 140 4	1 880 000 3 800 000	191 000 385 000	600 800	<b>24056CAE4</b>		
	460 146 5	2 230 000 4 000 000	228 000 410 000	560 750	<b>23156CAE4</b>		
	460 180 5	2 640 000 5 000 000	269 000 505 000	560 750	<b>24156CAE4</b>		
	500 130 5	2 280 000 3 650 000	233 000 370 000	630 800	<b>22256CAE4</b>		
	500 176 5	2 880 000 4 900 000	294 000 500 000	530 670	<b>23256CAE4</b>		
	580 175 6	3 500 000 5 150 000	355 000 525 000	560 710	<b>22356CAE4</b>		
<b>300</b>	420 90 3	1 230 000 2 490 000	125 000 254 000	710 900	<b>23960CAE4</b>		
	460 118 4	1 920 000 3 700 000	196 000 375 000	670 850	<b>23060CAE4</b>		
	460 160 4	2 310 000 4 600 000	235 000 470 000	530 710	<b>24060CAE4</b>		
	500 160 5	2 670 000 4 800 000	273 000 490 000	500 670	<b>23160CAE4</b>		
	500 200 5	3 100 000 5 800 000	315 000 595 000	500 670	<b>24160CAE4</b>		
	540 140 5	2 610 000 4 250 000	266 000 430 000	600 750	<b>22260CAE4</b>		
	540 192 5	3 400 000 5 900 000	350 000 600 000	480 630	<b>23260CAE4</b>		
<b>320</b>	440 90 3	1 300 000 2 750 000	132 000 281 000	670 850	<b>23964CAE4</b>		
	480 121 4	1 960 000 3 850 000	200 000 395 000	630 800	<b>23064CAE4</b>		
	480 160 4	2 440 000 5 050 000	249 000 515 000	500 670	<b>24064CAE4</b>		
	540 176 5	3 050 000 5 500 000	315 000 560 000	480 600	<b>23164CAE4</b>		
	540 218 5	3 550 000 6 650 000	360 000 675 000	480 600	<b>24164CAE4</b>		
	580 150 5	2 990 000 4 850 000	305 000 495 000	530 670	<b>22264CAE4</b>		
	580 208 5	3 900 000 6 900 000	395 000 700 000	450 600	<b>23264CAE4</b>		
<b>340</b>	460 90 3	1 330 000 2 840 000	136 000 289 000	630 800	<b>23968CAE4</b>		
	520 133 5	2 280 000 4 400 000	232 000 445 000	560 710	<b>23068CAE4</b>		
	520 180 5	2 920 000 6 050 000	298 000 615 000	480 600	<b>24068CAE4</b>		
	580 190 5	3 600 000 6 600 000	370 000 670 000	430 560	<b>23168CAE4</b>		
	580 243 5	4 250 000 7 900 000	430 000 810 000	430 560	<b>24168CAE4</b>		
	620 224 6	4 400 000 7 800 000	450 000 795 000	400 530	<b>23268CAE4</b>		

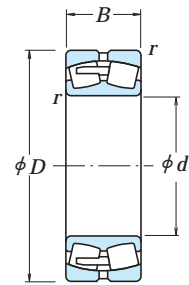
Note (1) The suffix K or K30 represents bearings with tapered bores (taper 1 : 12 or 1 : 30).

Numbers	Abutment and Fillet Dimensions (mm)				Constant	Axial Load Factors			Mass (kg)
	$d_a$ min.	$d_a$ max.	$D_a$ min.	$r_a$ max.		$e$	$Y_2$	$Y_3$	
Tapered Bore(1)									approx.
<b>23956CAKE4</b>	292	368	351	2	0.18	5.7	3.9	3.8	24.5
<b>23056CAKE4</b>	298	402	377	3	0.24	4.2	2.8	2.7	50.5
<b>24056CAK30E4</b>	298	402	369	3	0.31	3.3	2.2	2.2	66.4
<b>23156CAKE4</b>	302	438	400	4	0.30	3.3	2.2	2.2	94.3
<b>24156CAK30E4</b>	302	438	392	4	0.37	2.7	1.8	1.8	115
<b>22256CAKE4</b>	302	478	439	4	0.25	4.0	2.7	2.6	110
<b>23256CAKE4</b>	302	478	425	4	0.35	2.9	1.9	1.9	147
<b>22356CAKE4</b>	308	552	496	5	0.31	3.2	2.1	2.1	221
<b>23960CAKE4</b>	314	406	386	2.5	0.19	5.2	3.5	3.4	38.2
<b>23060CAKE4</b>	318	442	413	3	0.24	4.2	2.8	2.7	70.5
<b>24060CAK30E4</b>	318	442	400	3	0.32	3.1	2.1	2.0	93.6
<b>23160CAKE4</b>	322	478	433	4	0.31	3.3	2.2	2.2	125
<b>24160CAK30E4</b>	322	478	423	4	0.38	2.6	1.8	1.7	152
<b>22260CAKE4</b>	322	518	473	4	0.25	4.0	2.7	2.6	139
<b>23260CAKE4</b>	322	518	458	4	0.35	2.9	1.9	1.9	189
<b>23964CAKE4</b>	334	426	406	2.5	0.18	5.5	3.7	3.6	40.6
<b>23064CAKE4</b>	338	462	432	3	0.24	4.2	2.8	2.8	75.6
<b>24064CAK30E4</b>	338	462	422	3	0.31	3.3	2.2	2.2	99.7
<b>23164CAKE4</b>	342	518	466	4	0.31	3.2	2.1	2.1	162
<b>24164CAK30E4</b>	342	518	456	4	0.39	2.6	1.7	1.7	196
<b>22264CAKE4</b>	342	558	508	4	0.26	3.9	2.6	2.6	174
<b>23264CAKE4</b>	342	558	488	4	0.36	2.8	1.9	1.8	239
<b>23968CAKE4</b>	354	446	427	2.5	0.18	5.7	3.8	3.7	42.4
<b>23068CAKE4</b>	362	498	465	4	0.24	4.2	2.8	2.8	101
<b>24068CAK30E4</b>	362	498	454	4	0.32	3.2	2.1	2.1	135
<b>23168CAKE4</b>	362	558	499	4	0.31	3.2	2.1	2.1	206
<b>24168CAK30E4</b>	362	558	489	4	0.40	2.5	1.7	1.7	257
<b>23268CAKE4</b>	368	592	521	5	0.36	2.8	1.9	1.8	295

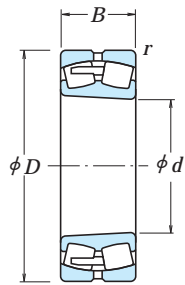
Remarks For the dimensions of adapters and withdrawal sleeves, refer to Pages B363 – B364, and B369 – B370.



Bore Diameter 360 – 440 mm



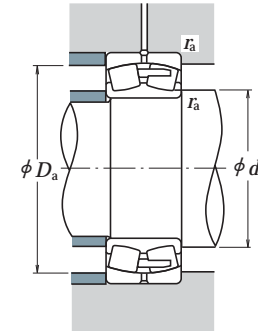
Cylindrical Bore



Tapered Bore



Without an Oil Groove and 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.

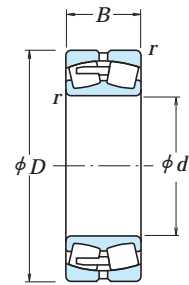
Boundary Dimensions (mm)	Basic Load Ratings				Limiting Speeds		Bearing			
	$d$	$D$	$B$	$r_{min.}$	(N)	(kgf)		(min <sup>-1</sup> )		
				$C_r$	$C_{0r}$	$C_r$	$C_{0r}$	Grease	Oil	Cylindrical Bore
<b>360</b>	480	90	3	1 390 000	3 050 000	142 000	315 000	600	750	<b>23972CAE4</b>
	540	134	5	2 390 000	4 700 000	244 000	480 000	530	670	<b>23072CAE4</b>
	540	180	5	2 930 000	6 100 000	299 000	625 000	450	600	<b>24072CAE4</b>
	600	192	5	3 800 000	7 100 000	390 000	725 000	400	530	<b>23172CAE4</b>
	600	243	5	4 200 000	8 000 000	430 000	815 000	400	530	<b>24172CAE4</b>
	650	232	6	4 800 000	8 550 000	490 000	870 000	380	500	<b>23272CAE4</b>
<b>380</b>	520	106	4	1 870 000	4 100 000	190 000	420 000	530	670	<b>23976CAE4</b>
	560	135	5	2 500 000	5 100 000	255 000	520 000	530	630	<b>23076CAE4</b>
	560	180	5	3 050 000	6 600 000	315 000	670 000	430	560	<b>24076CAE4</b>
	620	194	5	4 000 000	7 600 000	405 000	775 000	400	500	<b>23176CAE4</b>
	620	243	5	4 350 000	8 450 000	440 000	865 000	400	500	<b>24176CAE4</b>
	680	240	6	5 150 000	9 200 000	525 000	940 000	360	480	<b>23276CAE4</b>
<b>400</b>	540	106	4	1 890 000	4 250 000	193 000	435 000	530	630	<b>23980CAE4</b>
	600	148	5	2 970 000	5 900 000	305 000	605 000	480	600	<b>23080CAE4</b>
	600	200	5	3 600 000	7 600 000	370 000	775 000	400	500	<b>24080CAE4</b>
	650	200	6	4 150 000	7 900 000	420 000	805 000	380	480	<b>23180CAE4</b>
	650	250	6	4 950 000	10 100 000	505 000	1 030 000	380	480	<b>24180CAE4</b>
	720	256	6	5 800 000	10 400 000	590 000	1 060 000	340	450	<b>23280CAE4</b>
<b>420</b>	560	106	4	1 870 000	4 250 000	191 000	430 000	500	600	<b>23984CAE4</b>
	620	150	5	2 910 000	5 850 000	297 000	595 000	450	560	<b>23084CAE4</b>
	620	200	5	3 750 000	8 100 000	380 000	825 000	380	480	<b>24084CAE4</b>
	700	224	6	5 000 000	9 400 000	510 000	960 000	340	450	<b>23184CAE4</b>
	700	280	6	6 000 000	12 000 000	610 000	1 220 000	340	450	<b>24184CAE4</b>
	760	272	7.5	6 450 000	11 700 000	660 000	1 190 000	320	430	<b>23284CAE4</b>
<b>440</b>	600	118	4	2 190 000	4 800 000	223 000	490 000	450	560	<b>23988CAE4</b>
	650	157	6	3 150 000	6 350 000	320 000	645 000	430	530	<b>23088CAE4</b>
	650	212	6	4 150 000	9 100 000	425 000	930 000	360	450	<b>24088CAE4</b>
	720	226	6	5 300 000	10 300 000	540 000	1 060 000	320	430	<b>23188CAE4</b>
	720	280	6	6 000 000	12 100 000	610 000	1 230 000	320	430	<b>24188CAE4</b>
	790	280	7.5	6 900 000	12 800 000	705 000	1 300 000	300	400	<b>23288CAE4</b>

Note (1) The suffix K or K30 represents bearings with tapered bores (taper 1 : 12 or 1 : 30).

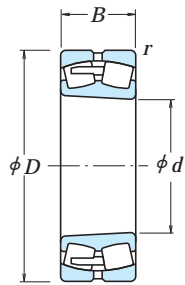
Numbers	Abutment and Fillet Dimensions (mm)				Constant	Axial Load Factors			Mass (kg)
	$d_a$ min.	$d_a$ max.	$D_a$ min.	$r_a$ max.		$e$	$Y_2$	$Y_3$	
<b>Tapered Bore<sup>(1)</sup></b>									approx.
<b>23972CAKE4</b>	374	466	447	2.5	0.17	6.0	4.1	4.0	44.7
<b>23072CAKE4</b>	382	518	485	4	0.24	4.2	2.8	2.8	106
<b>24072CAK30E4</b>	382	518	476	4	0.32	3.2	2.1	2.1	139
<b>23172CAKE4</b>	382	578	520	4	0.31	3.2	2.2	2.1	217
<b>24172CAK30E4</b>	382	578	507	4	0.40	2.5	1.7	1.7	264
<b>23272CAKE4</b>	388	622	549	5	0.36	2.8	1.9	1.8	342
<b>23976CAKE4</b>	398	502	482	3	0.18	5.5	3.7	3.6	65.4
<b>23076CAKE4</b>	402	538	506	4	0.22	4.5	3.0	3.0	113
<b>24076CAK30E4</b>	402	538	496	4	0.29	3.4	2.3	2.3	148
<b>23176CAKE4</b>	402	598	540	4	0.30	3.3	2.2	2.2	229
<b>24176CAK30E4</b>	402	598	529	4	0.38	2.6	1.8	1.7	275
<b>23276CAKE4</b>	408	652	578	5	0.35	2.9	1.9	1.9	372
<b>23980CAKE4</b>	418	522	501	3	0.18	5.7	3.9	3.8	69.1
<b>23080CAKE4</b>	422	578	540	4	0.23	4.4	3.0	2.9	146
<b>24080CAK30E4</b>	422	578	527	4	0.31	3.3	2.2	2.2	193
<b>23180CAKE4</b>	428	622	569	5	0.29	3.4	2.3	2.3	257
<b>24180CAK30E4</b>	428	622	551	5	0.37	2.7	1.8	1.8	316
<b>23280CAKE4</b>	428	692	610	5	0.36	2.8	1.9	1.9	449
<b>23984CAKE4</b>	438	542	521	3	0.17	6.0	4.0	3.9	71.6
<b>23084CAKE4</b>	442	598	562	4	0.23	4.3	2.9	2.8	151
<b>24084CAK30E4</b>	442	598	549	4	0.31	3.2	2.2	2.1	199
<b>23184CAKE4</b>	448	672	607	5	0.31	3.3	2.2	2.2	341
<b>24184CAK30E4</b>	448	672	598	5	0.38	2.6	1.8	1.7	421
<b>23284CAKE4</b>	456	724	644	6	0.35	2.9	1.9	1.9	534
<b>23988CAKE4</b>	458	582	555	3	0.18	5.7	3.9	3.8	96.3
<b>23088CAKE4</b>	468	622	587	5	0.23	4.3	2.9	2.8	173
<b>24088CAK30E4</b>	468	622	576	5	0.31	3.2	2.1	2.1	237
<b>23188CAKE4</b>	468	692	627	5	0.3	3.3	2.2	2.2	360
<b>24188CAK30E4</b>	468	692	617	5	0.37	2.7	1.8	1.8	433
<b>23288CAKE4</b>	476	754	669	6	0.35	2.9	1.9	1.9	594

Remarks For the dimensions of adapters and withdrawal sleeves, refer to Pages B364, and B370 – B371.

Bore Diameter 460 – 560 mm



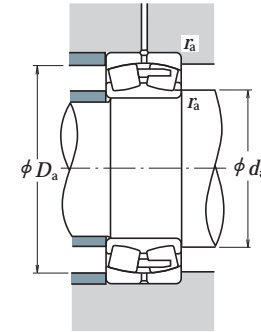
Cylindrical Bore



Tapered Bore



Without an Oil Groove and 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 (mm)	Basic Load Ratings				Limiting Speeds		Bearing
	$C_r$	$C_{0r}$	$C_r$	$C_{0r}$	Grease	Oil	
$d$ $D$ $B$ $r_{min.}$	(N)	(kgf)					Cylindrical Bore
<b>460</b>	620 118 4	2 220 000 4 950 000	227 000 505 000	430 530	<b>23992CAE4</b>		
	680 163 6	3 450 000 7 100 000	355 000 725 000	400 500	<b>23092CAE4</b>		
	680 218 6	4 500 000 9 950 000	460 000 1 010 000	340 430	<b>24092CAE4</b>		
	760 240 7.5	5 700 000 10 900 000	580 000 1 110 000	300 400	<b>23192CAE4</b>		
	760 300 7.5	6 300 000 12 400 000	640 000 1 270 000	300 400	<b>24192CAE4</b>		
	830 296 7.5	7 350 000 13 700 000	750 000 1 400 000	280 380	<b>23292CAE4</b>		
<b>480</b>	650 128 5	2 580 000 5 850 000	263 000 595 000	400 500	<b>23996CAE4</b>		
	700 165 6	3 800 000 7 950 000	385 000 810 000	400 480	<b>23096CAE4</b>		
	700 218 6	4 600 000 10 200 000	470 000 1 040 000	320 430	<b>24096CAE4</b>		
	790 248 7.5	6 050 000 11 700 000	620 000 1 200 000	300 380	<b>23196CAE4</b>		
	790 308 7.5	7 150 000 14 600 000	730 000 1 490 000	300 380	<b>24196CAE4</b>		
	870 310 7.5	7 850 000 14 400 000	805 000 1 470 000	260 360	<b>23296CAE4</b>		
<b>500</b>	670 128 5	2 460 000 5 550 000	250 000 565 000	400 500	<b>239/500CAE4</b>		
	720 167 6	3 750 000 8 100 000	385 000 825 000	380 480	<b>230/500CAE4</b>		
	720 218 6	4 450 000 9 900 000	450 000 1 010 000	300 400	<b>240/500CAE4</b>		
	830 264 7.5	6 850 000 13 400 000	700 000 1 360 000	280 360	<b>231/500CAE4</b>		
	830 325 7.5	8 000 000 16 000 000	815 000 1 630 000	280 360	<b>241/500CAE4</b>		
	920 336 7.5	9 000 000 16 600 000	915 000 1 690 000	260 320	<b>232/500CAE4</b>		
<b>530</b>	710 136 5	2 930 000 6 800 000	299 000 695 000	360 450	<b>239/530CAE4</b>		
	780 185 6	4 400 000 9 200 000	450 000 940 000	340 430	<b>230/530CAE4</b>		
	780 250 6	5 400 000 11 800 000	550 000 1 210 000	280 360	<b>240/530CAE4</b>		
	870 272 7.5	7 150 000 14 100 000	730 000 1 440 000	260 340	<b>231/530CAE4</b>		
	870 335 7.5	8 500 000 17 500 000	870 000 1 790 000	260 340	<b>241/530CAE4</b>		
	980 355 9.5	10 100 000 18 800 000	1 030 000 1 920 000	240 300	<b>232/530CAE4</b>		
<b>560</b>	750 140 5	3 100 000 7 250 000	320 000 740 000	340 430	<b>239/560CAE4</b>		
	820 195 6	5 000 000 10 700 000	510 000 1 090 000	320 400	<b>230/560CAE4</b>		
	820 258 6	5 950 000 13 300 000	605 000 1 360 000	260 340	<b>240/560CAE4</b>		
	920 280 7.5	7 850 000 15 500 000	800 000 1 580 000	240 320	<b>231/560CAE4</b>		
	920 355 7.5	9 400 000 19 600 000	960 000 2 000 000	240 320	<b>241/560CAE4</b>		
	1 030 365 9.5	10 900 000 20 500 000	1 110 000 2 090 000	220 280	<b>232/560CAE4</b>		

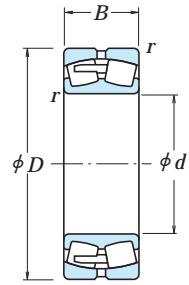
Note (1) The suffix K or K30 represents bearings with tapered bores (taper 1 : 12 or 1 : 30).

Numbers	Abutment and Fillet Dimensions (mm)				Constant	Axial Load Factors			Mass (kg)
	$d_a$ min.	$d_a$ max.	$D_a$ min.	$r_a$ max.		$e$	$Y_2$	$Y_3$	
Tapered Bore(1)									approx.
<b>23992CAKE4</b>	478	602	575	3	0.17	5.9	4.0	3.9	100
<b>23092CAKE4</b>	488	652	615	5	0.22	4.6	3.1	3.0	201
<b>24092CAK30E4</b>	488	652	604	5	0.29	3.4	2.3	2.3	266
<b>23192CAKE4</b>	496	724	661	6	0.31	3.3	2.2	2.2	423
<b>24192CAK30E4</b>	496	724	646	6	0.39	2.6	1.7	1.7	512
<b>23292CAKE4</b>	496	794	702	6	0.36	2.8	1.9	1.8	691
<b>23996CAKE4</b>	502	628	602	4	0.18	5.7	3.8	3.7	121
<b>23096CAKE4</b>	508	672	633	5	0.22	4.6	3.1	3.0	211
<b>24096CAK30E4</b>	508	672	625	5	0.30	3.4	2.3	2.2	270
<b>23196CAKE4</b>	516	754	688	6	0.31	3.3	2.2	2.2	475
<b>24196CAK30E4</b>	516	754	670	6	0.39	2.6	1.7	1.7	567
<b>23296CAKE4</b>	516	834	733	6	0.36	2.8	1.9	1.8	795
<b>239/500CAKE4</b>	522	648	622	4	0.17	6.0	4.0	3.9	124
<b>230/500CAKE4</b>	528	692	655	5	0.21	4.8	3.2	3.1	220
<b>240/500CAK30E4</b>	528	692	643	5	0.30	3.4	2.3	2.2	276
<b>231/500CAKE4</b>	536	794	720	6	0.31	3.2	2.2	2.1	567
<b>241/500CAK30E4</b>	536	794	703	6	0.39	2.6	1.7	1.7	666
<b>232/500CAKE4</b>	536	884	773	6	0.38	2.7	1.8	1.8	969
<b>239/530CAKE4</b>	552	688	659	4	0.17	6.0	4.0	3.9	149
<b>230/530CAKE4</b>	558	752	706	5	0.22	4.6	3.1	3.0	298
<b>240/530CAK30E4</b>	558	752	690	5	0.31	3.3	2.2	2.2	390
<b>231/530CAKE4</b>	566	834	758	6	0.30	3.3	2.2	2.2	628
<b>241/530CAK30E4</b>	566	834	740	6	0.38	2.6	1.8	1.7	773
<b>232/530CAKE4</b>	574	936	824	8	0.38	2.7	1.8	1.7	1 170
<b>239/560CAKE4</b>	582	728	697	4	0.16	6.1	4.1	4.0	172
<b>230/560CAKE4</b>	588	792	742	5	0.22	4.5	3.0	2.9	344
<b>240/560CAK30E4</b>	588	792	729	5	0.30	3.3	2.2	2.2	440
<b>231/560CAKE4</b>	596	884	804	6	0.30	3.4	2.3	2.2	727
<b>241/560CAK30E4</b>	596	884	782	6	0.39	2.6	1.8	1.7	886
<b>232/560CAKE4</b>	604	986	870	8	0.36	2.8	1.9	1.8	1 320

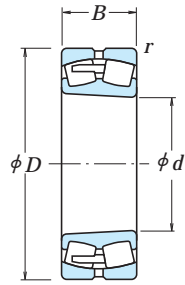
Remarks For the dimensions of adapters and withdrawal sleeves, refer to Pages B365 and B371.



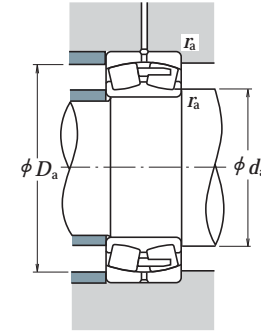
Bore Diameter 850 – 1400 mm



Cylindrical Bore



Tapered Bore



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 (mm)	Basic Load Ratings				Limiting Speeds		Bearing			
	$d$	$D$	$B$	$r_{min.}$	(N)	(kgf)		(min <sup>-1</sup> )		
				$C_r$	$C_{0r}$	$C_r$	$C_{0r}$	Grease	Oil	Cylindrical Bore
850	1 120	200	6	6 100 000	15 200 000	620 000	1 550 000	190	240	239/850CAE4 230/850CAE4
	1 220	272	7.5	9 300 000	21 400 000	945 000	2 190 000	180	220	
	1 220	365	7.5	11 600 000	28 300 000	1 180 000	2 890 000	150	190	240/850CAE4 232/850CAE4
	1 500	515	15	22 300 000	45 500 000	2 270 000	4 650 000	120	160	
900	1 180	206	6	6 600 000	16 700 000	670 000	1 700 000	180	220	239/900CAE4 230/900CAE4
	1 280	280	7.5	9 850 000	22 800 000	1 000 000	2 330 000	160	200	
	1 280	375	7.5	12 800 000	31 500 000	1 300 000	3 250 000	140	180	240/900CAE4 232/900CAE4
	1 580	515	15	23 400 000	47 500 000	2 380 000	4 850 000	110	140	
950	1 250	224	7.5	7 600 000	19 900 000	775 000	2 030 000	160	200	239/950CAE4 230/950CAE4
	1 360	300	7.5	11 300 000	26 500 000	1 160 000	2 710 000	150	190	
	1 360	412	7.5	14 500 000	36 500 000	1 480 000	3 700 000	120	160	240/950CAE4 232/950CAE4
	1 660	530	15	24 700 000	50 500 000	2 520 000	5 150 000	100	130	
1 000	1 320	236	7.5	8 200 000	21 700 000	835 000	2 210 000	150	190	239/1000CAE4
	1 420	308	7.5	11 900 000	28 100 000	1 210 000	2 860 000	140	170	230/1000CAE4
	1 420	412	7.5	15 300 000	38 500 000	1 560 000	3 950 000	110	150	240/1000CAE4
1 060	1 400	250	7.5	9 300 000	24 400 000	950 000	2 490 000	130	170	239/1060CAE4
	1 500	325	9.5	13 000 000	31 500 000	1 330 000	3 200 000	120	160	230/1060CAE4
	1 500	438	9.5	16 800 000	43 000 000	1 720 000	4 350 000	100	130	240/1060CAE4
1 120	1 580	345	9.5	15 400 000	38 000 000	1 570 000	3 850 000	110	140	230/1120CAE4
	1 580	462	9.5	18 700 000	49 500 000	1 910 000	5 050 000	95	120	240/1120CAE4
1 180	1 660	475	9.5	20 200 000	52 500 000	2 060 000	5 350 000	85	110	240/1180CAE4
1 250	1 750	500	9.5	21 000 000	59 500 000	2 140 000	6 050 000	75	100	240/1250CAE4
1 320	1 850	530	12	22 600 000	63 500 000	2 310 000	6 500 000	67	85	240/1320CAE4
1 400	1 950	545	12	24 500 000	65 000 000	2 500 000	6 650 000	60	75	240/1400CAE4

Note (1) The suffix K or K30 represents bearings with tapered bores (taper 1 : 12 or 1 : 30).

Numbers	Abutment and Fillet Dimensions (mm)				Constant	Axial Load Factors			Mass (kg)					
	$d_a$ min.	$d_a$ max.	$D_a$ min.	$r_a$ max.		$e$	$Y_2$	$Y_3$		$Y_0$				
239/850CAKE4 230/850CAKE4	878	1 092	1 046	5	0.16	6.2	4.2	4.1	523					
	886	1 184	1 109	6						0.21	4.8	3.2	3.1	1 020
240/850CAK30E4 232/850CAKE4	886	1 184	1 093	6	0.28	3.6	2.4	2.4	1 350					
	914	1 436	1 274	12						0.35	2.8	1.9	1.9	3 890
239/900CAKE4 230/900CAKE4	928	1 152	1 103	5	0.16	6.4	4.3	4.2	591					
	936	1 244	1 169	6						0.20	4.9	3.3	3.2	1 160
240/900CAK30E4 232/900CAKE4	936	1 244	1 147	6	0.28	3.6	2.4	2.4	1 520					
	964	1 516	1 354	12						0.33	3.0	2.0	2.0	4 300
239/950CAKE4 230/950CAKE4	986	1 214	1 169	6	0.16	6.3	4.2	4.1	732					
	986	1 324	1 241	6						0.21	4.8	3.2	3.2	1 400
240/950CAK30E4 232/950CAKE4	986	1 324	1 219	6	0.28	3.6	2.4	2.3	1 880					
	1 014	1 596	1 428	12						0.32	3.1	2.1	2.1	4 800
239/1000CAKE4 230/1000CAKE4 240/1000CAK30E4	1 036	1 284	1 229	6	0.16	6.4	4.3	4.2	881					
	1 036	1 384	1 298	6						0.20	4.9	3.3	3.2	1 560
	1 036	1 384	1 275	6						0.27	3.7	2.5	2.4	2 010
239/1060CAKE4 230/1060CAKE4 240/1060CAK30E4	1 096	1 364	1 302	6	0.16	6.1	4.1	4.0	1 030					
	1 104	1 456	1 368	8						0.21	4.9	3.3	3.2	1 790
	1 104	1 456	1 346	8						0.28	3.6	2.4	2.4	2 410
230/1120CAKE4 240/1120CAK30E4	1 164	1 536	1 444	8	0.20	5.0	3.4	3.3	2 120					
	1 164	1 536	1 421	8						0.27	3.7	2.5	2.5	2 790
240/1180CAK30E4	1 224	1 616	1 494	8	0.27	3.7	2.5	2.4	3 180					
240/1250CAK30E4	1 294	1 706	1 579	8	0.25	4.0	2.7	2.6	3 700					
240/1320CAK30E4	1 374	1 796	1 656	10	0.26	3.9	2.6	2.6	4 400					
240/1400CAK30E4	1 454	1 896	1 767	10	0.25	4.0	2.7	2.6	4 900					