

## 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



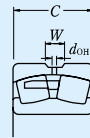
### DESIGN, TYPES, AND FEATURES

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 HPS 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.



<b>TOLERANCES AND RUNNING ACCURACY</b> .....	Table 8.2 (Pages A60 to A63)
<b>RECOMMENDED FITS</b> .....	Table 9.2 (Page A84)
	Table 9.4 (Page A85)
<b>INTERNAL CLEARANCE</b> .....	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 Outer Ring Width	Oil Groove		Hole Diameter
	over	incl	
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**

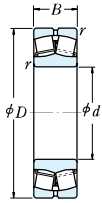
Nominal Outer Ring Dia D <sub>o</sub>	Number of Holes	
	over	incl
—	180	4
180	250	6
250	315	6
315	400	6
400	500	6
500	630	8
630	800	8
800	1000	8
1000	1250	8
1250	1600	8
1600	2000	8

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.

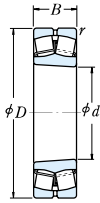
If very small bearing loads are expected, please contact NSK for selection of an appropriate bearing.

# SPHERICAL ROLLER BEARINGS

Bore Diameter 20 – 55 mm



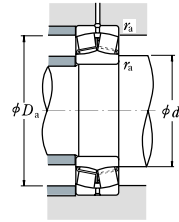
Cylindrical Bore



Tapered Bore



Without an Oil Groove or Holes



### Dynamic Equivalent Load

$$P = X F_r + Y F_a$$

$F_a / F_r \leq e$		$F_a / F_r > e$	
X	Y	X	Y
1	$Y_2$	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
$d$	$D$	$B$	$r_{min}$	$C_r$	$C_{0r}$	$C_r$	$C_{0r}$	Grease	Oil	
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

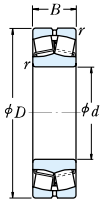
Note (\*) The suffix K represents bearings with tapered bores (taper 1 : 12).

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

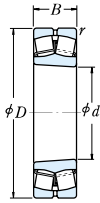
- Remarks
- The bearings denoted by an asterisk (\*) are HPS bearings and an oil groove and holes are standard for them.
  - When making a selection of the recommended fit (Tolerance of Shaft) on Page A84 of the NSK Rolling Bearings catalog, in case of HPS bearings, the conditions are different.  
The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

# SPHERICAL ROLLER BEARINGS

Bore Diameter 60 – 85 mm



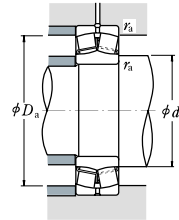
Cylindrical Bore



Tapered Bore



Without an Oil Groove or Holes



### Dynamic Equivalent Load

$$P = X F_r + Y F_a$$

$F_a / F_r \leq e$		$F_a / F_r > e$	
X	Y	X	Y
1	$Y_2$	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
$d$	$D$	$B$	$r_{min}$	$C_r$	$C_{0r}$	$C_r$	$C_{0r}$	Grease	Oil		Cylindrical Bore	
60	95	26	1,1	98 500	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>*2312EAE4</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	22 800	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>	
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>	

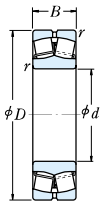
Note (\*) The suffix K represents bearings with tapered bores (taper 1 : 12).

Numbers	Abutment and Fillet Dimensions (mm)				Constant	Axial Load Factors			Mass (kg)	
	$d_a$		$D_a$	$r_a$		$e$	$Y_2$	$Y_3$		$Y_0$
Tapered Bore <sup>(1)</sup>	min.	max.	max.	min.					approx.	
<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

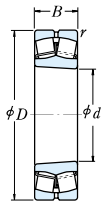
- Remarks
- The bearings denoted by an asterisk (\*) are HPS bearings and an oil groove and holes are standard for them.
  - When making a selection of the recommended fit (Tolerance of Shaft) on Page A84 of the NSK Rolling Bearings catalog, in case of HPS bearings, the conditions are different.  
The segmentations are: Light Loads ( $\leq 0,05C_r$ ); Normal Loads ( $0,05$  to  $0,10C_r$ ); and Heavy Loads ( $> 0,10C_r$ ).
  - For the dimensions of adapters and withdrawal sleeves, refer to Pages B359 – B361, and B366.

**SPHERICAL ROLLER BEARINGS**

Bore Diameter 90 – 110 mm



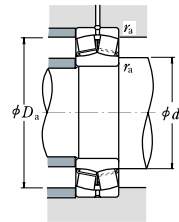
Cylindrical Bore



Tapered Bore



Without an Oil Groove or Holes



**Dynamic Equivalent Load**

$$P = X F_r + Y F_a$$

$F_a / F_r \leq e$		$F_a / F_r > e$	
X	Y	X	Y
1	$Y_2$	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			
	$C_r$	$C_{0r}$	$C_r$	$C_{0r}$	Grease	Oil				
<b>90</b>	160	40	2	360 000	395 000	37 000	40 000	3 200	4 000	*22218EAE4
	160	52,4	2	340 000	490 000	34 500	50 000	1 800	2 400	23218CE4
	190	43	3	415 000	450 000	42 000	46 000	2 800	3 600	*21318EAE4
	190	64	3	665 000	705 000	68 000	72 000	2 400	3 000	*22318EAE4
<b>95</b>	170	43	2,1	415 000	450 000	42 000	46 000	3 000	3 800	*22219EAE4
	170	55,6	2,1	370 000	525 000	37 500	53 500	1 700	2 200	23219CAE4
	200	45	3	345 000	435 000	35 000	44 500	1 500	2 000	21319CE4
	200	67	3	735 000	780 000	75 000	79 500	2 200	2 800	*22319EAE4
<b>100</b>	150	37	1,5	212 000	335 000	21 600	34 500	2 200	2 800	23020CDE4
	150	50	1,5	276 000	470 000	28 100	48 000	1 800	2 400	24020CE4
	165	52	2	345 000	530 000	35 500	54 000	1 700	2 200	23120CE4
	165	65	2	345 000	535 000	35 000	55 000	1 700	2 200	24120CAE4
	180	46	2,1	455 000	490 000	46 500	50 000	2 800	3 600	*22220EAE4
	180	60,3	2,1	420 000	605 000	42 500	61 500	1 600	2 200	23220CE4
	215	47	3	395 000	485 000	40 500	49 500	1 400	1 900	21320CE4
	215	73	3	860 000	930 000	88 000	94 500	2 000	2 600	*22320EAE4
<b>110</b>	170	45	2	293 000	465 000	29 900	47 500	2 000	2 400	23022CDE4
	170	60	2	380 000	645 000	38 500	66 000	1 600	2 200	24022CE4
	180	56	2	385 000	630 000	39 500	64 000	1 600	2 000	23122CE4
	180	69	2	460 000	750 000	47 000	76 500	1 600	2 000	24122CE4
	200	53	2,1	605 000	645 000	61 500	66 000	2 600	3 200	*22222EAE4
	200	69,8	2,1	515 000	760 000	52 500	77 500	1 500	1 900	23222CE4
	240	50	3	450 000	545 000	46 000	55 500	1 300	1 700	21322CAE4
	240	80	3	1030 000	1 120 000	105 000	115 000	1 900	2 400	*22322EAE4

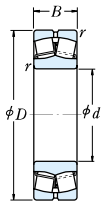
Note (\*) The suffix K or K30 represents bearings with tapered bores (taper 1 : 12 or 1 : 30).

Numbers	Abutment and Fillet Dimensions (mm)				Constant	Axial Load Factors			Mass (kg) approx.	
	$d_a$		$D_a$	$r_a$		$e$	$Y_2$	$Y_3$		$Y_0$
Tapered Bore <sup>(1)</sup>	min.	max.	max.	min.	max.					
*22218EAKE4	100	108	150	142	2	0,24	4,3	2,9	2,8	3,3
23218CKE4	100	105	150	138	2	0,32	3,2	2,1	2,1	4,51
*21318EAKE4	104	115	176	152	2,5	0,24	4,3	2,9	2,8	6,1
*22318EAKE4	104	115	176	163	2,5	0,33	3,1	2,1	2,0	8,56
*22219EAKE4	107	115	158	152	2	0,24	4,3	2,9	2,8	4,04
23219CAKE4	107	—	158	146	2	0,32	3,1	2,1	2,0	5,33
21319CKE4	109	127	186	172	2,5	0,22	4,6	3,1	3,0	6,92
*22319EAKE4	109	121	186	172	2,5	0,33	3,1	2,1	2,0	9,91
23020CDKE4	109	112	141	136	1,5	0,22	4,6	3,1	3,0	2,31
24020CK30E4	109	110	141	132	1,5	0,30	3,4	2,3	2,2	3,08
23120CKE4	110	113	155	144	2	0,30	3,4	2,3	2,2	4,38
24120CAK30E4	110	—	155	143	2	0,35	2,9	1,9	1,9	5,42
*22220EAKE4	112	119	168	160	2	0,24	4,3	2,9	2,8	4,84
23220CKE4	112	118	168	155	2	0,32	3,2	2,1	2,1	6,6
21320CKE4	114	133	201	184	2,5	0,21	4,7	3,2	3,1	8,46
*22320EAKE4	114	130	201	184	2,5	0,33	3,0	2,0	2,0	12,7
23022CDKE4	120	124	160	153	2	0,24	4,2	2,8	2,8	3,76
24022CK30E4	120	121	160	148	2	0,32	3,1	2,1	2,1	4,96
23122CKE4	120	127	170	158	2	0,28	3,5	2,4	2,3	5,7
24122CK30E4	120	123	170	154	2	0,36	2,8	1,9	1,8	6,84
*22222EAKE4	122	129	188	178	2	0,25	4,0	2,7	2,6	6,99
23222CKE4	122	130	188	170	2	0,34	3,0	2,0	1,9	9,54
21322CAE4	124	—	226	206	2,5	0,22	4,6	3,1	3,0	11,2
*22322EAKE4	124	145	226	206	2,5	0,33	3,1	2,1	2,0	17,6

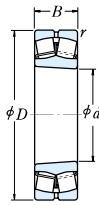
- Remarks**
- The bearings denoted by an asterisk (\*) are HPS bearings and an oil groove and holes are standard for them.
  - When making a selection of the recommended fit (Tolerance of Shaft) on Page A84 of the NSK Rolling Bearings catalog, in case of HPS bearings, the conditions are different.  
The segmentations are: Light Loads ( $\leq 0,05C_r$ ); Normal Loads ( $0,05$  to  $0,10C_r$ ); and Heavy Loads ( $> 0,10C_r$ ).
  - For the dimensions of adapters and withdrawal sleeves, refer to Pages B360 – B361, and B366 – B367.

**SPHERICAL ROLLER BEARINGS**

Bore Diameter 120 – 150 mm



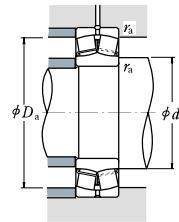
Cylindrical Bore



Tapered Bore



Without an Oil Groove or Holes



**Dynamic Equivalent Load**

$$P = X F_r + Y F_a$$

$F_r / F_r \leq e$		$F_r / F_r > e$	
X	Y	X	Y
1	$Y_2$	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
	$C_r$	$C_{Or}$	$C_r$	$C_{Or}$	Grease	Oil	
$d$ $D$ $B$ $r$ min.							Cylindrical Bore
<b>120</b>	180 46 2 180 60 2 200 62 2	315 000 395 000 465 000	525 000 705 000 720 000	32 000 40 500 47 500	53 500 72 000 73 500	1 800 2 200 1 500 2 000 1 400 1 800	<b>23024CDE4</b> <b>24024CE4</b> <b>23124CE4</b>
	200 80 2 215 58 2,1 215 76 2,1 260 86 3	575 000 685 000 630 000 1 190 000	950 000 765 000 970 000 1 320 000	58 500 70 000 64 500 122 000	96 500 78 000 99 000 134 000	1 400 1 800 2 400 3 000 1 300 1 700 1 700 2 200	<b>24124CE4</b> <b>*22224AE4</b> <b>23224CE4</b> <b>*22324AE4</b>
<b>130</b>	200 52 2 200 69 2 210 64 2	400 000 495 000 505 000	655 000 865 000 825 000	40 500 50 500 51 500	67 000 88 000 84 500	1 700 2 000 1 400 1 800 1 300 1 700	<b>23026CDE4</b> <b>24026CE4</b> <b>23126CE4</b>
	210 80 2 230 64 3 230 80 3 280 93 4	590 000 820 000 700 000 995 000	1 010 000 940 000 1 080 000 1 350 000	60 000 83 500 71 500 101 000	103 000 96 000 110 000 137 000	1 300 1 700 2 200 2 600 1 200 1 600 1 300 1 600	<b>24126CE4</b> <b>*22226AE4</b> <b>23226CE4</b> <b>22326CE4</b>
<b>140</b>	210 53 2 210 69 2 225 68 2,1	420 000 525 000 580 000	715 000 945 000 945 000	43 000 53 500 59 000	73 000 96 500 96 500	1 600 1 900 1 300 1 700 1 200 1 600	<b>23028CDE4</b> <b>24028CE4</b> <b>23128CE4</b>
	225 85 2,1 250 68 3 250 88 3 300 102 4	670 000 645 000 835 000 1 160 000	1 160 000 930 000 1 300 000 1 590 000	68 500 65 500 85 000 118 000	118 000 95 000 133 000 162 000	1 200 1 600 1 400 1 700 1 100 1 500 1 200 1 500	<b>24128CE4</b> <b>22228CE4</b> <b>23228CE4</b> <b>22328CE4</b>
<b>150</b>	225 56 2,1 225 75 2,1 250 80 2,1	470 000 590 000 725 000	815 000 1 090 000 1 180 000	48 000 60 500 74 000	83 000 111 000 121 000	1 400 1 800 1 200 1 500 1 100 1 400	<b>23030CDE4</b> <b>24030CE4</b> <b>23130CE4</b>
	250 100 2,1 270 73 3 270 96 3 320 108 4	890 000 765 000 975 000 1 220 000	1 530 000 1 120 000 1 560 000 1 690 000	91 000 78 000 99 500 125 000	156 000 114 000 159 000 172 000	1 100 1 400 1 300 1 600 1 100 1 400 1 100 1 400	<b>24130CE4</b> <b>22230CDE4</b> <b>23230CE4</b> <b>22330CAE4</b>

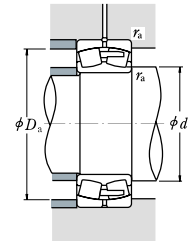
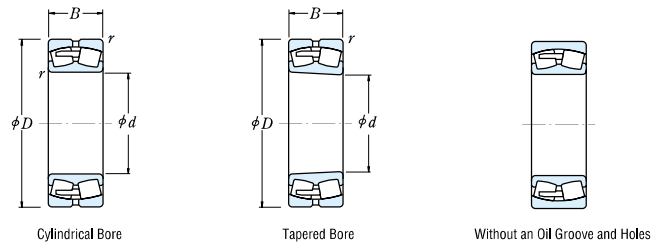
Note (\*) The suffix K or K30 represents bearings with tapered bores (taper 1 : 12 or 1 : 30).

Numbers	Abutment and Fillet Dimensions (mm)				Constant	Axial Load Factors			Mass (kg)	
	$d_a$		$D_a$	$r_a$		$e$	$Y_2$	$Y_3$		$Y_0$
Tapered Bore <sup>(1)</sup>	min.	max.	max.	min.	max.				approx.	
<b>23024CDKE4</b>	130	134	170	163	2	0,22	4,5	3,0	2,9	4,11
<b>24024CK30E4</b>	130	131	170	158	2	0,32	3,2	2,1	2,1	5,33
<b>23124CKE4</b>	130	138	190	175	2	0,29	3,5	2,4	2,3	7,85
<b>24124CK30E4</b>	130	136	190	171	2	0,37	2,7	1,8	1,8	10
<b>*22224AE4</b>	132	142	203	190	2	0,25	3,9	2,7	2,6	8,8
<b>23224CKE4</b>	132	140	203	182	2	0,34	2,9	2,0	1,9	12,1
<b>*22324AE4</b>	134	157	246	222	2,5	0,32	3,1	2,1	2,0	22,2
<b>23026CDKE4</b>	140	147	190	180	2	0,23	4,3	2,9	2,8	5,98
<b>24026CK30E4</b>	140	143	190	175	2	0,31	3,2	2,2	2,1	7,84
<b>23126CKE4</b>	140	149	200	184	2	0,28	3,6	2,4	2,4	8,69
<b>24126CK30E4</b>	140	146	200	180	2	0,35	2,9	1,9	1,9	10,7
<b>*22226AE4</b>	144	152	216	204	2,5	0,26	3,8	2,6	2,5	11
<b>23226CKE4</b>	144	150	216	196	2,5	0,34	2,9	2,0	1,9	14,3
<b>22326CKE4</b>	148	166	262	236	3	0,34	2,9	2,0	1,9	28,1
<b>23028CDKE4</b>	150	157	200	190	2	0,22	4,5	3,0	2,9	6,49
<b>24028CK30E4</b>	150	154	200	186	2	0,29	3,4	2,3	2,2	8,37
<b>23128CKE4</b>	152	158	213	198	2	0,28	3,6	2,4	2,3	10,5
<b>24128CK30E4</b>	152	156	213	193	2	0,35	2,9	1,9	1,9	13
<b>22228CDKE4</b>	154	167	236	219	2,5	0,25	4,0	2,7	2,6	14,5
<b>23228CKE4</b>	154	163	236	213	2,5	0,35	2,9	1,9	1,9	18,8
<b>22328CKE4</b>	158	177	282	253	3	0,35	2,9	1,9	1,9	35,4
<b>23030CDKE4</b>	162	168	213	203	2	0,22	4,6	3,1	3,0	7,9
<b>24030CK30E4</b>	162	165	213	198	2	0,30	3,4	2,3	2,2	10,5
<b>23130CKE4</b>	162	174	238	218	2	0,30	3,4	2,3	2,2	15,8
<b>24130CK30E4</b>	162	169	238	212	2	0,38	2,6	1,8	1,7	19,8
<b>22230CDKE4</b>	164	179	256	236	2,5	0,26	3,9	2,6	2,5	18,4
<b>23230CKE4</b>	164	176	256	230	2,5	0,35	2,9	1,9	1,9	24,2
<b>22330CAKE4</b>	168	—	302	270	3	0,35	2,9	1,9	1,9	41,5

- Remarks
- The bearings denoted by an asterisk (\*) are HPS 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 HPS bearings, the conditions are different.  
The segmentations are: Light Loads ( $\leq 0.05C_r$ ); Normal Loads ( $0.05$  to  $0.10C_r$ ); and Heavy Loads ( $> 0.10C_r$ ).
  - For the dimensions of adapters and withdrawal sleeves, refer to Pages B361 – B362, and B367 – B368.

# SPHERICAL ROLLER BEARINGS

Bore Diameter 160 – 190 mm



Dynamic Equivalent Load

$$P = X F_r + Y F_a$$

$F_r / F_r \leq e$		$F_r / F_r > e$	
X	Y	X	Y
1	$Y_2$	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.	$C_r$	$C_{0r}$	(kgf)		Grease	Oil	
160	220	45	2	360 000	675 000	37 000	69 000	1 400	1 800	23932CAE4
	240	60	2.1	540 000	955 000	55 000	97 500	1 300	1 700	23032CDE4
	240	80	2.1	680 000	1 260 000	69 000	128 000	1 100	1 400	24032CE4
	270	86	2.1	855 000	1 400 000	87 000	143 000	1 000	1 300	23132CE4
	270	109	2.1	1 040 000	1 760 000	106 000	179 000	1 000	1 300	24132CE4
170	230	45	2	350 000	660 000	35 500	67 500	1 400	1 800	23934BCAE4
	260	67	2.1	640 000	1 090 000	65 000	112 000	1 200	1 600	23034CDE4
	260	90	2.1	825 000	1 520 000	84 000	155 000	1 000	1 300	24034CE4
	280	88	2.1	940 000	1 570 000	96 000	160 000	1 000	1 300	23134CE4
	280	109	2.1	1 080 000	1 860 000	110 000	190 000	1 000	1 300	24134CE4
180	250	52	2	470 000	890 000	48 000	90 500	1 200	1 600	23936CAE4
	280	74	2.1	750 000	1 270 000	76 000	129 000	1 200	1 400	23036CDE4
	280	100	2.1	965 000	1 750 000	98 500	178 000	950	1 200	24036CE4
	300	96	3	1 050 000	1 760 000	108 000	180 000	900	1 200	23136CE4
	300	118	3	1 190 000	2 040 000	121 000	208 000	900	1 200	24136CE4
190	260	52	2	460 000	875 000	47 000	89 500	1 200	1 500	23938CAE4
	290	75	2.1	775 000	1 350 000	79 000	138 000	1 100	1 400	23038CDE4
	290	100	2.1	975 000	1 840 000	99 500	188 000	900	1 200	24038CE4
	320	104	3	1 190 000	2 020 000	121 000	206 000	850	1 100	23138CE4
	320	128	3	1 370 000	2 330 000	140 000	238 000	850	1 100	24138CE4

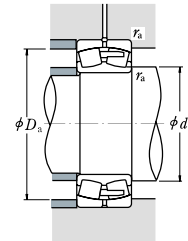
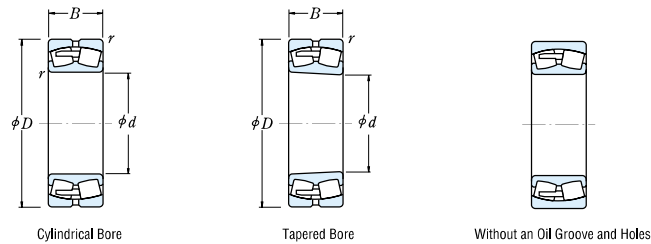
Note (1) The suffix K or K30 represents bearings with tapered bores (taper 1 : 12 or 1 : 30).

Numbers	Abutment and Fillet Dimensions (mm)				Constant	Axial Load Factors			Mass (kg) approx.	
	$d_a$		$D_a$			$e$	$Y_2$	$Y_3$		$Y_0$
23932CAKE4	170	—	210	203	2	0.18	5.6	3.8	3.7	4.97
23032CKE4	172	179	228	216	2	0.22	4.5	3.0	2.9	9.66
24032CK30E4	172	177	228	212	2	0.30	3.4	2.3	2.2	12.7
23132CKE4	172	185	258	234	2	0.30	3.4	2.3	2.2	20.3
24132CK30E4	172	179	258	229	2	0.39	2.6	1.7	1.7	25.4
22232CDKE4	174	190	276	255	2.5	0.26	3.8	2.6	2.5	23.1
23232CKE4	174	189	276	245	2.5	0.34	2.9	2.0	1.9	30.5
22332CAKE4	178	—	322	287	3	0.35	2.9	1.9	1.9	49.3
23934BCAKE4	180	—	220	213	2	0.17	5.8	3.9	3.8	5.38
23034CKE4	182	191	248	233	2	0.23	4.3	2.9	2.8	13
24034CK30E4	182	188	248	228	2	0.31	3.2	2.2	2.1	17.3
23134CKE4	182	194	268	245	2	0.29	3.5	2.3	2.3	21.8
24134CK30E4	182	190	268	239	2	0.37	2.7	1.8	1.8	26.6
22234CDKE4	188	206	292	270	3	0.26	3.8	2.6	2.5	28.8
23234CKE4	188	201	292	261	3	0.34	2.9	2.0	1.9	36.4
22334CAKE4	188	—	342	304	3	0.35	2.9	1.9	1.9	57.9
23936CAKE4	190	—	240	230	2	0.18	5.5	3.7	3.6	7.64
23036CCKE4	192	202	268	249	2	0.24	4.2	2.8	2.8	17.1
24036CK30E4	192	200	268	245	2	0.32	3.1	2.1	2.0	22.7
23136CKE4	194	206	286	260	2.5	0.30	3.4	2.3	2.2	27.5
24136CK30E4	194	202	286	255	2.5	0.37	2.7	1.8	1.8	33.1
22236CDKE4	198	212	302	278	3	0.26	3.9	2.6	2.6	30.2
23236CKE4	198	211	302	274	3	0.33	3.0	2.0	2.0	38.9
22336CAKE4	198	—	362	322	3	0.34	2.9	2.0	1.9	67
23938CAKE4	200	—	250	240	2	0.18	5.7	3.8	3.7	8.03
23038CAKE4	202	—	278	261	2	0.24	4.2	2.8	2.8	17.6
24038CK30E4	202	210	278	253	2	0.31	3.2	2.2	2.1	24
23138CKE4	204	219	306	276	2.5	0.31	3.3	2.2	2.2	34.5
24138CK30E4	204	211	306	269	2.5	0.40	2.5	1.7	1.6	41.5
22238CDKE4	208	—	322	296	3	0.26	3.8	2.6	2.5	35.5
23238CKE4	208	222	322	288	3	0.35	2.9	1.9	1.9	47.6
22338CAKE4	212	—	378	338	4	0.34	2.9	2.0	1.9	77.6

Remarks For the dimensions of adapters and withdrawal sleeves, refer to Pages B362 and B368.

# SPHERICAL ROLLER BEARINGS

Bore Diameter 200 – 260 mm



Dynamic Equivalent Load

$$P = X F_r + Y F_a$$

$F_a / F_r \leq e$		$F_a / F_r > e$	
X	Y	X	Y
1	$Y_2$	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	
	$C_r$	$C_{0r}$	$C_r$	$C_{0r}$	Grease	Oil				
<b>200</b>	280	60	2.1	570 000	1 060 000	58 000	108 000	1 100	1 400	<b>23940CAE4</b>
	310	82	2.1	940 000	1 700 000	96 000	174 000	1 000	1 300	<b>23040CAE4</b>
	310	109	2.1	1 140 000	2 120 000	116 000	216 000	850	1 100	<b>24040CE4</b>
	340	112	3	1 360 000	2 330 000	139 000	238 000	800	1 000	<b>23140CE4</b>
	340	140	3	1 570 000	2 670 000	160 000	272 000	800	1 000	<b>24140CE4</b>
	360	98	4	1 300 000	2 010 000	133 000	204 000	950	1 200	<b>22240CAE4</b>
	360	128	4	1 660 000	2 750 000	169 000	281 000	750	1 000	<b>23240CE4</b>
	420	138	5	2 000 000	2 990 000	204 000	305 000	850	1 000	<b>22340CAE4</b>
<b>220</b>	300	60	2.1	625 000	1 240 000	64 000	126 000	1 000	1 300	<b>23944CAE4</b>
	340	90	3	1 090 000	1 980 000	111 000	202 000	950	1 200	<b>23044CAE4</b>
	340	118	3	1 360 000	2 600 000	138 000	265 000	750	1 000	<b>24044CE4</b>
	370	120	4	1 570 000	2 710 000	160 000	276 000	710	950	<b>23144CE4</b>
	370	150	4	1 800 000	3 200 000	183 000	325 000	710	950	<b>24144CE4</b>
	400	108	4	1 570 000	2 430 000	160 000	247 000	850	1 000	<b>22244CAE4</b>
	400	144	4	2 020 000	3 400 000	206 000	350 000	670	900	<b>23244CE4</b>
	460	145	5	2 350 000	3 400 000	240 000	345 000	750	950	<b>22344CAE4</b>
<b>240</b>	320	60	2.1	635 000	1 300 000	65 000	133 000	950	1 200	<b>23948CAE4</b>
	360	92	3	1 160 000	2 140 000	118 000	218 000	850	1 100	<b>23048CAE4</b>
	360	118	3	1 390 000	2 730 000	141 000	278 000	710	950	<b>24048CE4</b>
	400	128	4	1 790 000	3 100 000	182 000	320 000	670	850	<b>23148CE4</b>
	400	160	4	2 130 000	3 800 000	217 000	385 000	670	850	<b>24148CE4</b>
	440	120	4	1 870 000	2 890 000	191 000	294 000	750	950	<b>22248CAE4</b>
	440	160	4	2 440 000	4 050 000	249 000	415 000	630	800	<b>23248CAE4</b>
	500	155	5	2 600 000	3 800 000	265 000	385 000	670	850	<b>22348CAE4</b>
<b>260</b>	360	75	2.1	930 000	1 870 000	95 000	191 000	850	1 000	<b>23952CAE4</b>
	400	104	4	1 430 000	2 580 000	145 000	263 000	800	950	<b>23052CAE4</b>
	400	140	4	1 810 000	3 500 000	185 000	360 000	630	850	<b>24052CAE4</b>
	440	144	4	2 160 000	3 750 000	221 000	385 000	600	800	<b>23152CAE4</b>
	440	160	4	2 560 000	4 700 000	261 000	460 000	600	800	<b>24152CAE4</b>
	480	130	5	2 150 000	3 400 000	222 000	345 000	670	850	<b>22252CAE4</b>
	480	174	5	2 740 000	4 550 000	279 000	460 000	560	750	<b>23252CAE4</b>
	540	165	6	3 100 000	4 600 000	320 000	470 000	630	800	<b>22352CAE4</b>

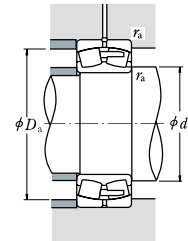
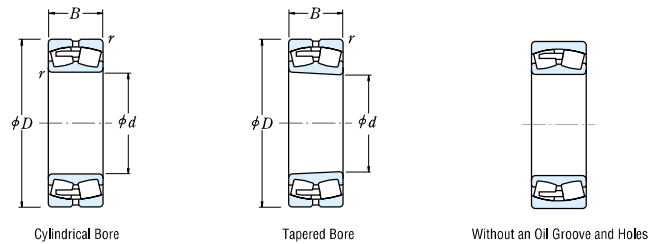
Note (1) The suffix K or K30 represents bearings with tapered bores (taper 1 : 12 or 1 : 30).

Numbers	Abutment and Fillet Dimensions (mm)				Constant	Axial Load Factors			Mass (kg)	
	$d_a$		$D_a$			$e$	$Y_2$	$Y_3$		$Y_0$
Tapered Bore <sup>(1)</sup>	min.	max.	min.	max.					approx.	
<b>23940CAKE4</b>	212	—	268	258	2	0.20	5.1	3.4	3.3	11
<b>23040CAKE4</b>	212	—	298	279	2	0.25	4.0	2.7	2.6	22.6
<b>24040CK30E4</b>	212	223	298	271	2	0.32	3.1	2.1	2.0	30.4
<b>23140KE4</b>	214	232	326	293	2.5	0.31	3.2	2.2	2.1	42.7
<b>24140CK30E4</b>	214	226	326	290	2.5	0.39	2.6	1.8	1.7	51.3
<b>22240CAKE4</b>	218	—	342	315	3	0.26	3.8	2.6	2.5	42.6
<b>23240KE4</b>	218	237	342	307	3	0.34	2.9	2.0	1.9	57.1
<b>22340CAKE4</b>	222	—	398	352	4	0.34	2.9	2.0	1.9	92.6
<b>23944CAKE4</b>	232	—	288	278	2	0.18	5.7	3.8	3.7	12.2
<b>23044CAKE4</b>	234	—	326	302	2.5	0.24	4.1	2.8	2.7	29.7
<b>24044CK30E4</b>	234	244	326	296	2.5	0.31	3.2	2.1	2.1	40.5
<b>23144CKE4</b>	238	254	352	320	3	0.30	3.3	2.2	2.2	53
<b>24144CK30E4</b>	238	248	352	313	3	0.39	2.6	1.7	1.7	66.7
<b>22244CAKE4</b>	238	—	382	348	3	0.27	3.7	2.5	2.4	59
<b>23244CKE4</b>	238	260	382	337	3	0.35	2.9	1.9	1.9	80.4
<b>22344CAKE4</b>	242	—	438	391	4	0.33	3.0	2.0	2.0	116
<b>23948CAKE4</b>	262	—	308	298	2	0.17	6.0	4.0	3.9	13.3
<b>23048CAKE4</b>	264	—	346	324	2.5	0.24	4.2	2.8	2.7	32.6
<b>24048CK30E4</b>	264	265	346	317	2.5	0.29	3.4	2.3	2.2	43.4
<b>23148CKE4</b>	268	275	382	347	3	0.30	3.3	2.2	2.2	66.9
<b>24148CK30E4</b>	268	268	382	341	3	0.38	2.7	1.8	1.8	79.5
<b>22248CAKE4</b>	268	—	422	383	3	0.27	3.7	2.5	2.4	80.2
<b>23248CAKE4</b>	268	—	422	372	3	0.37	2.7	1.8	1.8	106
<b>22348CAKE4</b>	262	—	478	423	4	0.32	3.2	2.1	2.1	147
<b>23952CAKE4</b>	272	—	348	333	2	0.19	5.4	3.6	3.5	23
<b>23052CAKE4</b>	278	—	382	356	3	0.25	4.1	2.7	2.7	46.6
<b>24052CAK30E4</b>	278	—	382	348	3	0.32	3.1	2.1	2.1	62.6
<b>23152CAKE4</b>	278	—	422	380	3	0.32	3.2	2.1	2.1	88.2
<b>24152CAK30E4</b>	278	—	422	371	3	0.39	2.6	1.7	1.7	109
<b>22252CAKE4</b>	282	—	458	418	4	0.27	3.7	2.5	2.5	104
<b>23252CAKE4</b>	282	—	458	406	4	0.37	2.7	1.8	1.8	137
<b>22352CAKE4</b>	288	—	512	462	5	0.32	3.2	2.1	2.1	180

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

**SPHERICAL ROLLER BEARINGS**

Bore Diameter 280 – 340 mm



**Dynamic Equivalent Load**  
 $P = X F_r + Y F_a$

$F_a / F_r \leq e$		$F_a / F_r > e$	
X	Y	X	Y
1	$Y_2$	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	
	(N)		(kgf)		(min <sup>-1</sup> )			
$d$ $D$ $B$ $r$ min.	$C_r$	$C_{0r}$	$C_r$	$C_{0r}$	Grease	Oil	Cylindrical Bore	
280	380 75 2.1	925 000	1 950 000	94 500	199 000	800	950	23956CAE4
	420 106 4	1 540 000	2 950 000	157 000	300 000	710	900	23056CAE4
	420 140 4	1 880 000	3 800 000	191 000	385 000	600	800	24056CAE4
	460 146 5	2 230 000	4 000 000	228 000	410 000	560	750	23156CAE4
	460 180 5	2 640 000	5 000 000	269 000	505 000	560	750	24156CAE4
	500 130 5	2 280 000	3 650 000	233 000	370 000	630	800	22256CAE4
300	500 176 5	2 880 000	4 900 000	294 000	500 000	530	670	23256CAE4
	580 175 6	3 500 000	5 150 000	355 000	525 000	560	710	22356CAE4
	420 90 3	1 230 000	2 490 000	125 000	254 000	710	900	23960CAE4
	460 118 4	1 920 000	3 700 000	196 000	375 000	670	850	23060CAE4
	460 160 4	2 310 000	4 600 000	235 000	470 000	530	710	24060CAE4
	500 160 5	2 670 000	4 800 000	273 000	490 000	500	670	23160CAE4
500 200 5	3 100 000	5 800 000	315 000	595 000	500	670	24160CAE4	
320	540 140 5	2 610 000	4 250 000	266 000	430 000	600	750	22260CAE4
	540 192 5	3 400 000	5 900 000	350 000	600 000	480	630	23260CAE4
	440 90 3	1 300 000	2 750 000	132 000	261 000	670	850	23964CAE4
	480 121 4	1 960 000	3 850 000	200 000	395 000	630	800	23064CAE4
	480 160 4	2 440 000	5 050 000	249 000	515 000	500	670	24064CAE4
	540 176 5	3 050 000	5 500 000	315 000	560 000	480	600	23164CAE4
540 218 5	3 550 000	6 650 000	360 000	675 000	480	600	24164CAE4	
340	580 150 5	2 990 000	4 850 000	305 000	495 000	530	670	22264CAE4
	580 208 5	3 900 000	6 900 000	395 000	700 000	450	600	23264CAE4
	460 90 3	1 330 000	2 840 000	136 000	289 000	630	800	23968CAE4
	520 133 5	2 280 000	4 400 000	232 000	445 000	560	710	23068CAE4
	520 180 5	2 920 000	6 050 000	298 000	615 000	480	600	24068CAE4
	580 190 5	3 600 000	6 600 000	370 000	670 000	430	560	23168CAE4
580 243 5	4 250 000	7 900 000	430 000	810 000	430	560	24168CAE4	
620 224 6	4 400 000	7 800 000	450 000	795 000	400	530	23268CAE4	

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

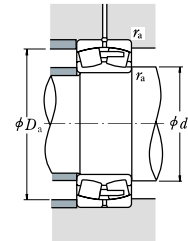
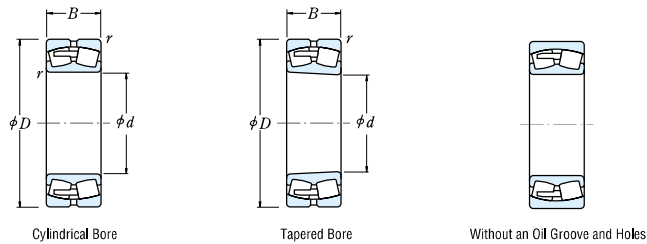
Numbers	Abutment and Fillet Dimensions (mm)				Constant	Axial Load Factors			Mass (kg)	
	$d_a$ min.	$d_a$ max.	$D_a$ min.	$r_a$ max.		$e$	$Y_2$	$Y_3$		$Y_0$
Tapered Bore(1)									approx.	
	23956CAKE4	292	368	351	2	0.18	5.7	3.9	3.9	24.5
	23056CAKE4	298	402	377	3	0.24	4.2	2.8	2.7	50.5
24056CAK30E4	298	402	369	3	0.31	3.3	2.2	2.2	66.4	
23156CAKE4	302	438	400	4	0.30	3.3	2.2	2.2	94.3	
24156CAK30E4	302	438	392	4	0.37	2.7	1.8	1.8	115	
22256CAKE4	302	478	439	4	0.25	4.0	2.7	2.6	110	
23256CAKE4	302	478	425	4	0.35	2.9	1.9	1.9	147	
22356CAKE4	308	552	496	5	0.31	3.2	2.1	2.1	221	
23960CAKE4	314	406	386	2.5	0.19	5.2	3.5	3.4	38.2	
23060CAKE4	318	442	413	3	0.24	4.2	2.8	2.7	70.5	
24060CAK30E4	318	442	400	3	0.32	3.1	2.1	2.0	93.6	
23160CAKE4	322	478	433	4	0.31	3.3	2.2	2.2	125	
24160CAK30E4	322	478	423	4	0.38	2.6	1.8	1.7	152	
22260CAKE4	322	518	473	4	0.25	4.0	2.7	2.6	139	
23260CAKE4	322	518	458	4	0.35	2.9	1.9	1.9	189	
23964CAKE4	334	426	406	2.5	0.18	5.5	3.7	3.6	40.6	
23064CAKE4	338	462	432	3	0.24	4.2	2.8	2.8	75.6	
24064CAK30E4	338	462	422	3	0.31	3.3	2.2	2.2	99.7	
23164CAKE4	342	518	466	4	0.31	3.2	2.1	2.1	162	
24164CAK30E4	342	518	456	4	0.39	2.6	1.7	1.7	196	
22264CAKE4	342	558	508	4	0.26	3.9	2.6	2.6	174	
23264CAKE4	342	558	488	4	0.36	2.8	1.9	1.8	239	
23968CAKE4	354	446	427	2.5	0.18	5.7	3.8	3.7	42.4	
23068CAKE4	362	498	465	4	0.24	4.2	2.8	2.8	101	
24068CAK30E4	362	498	454	4	0.32	3.2	2.1	2.1	135	
23168CAKE4	362	558	499	4	0.31	3.2	2.1	2.1	206	
24168CAK30E4	362	558	489	4	0.40	2.5	1.7	1.7	257	
23268CAKE4	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.



**SPHERICAL ROLLER BEARINGS**

Bore Diameter 360 – 440 mm



**Dynamic Equivalent Load**  
 $P = X F_r + Y F_a$

$F_a / F_r \leq e$		$F_a / F_r > e$	
X	Y	X	Y
1	$Y_2$	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 (min <sup>-1</sup> )		Bearing Cylindrical Bore		
	$C_r$ (N)	$C_{0r}$ (kgf)	$C_r$ (kgf)	$C_{0r}$ (kgf)	Grease	Oil			
<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>

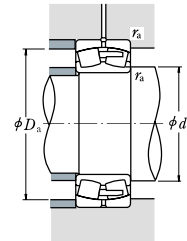
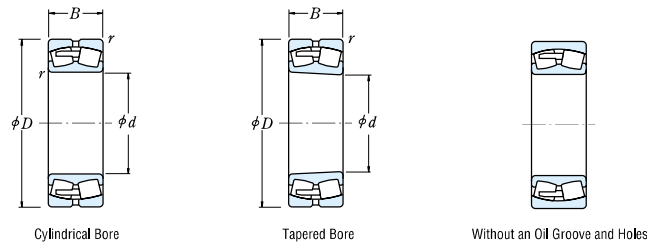
Note (1) The suffix K or K30 represents bearings with tapered bores (taper 1 : 12 or 1 : 30).

Numbers	Abutment and Fillet Dimensions (mm)				Constant	Axial Load Factors				Mass (kg)
	$d_a$ min.	$d_a$ max.	$D_a$ min.	$r_a$ max.		$e$	$Y_2$	$Y_3$	$Y_0$	
<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.

## SPHERICAL ROLLER BEARINGS

Bore Diameter 460 – 560 mm



Dynamic Equivalent Load  
 $P = X F_r + Y F_a$

$F_a / F_r \leq e$		$F_a / F_r > e$	
X	Y	X	Y
1	$Y_2$	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
	$C_r$ (N)	$C_{0r}$ (N)	$C_r$ (kgf)	$C_{0r}$ (kgf)	Grease	Oil	
$d$ $D$ $B$ $r_{min}$							Cylindrical Bore
460 620 118 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>
480 650 128 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>
500 670 128 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>
530 710 136 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>
560 750 140 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>

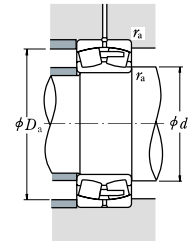
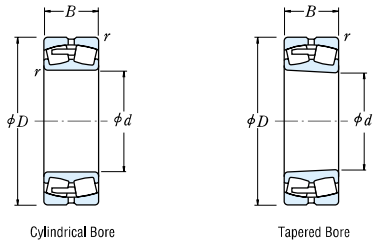
Note (1) The suffix K or K30 represents bearings with tapered bores (taper 1 : 12 or 1 : 30).

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 <sup>(1)</sup>									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	804	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.

# SPHERICAL ROLLER BEARINGS

Bore Diameter 600 – 800 mm



**Dynamic Equivalent Load**  
 $P = X F_r + Y F_a$

$F_a / F_r \leq e$		$F_a / F_r > e$	
X	Y	X	Y
1	$Y_2$	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.

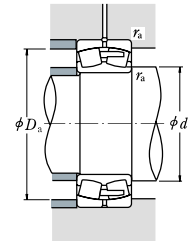
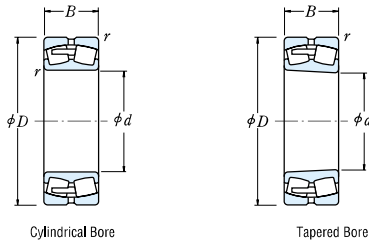
Boundary Dimensions (mm)	Basic Load Ratings (N)				Basic Load Ratings (kgf)				Limiting Speeds (min <sup>-1</sup> )		Bearing Cylindrical Bore
	$d$	$D$	$B$	$r_{min}$	$C_r$	$C_{0r}$	$C_r$	$C_{0r}$	Grease	Oil	
600	800	150	5	3 450 000	8 100 000	350 000	830 000	320	400	239/600CAE4	
	870	200	6	5 450 000	12 200 000	555 000	1 240 000	300	360	230/600CAE4	
	870	272	6	6 600 000	15 100 000	675 000	1 540 000	240	320	240/600CAE4	
	980	300	7.5	8 750 000	17 500 000	895 000	1 790 000	220	280	231/600CAE4	
980	375	7.5	10 400 000	21 900 000	1 060 000	2 230 000	220	280	241/600CAE4		
	1 090	398	9.5	12 700 000	24 900 000	1 300 000	2 540 000	200	260	232/600CAE4	
630	850	165	6	4 000 000	9 350 000	405 000	950 000	300	360	239/630CAE4	
	920	212	7.5	5 900 000	12 700 000	600 000	1 300 000	280	340	230/630CAE4	
	920	290	7.5	7 550 000	17 700 000	770 000	1 810 000	220	300	240/630CAE4	
	1 030	315	7.5	9 600 000	19 400 000	980 000	1 970 000	200	260	231/630CAE4	
1 030		400	7.5	11 300 000	23 900 000	1 160 000	2 440 000	200	260	241/630CAE4	
1 150	412	12	13 400 000	25 600 000	1 370 000	2 610 000	180	240	232/630CAE4		
670	900	170	6	4 350 000	10 300 000	445 000	1 050 000	260	340	239/670CAE4	
	980	230	7.5	6 850 000	15 000 000	700 000	1 530 000	240	320	230/670CAE4	
	980	308	7.5	8 450 000	19 500 000	860 000	1 990 000	200	260	240/670CAE4	
	1 090	336	7.5	10 600 000	21 600 000	1 080 000	2 200 000	190	240	231/670CAE4	
1 090	412	7.5	12 400 000	26 500 000	1 270 000	2 700 000	190	240	241/670CAE4		
	1 220	438	12	14 900 000	28 700 000	1 520 000	2 920 000	170	220	232/670CAE4	
710	950	180	6	4 800 000	11 700 000	490 000	1 200 000	240	300	239/710CAE4	
	1 030	236	7.5	7 100 000	15 800 000	725 000	1 610 000	240	280	230/710CAE4	
	1 030	315	7.5	8 850 000	20 700 000	905 000	2 110 000	190	240	240/710CAE4	
	1 150	438	9.5	13 900 000	30 500 000	1 410 000	3 100 000	170	220	241/710CAE4	
1 280		450	12	15 700 000	30 500 000	1 600 000	3 100 000	160	200	232/710CAE4	
750	1 000	185	6	5 250 000	12 800 000	535 000	1 310 000	220	280	239/750CAE4	
	1 090	250	7.5	7 750 000	17 200 000	790 000	1 750 000	220	260	230/750CAE4	
	1 090	335	7.5	10 100 000	24 000 000	1 030 000	2 450 000	180	220	240/750CAE4	
		1 360	475	15	17 700 000	35 500 000	1 800 000	3 600 000	140	190	232/750CAE4
800	1 060	195	6	5 600 000	13 700 000	570 000	1 400 000	220	260	239/800CAE4	
	1 150	258	7.5	8 350 000	19 100 000	850 000	1 950 000	200	240	230/800CAE4	
	1 150	345	7.5	10 900 000	26 300 000	1 110 000	2 680 000	160	200	240/800CAE4	
	1 280	375	9.5	13 800 000	29 200 000	1 410 000	2 970 000	150	190	231/800CAE4	
1 420		488	15	20 300 000	41 000 000	2 070 000	4 150 000	130	170	232/800CAE4	

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.		$e$	$Y_2$	$Y_3$	$Y_0$	
Tapered Bore <sup>(1)</sup>	239/600CAKE4	622	778	745	4	0.17	5.9	3.9	3.9	205
	230/600CAKE4	628	842	794	5	0.21	4.8	3.3	3.2	389
	240/600CAK30E4	628	842	772	5	0.30	3.3	2.2	2.2	529
	231/600CAKE4	636	944	856	6	0.30	3.4	2.3	2.2	898
241/600CAK30E4	636	944	836	6	0.39	2.6	1.8	1.7	1 050	
232/600CAKE4	644	1 046	923	8	0.36	2.8	1.9	1.8	1 590	
239/630CAKE4	658	822	786	5	0.18	5.6	3.8	3.7	259	
230/630CAKE4	666	884	835	6	0.22	4.7	3.1	3.1	468	
240/630CAKE4	666	884	815	6	0.30	3.3	2.2	2.2	637	
231/630CAKE4	666	994	900	6	0.30	3.4	2.3	2.2	1 040	
241/630CAK30E4	666	994	876	6	0.38	2.7	1.8	1.7	1 250	
232/630CAKE4	684	1 096	970	10	0.36	2.8	1.9	1.8	1 850	
239/670CAKE4	698	872	836	5	0.17	5.8	3.9	3.8	300	
230/670CAKE4	706	944	891	6	0.22	4.7	3.1	3.1	571	
240/670CAK30E4	706	944	868	6	0.30	3.3	2.2	2.2	773	
231/670CAKE4	706	1 054	952	6	0.30	3.3	2.2	2.2	1 230	
241/670CAK30E4	706	1 054	934	6	0.37	2.7	1.8	1.8	1 440	
232/670CAKE4	724	1 166	1 024	10	0.37	2.7	1.8	1.8	2 210	
239/710CAKE4	738	922	883	5	0.17	5.8	3.9	3.8	352	
230/710CAKE4	746	984	936	6	0.22	4.6	3.1	3.0	647	
240/710CAK30E4	746	984	916	6	0.29	3.4	2.3	2.2	861	
241/710CAK30E4	754	1 106	981	8	0.38	2.6	1.8	1.7	1 730	
232/710CAKE4	764	1 226	1 080	10	0.36	2.8	1.9	1.8	2 470	
239/750CAKE4	778	972	931	5	0.17	6.0	4.1	4.0	398	
230/750CAKE4	786	1 054	990	6	0.22	4.6	3.1	3.0	768	
240/750CAK30E4	786	1 054	969	6	0.29	3.4	2.3	2.2	1 030	
232/750CAKE4	814	1 296	1 148	12	0.36	2.8	1.9	1.8	2 980	
239/800CAKE4	828	1 032	987	5	0.17	6.0	4.0	3.9	462	
230/800CAKE4	836	1 114	1 045	6	0.21	4.7	3.2	3.1	870	
240/800CAK30E4	836	1 114	1 029	6	0.27	3.7	2.5	2.5	1 130	
231/800CAKE4	844	1 236	1 127	8	0.28	3.6	2.4	2.3	1 870	
232/800CAKE4	864	1 356	1 208	12	0.35	2.8	1.9	1.9	3 250	

**SPHERICAL ROLLER BEARINGS**

Bore Diameter 850 – 1400 mm



**Dynamic Equivalent Load**

$$P = XF_r + YF_a$$

$F_a / F_r \leq e$		$F_a / F_r > e$	
X	Y	X	Y
1	$Y_2$	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.	$C_r$	$C_{0r}$	$C_r$ (kgf)	$C_{0r}$ (kgf)	Grease	Oil	
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 230/1000CAE4 240/1000CAE4
	1 420	308	7.5	11 900 000	28 100 000	1 210 000	2 860 000	140	170	
	1 420	412	7.5	15 300 000	38 500 000	1 560 000	3 950 000	110	150	
1 060	1 400	250	7.5	9 300 000	24 400 000	950 000	2 490 000	130	170	239/1060CAE4 230/1060CAE4 240/1060CAE4
	1 500	325	9.5	13 000 000	31 500 000	1 330 000	3 200 000	120	160	
	1 500	438	9.5	16 800 000	43 000 000	1 720 000	4 350 000	100	130	
1 120	1 580	345	9.5	15 400 000	38 000 000	1 570 000	3 850 000	110	140	230/1120CAE4 240/1120CAE4
	1 580	462	9.5	18 700 000	49 500 000	1 910 000	5 050 000	95	120	
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	4.5	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
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					