

5. CYLINDRICAL ROLLER BEARINGS

SINGLE-ROW AND DOUBLE-ROW CYLINDRICAL ROLLER BEARINGS

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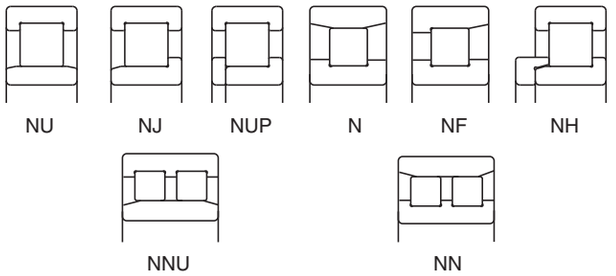
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Bore Diameter 40 – 400 mm ..... C 178

DESIGN, TYPES, AND FEATURES

Cylindrical roller bearings are classified into the following types depending on whether or not they have ribs on their rings:



Types NU, N, NNU, and NN are suitable as free-end bearings. Types NJ and NF can sustain limited axial loads in one direction. Types NH and NUP can be used as fixed-end bearings.

The NH type consists of NJ-type cylindrical roller bearings and HJ-type L-shaped thrust collars (see Pages C156 and C157).

The inner ring loose rib of the NUP type should be mounted so that the marked side is on the outside.

Features of Single-Row Cylindrical Roller Bearings

Cage Spec.		Material	Steel	Steel	Polyamide 66 resin	L-PPS resin	Brass	
		Method	Pressed		Molded		Machined	
		Designation	W	EW	ET	ET7	M	EM
Features		High Load Capacity	○	◎	◎	◎	△	◎
		High-Speed	△	○	○	○	○	◎
		High-Temperature	○	○	△	○	○	○
		Vibration	×	×	×	×	△	○

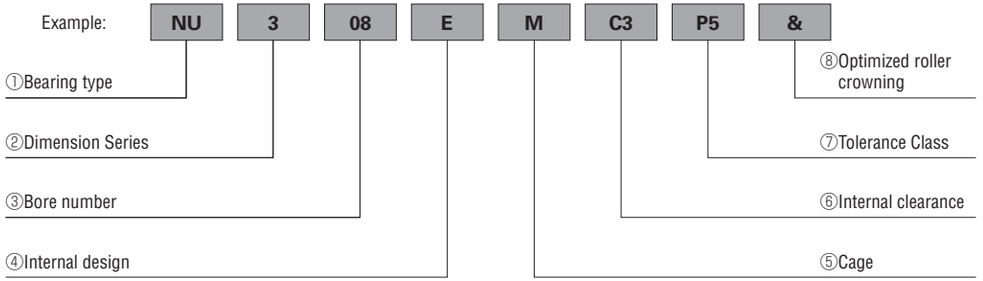
◎ Excellent ○ Good △ Fair × Poor

If a cage is nonstandard for a given designation, the number of rollers may vary; in such a case, the load rating will differ from that listed in the bearing tables.

Many NN double-row bearings have tapered bores, and they are primarily used in the main spindles of machine tools. Cages are made of either molded polyphenylenesulfide (PPS) or machined brass.

Formulation of Bearing Designations

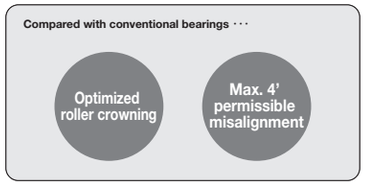
Single-Row Cylindrical Roller Bearing



①Bearing type	NU: Single-row cylindrical roller bearings (Outer ring with both ribs + Inner ring without rib) Please refer to page C126 for detailed information.
②Dimension Series	10: 10 Series, 2: 02 Series, 22: 22 Series, 3: 03 Series, 23: 23 Series, 4: 04 Series,
③Bore number	Bore diameter for 03 and under—01: 12 mm, 02: 15 mm, 03: 17 mm 04 and over—Bore diameter = Bore number × 5 (mm)
④Internal design	E: High load capacity
⑤Cage	W: Pressed-steel Cage, M: Machined Brass Cage, No designation: Machined-brass cage (in Series 10) T: Polyamide 66 resin cage, T7: L-PPS resin cage
⑥Internal clearance	For Interchangeable Cylindrical Roller Bearings— Omitted: CN clearance, C3: Clearance greater than CN, C4: Clearance greater than C3, CG: Special Clearance For Non-Interchangeable Cylindrical Roller Bearings— CC: Normal Clearance, CC3: Clearance greater than CC, CC4: Clearance greater than CC3, CCG: Special Clearance
⑦Tolerance class	Omitted: ISO Normal, P6: ISO Class 6, P5: ISO Class 5, P4: ISO Class 4
⑧Optimized roller crowning	&: Optimized roller crowing (Uses high load capacity machined brass cage and ISO Normal tolerance with clearance CN, C3, or C4)

Cylindrical Roller Bearings with Optimized Roller Crowning

Features



1. Increased reliability
A special crowning applied to the rollers optimizes the distribution of surface pressure at the roller contact area inside the bearing.
2. Improved performance
Accommodate a maximum permissible misalignment of 4'
—twice that of conventional products.

PRECAUTIONS FOR USE OF CYLINDRICAL ROLLER BEARINGS

If the load on cylindrical roller bearings becomes too small during operation, slippage occurs between the rollers and raceways, which may result in smearing. This tendency is prevalent especially with large bearings since the weight of the rollers and cage is high.

In case of strong shock loads or vibration, pressed-steel cages are sometimes inadequate.

If very small bearing loads, strong shock loads, or vibration are expected, please consult with NSK for selection of the bearings.

Bearings with molded polyamide cages (ET type) can be used continuously at temperatures between −40 and 120 °C. If the bearings are to be used in gear oil, nonflammable hydraulic oil, or ester oil at a temperature over 100 °C, please contact NSK beforehand.

TOLERANCES AND RUNNING ACCURACY

CYLINDRICAL ROLLER BEARINGS ..... Table 7.2 (Pages A128 to A131)
WITH OPTIMIZED ROLLER CROWNING
Tolerance for Dimensions : ISO Normal
Running Accuracy : ISO Normal

DOUBLE-ROW CYLINDRICAL ROLLER BEARINGS ..... Table 7.2 (Pages A128 to A131)

Table 2 Tolerances for Roller Inscribed Circle Diameter F_w and Roller Circumscribed Circle Diameter E_w of Cylindrical Roller Bearings With Interchangeable Rings

Units : μm

Nominal Bore Diameter d (mm)		Tolerances for F_w of Types NU, NJ, NUP, NH, and NNU Δ_{F_w}		Tolerances for E_w of Types N, NF, and NN Δ_{E_w}	
over	incl.	high	low	high	low
—	20	+10	0	0	−10
20	50	+15	0	0	−15
50	120	+20	0	0	−20
120	200	+25	0	0	−25
200	250	+30	0	0	−30
250	315	+35	0	0	−35
315	400	+40	0	0	−40
400	500	+45	0	—	—

RECOMMENDED FITS

CYLINDRICAL ROLLER BEARINGS ..... Table 8.3 (Page A164)
Table 8.5 (Page A165)
DOUBLE-ROW CYLINDRICAL ROLLER BEARINGS ..... Table 8.3 (Page A164)
Table 8.5 (Page A165)

INTERNAL CLEARANCES

CYLINDRICAL ROLLER BEARINGS ..... Table 8.15 (Page A171)
WITH OPTIMIZED ROLLER CROWNING
INTERNAL CLEARANCE DESIGNATION : CN, C3, C4
DOUBLE-ROW CYLINDRICAL ROLLER BEARINGS .... Table 8.15 (Page A171)

PERMISSIBLE MISALIGNMENT

The permissible misalignment of cylindrical roller bearings varies depending on the type and internal specifications, but under normal loads, the angles are approximately as follows:

Cylindrical roller bearings of Width Series 0 or 1 ..... 0.0012 radian (4′)
Cylindrical roller bearings of Width Series 2 ..... 0.0006 radian (2′)

For double-row cylindrical roller bearings, nearly no misalignment is allowed.

LIMITING SPEEDS (Mechanical)

In some single-row cylindrical roller bearings, optional cage types are available for special purposes or customer requests. The limiting speeds (mechanical) in the bearing tables reflect values for the standard cage type. Please consult with NSK regarding limiting speeds (mechanical) for optional cages.

LIMITING SPEEDS (Grease/Oil)

The limiting speeds (grease) and limiting speeds (oil) listed in the bearing tables should be adjusted depending on bearing load. Furthermore, higher speeds are attainable by making changes in the lubrication method, cage design, etc. Refer to Page A098 for more detailed information.

TECHNICAL DATA

Free Space of Cylindrical Roller Bearings

Cylindrical roller bearings often employ grease lubrication because it makes maintenance easier and simplifies the peripheral construction of the housing. Select a grease brand appropriate for the operating conditions while noting the grease fill amount and position of the bearing and housing.

Cylindrical roller bearings can be divided into types NU, NJ, N, NF, NH, and NUP according to the collar, collar ring, and position of the inner or outer ring ribs. Even if bearings belong to the same Dimension Series, they may have different amounts of free space depending on whether the cage provided is made from pressed-steel or from machined high-tension brass. When determining the grease filling amount, please refer to Tables 1 and 2 for the free space of NU type bearings.

For other types, the free space can be determined from a free space ratio based on the NU type, as shown in Table 3. For example, the free space of an NJ310 bearing with a pressed steel cage may be calculated approximately as 47 cm^3. This result was obtained by multiplying the free space of the bearing (52 cm^3) in Table 1 by the space ratio 0.90 for the NJ type (Table 3).

Table 1 Free Space of Cylindrical Roller Bearings (NU Type) (1) (With Pressed Cage)

Units: cm^3

Bearing Bore No.	Bearing Free Space			
	Bearing Series			
	NU2	NU3	NU22	NU23
05	6.6	11	7.8	16
06	9.6	17	12	24
07	14	22	18	35
08	18	31	22	44
09	20	42	23	62
10	23	52	26	80
11	30	68	35	102
12	37	85	45	130
13	44	107	57	156
14	51	124	62	179
15	58	155	70	226
16	71	177	85	260
17	85	210	104	300
18	103	244	134	365
19	132	283	164	415
20	151	335	200	540

Table 2 Free Space of Cylindrical Roller Bearings (NU Type) (2) (With High-Tension Brass Machined Cage)

Units: cm^3

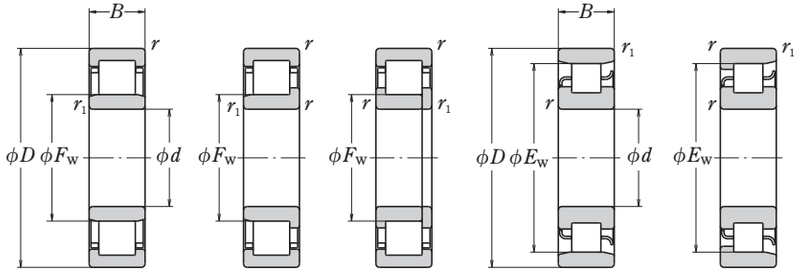
Bearing Bore No.	Bearing Free Space			
	Bearing Series			
	NU2	NU3	NU22	NU23
05	5.0	7.6	5.7	10
06	7.4	12	7.9	16
07	9.6	16	12	27
08	12	21	15	32
09	15	29	16	45
10	18	38	17	58
11	22	52	24	77
12	26	62	31	88
13	31	74	43	104
14	37	92	44	129
15	42	102	50	149
16	51	122	60	181
17	64	164	74	200
18	79	193	96	279
19	94	218	116	280
20	115	221	137	355

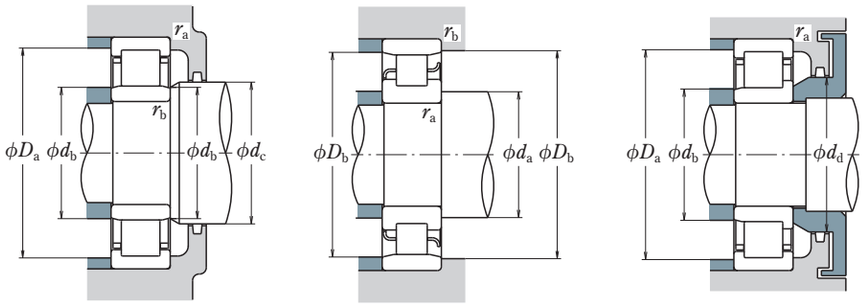
Table 3 Ratio of Free Space in Cylindrical Roller Bearing Types

NU Type	NJ Type	N Type	NF Type
1	0.90	1.05	0.95

■SINGLE-ROW CYLINDRICAL ROLLER BEARINGS

Bore Diameter 20 – 30 mm



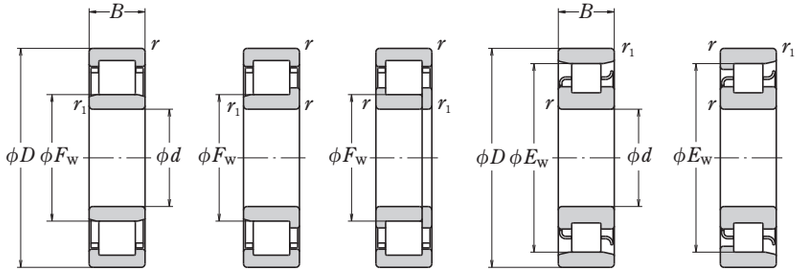


Bearing Designations								Boundary Dimensions (mm)						Basic Load Ratings(6) (N)		Speeds(5) (min−1) Limiting Speeds			Abutment and Fillet Dimensions (mm)								Mass (kg)
	Cage(1) Standard Option		(2) NU	NJ	NUP	N	NF	d	D	B	r min.	r1 min.	FW	EW	Cr	C0r	Thermal Speed Rating (Oil Bath)	Mechanical (Forced Oil Circulation)	Grease	Oil (Oil Bath)	da(3) min.	db min.	db(4) max.	dc min.	dd min.	Da(3) max.	Db max.	Db min.	ra max.	rb max.	approx.
N 204	**W**	—	—	—	—	**N**	**NF**	**20**	47	14	1	0.6	—	40	19 000	12 700	18 000	—	12 000	14 000	25	—	—	—	—	—	43	42	1	0.6	0.107
NU204E	**T**	**T7**	**NU**	**NJ**	**NUP**	—	—		47	14	1	0.6	26.5	—	31 500	22 600	16 000	19 000	13 000	16 000	25	24	25	29	32	42	—	—	1	0.6	0.107
NU2204	**W**	**M**	**NU**	**NJ**	—	—	—		47	18	1	0.6	27	—	25 400	18 400	19 000	—	11 000	13 000	25	24	25	29	32	42	—	—	1	0.6	0.144
N 304	**W**	—	—	—	—	**N**	**NF**		52	15	1.1	0.6	—	44.5	26 300	17 300	14 000	—	10 000	12 000	26.5	—	—	—	—	—	48	46	1	0.6	0.148
NU304E	**T**	**T7**	**NU**	**NJ**	**NUP**	—	—		52	15	1.1	0.6	27.5	—	39 000	26 900	13 000	18 000	12 000	15 000	26.5	24	26	30	33	45.5	—	—	1	0.6	0.145
NU2304	**M**	—	**NU**	**NJ**	**NUP**	—	—		52	21	1.1	0.6	28.5	—	40 500	30 000	14 000	—	11 000	14 000	26.5	24	27	30	33	45.5	—	—	1	0.6	0.217
NU2304E	**T7**	—	**NU**	**NJ**	**NUP**	—	—		52	21	1.1	0.6	27.5	—	51 500	39 000	13 000	—	11 000	14 000	26.5	24	26	30	33	45.5	—	—	1	0.6	0.209
NU1005	**(M)**	—	**NU**	—	—	—	—	**25**	47	12	0.6	0.3	30.5	—	17 600	13 100	15 000	—	15 000	18 000	—	27	30	32	—	43	—	—	0.6	0.3	0.094
N 205	**W**	**M**	—	—	—	**N**	**NF**		52	15	1	0.6	—	45	21 800	15 700	16 000	—	10 000	12 000	30	—	—	—	—	—	48	46	1	0.6	0.135
NU205E	**W**	**M, T, T7**	**NU**	**NJ**	**NUP**	—	—		52	15	1	0.6	31.5	—	36 000	27 700	14 000	20 000	12 000	14 000	30	29	30	34	37	47	—	—	1	0.6	0.136
NU2205E	**T**	**M, T7**	**NU**	**NJ**	**NUP**	—	—		52	18	1	0.6	31.5	—	43 000	34 500	14 000	17 000	12 000	14 000	30	29	30	34	37	47	—	—	1	0.6	0.16
N 305	**W**	**M**	—	—	—	**N**	**NF**		62	17	1.1	1.1	—	53	36 000	25 200	12 000	—	8 000	10 000	31.5	—	—	—	—	—	55.5	50	1	1	0.233
NU305E	**W**	**M, T, T7**	**NU**	**NJ**	**NUP**	—	—		62	17	1.1	1.1	34	—	51 000	37 500	11 000	18 000	10 000	12 000	31.5	31.5	32	37	40	55.5	—	—	1	1	0.269
NU2305E	**T**	**M, T7**	**NU**	**NJ**	**NUP**	—	—		62	24	1.1	1.1	34	—	70 000	56 000	11 000	15 000	9 000	11 000	31.5	31.5	32	37	40	55.5	—	—	1	1	0.338
NU1006	**(M)**	—	**NU**	—	—	**N**	—	**30**	55	13	1	0.6	36.5	48.5	24 200	19 600	13 000	—	12 000	15 000	35	34	36	38	—	50	51	49	1	0.6	0.136
N 206	**W**	**M**	—	—	—	**N**	**NF**		62	16	1	0.6	—	53.5	30 500	23 300	13 000	—	8 500	10 000	35	—	—	—	—	—	58	56	1	0.6	0.208
NU206E	**W**	**M, T, T7**	**NU**	**NJ**	**NUP**	—	—		62	16	1	0.6	37.5	—	48 000	37 500	12 000	17 000	9 500	12 000	35	34	36	40	44	57	—	—	1	0.6	0.205
NU2206E	**T**	**M, T7**	**NU**	**NJ**	**NUP**	—	—		62	20	1	0.6	37.5	—	60 000	50 000	12 000	14 000	9 500	12 000	35	34	36	40	44	57	—	—	1	0.6	0.255
N 306	**W**	**M**	—	—	—	**N**	**NF**		72	19	1.1	1.1	—	62	47 500	35 000	10 000	—	7 100	8 500	36.5	—	—	—	—	—	65.5	64	1	1	0.353
NU306E	**W**	**M, T, T7**	**NU**	**NJ**	**NUP**	—	—		72	19	1.1	1.1	40.5	—	65 500	50 000	9 500	16 000	8 500	10 000	36.5	36.5	39	44	48	65.5	—	—	1	1	0.409
NU2306E	**T**	**M, T7**	**NU**	**NJ**	**NUP**	—	—		72	27	1.1	1.1	40.5	—	92 000	77 500	9 500	13 000	8 000	9 500	36.5	36.5	39	44	48	65.5	—	—	1	1	0.518

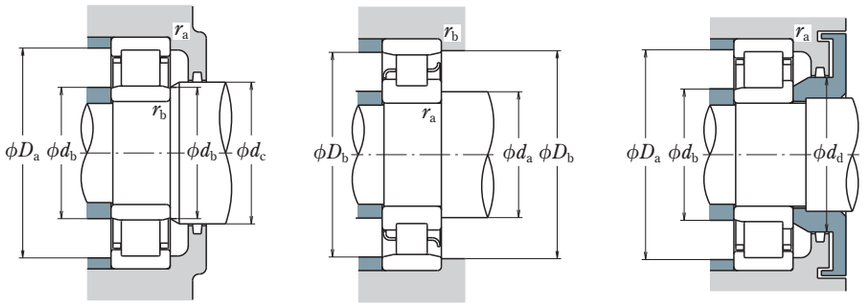
Notes (1) Cage designation (M) is usually omitted from the bearing designation.
(2) When L-shaped thrust collars (see Pages C156-C157) are used, the bearings are considered the NH type.
(3) If axial loads are applied, increase d_a and reduce D_a from the values listed above.
(4) d_b (max.) refers to values for adjusting rings for NU and NJ bearings.
(5) The limiting speeds in the bearing tables are for standard cages.
(6) The basic load ratings in the bearing tables are for standard cages.

SINGLE-ROW CYLINDRICAL ROLLER BEARINGS

Bore Diameter 35 – 40 mm



NU NJ NUP N NF

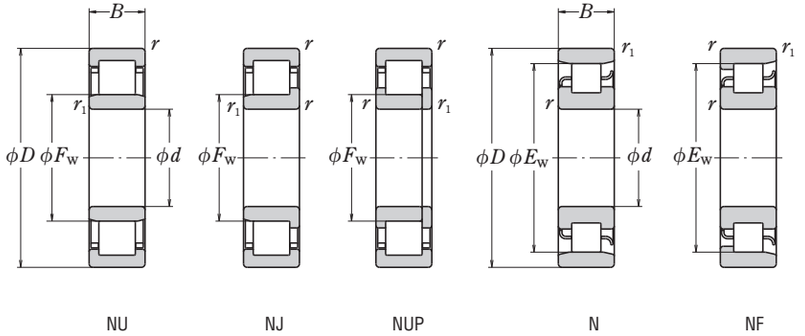


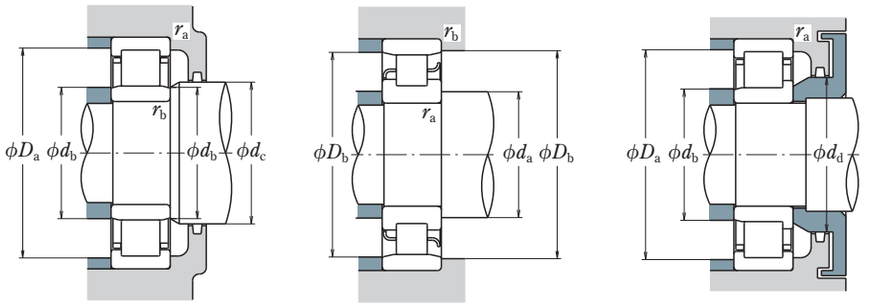
Bearing Designations								Boundary Dimensions (mm)						Basic Load Ratings[6] (N)		Speeds[5] (min⁻¹) Limiting Speeds			Abutment and Fillet Dimensions (mm)										Mass (kg)
	Cage[1] Standard Option		[2] NU	NJ	NUP	N	NF	d	D	B	r min.	r_1 min.	F_W	E_W	C_r	C_{0r}	Thermal Speed Rating (Oil Bath)	Mechanical (Forced Oil Circulation)	Grease	Oil (Oil Bath)	d_a[3] min.	d_b min.	d_b[4] max.	d_c min.	d_d min.	D_a[3] max.	D_b max.	D_b min.	r_a max.	r_b max.	approx.
NU1007	(M)	—	**NU**	**NJ**	—	**N**	—	**35**	62	14	1	0.6	42	55	27 800	23 200	11 000	—	11 000	13 000	40	39	41	44	—	57	58	56	1	0.6	0.18
N 207	W	M	—	—	—	**N**	**NF**		72	17	1.1	0.6	—	61.8	44 000	34 000	11 000	—	7 500	9 000	41.5	—	—	—	—	—	68	64	1	0.6	0.301
NU207E	W	M, T, T7	**NU**	**NJ**	**NUP**	—	—		72	17	1.1	0.6	44	—	62 000	50 000	10 000	15 000	8 500	10 000	41.5	39	42	46	50	65.5	—	—	1	0.6	0.304
NU2207E	T	M, T7	**NU**	**NJ**	**NUP**	—	—		72	23	1.1	0.6	44	—	76 000	65 500	11 000	12 000	8 500	10 000	41.5	39	42	46	50	65.5	—	—	1	0.6	0.40
N 307	W	M	—	—	—	**N**	**NF**		80	21	1.5	1.1	—	68.2	61 000	47 000	9 500	—	6 300	7 500	43	—	—	—	—	—	73.5	70	1.5	1	0.476
NU307E	W	M, T, T7	**NU**	**NJ**	**NUP**	—	—		80	21	1.5	1.1	46.2	—	82 000	65 500	8 500	14 000	7 500	9 500	43	41.5	45	48	53	72	—	—	1.5	1	0.545
NU2307E	T	M, T7	**NU**	**NJ**	**NUP**	—	—		80	31	1.5	1.1	46.2	—	115 000	101 000	9 000	11 000	6 700	8 500	43	41.5	45	48	53	72	—	—	1.5	1	0.711
NU1008	(M)	—	**NU**	**NJ**	**NUP**	**N**	—	**40**	68	15	1	0.6	47	61	33 500	29 000	10 000	—	10 000	12 000	45	44	46	49	—	63	64	62	1	0.6	0.223
N 208	W	M	—	—	—	**N**	**NF**		80	18	1.1	1.1	—	70	54 000	43 000	9 500	—	6 700	8 000	46.5	—	—	—	—	—	73.5	72	1	1	0.375
NU208E	W	M, T, T7	**NU**	**NJ**	**NUP**	—	—		80	18	1.1	1.1	49.5	—	68 500	55 500	9 000	13 000	7 500	9 000	46.5	46.5	48	52	56	73.5	—	—	1	1	0.379
NU2208E	T	M, T7	**NU**	**NJ**	**NUP**	—	—		80	23	1.1	1.1	49.5	—	89 000	77 500	9 000	11 000	7 500	9 000	46.5	46.5	48	52	56	73.5	—	—	1	1	0.480
N 308	W	M	—	—	—	**N**	**NF**		90	23	1.5	1.5	—	77.5	72 000	57 000	8 500	—	5 600	6 700	48	—	—	—	—	—	82	79	1.5	1.5	0.649
NU308E	W	M, T, T7	**NU**	**NJ**	**NUP**	—	—		90	23	1.5	1.5	52	—	102 000	81 500	7 500	12 000	6 700	8 000	48	48	50	55	60	82	—	—	1.5	1.5	0.747
NU2308E	T	M, T7	**NU**	**NJ**	**NUP**	—	—		90	33	1.5	1.5	52	—	140 000	122 000	8 000	10 000	6 000	7 500	48	48	50	55	60	82	—	—	1.5	1.5	0.933

Notes (1) Cage designation (M) is usually omitted from the bearing designation.
(2) When L-shaped thrust collars (see Pages C156-C157) are used, the bearings are considered the NH type.
(3) If axial loads are applied, increase d_a and reduce D_a from the values listed above.
(4) d_b (max.) refers to values for adjusting rings for NU and NJ bearings.
(5) The limiting speeds in the bearing tables are for standard cages.
(6) The basic load ratings in the bearing tables are for standard cages.

SINGLE-ROW CYLINDRICAL ROLLER BEARINGS

Bore Diameter 45 – 50 mm





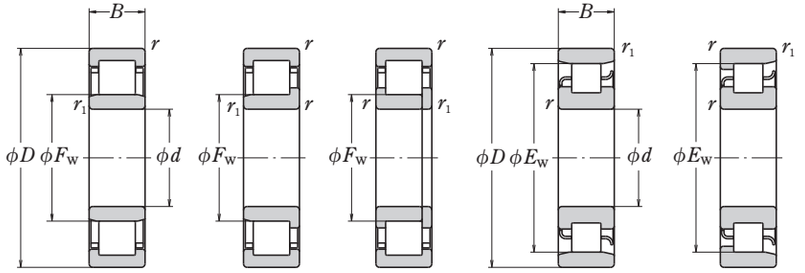
Boundary Dimensions (mm)							Basic Load Ratings[6] (N)		Speeds[5] (min^{-1}) Limiting Speeds			
d	D	B	r min.	r_1 min.	F_W	E_W	C_r	C_{0r}	Thermal Speed Rating (Oil Bath)	Mechanical (Forced Oil Circulation)	Grease	Oil (Oil Bath)
45	75	16	1	0.6	52.5	67.5	40 000	35 500	9 500	—	9 000	11 000
	85	19	1.1	1.1	—	75	56 500	47 000	9 000	—	6 300	7 500
	85	19	1.1	1.1	54.5	—	77 500	66 500	8 500	12 000	6 700	8 000
	85	23	1.1	1.1	54.5	—	93 500	84 500	8 500	10 000	6 700	8 500
	100	25	1.5	1.5	—	86.5	97 000	77 500	7 500	—	5 000	6 000
	100	25	1.5	1.5	58.5	—	120 000	98 500	7 100	11 000	6 000	7 500
	100	36	1.5	1.5	58.5	—	169 000	153 000	7 100	9 000	5 300	6 700
50	80	16	1	0.6	57.5	72.5	39 500	36 000	8 500	—	8 000	10 000
	90	20	1.1	1.1	—	80.4	59 500	51 000	8 500	—	5 600	6 700
	90	20	1.1	1.1	59.5	—	85 000	76 500	8 000	11 000	6 300	7 500
	90	23	1.1	1.1	59.5	—	102 000	97 000	7 500	9 000	6 300	8 000
	110	27	2	2	—	95	107 000	86 000	7 100	—	4 500	5 600
	110	27	2	2	65	—	135 000	113 000	6 700	10 000	5 000	6 000
	110	40	2	2	65	—	200 000	187 000	6 700	8 000	5 000	6 300

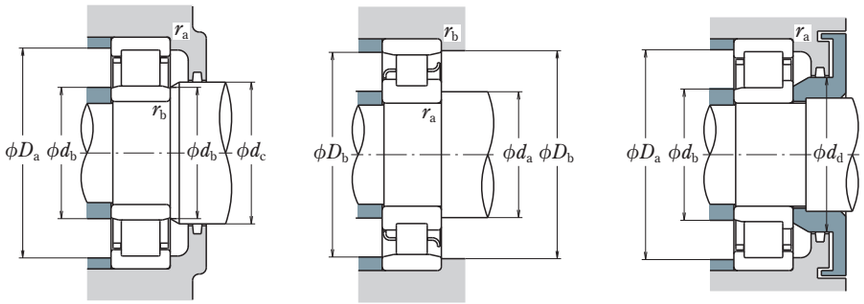
Bearing Designations							Abutment and Fillet Dimensions (mm)										Mass (kg)
	Cage[1] Standard Option		(2) NU	NJ	NUP	N	NF	d_a[3] min.	d_b min.	d_b[4] max.	d_c min.	d_d min.	D_a[3] max.	D_b max.	D_b min.	r_a max.	r_b max.	approx.
NU1009	(M)	—	**NU**	—	—	**N**	**NF**	50	49	51	54	—	70	71	68	1	0.6	0.279
N 209	**W**	**M**	—	—	—	**N**	**NF**	51.5	—	—	—	—	—	78.5	77	1	1	0.429
NU209E	**W**	**M, T, T7**	**NU**	**NJ**	**NUP**	—	—	51.5	51.5	52	57	61	78.5	—	—	1	1	0.438
NU2209E	**T**	**M, T7**	**NU**	**NJ**	**NUP**	—	—	51.5	51.5	52	57	61	78.5	—	—	1	1	0.521
N 309	**W**	**M**	—	—	—	**N**	**NF**	53	—	—	—	—	—	92	77	1.5	1.5	0.869
NU309E	**W**	**M, T, T7**	**NU**	**NJ**	**NUP**	—	—	53	53	56	60	66	92	—	—	1.5	1.5	1.01
NU2309E	**T**	**M, T7**	**NU**	**NJ**	**NUP**	—	—	53	53	56	60	66	92	—	—	1.5	1.5	1.28
NU1010	(M)	—	**NU**	**NJ**	**NUP**	**N**	—	55	54	56	59	—	75	76	73	1	0.6	0.301
N 210	**W**	**M**	—	—	—	**N**	**NF**	56.5	—	—	—	—	—	83.5	82	1	1	0.483
NU210E	**W**	**M, T, T7**	**NU**	**NJ**	**NUP**	—	—	56.5	56.5	57	62	67	83.5	—	—	1	1	0.50
NU2210E	**T**	**M, T7**	**NU**	**NJ**	**NUP**	—	—	56.5	56.5	57	62	67	83.5	—	—	1	1	0.562
N 310	**W**	**M**	—	—	—	**N**	**NF**	59	—	—	—	—	—	101	97	2	2	1.11
NU310E	**W**	**M, T, T7**	**NU**	**NJ**	**NUP**	—	—	59	59	63	67	73	101	—	—	2	2	1.3
NU2310E	**T**	**M, T7**	**NU**	**NJ**	**NUP**	—	—	59	59	63	67	73	101	—	—	2	2	1.7

Notes (1) Cage designation (M) is usually omitted from the bearing designation.
(2) When L-shaped thrust collars (see Pages C156-C157) are used, the bearings are considered the NH type.
(3) If axial loads are applied, increase d_a and reduce D_a from the values listed above.
(4) d_b (max.) refers to values for adjusting rings for NU and NJ bearings.
(5) The limiting speeds in the bearing tables are for standard cages.
(6) The basic load ratings in the bearing tables are for standard cages.

SINGLE-ROW CYLINDRICAL ROLLER BEARINGS

Bore Diameter 55 – 60 mm





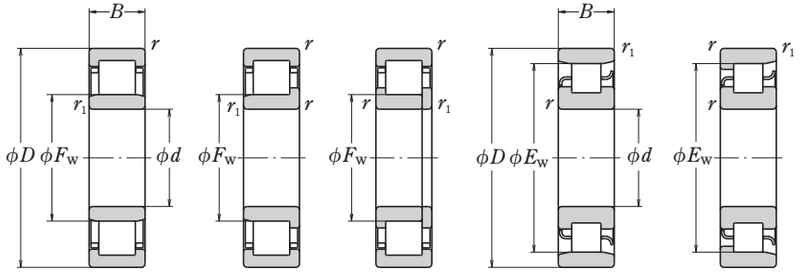
Boundary Dimensions (mm)							Basic Load Ratings[6] (N)		Speeds[5] (min^{-1}) Limiting Speeds			
d	D	B	r min.	r_1 min.	F_W	E_W	C_r	C_{0r}	Thermal Speed Rating (Oil Bath)	Mechanical (Forced Oil Circulation)	Grease	Oil (Oil Bath)
55	90	18	1.1	1	64.5	80.5	46 500	44 000	8 000	—	7 500	9 000
	100	21	1.5	1.1	—	88.5	71 500	62 500	7 500	—	5 300	6 300
	100	21	1.5	1.1	66	—	106 000	98 500	6 700	10 000	5 600	7 100
	100	25	1.5	1.1	66	—	125 000	122 000	6 700	8 500	5 600	7 100
	120	29	2	2	—	104.5	136 000	111 000	6 300	—	4 000	5 000
	120	29	2	2	70.5	—	169 000	143 000	6 000	9 000	4 500	5 600
	120	43	2	2	70.5	—	247 000	233 000	6 000	7 500	4 500	5 600
60	95	18	1.1	1	69.5	85.5	49 500	48 500	7 500	—	6 700	8 500
	110	22	1.5	1.5	—	97.5	84 500	75 000	7 100	—	4 800	5 600
	110	22	1.5	1.5	72	—	120 000	107 000	6 300	9 500	5 300	6 300
	110	28	1.5	1.5	72	—	161 000	157 000	6 300	7 500	5 300	6 300
	130	31	2.1	2.1	—	113	152 000	126 000	6 000	—	3 800	4 500
	130	31	2.1	2.1	77	—	152 000	126 000	6 000	—	3 800	4 500
	130	31	2.1	2.1	77	—	184 000	157 000	5 600	9 500	4 800	5 600
	130	46	2.1	2.1	77	—	274 000	262 000	5 600	6 700	4 300	5 300

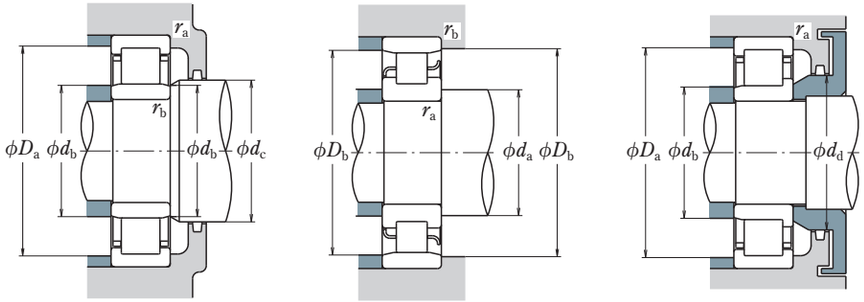
Bearing Designations								Abutment and Fillet Dimensions (mm)									Mass (kg)
	Cage[1] Standard Option		(2) NU	NJ	NUP	N	NF	d_a[3] min.	d_b min.	d_b[4] max.	d_c min.	d_d min.	D_a[3] max.	D_b max.	D_b min.	r_a max.	r_b max.	approx.
NU1011	**(M)**	—	**NU**	**NJ**	—	**N**	—	61.5	60	63	66	—	83.5	85	82	1	1	0.445
N 211	**W**	**M**	—	—	—	**N**	**NF**	63	—	—	—	—	—	93.5	91	1.5	1	0.634
NU211E	**W**	**M, T, T7**	**NU**	**NJ**	**NUP**	—	—	63	61.5	64	68	73	92	—	—	1.5	1	0.669
NU2211E	**T**	**M, T7**	**NU**	**NJ**	**NUP**	—	—	63	61.5	64	68	73	92	—	—	1.5	1	0.783
N 311	**W**	**M**	—	—	—	**N**	**NF**	64	—	—	—	—	—	111	107	2	2	1.42
NU311E	**W**	**M, T, T7**	**NU**	**NJ**	**NUP**	—	—	64	64	68	72	80	111	—	—	2	2	1.64
NU2311E	**T**	**M, T7**	**NU**	**NJ**	**NUP**	—	—	64	64	68	72	80	111	—	—	2	2	2.18
NU1012	**(M)**	—	**NU**	**NJ**	—	**N**	**NF**	66.5	65	68	71	—	88.5	90	87	1	1	0.474
N 212	**W**	**M**	—	—	—	**N**	**NF**	68	—	—	—	—	—	102	100	1.5	1.5	0.823
NU212E	**W**	**M, T, T7**	**NU**	**NJ**	**NUP**	—	—	68	68	70	75	80	102	—	—	1.5	1.5	0.824
NU2212E	**T**	**M, T7**	**NU**	**NJ**	**NUP**	—	—	68	68	70	75	80	102	—	—	1.5	1.5	1.06
N 312	**W**	**M**	—	—	—	**N**	**NF**	71	—	—	—	—	—	119	115	2	2	1.78
NU312	**W**	—	**NU**	**NJ**	**NUP**	—	—	71	71	75	79	86	119	—	—	2	2	1.82
NU312E	**M**	**T, T7**	**NU**	**NJ**	**NUP**	—	—	71	71	75	79	86	119	—	—	2	2	2.06
NU2312E	**T**	**M, T7**	**NU**	**NJ**	**NUP**	—	—	71	71	75	79	86	119	—	—	2	2	2.7

Notes (1) Cage designation (M) is usually omitted from the bearing designation.
(2) When L-shaped thrust collars (see Pages C156-C157) are used, the bearings are considered the NH type.
(3) If axial loads are applied, increase d_a and reduce D_a from the values listed above.
(4) d_b (max.) refers to values for adjusting rings for NU and NJ bearings.
(5) The limiting speeds in the bearing tables are for standard cages.
(6) The basic load ratings in the bearing tables are for standard cages.

■SINGLE-ROW CYLINDRICAL ROLLER BEARINGS

Bore Diameter 65 – 70 mm





Boundary Dimensions (mm)							Basic Load Ratings[6] (N)		Speeds[5] (min⁻¹) Limiting Speeds			
d	D	B	r min.	r_1 min.	F_W	E_W	C_r	C_{0r}	Thermal Speed Rating (Oil Bath)	Mechanical (Forced Oil Circulation)	Grease	Oil (Oil Bath)
65	100	18	1.1	1	74.5	90.5	50 500	51 000	6 700	—	6 300	8 000
	120	23	1.5	1.5	—	105.6	103 000	94 500	6 300	—	4 300	5 300
	120	23	1.5	1.5	78.5	—	132 000	119 000	6 000	8 500	4 800	5 600
	120	31	1.5	1.5	78.5	—	183 000	181 000	6 000	7 100	4 800	6 000
	140	33	2.1	2.1	—	121.5	166 000	139 000	5 600	—	3 600	4 300
	140	33	2.1	2.1	83.5	—	166 000	139 000	5 600	—	3 600	4 300
	140	33	2.1	2.1	82.5	—	222 000	191 000	5 300	8 500	4 300	5 300
	140	48	2.1	2.1	82.5	—	287 000	265 000	5 600	6 300	3 800	4 800
70	110	20	1.1	1	80	100	71 500	70 500	6 300	—	6 000	7 100
	125	24	1.5	1.5	—	110.5	103 000	95 000	6 300	—	4 000	5 000
	125	24	1.5	1.5	83.5	—	146 000	137 000	5 600	9 000	5 000	6 300
	125	31	1.5	1.5	83.5	—	191 000	194 000	5 600	6 700	4 500	5 600
	150	35	2.1	2.1	—	130	183 000	156 000	5 600	—	3 200	4 000
	150	35	2.1	2.1	90	—	195 000	168 000	5 300	—	3 200	4 000
	150	35	2.1	2.1	89	—	252 000	222 000	4 800	8 000	4 000	5 000
	150	51	2.1	2.1	89	—	335 000	325 000	5 000	6 000	3 600	4 500

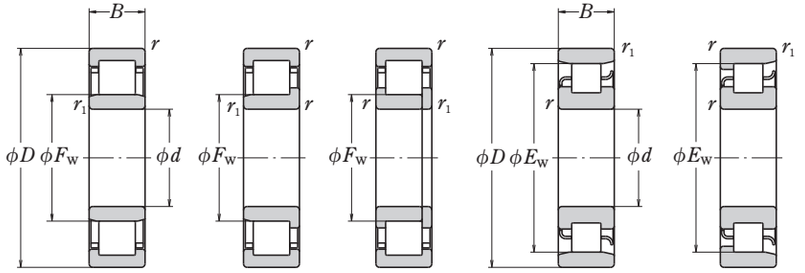
Bearing Designations								Abutment and Fillet Dimensions (mm)									Mass (kg)
	Cage[1] Standard Option		(2) NU	NJ	NUP	N	NF	d_a[3] min.	d_b min.	d_b[4] max.	d_c min.	d_d min.	D_a[3] max.	D_b max.	D_b min.	r_a max.	r_b max.	approx.
NU1013	(M)	—	**NU**	**NJ**	—	**N**	**NF**	71.5	70	73	76	—	93.5	95	92	1	1	0.504
N 213	**W**	**M**	—	—	—	**N**	**NF**	73	—	—	—	—	—	112	108	1.5	1.5	1.05
NU213E	**W**	**M, T, T7**	**NU**	**NJ**	**NUP**	—	—	73	73	76	81	87	112	—	—	1.5	1.5	1.05
NU2213E	**T**	**M, T7**	**NU**	**NJ**	**NUP**	—	—	73	73	76	81	87	112	—	—	1.5	1.5	1.41
N 313	**W**	**M**	—	—	—	**N**	**NF**	76	—	—	—	—	—	129	125	2	2	2.17
NU313	**W**	—	**NU**	**NJ**	**NUP**	—	—	76	76	81	85	93	129	—	—	2	2	2.23
NU313E	**M**	**T, T7**	**NU**	**NJ**	**NUP**	—	—	76	76	80	85	93	129	—	—	2	2	2.56
NU2313E	**T**	**M, T7**	**NU**	**NJ**	**NUP**	—	—	76	76	80	85	93	129	—	—	2	2	3.16
NU1014	(M)	—	**NU**	**NJ**	**NUP**	**N**	**NF**	76.5	75	79	82	—	103.5	105	101	1	1	0.693
N 214	**W**	**M**	—	—	—	**N**	**NF**	78	—	—	—	—	—	117	113	1.5	1.5	1.14
NU214E	**M**	**T, T7**	**NU**	**NJ**	**NUP**	—	—	78	78	81	86	92	117	—	—	1.5	1.5	1.29
NU2214E	**T**	**M, T7**	**NU**	**NJ**	**NUP**	—	—	78	78	81	86	92	117	—	—	1.5	1.5	1.49
N 314	**W**	**M**	—	—	—	**N**	**NF**	81	—	—	—	—	—	139	133.5	2	2	2.67
NU314	**W**	—	**NU**	**NJ**	**NUP**	—	—	81	81	87	92	100	139	—	—	2	2	2.75
NU314E	**M**	**T, T7**	**NU**	**NJ**	**NUP**	—	—	81	81	86	92	100	139	—	—	2	2	3.09
NU2314E	**T**	**M, T7**	**NU**	**NJ**	**NUP**	—	—	81	81	86	92	100	139	—	—	2	2	3.92

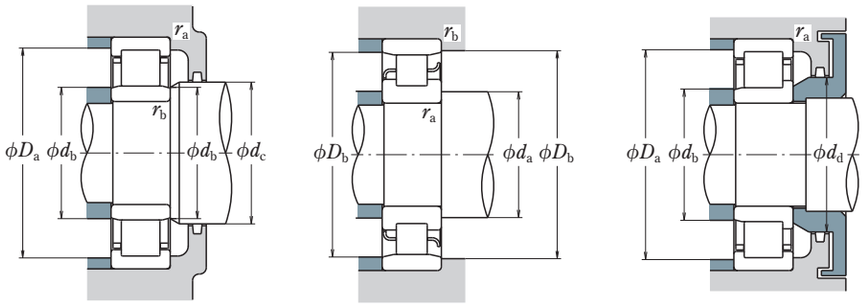
Notes (1) Cage designation (M) is usually omitted from the bearing designation.
(2) When L-shaped thrust collars (see Pages C156-C157) are used, the bearings are considered the NH type.
(3) If axial loads are applied, increase d_a and reduce D_a from the values listed above.

Notes (4) d_b (max.) refers to values for adjusting rings for NU and NJ bearings.
(5) The limiting speeds in the bearing tables are for standard cages.
(6) The basic load ratings in the bearing tables are for standard cages.

■SINGLE-ROW CYLINDRICAL ROLLER BEARINGS

Bore Diameter 75 mm





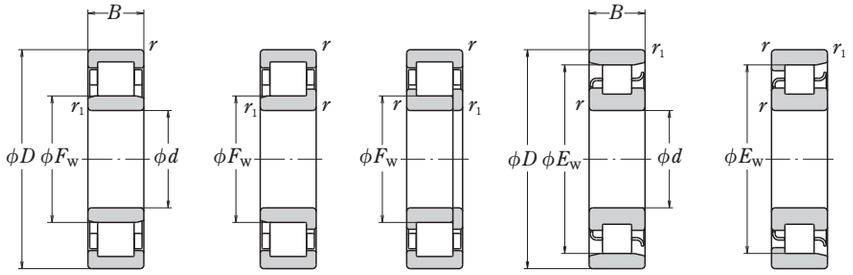
Boundary Dimensions (mm)							Basic Load Ratings[6] (N)		Speeds[5] (min^{-1}) Limiting Speeds			
d	D	B	r min.	r_1 min.	F_W	E_W	C_r	C_{0r}	Thermal Speed Rating (Oil Bath)	Mechanical (Forced Oil Circulation)	Grease	Oil (Oil Bath)
75	115	20	1.1	1	85	105	74 000	74 500	6 000	—	5 600	6 700
	130	25	1.5	1.5	—	116.5	119 000	111 000	6 000	—	3 800	4 800
	130	25	1.5	1.5	88.5	—	160 000	156 000	5 300	8 500	4 800	6 000
	130	31	1.5	1.5	88.5	—	199 000	207 000	5 300	6 300	4 300	5 300
	160	37	2.1	2.1	—	139.5	220 000	189 000	5 000	—	3 000	3 800
	160	37	2.1	2.1	95.5	—	220 000	189 000	5 000	—	3 000	3 800
	160	37	2.1	2.1	95	—	295 000	263 000	4 500	7 500	3 800	4 800
	160	55	2.1	2.1	95	—	405 000	395 000	4 800	5 600	3 400	4 300

Bearing Designations								Abutment and Fillet Dimensions (mm)									Mass (kg)
	Cage[1] Standard Option		NU	NJ	NUP	N	NF	d_a[3] min.	d_b min.	d_b[4] max.	d_c min.	d_d min.	D_a[3] max.	D_b max.	D_b min.	r_a max.	r_b max.	approx.
NU1015	**(M)**	—	**NU**	—	—	**N**	**NF**	81.5	80	83	87	—	108.5	110	106	1	1	0.731
N 215	**W**	**M**	—	—	—	**N**	**NF**	83	—	—	—	—	—	122	119	1.5	1.5	1.23
NU215E	**M**	**T, T7**	**NU**	**NJ**	**NUP**	—	—	83	83	86	90	96	122	—	—	1.5	1.5	1.44
NU2215E	**T**	**M, T7**	**NU**	**NJ**	**NUP**	—	—	83	83	86	90	96	122	—	—	1.5	1.5	1.57
N 315	**W**	**M**	—	—	—	**N**	**NF**	86	—	—	—	—	—	149	143	2	2	3.2
NU315	**W**	—	**NU**	**NJ**	**NUP**	—	—	86	86	93	97	106	149	—	—	2	2	3.26
NU315E	**M**	**T, T7**	**NU**	**NJ**	**NUP**	—	—	86	86	92	97	106	149	—	—	2	2	3.73
NU2315E	**T**	**M, T7**	**NU**	**NJ**	**NUP**	—	—	86	86	92	97	106	149	—	—	2	2	4.86

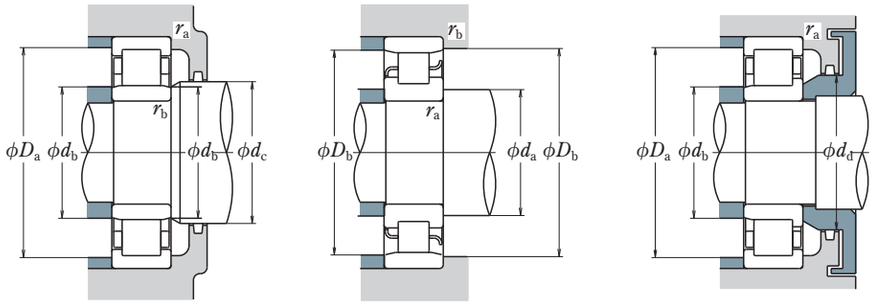
Notes (1) Cage designation (M) is usually omitted from the bearing designation.
(2) When L-shaped thrust collars (see Pages C156-C157) are used, the bearings are considered the NH type.
(3) If axial loads are applied, increase d_a and reduce D_a from the values listed above.
(4) d_b (max.) refers to values for adjusting rings for NU and NJ bearings.
(5) The limiting speeds in the bearing tables are for standard cages.
(6) The basic load ratings in the bearing tables are for standard cages.

SINGLE-ROW CYLINDRICAL ROLLER BEARINGS

Bore Diameter 80 – 90 mm



NU NJ NUP N NF



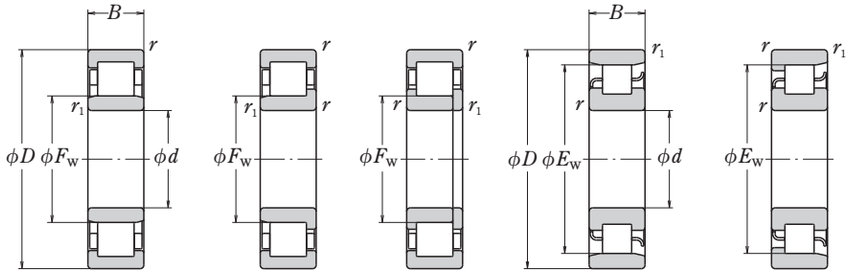
Bearing Designations								Boundary Dimensions (mm)						Basic Load Ratings(6) (N)		Speeds(5) (min−1) Limiting Speeds			Abutment and Fillet Dimensions (mm)										Mass (kg)
	Cage(1) Standard Option	(2) NU	NJ	NUP	N	NF	d	D	B	r min.	r_1 min.	F_w	E_w	C_r	C_{0r}	Thermal Speed Rating (Oil Bath)	Mechanical (Forced Oil Circulation)	Grease	Oil (Oil Bath)	d_a(3) min.	d_b min.	d_b(4) max.	d_c min.	d_d min.	D_a(3) max.	D_b max.	D_b min.	r_a max.	r_b max.	approx.
NU1016	(M)	—	**NU**	—	**NUP**	**N**	—	**80**	125	22	1.1	1	91.5	113.5	89 000	90 500	6 000	—	5 300	6 300	86.5	85	90	94	—	118.5	120	115	1	1	0.969
N 216	W	M	—	—	—	**N**	**NF**		140	26	2	2	—	125.3	131 000	122 000	5 600	—	3 600	4 300	89	—	—	—	—	—	131	128	2	2	1.47
NU216E	M	T, T7	**NU**	**NJ**	**NUP**	—	—		140	26	2	2	95.3	—	171 000	167 000	5 000	8 000	4 500	5 300	89	89	93	97	104	131	—	—	2	2	1.7
NU2216E	T	M, T7	**NU**	**NJ**	**NUP**	—	—		140	33	2	2	95.3	—	229 000	243 000	5 000	6 000	4 000	5 000	89	89	93	97	104	131	—	—	2	2	1.96
N 316	W	M	—	—	—	**N**	**NF**		170	39	2.1	2.1	—	147	234 000	207 000	4 800	—	2 800	3 400	91	—	—	—	—	—	159	150	2	2	3.85
NU316E	M	T, T7	**NU**	**NJ**	**NUP**	—	—		170	39	2.1	2.1	101	—	315 000	282 000	4 300	7 100	3 600	4 300	91	91	98	105	114	159	—	—	2	2	4.45
NU2316E	T	M, T7	**NU**	**NJ**	**NUP**	—	—		170	58	2.1	2.1	101	—	440 000	430 000	4 500	5 300	3 200	4 000	91	91	98	105	114	159	—	—	2	2	5.73
NU1017	(M)	—	**NU**	—	—	**N**	—	**85**	130	22	1.1	1	96.5	118.5	91 500	95 500	5 600	—	5 000	6 000	91.5	90	95	99	—	123.5	125	120	1	1	1.01
N 217	W	M	—	—	—	**N**	**NF**		150	28	2	2	—	133.8	148 000	140 000	5 300	—	3 400	4 000	94	—	—	—	—	—	141	137	2	2	1.87
NU217E	M	T, T7	**NU**	**NJ**	**NUP**	—	—		150	28	2	2	100.5	—	206 000	199 000	4 800	7 500	4 300	5 000	94	94	98	104	110	141	—	—	2	2	2.11
NU2217E	T	M, T7	**NU**	**NJ**	**NUP**	—	—		150	36	2	2	100.5	—	268 000	279 000	4 800	5 600	3 800	4 500	94	94	98	104	110	141	—	—	2	2	2.44
N 317	W	M	—	—	—	**N**	**NF**		180	41	3	3	—	156	277 000	247 000	4 500	—	2 600	3 200	98	—	—	—	—	—	167	159	2.5	2.5	4.53
NU317	W	M	**NU**	**NJ**	**NUP**	—	—		180	41	3	3	108	—	261 000	228 000	4 800	—	2 600	3 200	98	98	105	110	119	167	—	—	2.5	2.5	4.6
***NU317E**	M	T, T7	**NU**	**NJ**	**NUP**	—	—		180	41	3	3	108	—	360 000	330 000	4 000	6 700	3 400	4 000	98	98	105	110	119	167	—	—	2.5	2.5	5.26
***NU2317E**	T	M, T7	**NU**	**NJ**	**NUP**	—	—		180	60	3	3	108	—	485 000	485 000	4 300	6 000	3 000	3 800	98	98	105	110	119	167	—	—	2.5	2.5	6.77
NU1018	(M)	—	**NU**	—	**NUP**	**N**	—	**90**	140	24	1.5	1.1	103	127	108 000	114 000	5 300	—	4 500	5 600	98	96.5	101	106	—	132	133.5	129	1.5	1	1.35
N 218	W	M	—	—	—	**N**	**NF**		160	30	2	2	—	143	187 000	178 000	5 000	—	3 200	3 800	99	—	—	—	—	—	151	146	2	2	2.31
NU218E	M	T, T7	**NU**	**NJ**	**NUP**	—	—		160	30	2	2	107	—	224 000	217 000	4 800	7 100	4 000	4 800	99	99	104	109	116	151	—	—	2	2	2.6
NU2218E	T	M, T7	**NU**	**NJ**	**NUP**	—	—		160	40	2	2	107	—	298 000	315 000	4 800	5 300	3 600	4 300	99	99	104	109	116	151	—	—	2	2	3.11
N 318	W	M	—	—	—	**N**	**NF**		190	43	3	3	—	165	295 000	265 000	4 500	—	2 600	3 000	103	—	—	—	—	—	177	168	2.5	2.5	5.31
NU318	W	—	**NU**	**NJ**	**NUP**	—	—		190	43	3	3	115	—	295 000	265 000	4 500	—	2 600	3 000	103	103	112	117	127	177	—	—	2.5	2.5	5.38
***NU318E**	M	T, T7	**NU**	**NJ**	**NUP**	—	—		190	43	3	3	113.5	—	390 000	355 000	4 000	6 300	3 200	3 800	103	103	111	117	127	177	—	—	2.5	2.5	6.1
***NU2318E**	T	M, T7	**NU**	**NJ**	**NUP**	—	—		190	64	3	3	113.5	—	535 000	535 000	4 000	5 600	2 800	3 400	103	103	111	117	127	177	—	—	2.5	2.5	7.9

Notes (1) Cage designation (M) is usually omitted from the bearing designation.
(2) When L-shaped thrust collars (see Pages C156-C157) are used, the bearings are considered the NH type.
(3) If axial loads are applied, increase d_a and reduce D_a from the values listed above.
(4) d_b (max.) refers to values for adjusting rings for NU and NJ bearings.
(5) The limiting speeds in the bearing tables are for standard cages.
(6) The basic load ratings in the bearing tables are for standard cages.

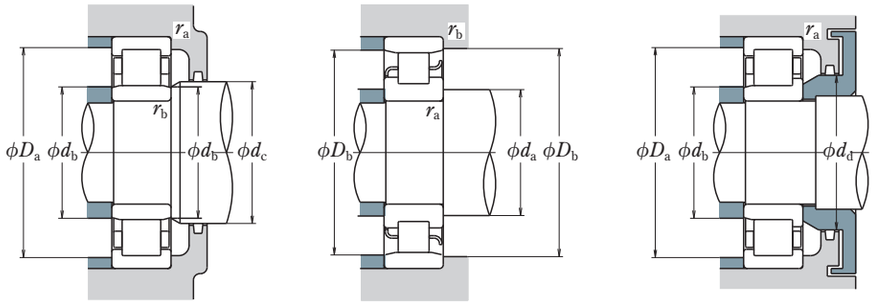
Remark Bearings with an asterisk (*) may be manufactured with an optimized roller crowning. Consult NSK for details.

■SINGLE-ROW CYLINDRICAL ROLLER BEARINGS

Bore Diameter 95 – 105 mm



NU NJ NUP N NF



Bearing Designations								Boundary Dimensions (mm)						Basic Load Ratings(6) (N)		Speeds(5) (min⁻¹) Limiting Speeds			
	Cage(1) Standard Option		(2) NU	NJ	NUP	N	NF	d	D	B	r min.	r1 min.	Fw	Ew	Cr	C0r	Thermal Speed Rating (Oil Bath)	Mechanical (Forced Oil Circulation)	Grease	Oil (Oil Bath)
95								145	24	1.5	1.1	108	132	111 000	120 000	5 000	—	4 300	5 300
								170	32	2.1	2.1	—	151.5	204 000	195 000	4 800	—	3 000	3 600
								170	32	2.1	2.1	112.5	—	271 000	265 000	4 300	6 700	3 800	4 500
								170	43	2.1	2.1	112.5	—	350 000	370 000	4 500	4 800	3 400	4 000
								200	45	3	3	—	173.5	320 000	289 000	4 300	—	2 400	3 000
								200	45	3	3	121.5	—	320 000	289 000	4 300	—	2 400	3 000
								200	45	3	3	121.5	—	410 000	385 000	3 800	6 000	3 000	3 600
								200	67	3	3	121.5	—	565 000	585 000	3 800	5 300	2 600	3 400
100								150	24	1.5	1.1	113	137	114 000	126 000	4 800	—	4 300	5 300
								180	34	2.1	2.1	—	160	225 000	217 000	4 500	—	2 800	3 400
								180	34	2.1	2.1	119	—	305 000	305 000	4 300	6 300	3 600	4 300
								180	46	2.1	2.1	119	—	410 000	445 000	4 300	4 500	3 200	3 800
								215	47	3	3	—	185.5	365 000	335 000	4 000	—	2 200	2 800
								215	47	3	3	129.5	—	365 000	335 000	4 000	—	2 200	2 800
								215	47	3	3	127.5	—	465 000	425 000	3 600	5 600	2 800	3 400
								215	73	3	3	127.5	—	700 000	715 000	3 400	4 000	2 400	3 000
105								160	26	2	1.1	119.5	145.5	134 000	149 000	4 500	—	4 000	4 800
								190	36	2.1	2.1	—	168.8	247 000	241 000	4 500	—	2 600	3 200
								190	36	2.1	2.1	125	—	320 000	310 000	4 300	6 000	3 400	4 000
								225	49	3	3	—	195	420 000	390 000	3 800	—	2 200	2 600
								225	49	3	3	133	—	525 000	480 000	3 400	5 300	2 600	3 200

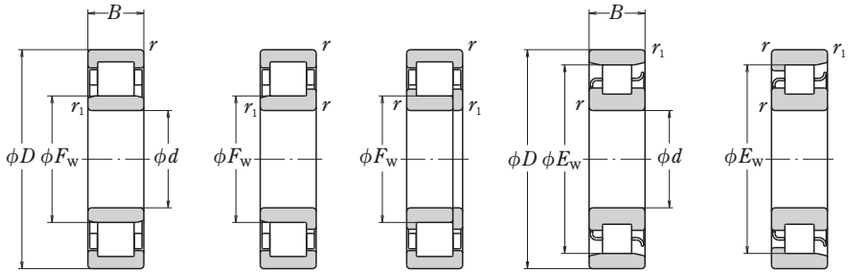
Notes (1) Cage designation (M) is usually omitted from the bearing designation.
(2) When L-shaped thrust collars (see Pages C156-C157) are used, the bearings are considered the NH type.
(3) If axial loads are applied, increase d_a and reduce D_a from the values listed above.

Bearing Designations								Abutment and Fillet Dimensions (mm)										Mass (kg)
	Cage(1) Standard Option		(2) NU	NJ	NUP	N	NF	da(3) min.	db min.	db(4) max.	dc min.	dd min.	Da(3) max.	Db max.	Db min.	ra max.	rb max.	approx.
NU1019	(M)	—	**NU**	**NJ**	—	**N**	—	103	101.5	106	111	—	137	138.5	134	1.5	1	1.41
N 219	**W**	**M**	—	—	—	**N**	**NF**	106	—	—	—	—	—	159	155	2	2	2.79
NU219E	**M**	**T, T7**	**NU**	**NJ**	**NUP**	—	—	106	106	110	116	123	159	—	—	2	2	3.17
NU2219E	**T**	**M, T7**	**NU**	**NJ**	**NUP**	—	—	106	106	110	116	123	159	—	—	2	2	3.81
N 319	**W**	**M**	—	—	—	**N**	**NF**	108	—	—	—	—	—	187	177	2.5	2.5	6.09
NU319	**W**	—	**NU**	**NJ**	**NUP**	—	—	108	108	118	124	134	187	—	—	2.5	2.5	6.23
∗**NU319E**	**M**	**T, T7**	**NU**	**NJ**	**NUP**	—	—	108	108	118	124	134	187	—	—	2.5	2.5	7.13
∗**NU2319E**	**T**	**M, T7**	**NU**	**NJ**	**NUP**	—	—	108	108	118	124	134	187	—	—	2.5	2.5	9.21
NU1020	(M)	—	**NU**	**NJ**	**NUP**	**N**	—	108	106.5	111	116	—	142	143.5	139	1.5	1	1.47
N 220	**W**	**M**	—	—	—	**N**	**NF**	111	—	—	—	—	—	169	163	2	2	3.36
∗**NU220E**	**M**	**T, T7**	**NU**	**NJ**	**NUP**	—	—	111	111	116	122	130	169	—	—	2	2	3.81
∗**NU2220E**	**T**	**M, T7**	**NU**	**NJ**	**NUP**	—	—	111	111	116	122	130	169	—	—	2	2	4.69
N 320	**W**	**M**	—	—	—	**N**	**NF**	113	—	—	—	—	—	202	190	2.5	2.5	7.59
NU320	**W**	—	**NU**	**NJ**	**NUP**	—	—	113	113	126	132	143	202	—	—	2.5	2.5	7.69
∗**NU320E**	**M**	**T, T7**	**NU**	**NJ**	**NUP**	—	—	113	113	124	132	143	202	—	—	2.5	2.5	8.63
∗**NU2320E**	**T**	**M, T7**	**NU**	**NJ**	**NUP**	—	—	113	113	124	132	143	202	—	—	2.5	2.5	11.8
NU1021	(M)	—	**NU**	—	—	**N**	**NF**	114	111.5	118	122	—	151	153.5	147	2	1	1.83
N 221	**W**	**M**	—	—	—	**N**	**NF**	116	—	—	—	—	—	179	172	2	2	4.0
∗**NU221E**	**M**	—	**NU**	**NJ**	**NUP**	—	—	116	116	121	129	137	179	—	—	2	2	4.58
N 321	**W**	**M**	—	—	—	**N**	**NF**	118	—	—	—	—	—	212	199	2.5	2.5	8.69
∗**NU321E**	**M**	—	**NU**	**NJ**	**NUP**	—	—	118	118	129	137	149	212	—	—	2.5	2.5	9.84

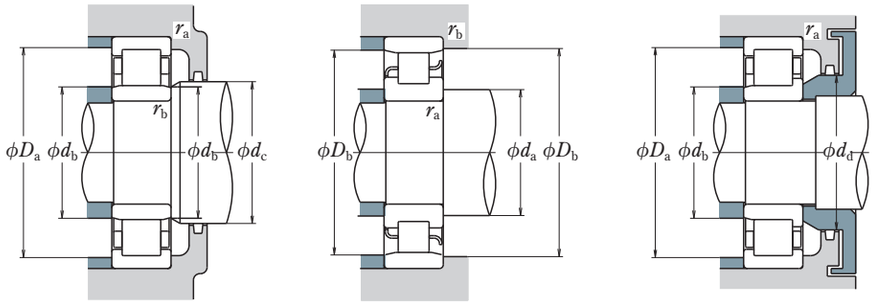
Notes (4) d_b (max.) refers to values for adjusting rings for NU and NJ bearings.
(5) The limiting speeds in the bearing tables are for standard cages.
(6) The basic load ratings in the bearing tables are for standard cages.
Remark Bearings with an asterisk (∗) may be manufactured with an optimized roller crowning. Consult NSK for details.

■SINGLE-ROW CYLINDRICAL ROLLER BEARINGS

Bore Diameter 110 – 130 mm



NU NJ NUP N NF



Boundary Dimensions (mm)							Basic Load Ratings(6) (N)		Speeds(5) (min−1) Limiting Speeds			
d	D	B	r min.	r_1 min.	F_W	E_W	C_r	C_{0r}	Thermal Speed Rating (Oil Bath)	Mechanical (Forced Oil Circulation)	Grease	Oil (Oil Bath)
110	170	28	2	1.1	125	155	161 000	174 000	4 500	—	3 800	4 500
	200	38	2.1	2.1	—	178.5	281 000	272 000	4 300	—	2 600	3 000
	200	38	2.1	2.1	132.5	—	360 000	365 000	4 000	5 600	3 200	3 800
	200	53	2.1	2.1	132.5	—	470 000	515 000	4 000	5 000	2 800	3 400
	240	50	3	3	—	207	465 000	435 000	3 400	—	2 000	2 400
	240	50	3	3	143	—	555 000	525 000	3 200	5 000	2 600	3 000
	240	80	3	3	143	—	830 000	880 000	3 000	4 500	2 200	2 800
120	180	28	2	1.1	135	165	171 000	191 000	4 000	—	3 400	4 300
	215	40	2.1	2.1	—	191.5	320 000	320 000	4 000	—	2 400	2 800
	215	40	2.1	2.1	143.5	—	410 000	420 000	3 600	5 300	3 000	3 400
	215	58	2.1	2.1	143.5	—	555 000	620 000	3 600	4 800	2 600	3 200
	260	55	3	3	—	226	550 000	510 000	3 000	—	2 200	2 800
	260	55	3	3	154	—	650 000	610 000	2 800	4 800	2 200	2 800
	260	86	3	3	154	—	975 000	1 030 000	2 600	4 300	2 000	2 600
130	200	33	2	1.1	148	182	211 000	238 000	4 000	—	3 200	3 800
	230	40	3	3	—	204	335 000	340 000	3 800	—	2 200	2 600
	230	40	3	3	153.5	—	445 000	455 000	3 400	5 000	2 600	3 200
	230	64	3	3	153.5	—	650 000	735 000	3 400	4 500	2 400	3 000
	280	58	4	4	—	243	685 000	665 000	2 600	—	2 200	2 600
	280	58	4	4	167	—	760 000	735 000	2 600	4 300	2 200	2 600
	280	93	4	4	167	—	1 130 000	1 230 000	2 400	3 800	1 900	2 400

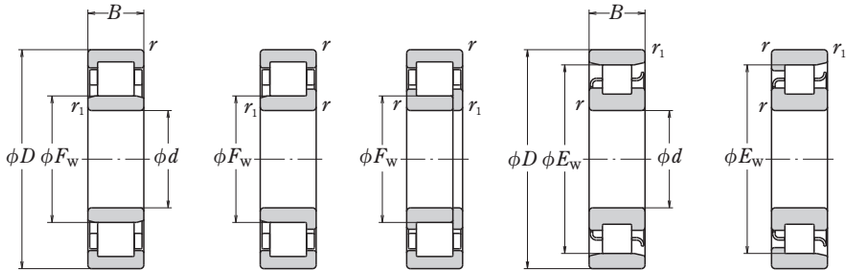
Notes (1) Cage designation (M) is usually omitted from the bearing designation.
(2) When L-shaped thrust collars (see Pages C156-C157) are used, the bearings are considered the NH type.
(3) If axial loads are applied, increase d_a and reduce D_a from the values listed above.

Bearing Designations								Abutment and Fillet Dimensions (mm)									Mass (kg)
	Cage(1) Standard Option		(2) NU	NJ	NUP	N	NF	d_a(3) min.	d_b min.	d_b(4) max.	d_c min.	d_d min.	D_a(3) max.	D_b max.	D_b min.	r_a max.	r_b max.	approx.
NU1022	**(M)**	—	**NU**	**NJ**	—	**N**	**NF**	119	116.5	123	128	—	161	163.5	157	2	1	2.27
N 222	**W**	**M**	—	—	—	**N**	**NF**	121	—	—	—	—	—	189	182	2	2	4.64
∗**NU222E**	**M**	**T, T7**	**NU**	**NJ**	**NUP**	—	—	121	121	129	135	144	189	—	—	2	2	5.37
∗**NU2222E**	**M**	—	**NU**	**NJ**	**NUP**	—	—	121	121	129	135	144	189	—	—	2	2	7.65
N 322	**W**	**M**	—	—	—	**N**	**NF**	123	—	—	—	—	—	227	211	2.5	2.5	10.3
∗**NU322E**	**M**	—	**NU**	**NJ**	**NUP**	—	—	123	123	139	145	158	227	—	—	2.5	2.5	11.8
∗**NU2322E**	**M**	—	**NU**	**NJ**	**NUP**	—	—	123	123	139	145	158	227	—	—	2.5	2.5	18.8
NU1024	**(M)**	—	**NU**	**NJ**	**NUP**	**N**	—	129	126.5	133	138	—	171	173.5	167	2	1	2.43
N 224	**W**	**M**	—	—	—	**N**	**NF**	131	—	—	—	—	—	204	196	2	2	5.63
∗**NU224E**	**M**	—	**NU**	**NJ**	**NUP**	—	—	131	131	140	146	156	204	—	—	2	2	6.43
∗**NU2224E**	**M**	—	**NU**	**NJ**	**NUP**	—	—	131	131	140	146	156	204	—	—	2	2	9.51
N 324	**W**	**M**	—	—	—	**N**	**NF**	133	—	—	—	—	—	247	230	2.5	2.5	12.9
∗**NU324E**	**M**	—	**NU**	**NJ**	**NUP**	—	—	133	133	150	156	171	247	—	—	2.5	2.5	15
∗**NU2324E**	**M**	—	**NU**	**NJ**	**NUP**	—	—	133	133	150	156	171	247	—	—	2.5	2.5	25
NU1026	**(M)**	—	**NU**	**NJ**	—	**N**	**NF**	139	136.5	146	151	—	191	193.5	184	2	1	3.66
N 226	**W**	**M**	—	—	—	**N**	**NF**	143	—	—	—	—	—	217	208	2.5	2.5	6.48
∗**NU226E**	**M**	**T, T7**	**NU**	**NJ**	**NUP**	—	—	143	143	150	158	168	217	—	—	2.5	2.5	8.03
∗**NU2226E**	**M**	—	**NU**	**NJ**	**NUP**	—	—	143	143	150	158	168	217	—	—	2.5	2.5	9.44
N 326	**M**	—	—	—	—	**N**	**NF**	146	—	—	—	—	—	264	247.5	3	3	17.7
∗**NU326E**	**M**	—	**NU**	**NJ**	**NUP**	—	—	146	146	163	169	184	264	—	—	3	3	18.7
∗**NU2326E**	**M**	—	**NU**	**NJ**	**NUP**	—	—	146	146	163	169	184	264	—	—	3	3	30

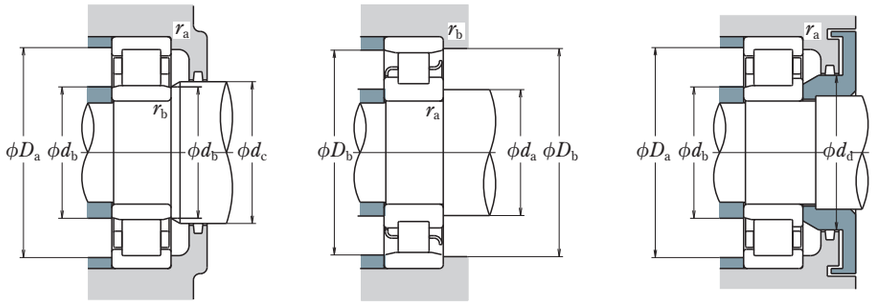
Notes (4) d_b (max.) refers to values for adjusting rings for NU and NJ bearings.
(5) The limiting speeds in the bearing tables are for standard cages.
(6) The basic load ratings in the bearing tables are for standard cages.
Remark Bearings with an asterisk (∗) may be manufactured with an optimized roller crowning. Consult NSK for details.

■SINGLE-ROW CYLINDRICAL ROLLER BEARINGS

Bore Diameter 140 – 160 mm



NU NJ NUP N NF



Bearing Designations								Boundary Dimensions (mm)						Basic Load Ratings(6) (N)		Speeds(5) (min−1) Limiting Speeds			Mass (kg)
	Cage(1) Standard Option		(2) NU	NJ	NUP	N	NF	d	D	B	r min.	r1 min.	Fw	Ew	Cr	C0r	Thermal Speed Rating (Oil Bath)	Mechanical (Forced Oil Circulation)	Grease	Oil (Oil Bath)	approx.
NU1028	(M)	—	**NU**	**NJ**	**NUP**	**N**	—	**140**	210	33	2	1.1	158	192	216 000	250 000	3 800	—	3 000	3 600	3.87
N 228	**W**	**M**	—	—	—	**N**	**NF**		250	42	3	3	—	221	365 000	375 000	3 400	—	2 000	2 400	8.08
∗**NU228E**	**M**	—	**NU**	**NJ**	**NUP**	—	—		250	42	3	3	169	—	485 000	515 000	3 200	4 500	2 400	3 000	9.38
∗**NU2228E**	**M**	—	**NU**	**NJ**	**NUP**	—	—		250	68	3	3	169	—	675 000	790 000	3 200	4 000	2 200	2 800	15.2
N 328	**M**	—	—	—	—	**N**	**NF**		300	62	4	4	—	260	760 000	745 000	2 400	—	2 000	2 400	21.7
∗**NU328E**	**M**	—	**NU**	**NJ**	**NUP**	—	—		300	62	4	4	180	—	815 000	795 000	2 400	4 000	2 000	2 400	22.8
∗**NU2328E**	**M**	—	**NU**	**NJ**	**NUP**	—	—		300	102	4	4	180	—	1 250 000	1 380 000	2 200	2 600	1 700	2 200	37.7
NU1030	(M)	—	**NU**	**NJ**	—	**N**	**NF**	**150**	225	35	2.1	1.5	169.5	205.5	249 000	294 000	3 600	—	2 800	3 400	4.77
N 230	**W**	**M**	—	—	—	**N**	**NF**		270	45	3	3	—	238	440 000	465 000	3 000	—	1 800	2 200	10.4
∗**NU230E**	**M**	—	**NU**	**NJ**	**NUP**	—	—		270	45	3	3	182	—	550 000	595 000	2 800	4 300	2 200	2 800	11.9
∗**NU2230E**	**M**	—	**NU**	**NJ**	**NUP**	—	—		270	73	3	3	182	—	780 000	930 000	2 800	3 800	2 000	2 600	19.3
N 330	**M**	—	—	—	—	**N**	**NF**		320	65	4	4	—	277	815 000	805 000	2 200	—	1 800	2 200	25.8
∗**NU330E**	**M**	—	**NU**	**NJ**	**NUP**	—	—		320	65	4	4	193	—	930 000	920 000	2 200	3 800	1 800	2 200	27.1
∗**NU2330E**	**M**	—	**NU**	**NJ**	**NUP**	—	—		320	108	4	4	193	—	1 430 000	1 600 000	2 000	2 400	1 600	2 000	45.1
NU1032	(M)	—	**NU**	**NJ**	—	**N**	**NF**	**160**	240	38	2.1	1.5	180	220	292 000	340 000	3 400	—	2 600	3 200	5.81
N 232	**M**	—	—	—	—	**N**	**NF**		290	48	3	3	—	255	525 000	570 000	2 800	—	2 200	2 600	14.1
∗**NU232E**	**M**	—	**NU**	**NJ**	**NUP**	—	—		290	48	3	3	195	—	615 000	665 000	2 600	4 000	2 200	2 600	14.7
∗**NU2232E**	**M**	—	**NU**	**NJ**	**NUP**	—	—		290	80	3	3	193	—	995 000	1 190 000	2 400	3 600	1 900	2 400	24.5
N 332	**M**	—	—	—	—	**N**	—		340	68	4	4	—	292	860 000	875 000	2 000	—	1 700	2 000	30.8
∗**NU332E**	**M**	—	**NU**	**NJ**	**NUP**	—	—		340	68	4	4	204	—	1 060 000	1 050 000	1 900	3 600	1 700	2 000	32.1
NU2332E	**M**	—	**NU**	**NJ**	**NUP**	—	—		340	114	4	4	204	—	1 610 000	1 820 000	1 800	2 400	1 500	1 900	53.9

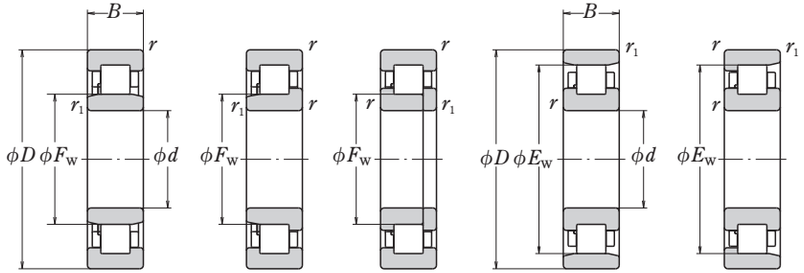
Abutment and Fillet Dimensions (mm)											
da(3) min.	db min.	db(4) max.	dc min.	dd min.	Da(3) max.	Db max.	Db min.	ra max.	rb max.
149	146.5	156	161	—	201	203.5	194	2	1
153	—	—	—	—	—	237	225	2.5	2.5
153	153	165	171	182	237	—	—	2.5	2.5
153	153	165	171	182	237	—	—	2.5	2.5
156	—	—	—	—	—	284	266	3	3
156	156	176	182	198	284	—	—	3	3
156	156	176	182	198	284	—	—	3	3
161	158	167	173	—	214	217	208	2	1.5
163	—	—	—	—	—	257	242	2.5	2.5
163	163	177	184	196	257	—	—	2.5	2.5
163	163	177	184	196	257	—	—	2.5	2.5
166	—	—	—	—	—	304	283	3	3
166	166	188	195	213	304	—	—	3	3
166	166	188	195	213	304	—	—	3	3
171	168	178	184	—	229	232	222	2	1.5
173	—	—	—	—	—	277	261	2.5	2.5
173	173	190	197	210	277	—	—	2.5	2.5
173	173	188	197	210	277	—	—	2.5	2.5
176	—	—	—	—	—	324	298	3	3
176	176	199	211	228	324	—	—	3	3
176	176	199	211	228	324	—	—	3	3

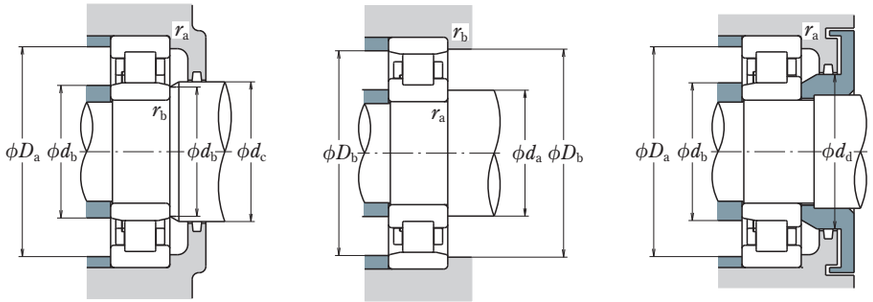
Notes (1) Cage designation (M) is usually omitted from the bearing designation.
(2) When L-shaped thrust collars (see Pages C156-C157) are used, the bearings are considered the NH type.
(3) If axial loads are applied, increase d_a and reduce D_a from the values listed above.
(4) d_b (max.) refers to values for adjusting rings for NU and NJ bearings.
(5) The limiting speeds in the bearing tables are for standard cages.
(6) The basic load ratings in the bearing tables are for standard cages.

Remark Bearings with an asterisk (∗) may be manufactured with an optimized roller crowning. Consult NSK for details.

SINGLE-ROW CYLINDRICAL ROLLER BEARINGS

Bore Diameter 170 – 200 mm





Boundary Dimensions (mm)							Basic Load Ratings[6] (N)		Speeds[5] (min⁻¹) Limiting Speeds			
d	D	B	r min.	r_1 min.	F_W	E_W	C_r	C_{0r}	Thermal Speed Rating (Oil Bath)	Mechanical (Forced Oil Circulation)	Grease	Oil (Oil Bath)
170	260	42	2.1	2.1	193	237	355 000	415 000	3 200	—	2 400	2 800
	310	52	4	4	—	272	585 000	635 000	2 600	—	2 000	2 400
	310	52	4	4	207	—	740 000	800 000	2 400	3 800	2 000	2 400
	310	86	4	4	205	—	1 140 000	1 330 000	2 200	3 200	1 800	2 200
	360	72	4	4	—	310	980 000	1 010 000	1 900	—	1 600	2 000
	360	72	4	4	218	—	1 140 000	1 150 000	1 800	3 400	1 600	2 000
	360	120	4	4	216	—	1 830 000	2 070 000	1 600	2 200	1 400	1 800
180	280	46	2.1	2.1	205	255	435 000	510 000	3 000	—	2 200	2 600
	320	52	4	4	—	282	610 000	675 000	2 400	—	1 900	2 200
	320	52	4	4	217	—	770 000	850 000	2 200	3 600	1 900	2 200
	320	86	4	4	215	—	1 240 000	1 510 000	2 000	3 200	1 700	2 000
	380	75	4	4	—	328	1 110 000	1 150 000	1 700	—	1 500	1 800
	380	75	4	4	231	—	1 210 000	1 230 000	1 700	2 800	1 500	1 800
	380	126	4	4	227	—	1 920 000	2 220 000	1 500	2 000	1 300	1 700
190	290	46	2.1	2.1	215	265	445 000	535 000	2 800	—	2 000	2 600
	340	55	4	4	—	299	685 000	770 000	2 200	—	1 800	2 200
	340	55	4	4	230	—	855 000	955 000	2 000	3 400	1 800	2 200
	340	92	4	4	228	—	1 360 000	1 670 000	1 900	3 000	1 600	2 000
	400	78	5	5	—	345	1 200 000	1 260 000	1 600	—	1 400	1 700
	400	78	5	5	245	—	1 300 000	1 340 000	1 600	2 600	1 400	1 700
	400	132	5	5	240	—	2 170 000	2 520 000	1 400	2 000	1 300	1 600
200	310	51	2.1	2.1	229	281	480 000	580 000	2 600	—	2 000	2 400
	360	58	4	4	—	316	765 000	865 000	2 000	—	1 700	2 000
	360	58	4	4	243	—	945 000	1 060 000	1 900	3 200	1 700	2 000
	360	98	4	4	241	—	1 500 000	1 870 000	1 800	2 200	1 500	1 800
	420	80	5	5	—	360	1 200 000	1 270 000	1 600	—	1 300	1 600
	420	80	5	5	258	—	1 400 000	1 450 000	1 500	2 600	1 300	1 600
	420	138	5	5	253	—	2 350 000	2 760 000	1 300	1 900	1 200	1 500

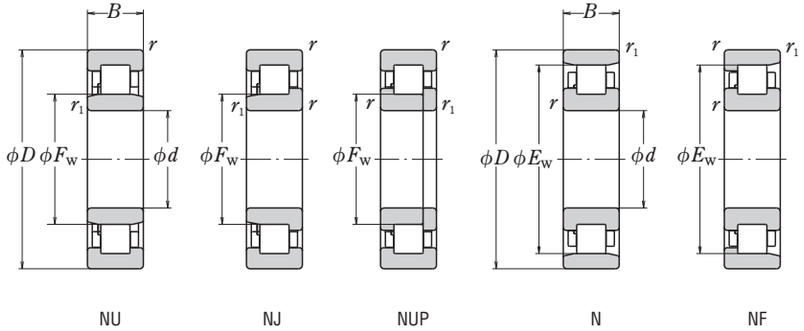
Bearing Designations								Abutment and Fillet Dimensions (mm)									Mass (kg)
	Cage[1] Standard Option		NU	NJ	[2] NUP	N	NF	d_a[3] min.	d_b min.	d_b[4] max.	d_c min.	d_d min.	D_a[3] max.	D_b max.	D_b min.	r_a max.	r_b max.	approx.
NU1034	(M)	—	**NU**	**NJ**	—	**N**	—	181	181	190	197	—	249	249	239	2	2	7.91
N 234	M	—	—	—	—	**N**	**NF**	186	—	—	—	—	—	294	278	3	3	17.4
***NU234E**	M	—	**NU**	**NJ**	**NUP**	—	—	186	186	202	211	223	294	—	—	3	3	18.3
***NU2234E**	M	—	**NU**	**NJ**	**NUP**	—	—	186	186	200	211	223	294	—	—	3	3	29.9
N 334	M	—	—	—	—	**N**	**NF**	186	—	—	—	—	—	344	316	3	3	36.6
NU334E	M	—	**NU**	**NJ**	**NUP**	—	—	186	186	213	223	241	344	—	—	3	3	37.9
NU2334E	M	—	**NU**	**NJ**	**NUP**	—	—	186	186	211	223	241	344	—	—	3	3	63.4
NU1036	(M)	—	**NU**	**NJ**	—	**N**	**NF**	191	191	202	209	—	269	269	258	2	2	10.2
N 236	M	—	—	—	—	**N**	**NF**	196	—	—	—	—	—	304	288	3	3	18.1
***NU236E**	M	—	**NU**	**NJ**	**NUP**	—	—	196	196	212	221	233	304	—	—	3	3	19
***NU2236E**	M	—	**NU**	**NJ**	**NUP**	—	—	196	196	210	221	233	304	—	—	3	3	31.4
N 336	M	—	—	—	—	**N**	**NF**	196	—	—	—	—	—	364	335	3	3	42.6
NU336E	M	—	**NU**	**NJ**	**NUP**	—	—	196	196	226	235	255	364	—	—	3	3	44
NU2336E	M	—	**NU**	**NJ**	**NUP**	—	—	196	196	222	235	255	364	—	—	3	3	74.6
NU1038	(M)	—	**NU**	**NJ**	—	**N**	—	201	201	212	219	—	279	279	268	2	2	10.7
N 238	M	—	—	—	—	**N**	**NF**	206	—	—	—	—	—	324	305	3	3	22
***NU238E**	M	—	**NU**	**NJ**	**NUP**	—	—	206	206	225	234	247	324	—	—	3	3	23
***NU2238E**	M	—	**NU**	**NJ**	**NUP**	—	—	206	206	223	234	247	324	—	—	3	3	38.3
N 338	M	—	—	—	—	**N**	—	210	—	—	—	—	—	380	352	4	4	48.7
NU338E	M	—	**NU**	**NJ**	**NUP**	—	—	210	210	240	248	268	380	—	—	4	4	50.6
NU2338E	M	—	**NU**	**NJ**	**NUP**	—	—	210	210	235	248	268	380	—	—	4	4	86.2
NU1040	(M)	—	**NU**	**NJ**	—	**N**	**NF**	211	211	226	233	—	299	299	284	2	2	14
N 240	M	—	—	—	—	**N**	**NF**	216	—	—	—	—	—	344	323	3	3	26.2
***NU240E**	M	—	**NU**	**NJ**	**NUP**	—	—	216	216	238	247	261	344	—	—	3	3	27.4
***NU2240E**	M	—	**NU**	**NJ**	**NUP**	—	—	216	216	236	247	261	344	—	—	3	3	46.1
N 340	M	—	—	—	—	**N**	**NF**	220	—	—	—	—	—	400	367	4	4	55.3
NU340E	M	—	**NU**	**NJ**	**NUP**	—	—	220	220	252	263	283	400	—	—	4	4	57.1
NU2340E	M	—	**NU**	**NJ**	**NUP**	—	—	220	220	247	263	283	400	—	—	4	4	99.3

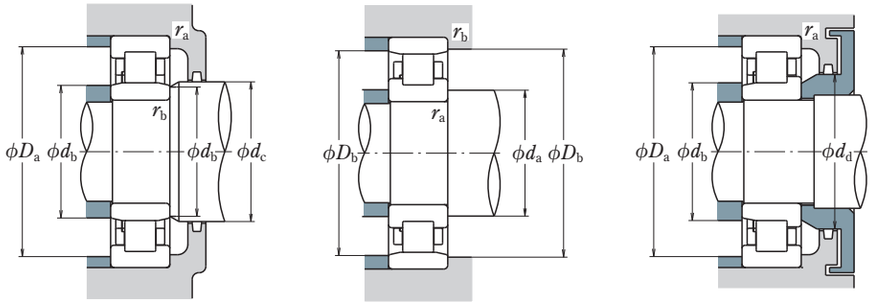
Notes (1) Cage designation (M) is usually omitted from the bearing designation.
(2) When L-shaped thrust collars (see Pages C156-C157) are used, the bearings are considered the NH type.
(3) If axial loads are applied, increase d_a and reduce D_a from the values listed above.
(4) d_b (max.) refers to values for adjusting rings for NU and NJ bearings.
(5) The limiting speeds in the bearing tables are for standard cages.
(6) The basic load ratings in the bearing tables are for standard cages.

Remark Bearings with an asterisk (*) may be manufactured with an optimized roller crowning. Consult NSK for details.

SINGLE-ROW CYLINDRICAL ROLLER BEARINGS

Bore Diameter 220 – 500 mm





Bearing Designations								Boundary Dimensions (mm)						Basic Load Ratings(6) (N)		Speeds(5) (min−1) Limiting Speeds			Abutment and Fillet Dimensions (mm)										Mass (kg)
	Cage(1) Standard Option	(2) NU	NJ	NUP	N	NF		d	D	B	r min.	r_1 min.	F_W	E_W	C_r	C_{0r}	Thermal Speed Rating (Oil Bath)	Mechanical (Forced Oil Circulation)	Grease / Oil (Oil Bath)	d_a(3) min.	d_b min.	d_b(4) max.	d_c min.	d_d min.	D_a(3) max.	D_b max.	D_b min.	r_a max.	r_b max.	approx.
NU1044	(M)	—	**NU**	**NJ**	—	**N**	—	**220**	340	56	3	3	250	310	615 000	750 000	2 400	—	1 800 / 2 200	233	233	247	254	—	327	327	313	2.5	2.5	18.2
N 244	M	—	—	—	—	**N**	**NF**		400	65	4	4	—	350	935 000	1 080 000	1 800	—	1 500 / 1 800	236	—	—	—	—	—	384	357	3	3	37
∗**NU244E**	M	—	**NU**	**NJ**	**NUP**	—	—		400	65	4	4	268	—	1 110 000	1 250 000	1 700	—	1 500 / 1 800	236	236	264	273	289	384	—	—	3	3	37.4
NU2244	M	—	**NU**	—	—	—	—		400	108	4	4	270	—	1 400 000	1 810 000	1 700	—	1 300 / 1 600	—	236	264	273	289	384	—	—	3	3	61.8
N 344	M	—	—	—	—	**N**	**NF**		460	88	5	5	—	396	1 470 000	1 570 000	1 400	—	1 200 / 1 500	240	—	—	—	—	—	440	403	4	4	72.8
NU344	M	—	**NU**	**NJ**	—	—	—		460	88	5	5	284	—	1 470 000	1 570 000	1 400	—	1 200 / 1 500	240	240	278	287	307	440	—	—	4	4	74.6
NU1048	(M)	—	**NU**	**NJ**	—	**N**	—	**240**	360	56	3	3	270	330	650 000	820 000	2 200	—	1 600 / 2 000	253	253	266	275	—	347	347	333	2.5	2.5	19.5
N 248	M	—	—	—	—	**N**	**NF**		440	72	4	4	—	385	1 150 000	1 340 000	1 600	—	1 300 / 1 600	256	—	—	—	—	—	424	392	3	3	49.6
NU248	M	—	**NU**	**NJ**	**NUP**	—	—		440	72	4	4	295	—	1 150 000	1 340 000	1 600	—	1 300 / 1 600	256	256	289	298	316	424	—	—	3	3	50.4
NU2248	M	—	**NU**	—	—	—	—		440	120	4	4	295	—	1 770 000	2 320 000	1 500	—	1 200 / 1 500	—	256	289	298	316	424	—	—	3	3	84.9
N 348	M	—	—	—	—	**N**	**NF**		500	95	5	5	—	430	1 680 000	1 820 000	1 200	—	1 100 / 1 300	260	—	—	—	—	—	480	438	4	4	92.3
NU348	M	—	**NU**	**NJ**	—	—	—		500	95	5	5	310	—	1 680 000	1 820 000	1 200	—	1 100 / 1 300	260	260	304	313	333	480	—	—	4	4	94.6
NU1052	(M)	—	**NU**	**NJ**	—	**N**	**NF**	**260**	400	65	4	4	296	364	790 000	1 000 000	1 900	—	1 500 / 1 800	276	276	292	300	—	384	384	367	3	3	29.1
N 252	M	—	—	—	—	**N**	—		480	80	5	5	—	420	1 360 000	1 580 000	1 500	—	1 200 / 1 500	280	—	—	—	—	—	460	428	4	4	66.2
NU252	M	—	**NU**	**NJ**	—	—	—		480	80	5	5	320	—	1 360 000	1 580 000	1 500	—	1 200 / 1 500	280	280	314	323	343	460	—	—	4	4	67.1
NU2252	M	—	**NU**	—	**NUP**	—	—		480	130	5	5	320	—	2 110 000	2 770 000	1 300	—	1 100 / 1 300	280	280	314	323	343	460	—	—	4	4	111
NU352	M	—	**NU**	**NJ**	—	—	—		540	102	6	6	336	—	1 900 000	2 090 000	1 100	—	1 000 / 1 200	286	286	330	339	359	514	—	—	5	5	118
NU1056	(M)	—	**NU**	**NJ**	**NUP**	**N**	**NF**	**280**	420	65	4	4	316	384	810 000	1 050 000	1 800	—	1 400 / 1 700	296	296	312	320	—	404	404	387	3	3	30.8
N 256	M	—	—	—	—	**N**	**NF**		500	80	5	5	—	440	1 410 000	1 680 000	1 300	—	1 100 / 1 400	300	—	—	—	—	—	480	448	4	4	69.6
NU256	M	—	**NU**	**NJ**	—	—	—		500	80	5	5	340	—	1 410 000	1 680 000	1 300	—	1 100 / 1 400	300	300	334	344	364	480	—	—	4	4	70.7
NU1060	(M)	—	**NU**	**NJ**	—	**N**	**NF**	**300**	460	74	4	4	340	420	1 090 000	1 400 000	1 600	—	1 300 / 1 500	316	316	336	344	—	444	444	424	3	3	43.7
NU260	M	—	**NU**	**NJ**	—	—	—		540	85	5	5	364	—	1 730 000	2 070 000	1 200	—	1 100 / 1 300	320	320	358	368	391	520	—	—	4	4	89.2
NU1064	(M)	—	**NU**	—	—	**N**	**NF**	**320**	480	74	4	4	360	440	1 110 000	1 470 000	1 500	—	1 200 / 1 400	336	336	356	365	—	464	464	444	3	3	46.1
N 264	M	—	—	—	—	**N**	—		580	92	5	5	—	510	1 890 000	2 270 000	1 100	—	950 / 1 200	340	—	—	—	—	—	560	519	4	4	110
NU264	M	—	**NU**	**NJ**	—	—	—		580	92	5	5	390	—	1 890 000	2 270 000	1 100	—	950 / 1 200	340	340	384	394	420	560	—	—	4	4	112
NU1068	(M)	—	**NU**	**NJ**	—	**N**	**NF**	**340**	520	82	5	5	385	475	1 330 000	1 740 000	1 400	—	1 100 / 1 300	360	360	381	390	—	500	500	479	4	4	61.8
NU1072	(M)	—	**NU**	—	—	**N**	**NF**	**360**	540	82	5	5	405	495	1 370 000	1 830 000	1 300	—	1 000 / 1 300	380	380	400	410	—	520	520	499	4	4	64.6
NU1076	(M)	—	**NU**	—	—	—	—	**380**	560	82	5	5	425	—	1 400 000	1 910 000	1 200	—	1 000 / 1 200	—	400	420	430	—	540	—	—	4	4	67.5
NU1080	(M)	—	**NU**	—	**NUP**	**N**	—	**400**	600	90	5	5	450	550	1 670 000	2 280 000	1 100	—	900 / 1 100	420	420	445	455	—	580	580	554.5	4	4	88.2
NU1084	(M)	—	**NU**	—	—	**N**	—	**420**	620	90	5	5	470	570	1 710 000	2 380 000	1 100	—	850 / 1 100	440	440	465	475	—	600	600	574.5	4	4	91.7
NU1088	(M)	—	**NU**	—	—	—	—	**440**	650	94	6	6	493	—	1 810 000	2 530 000	1 000	—	800 / 1 000	—	466	488	498	—	624	—	—	5	5	105
NU1092	(M)	—	**NU**	—	**NUP**	**N**	—	**460**	680	100	6	6	516	624	1 950 000	2 740 000	950	—	750 / 950	486	486	511	521	—	654	654	628.5	5	5	123
NU1096	(M)	—	**NU**	**NJ**	—	**N**	—	**480**	700	100	6	6	536	644	1 990 000	2 860 000	900	—	750 / 900	506	506	531	541	—	674	674	654	5	5	127
NU10/500	(M)	—	**NU**	—	—	**N**	—	**500**	720	100	6	6	556	664	2 040 000	2 970 000	900	—	710 / 850	526	526	551	558	—	694	694	674	5	5	131

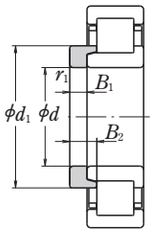
Notes (1) Cage designation (M) is usually omitted from the bearing designation.
(2) When L-shaped thrust collars (see Pages C156-C157) are used, the bearings are considered the NH type.
(3) If axial loads are applied, increase d_a and reduce D_a from the values listed above.

Notes (4) d_b (max.) refers to values for adjusting rings for NU and NJ bearings.
(5) The limiting speeds in the bearing tables are for standard cages.
(6) The basic load ratings in the bearing tables are for standard cages.
Remark Bearings with an asterisk (∗) may be manufactured with an optimized roller crowning. Consult NSK for details.

CYLINDRICAL ROLLER BEARINGS

L-Shaped Thrust Collars

Bore Diameter 20 – 85 mm

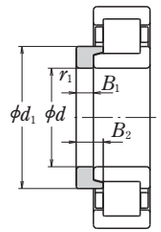


L-Shaped Thrust Collar

Boundary Dimensions (mm) d	d_1	B_1	B_2	r_1 min.	Bearing Designation	Mass (kg) approx.
20	30	3	6.75	0.6	**HJ 204**	0.012
	29.8	3	5.5	0.6	**HJ 204 E**	0.011
	30	3	7.5	0.6	**HJ 2204**	0.012
	29.8	3	6.5	0.6	**HJ 2204 E**	0.012
	31.7	4	7.5	0.6	**HJ 304**	0.017
	31.4	4	6.5	0.6	**HJ 304 E**	0.017
	31.8	4	8.5	0.6	**HJ 2304**	0.017
	31.4	4	7.5	0.6	HJ 2304 E	0.018
25	34.8	3	6	0.6	**HJ 205 E**	0.014
	34.8	3	6.5	0.6	**HJ 2205 E**	0.014
	38.2	4	7	1.1	**HJ 305 E**	0.025
	38.2	4	8	1.1	HJ 2305 E	0.026
	43.6	6	10.5	1.5	**HJ 405**	0.057
30	41.3	4	7	0.6	**HJ 206 E**	0.025
	41.4	4	7.5	0.6	**HJ 2206 E**	0.025
	45.1	5	8.5	1.1	**HJ 306 E**	0.042
	45.1	5	9.5	1.1	HJ 2306 E	0.043
	50.5	7	11.5	1.5	**HJ 406**	0.080
35	48.2	4	7	0.6	**HJ 207 E**	0.033
	48.2	4	8.5	0.6	**HJ 2207 E**	0.035
	51.1	6	9.5	1.1	**HJ 307 E**	0.060
	51.1	6	11	1.1	HJ 2307 E	0.062
	59	8	13	1.5	**HJ 407**	0.12
40	54.1	5	8.5	1.1	**HJ 208 E**	0.049
	54.1	5	9	1.1	**HJ 2208 E**	0.050
	57.6	7	11	1.5	**HJ 308 E**	0.088
	57.7	7	12.5	1.5	HJ 2308 E	0.091
	64.8	8	13	2	**HJ 408**	0.14
45	59.1	5	8.5	1.1	**HJ 209 E**	0.055
	59.1	5	9	1.1	**HJ 2209 E**	0.055
	64.5	7	11.5	1.5	**HJ 309 E**	0.11
	64.5	7	13	1.5	HJ 2309 E	0.113
	71.7	8	13.5	2	**HJ 409**	0.175
50	64.1	5	9	1.1	**HJ 210 E**	0.061
	64.1	5	9	1.1	**HJ 2210 E**	0.061
	71.4	8	13	2	**HJ 310 E**	0.151
	71.4	8	14.5	2	HJ 2310 E	0.155
	78.8	9	14.5	2.1	**HJ 410**	0.23

Boundary Dimensions (mm) d	d_1	B_1	B_2	r_1 min.	Bearing Designation	Mass (kg) approx.
55	70.9	6	9.5	1.1	**HJ 211 E**	0.087
	70.9	6	10	1.1	**HJ 2211 E**	0.088
	77.6	9	14	2	**HJ 311 E**	0.195
	77.6	9	15.5	2	HJ 2311 E	0.20
	85.2	10	16.5	2.1	**HJ 411**	0.29
60	77.7	6	10	1.5	**HJ 212 E**	0.108
	77.7	6	10	1.5	**HJ 2212 E**	0.108
	84.5	9	14.5	2.1	**HJ 312 E**	0.231
	84.5	9	16	2.1	HJ 2312 E	0.237
	91.8	10	16.5	2.1	**HJ 412**	0.34
65	84.5	6	10	1.5	HJ 213 E	0.129
	84.5	6	10.5	1.5	HJ 2213 E	0.131
	90.6	10	15.5	2.1	HJ 313 E	0.288
	90.6	10	18	2.1	HJ 2313 E	0.298
	98.5	11	18	2.1	**HJ 413**	0.42
70	89.5	7	11	1.5	HJ 214 E	0.157
	89.5	7	11.5	1.5	HJ 2214 E	0.158
	97.5	10	15.5	2.1	HJ 314 E	0.33
	97.5	10	18.5	2.1	HJ 2314 E	0.345
	110.5	12	20	3	**HJ 414**	0.605
75	94.5	7	11	1.5	HJ 215 E	0.166
	94.5	7	11.5	1.5	HJ 2215 E	0.167
	104.2	11	16.5	2.1	HJ 315 E	0.41
	104.2	11	19.5	2.1	HJ 2315 E	0.43
	116	13	21.5	3	**HJ 415**	0.71
80	101.6	8	12.5	2	HJ 216 E	0.222
	101.6	8	12.5	2	HJ 2216 E	0.222
	110.6	11	17	2.1	HJ 316 E	0.46
	111	11	20	2.1	HJ 2316 E	0.48
	122	13	22	3	**HJ 416**	0.78
85	107.6	8	12.5	2	HJ 217 E	0.25
	107.6	8	13	2	HJ 2217 E	0.252
	117.9	12	18.5	3	HJ 317 E	0.575
	117.9	12	22	3	HJ 2317 E	0.595
	126	14	24	4	**HJ 417**	0.88

Bore Diameter 90 – 320 mm



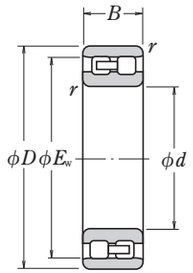
L-Shaped Thrust Collar

Boundary Dimensions (mm) d	d_1	B_1	B_2	r_1 min.	Bearing Designation	Mass (kg) approx.
90	114.3	9	14	2	HJ 218 E	0.32
	114.3	9	15	2	HJ 2218 E	0.325
	124.2	12	18.5	3	HJ 318 E	0.63
	124.2	12	22	3	HJ 2318 E	0.66
	137	14	24	4	**HJ 418**	1.05
95	120.6	9	14	2.1	HJ 219 E	0.355
	120.6	9	15.5	2.1	HJ 2219 E	0.365
	132.2	13	20.5	3	HJ 319 E	0.785
	132.2	13	24.5	3	HJ 2319 E	0.815
	147	15	25.5	4	**HJ 419**	1.3
100	127.5	10	15	2.1	HJ 220 E	0.44
	127.5	10	16	2.1	HJ 2220 E	0.45
	139.6	13	20.5	3	HJ 320 E	0.89
	139.6	13	23.5	3	HJ 2320 E	0.92
	153.5	16	27	4	**HJ 420**	1.5
105	145	13	20.5	3	**HJ 321 E**	0.97
	159.5	16	27	4	**HJ 421**	1.65
110	141.7	11	17	2.1	HJ 222 E	0.62
	141.7	11	19.5	2.1	HJ 2222 E	0.645
	155.8	14	22	3	HJ 322 E	1.21
	155.8	14	26.5	3	HJ 2322 E	1.27
	171	17	29.5	4	**HJ 422**	2.1
120	153.4	11	17	2.1	HJ 224 E	0.71
	153.4	11	20	2.1	HJ 2224 E	0.745
	168.6	14	22.5	3	HJ 324 E	1.41
	168.6	14	26	3	HJ 2324 E	1.46
	188	17	30.5	5	**HJ 424**	2.6
130	164.2	11	17	3	HJ 226 E	0.79
	164.2	11	21	3	HJ 2226 E	0.84
	182.3	14	23	4	HJ 326 E	1.65
	182.3	14	28	4	HJ 2326 E	1.73
	205	18	32	5	**HJ 426**	3.3
140	180	11	18	3	HJ 228 E	0.99
	180	11	23	3	HJ 2228 E	1.07
	196	15	25	4	HJ 328 E	2.04
	196	15	31	4	HJ 2328 E	2.14
	219	18	33	5	**HJ 428**	3.75

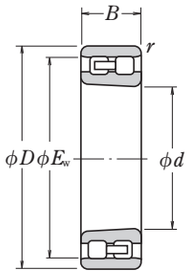
Boundary Dimensions (mm) d	d_1	B_1	B_2	r_1 min.	Bearing Designation	Mass (kg) approx.
150	193.7	12	19.5	3	HJ 230 E	1.26
	193.7	12	24.5	3	HJ 2230 E	1.35
	210	15	25	4	HJ 330 E	2.35
	210	15	31.5	4	HJ 2330 E	2.48
	234	20	36.5	5	**HJ 430**	4.7
160	207.3	12	20	3	HJ 232 E	1.48
	206.1	12	24.5	3	HJ 2232 E	1.55
	222	15	25	4	HJ 332 E	2.59
	222.1	15	32	4	HJ 2332 E	2.76
170	220.8	12	20	4	HJ 234 E	1.7
	219.5	12	24	4	HJ 2234 E	1.79
	238	16	33.5	4	**HJ 2334 E**	3.25
180	230.8	12	20	4	HJ 236 E	1.79
	229.5	12	24	4	HJ 2236 E	1.88
	252	17	35	4	**HJ 2336 E**	3.85
190	244.5	13	21.5	4	HJ 238 E	2.19
	243.2	13	26.5	4	HJ 2238 E	2.31
	260.6	18	36.5	5	**HJ 2338 E**	4.45
200	258.2	14	23	4	HJ 240 E	2.65
	258	14	34	4	**HJ 2240**	2.6
	256.9	14	28	4	HJ 2240 E	2.78
	280	18	30	5	**HJ 340 E**	5.0
220	286	15	27.5	4	**HJ 244**	3.55
	286	15	36.5	4	**HJ 2244**	3.55
	307	20	36	5	**HJ 344**	7.05
240	313	16	29.5	4	**HJ 248**	4.65
	313	16	38.5	4	**HJ 2248**	4.65
	334	22	39.5	5	**HJ 348**	8.2
260	340	18	33	5	**HJ 252**	6.2
	340	18	40.5	5	**HJ 2252**	6.2
	362	24	43	6	**HJ 352**	11.4
280	360	18	33	5	**HJ 256**	7.4
300	387	20	34.5	5	**HJ 260**	9.15
320	415	21	37	5	**HJ 264**	11.3

DOUBLE-ROW CYLINDRICAL ROLLER BEARINGS

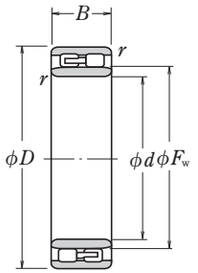
Bore Diameter 25 – 140 mm



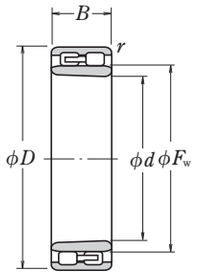
NN
Cylindrical Bore



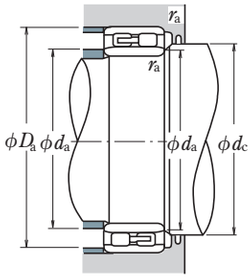
NN
Tapered Bore

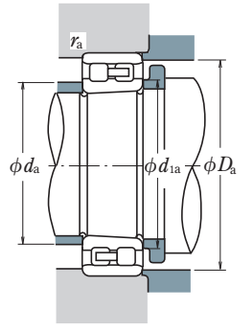


NNU
Cylindrical Bore



NNU
Tapered Bore





Boundary Dimensions (mm)						Basic Load Ratings (N)		Limiting Speeds (min⁻¹)	
d	D	B	r min.	F_W	E_W	C_r	C_{0r}	Grease	Oil
25	47	16	0.6	—	41.3	31 500	30 000	14 000	17 000
30	55	19	1	—	48.5	38 000	37 000	12 000	14 000
35	62	20	1	—	55	48 500	50 000	10 000	12 000
40	68	21	1	—	61	53 000	55 500	9 000	11 000
45	75	23	1	—	67.5	63 500	68 500	8 500	10 000
50	80	23	1	—	72.5	65 500	72 500	7 500	9 000
55	90	26	1.1	—	81	85 500	96 500	6 700	8 000
60	95	26	1.1	—	86.1	90 000	106 000	6 300	7 500
65	100	26	1.1	—	91	95 000	116 000	6 000	7 100
70	110	30	1.1	—	100	120 000	148 000	5 600	6 700
75	115	30	1.1	—	105	119 000	149 000	5 300	6 300
80	125	34	1.1	—	113	147 000	186 000	4 800	6 000
85	130	34	1.1	—	118	154 000	201 000	4 500	5 600
90	140	37	1.5	—	127	176 000	228 000	4 300	5 000
95	145	37	1.5	—	132	185 000	246 000	4 000	5 000
100	140	40	1.1	112	—	190 000	295 000	4 000	5 000
	150	37	1.5	—	137	193 000	265 000	4 000	4 800
105	145	40	1.1	117	—	198 000	315 000	3 800	4 800
	160	41	2	—	146	243 000	320 000	3 800	4 500
110	150	40	1.1	122	—	205 000	335 000	3 600	4 500
	170	45	2	—	155	281 000	375 000	3 400	4 300
120	165	45	1.1	133.5	—	225 000	360 000	3 200	4 000
	180	46	2	—	165	294 000	405 000	3 200	3 800
130	180	50	1.5	144	—	335 000	545 000	3 000	3 800
	200	52	2	—	182	350 000	475 000	3 000	3 600
140	190	50	1.5	154	—	350 000	585 000	2 800	3 600
	210	53	2	—	192	365 000	515 000	2 800	3 400

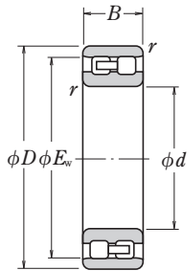
Bearing Designations		Abutment and Fillet Dimensions (mm)							Mass (kg)
Cylindrical Bore	Tapered Bore(1)	d_a(2) min.	d_a(2) max.	d_{1a} min.	d_c min.	D_a max.	D_a min.	r_a max.	approx.
NN 3005	**NN 3005 KR**	29	—	29	—	43	42	0.6	0.127
NN 3006	**NN 3006 KR**	35	—	36	—	50	50	1	0.198
NN 3007	**NN 3007 KR**	40	—	41	—	57	56	1	0.258
NN 3008	**NN 3008 KR**	45	—	46	—	63	62	1	0.309
NN 3009	**NN 3009 KR**	50	—	51	—	70	69	1	0.407
NN 3010	**NN 3010 KR**	55	—	56	—	75	74	1	0.436
NN 3011	**NN 3011 KR**	61.5	—	62	—	83.5	83	1	0.647
NN 3012	**NN 3012 KR**	66.5	—	67	—	88.5	88	1	0.693
NN 3013	**NN 3013 KR**	71.5	—	72	—	93.5	93	1	0.741
NN 3014	**NN 3014 KR**	76.5	—	77	—	103.5	102	1	1.06
NN 3015	**NN 3015 KR**	81.5	—	82	—	108.5	107	1	1.11
NN 3016	**NN 3016 KR**	86.5	—	87	—	118.5	115	1	1.54
NN 3017	**NN 3017 KR**	91.5	—	92	—	123.5	120	1	1.63
NN 3018	**NN 3018 KR**	98	—	99	—	132	129	1.5	2.09
NN 3019	**NN 3019 KR**	103	—	104	—	137	134	1.5	2.19
NNU 4920	**NNU 4920 KR**	106.5	111	108	115	133.5	—	1	1.9
NN 3020	**NN 3020 KR**	108	—	109	—	142	139	1.5	2.28
NNU 4921	**NNU 4921 KR**	111.5	116	113	120	138.5	—	1	1.99
NN 3021	**NN 3021 KR**	114	—	115	—	151	148	2	2.88
NNU 4922	**NNU 4922 KR**	116.5	121	118	125	143.5	—	1	2.07
NN 3022	**NN 3022 KR**	119	—	121	—	161	157	2	3.71
NNU 4924	**NNU 4924 KR**	126.5	133	128	137	158.5	—	1	2.85
NN 3024	**NN 3024 KR**	129	—	131	—	171	167	2	4.04
NNU 4926	**NNU 4926 KR**	138	143	140	148	172	—	1.5	3.85
NN 3026	**NN 3026 KR**	139	—	141	—	191	185	2	5.88
NNU 4928	**NNU 4928 KR**	148	153	150	158	182	—	1.5	4.08
NN 3028	**NN 3028 KR**	149	—	151	—	201	195	2	6.34

Note (1) Suffix KR represents bearings with tapered bores (taper 1 : 12).
Remark Double-row cylindrical roller bearings are generally produced in high precision classes (Class 5 or better).

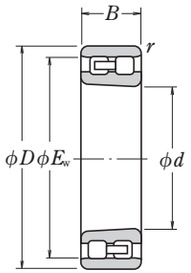
Note (2) d_a (max.) refers to values for adjusting rings for NNU bearings.

DOUBLE-ROW CYLINDRICAL ROLLER BEARINGS

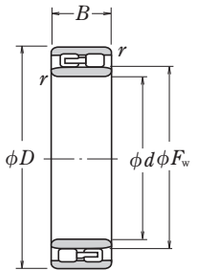
Bore Diameter 150 – 360 mm



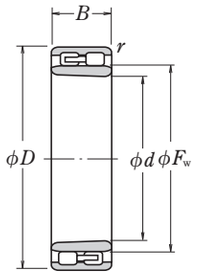
NN
Cylindrical Bore



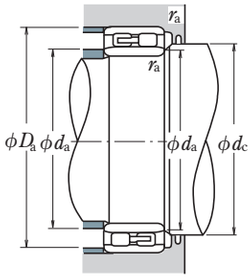
NN
Tapered Bore

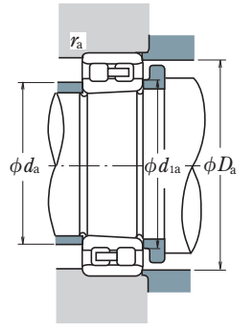


NNU
Cylindrical Bore



NNU
Tapered Bore





Boundary Dimensions (mm)						Basic Load Ratings (N)		Limiting Speeds (min⁻¹)	
d	D	B	r min.	F_W	E_W	C_r	C_{0r}	Grease	Oil
150	210	60	2	167	—	435 000	715 000	2 600	3 200
	225	56	2.1	—	206	410 000	585 000	2 600	3 000
160	220	60	2	177	—	450 000	760 000	2 400	3 000
	240	60	2.1	—	219	460 000	660 000	2 400	2 800
170	230	60	2	187	—	465 000	805 000	2 400	2 800
	260	67	2.1	—	236	555 000	805 000	2 200	2 600
180	250	69	2	200	—	590 000	1 020 000	2 200	2 600
	280	74	2.1	—	255	695 000	995 000	2 000	2 400
190	260	69	2	211.5	—	595 000	1 060 000	2 000	2 600
	290	75	2.1	—	265	730 000	1 080 000	2 000	2 400
200	280	80	2.1	223	—	700 000	1 220 000	1 900	2 400
	310	82	2.1	—	282	805 000	1 170 000	1 800	2 200
220	300	80	2.1	243	—	735 000	1 330 000	1 700	2 200
	340	90	3	—	310	1 000 000	1 480 000	1 700	2 000
240	320	80	2.1	263	—	770 000	1 450 000	1 600	2 000
	360	92	3	—	330	1 050 000	1 600 000	1 500	1 800
260	360	100	2.1	289	—	1 150 000	2 100 000	1 400	1 800
	400	104	4	—	364	1 270 000	1 920 000	1 400	1 700
280	380	100	2.1	309	—	1 180 000	2 230 000	1 300	1 700
	420	106	4	—	384	1 330 000	2 080 000	1 300	1 500
300	420	118	3	336	—	1 510 000	2 870 000	1 200	1 500
	460	118	4	—	418	1 590 000	2 460 000	1 200	1 400
320	440	118	3	356	—	1 560 000	3 050 000	1 100	1 400
	480	121	4	—	438	1 660 000	2 670 000	1 100	1 300
340	520	133	5	—	473	2 050 000	3 300 000	1 000	1 200
360	540	134	5	—	493	2 090 000	3 450 000	950	1 200

Note (1) Suffix KR represents bearings with tapered bores (taper 1 : 12).
Remark Double-row cylindrical roller bearings are generally produced in high precision classes (Class 5 or better).

Bearing Designations		Abutment and Fillet Dimensions (mm)							Mass (kg)
Cylindrical Bore	Tapered Bore(1)	d_a(2) min.	d_a(2) max.	d_{1a} min.	d_c min.	D_a max.	D_a min.	r_a max.	approx.
NNU 4930	**NNU 4930 KR**	159	166	162	171	201	—	2	6.39
NN 3030	**NN 3030 KR**	161	—	162	—	214	209	2	7.77
NNU 4932	**NNU 4932 KR**	169	176	172	182	211	—	2	6.76
NN 3032	**NN 3032 KR**	171	—	172	—	229	222	2	9.41
NNU 4934	**NNU 4934 KR**	179	186	182	192	221	—	2	7.12
NN 3034	**NN 3034 KR**	181	—	183	—	249	239	2	12.8
NNU 4936	**NNU 4936 KR**	189	199	193	205	241	—	2	10.4
NN 3036	**NN 3036 KR**	191	—	193	—	269	258	2	16.8
NNU 4938	**NNU 4938 KR**	199	211	203	217	251	—	2	10.9
NN 3038	**NN 3038 KR**	201	—	203	—	279	268	2	17.8
NNU 4940	**NNU 4940 KR**	211	222	214	228	269	—	2	15.3
NN 3040	**NN 3040 KR**	211	—	214	—	299	285	2	22.7
NNU 4944	**NNU 4944 KR**	231	242	234	248	289	—	2	16.6
NN 3044	**NN 3044 KR**	233	—	236	—	327	313	2.5	29.6
NNU 4948	**NNU 4948 KR**	251	262	254	269	309	—	2	18
NN 3048	**NN 3048 KR**	253	—	256	—	347	334	2.5	32.7
NNU 4952	**NNU 4952 KR**	271	288	275	295	349	—	2	31.1
NN 3052	**NN 3052 KR**	276	—	278	—	384	368	3	47.7
NNU 4956	**NNU 4956 KR**	291	308	295	315	369	—	2	33
NN 3056	**NN 3056 KR**	296	—	298	—	404	388	3	51.1
NNU 4960	**NNU 4960 KR**	313	335	318	343	407	—	2.5	51.9
NN 3060	**NN 3060 KR**	316	—	319	—	444	422	3	70.7
NNU 4964	**NNU 4964 KR**	333	355	338	363	427	—	2.5	54.9
NN 3064	**NN 3064 KR**	336	—	340	—	464	442	3	76.6
NN 3068	**NN 3068 KR**	360	—	365	—	500	477	4	102
NN 3072	**NN 3072 KR**	380	—	385	—	520	497	4	106

Note (2) d_a (max.) refers to values for adjusting rings for NNU bearings.

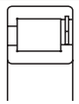
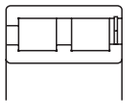
FULL COMPLEMENT SINGLE-ROW (NCF) / DOUBLE-ROW (NNCF) CYLINDRICAL ROLLER BEARINGS

Design, Types, and Features

Cageless, full complement cylindrical roller bearings have the maximum possible number of rollers and can sustain much heavier loads than cylindrical roller bearings of the same size with cages. On the other hand, high-speed capability is inferior to the bearings with cages.

Open single- and double-row bearings are mostly used in general industrial applications at low speed and under heavy load, while shielded double-row bearings are often used in crane sheaves.

Table 1 Features of Full Complement Cylindrical Roller Bearings

Appearance	Type	Design and Features
	NCF	The outer and inner rings and rollers are inseparable since a retaining snap ring is installed at the side opposite the outer ring rib. It can sustain axial loads in only one direction.
	NNCF	NNCF is a double-row version of NCF. It can sustain heavy radial loads.

Tolerances and Running Accuracy ..... Table 7.2 (Pages A128 to A131)

Single-Row
Double-Row

Recommended Fits

Single-Row
Double-Row

Inner Ring Rotation ..... Table 8.3 (Page A164)
Table 8.5 (Page A165)
Outer Ring Rotation ..... Table 2 below

Table 2 Fits and Internal Clearances for Full Complement Cylindrical Roller Bearings

Operating Conditions		Fitting Between Inner Ring and Shaft	Fitting Between Outer Ring and Housing Bore	Recommended Internal Clearance
Outer Ring Rotation	Thin-walled housings and heavy loads	g6 or h6	P7	C 3
	Normal to heavy loads	g6 or h6	N7	C 3
	Light or fluctuating loads	g6 or h6	M7	CN

Permissible Misalignment

The permissible misalignment of full complement single-row cylindrical roller bearings is generally 0.0006 radian (2') under normal load.

For double-row bearings, nearly no misalignment is allowed.

FULL COMPLEMENT CYLINDRICAL ROLLER BEARINGS FOR SHEAVES

DESIGN, TYPES, AND FEATURES

Cylindrical roller bearings for sheaves are specially designed thin-walled, broad-width, full complement double-row bearings. They are also widely used in general industrial machines running at low speed and under heavy loads. There are several Series, as shown in Table 1.

Table 1 Series of Cylindrical Roller Bearings for Sheaves

Bearing Type		Fixed-End	Free-End
Open Type	Without Snap Ring	RS-48E4 RS-49E4	RSF-48E4 RSF-49E4
Shielded Type	Without Snap Ring With Snap Ring	RS-50 RS-50NR	—

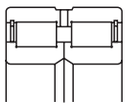
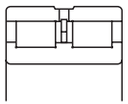
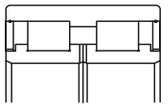
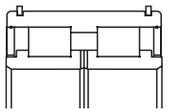
All bearings are inseparable, and the RSF type can be used as a free-end bearing. In this case, please refer to the permissible axial displacement in the bearing tables.

Since these cylindrical roller bearings are double-row and full complement, they can withstand heavy shock loads and moments and have sufficient axial load capacity for use in sheaves.

Shielded bearing units allow for the reduction of the number of parts surrounding the bearing, therefore allowing for a simple, compact design.

The surface of these bearings is treated with a rust preventive.

Table 2 Features of Full Complement Cylindrical Roller Bearings for Sheaves

Diagram	Type	Design and Features
	RS-48E4 RS-49E4	These types feature a double-row outer ring with center rib and two single-row inner rings with ribs. The outer and inner rings and rollers are inseparable since there are two retaining snap rings at the sides of the outer ring. They can sustain an axial load in either direction, so they may be used as fixed-end bearings. An oil groove and holes are located at the center of the outer ring.
	RSF-48E4 RSF-49E4	These types feature a double-row outer ring without ribs and a double-row inner ring with three ribs. The outer and inner rings and rollers are inseparable since there is a retaining snap ring at the middle of the outer ring. They can be used as free-end bearings, and permissible axial movement is listed in the bearing tables. An oil groove and holes are located at the center of the outer ring.
 	RS-50 RS-50NR	These types are shielded on both sides and feature a double-row outer ring with center rib and two inner rings with ribs. They can sustain an axial load in either direction. They are prelubricated, but it is possible to replenish the grease through an oil groove and hole. The RS-50NR type is designated if there are snap rings at the outside of the outer ring. Surfaces are treated with a rust preventive.

TOLERANCES AND RUNNING ACCURACY

····· Table 7.2 (Pages A128 to A131)

RECOMMENDED FITS AND INTERNAL CLEARANCES

When used with outer ring rotation for sheaves or wheels, the fit and radial internal clearance should conform to Table 3.

Table 3 Fits and Internal Clearances for Cylindrical Roller Bearings for Sheaves

Operating Conditions		Fitting Between Inner Ring and Shaft	Fitting Between Outer Ring and Housing Bore	Recommended Internal Clearance
Outer Ring Rotation	Thin-walled housings and heavy loads	g6 or h6	P7	C3
	Normal to heavy loads	g6 or h6	N7	C3
	Light or fluctuating loads	g6 or h6	M7	CN

The fits listed in Tables 8.3 (Page A164) and 8.5 (Page A165) apply when used with inner ring rotation in general applications, and internal clearance should conform to Table 4.

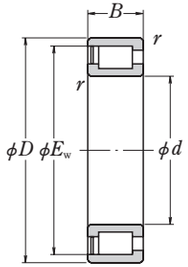
Table 4

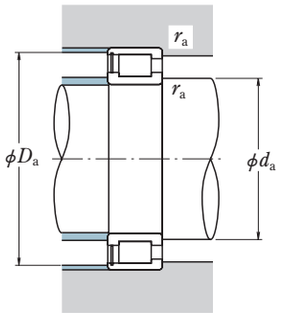
Units : μm

Nominal Bore Dia. d (mm)		Clearances			
		CN		C3	
over	incl.	min.	max.	min.	max.
30	**40**	15	50	35	70
40	**50**	20	55	40	75
50	**65**	20	65	45	90
65	**80**	25	75	55	105
80	**100**	30	80	65	115
100	**120**	35	90	80	135
120	**140**	40	105	90	155
140	**160**	50	115	100	165
160	**180**	60	125	110	175
180	**200**	65	135	125	195
200	**225**	75	150	140	215
225	**250**	90	165	155	230
250	**280**	100	180	175	255
280	**315**	110	195	195	280
315	**355**	125	215	215	305
355	**400**	140	235	245	340
400	**450**	155	275	270	390
450	**500**	180	300	300	420

FULL COMPLEMENT CYLINDRICAL ROLLER BEARINGS

NCF Type, Single-Row
Bore Diameter 100 – 260 mm





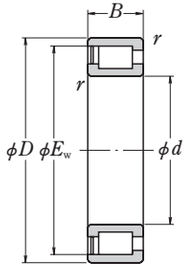
Boundary Dimensions (mm)					Basic Load Ratings (kN)		Bearing Designation
d	D	B	r min.	E_W	C_r	C_{0r}	
100	140	24	1.1	130.5	162	209	**NCF2920V**
	150	37	1.5	139.7	257	310	**NCF3020V**
110	150	24	1.1	141	170	229	**NCF2922V**
	170	45	2	156.3	340	405	**NCF3022V**
120	165	27	1.1	154	217	305	**NCF2924V**
	180	46	2	167.58	360	440	**NCF3024V**
130	180	30	1.5	166.5	258	370	**NCF2926V**
	200	52	2	183.81	520	685	NCF3026V
140	190	30	1.5	179.4	280	395	**NCF2928V**
	210	53	2	197.82	540	680	**NCF3028V**
150	210	36	2	195	355	505	**NCF2930V**
	225	56	2.1	206.82	565	710	**NCF3030V**
160	220	36	2	207	380	535	**NCF2932V**
	240	60	2.1	224.8	640	810	**NCF3032V**
170	215	22	1.5	203.5	184	272	**NCF1834V**
	230	36	2	218	390	570	**NCF2934V**
	260	67	2.1	242.87	835	1 070	**NCF3034V**
180	225	22	1.5	215	190	290	**NCF1836V**
	250	42	2	231.5	480	695	**NCF2936V**
	280	74	2.1	260.3	965	1 260	**NCF3036V**
190	240	24	1.5	228.7	219	335	NCF1838V
	260	42	2	243.6	535	785	**NCF2938V**
	290	75	2.1	269.9	990	1 320	**NCF3038V**
200	250	24	1.5	237	224	350	**NCF1840V**
	280	48	2.1	261	650	955	**NCF2940V**
	310	82	2.1	287.8	1 120	1 510	**NCF3040V**
220	270	24	2	257.7	235	385	**NCF1844V**
	300	48	2.1	282	680	1 050	**NCF2944V**
	340	90	3	312.3	1 350	1 820	**NCF3044V**
240	300	28	2	283	290	470	**NCF1848V**
	320	48	2.1	303	715	1 140	**NCF2948V**
	360	92	3	335.25	1 430	1 990	**NCF3048V**
260	320	28	2	307	305	510	**NCF1852V**
	360	60	2.1	333.2	925	1 460	**NCF2952V**
	400	104	4	376.1	1 930	2 600	**NCF3052V**

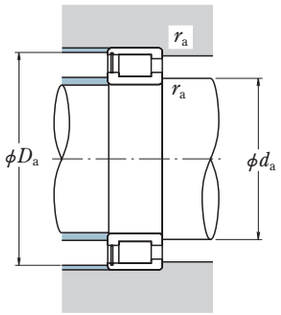
Abutment and Fillet Dimensions (mm)			Mass (kg)
d_a	D_a	r_a max.	approx.
109	131	1	1.0
111	140	1.5	2.1
119	142	1	1.1
122	157	2	3.3
130	155	1	1.7
132	168	2	3.6
141	168	1.5	2.2
142	187	2	5.6
151	180	1.5	2.3
152	198	2	5.9
163	196	2	3.7
165	209	2	7.1
173	208	2	3.8
175	225	2	8.6
182	204	1.5	1.8
183	219	2	4.1
185	244	2	11.9
192	216	1.5	1.8
193	236	2	6.0
195	263	2	15.8
202	229	1.5	2.4
203	245	2	6.5
206	273	2	16.7
213	238	1.5	2.5
216	263	2	8.9
216	293	2	21.4
234	258	2	2.7
236	283	2	9.6
238	320	2.5	28.2
254	285	2	4.2
257	304	2	10.4
259	340	2.5	31.2
275	308	2	4.5
277	342	2	18.1
282	377	3	45.3

Remark Full complement cylindrical roller bearings are designed for specific applications; when using them, please contact NSK.

FULL COMPLEMENT CYLINDRICAL ROLLER BEARINGS

NCF Type, Single-Row
Bore Diameter 300 – 800 mm





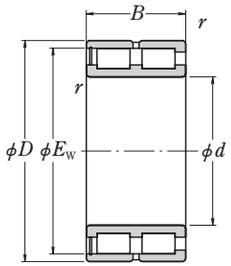
Boundary Dimensions (mm)					Basic Load Ratings (kN)		Bearing Designation
d	D	B	r min.	E_W	C_r	C_{0r}	
300	380	38	2.5	359	550	870	**NCF1860V**
	420	72	3	389.6	1 380	2 200	**NCF2960V**
	460	118	4	431.7	2 440	3 500	**NCF3060V**
320	400	38	2.1	380	565	925	**NCF1864V**
	440	72	3	410	1 420	2 340	**NCF2964V**
	480	121	4	449.6	2 680	3 900	NCF3064V
340	420	38	2.1	401	585	985	**NCF1868V**
	460	72	3	430.3	1 460	2 470	**NCF2968V**
	520	133	5	485.8	3 000	4 400	NCF3068V
360	440	38	2.5	422	605	1 040	**NCF1872V**
	480	72	3	450.7	1 510	2 610	**NCF2972V**
	540	134	5	503.6	3 150	4 600	NCF3072V
380	480	46	2.5	452.8	705	1 230	**NCF1876V**
	520	82	4	486.7	1 970	3 350	**NCF2976V**
	560	135	5	521.4	3 200	4 800	NCF3076V
400	500	46	2.5	475.7	725	1 300	**NCF1880V**
	540	82	4	511	2 030	3 550	**NCF2980V**
	600	148	5	558.7	3 800	5 750	**NCF3080AV**
420	520	46	2.1	491	740	1 340	**NCF1884V**
	560	82	4	523.2	2 060	3 650	**NCF2984V**
	620	150	5	577.7	3 700	5 650	NCF3084V
440	540	46	2.1	514	760	1 410	**NCF1888V**
	600	95	4	562	2 540	4 300	**NCF2988V**
460	580	56	3	552.7	1 130	1 950	**NCF1892V**
	620	95	4	576.5	2 510	4 500	NCF2992V
480	600	56	3	573	1 160	2 040	**NCF1896V**
	650	100	5	615	2 930	5 100	**NCF2996V**
500	620	56	3	593.5	1 180	2 120	**NCF18/500V**
	670	100	5	630.2	2 980	5 250	NCF29/500V
530	650	56	3	624	1 220	2 240	**NCF18/530V**
560	680	56	3	654.7	1 250	2 360	**NCF18/560V**
	820	195	6	770	6 900	11 300	**NCF30/560V**
600	730	60	3	695.5	1 400	2 680	NCF18/600V
	800	118	5	752	3 750	7 300	**NCF29/600V**
630	780	69	4	742	1 810	3 400	**NCF18/630V**
670	820	69	4	780	1 870	3 550	NCF18/670V
710	870	74	4	832.5	2 030	3 900	**NCF18/710V**
750	920	78	5	882.3	2 370	4 600	**NCF18/750V**
800	980	82	5	936	2 600	5 100	**NCF18/800V**

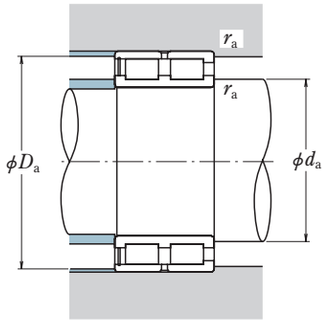
Abutment and Fillet Dimensions (mm)			Mass (kg)
d_a	D_a	r_a max.	approx.
319	360	2	9.7
320	398	2.5	30.7
323	435	3	67.6
338	381	2	10.3
340	418	2.5	33
343	454	3	73
359	402	2	10.7
361	438	2.5	34.1
368	490	4	97
380	423	2	11.5
381	457	2.5	36
388	509	4	102
400	458	2	18.6
404	493	3	52
408	529	4	108
421	478	2	19.5
425	513	3	53.4
429	568	4	139
440	498	2	20.5
445	533	3	55.7
449	588	4	147
461	518	2	21.3
466	572	3	78.2
483	555	2.5	32.5
486	591	3	81.2
503	575	2.5	33.8
510	617	4	95.1
524	594	2.5	35
531	637	4	98.4
554	625	2.5	36.9
585	655	2.5	39.3
598	778	5	332.5
626	702	2.5	48.9
633	764	4	164.9
659	748	3	68.8
700	787	3	72.7
741	836	3	87.6
786	883	4	103.3
832	950	4	123.1

Remark Full complement cylindrical roller bearings are designed for specific applications; when using them, please contact NSK.

FULL COMPLEMENT CYLINDRICAL ROLLER BEARINGS

NNCF Type, Double-Row
Bore Diameter 100 – 260 mm





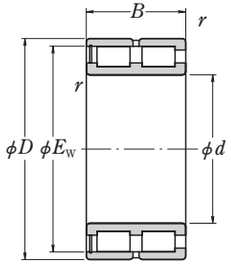
Boundary Dimensions (mm)					Basic Load Ratings (kN)		Bearing Designation
d	D	B	r min.	E_W	C_r	C_{0r}	
100	140	40	1.1	129.8	239	400	NNCF4920V
	150	67	1.5	139.7	440	615	**NNCF5020V**
110	150	40	1.1	138.4	248	430	NNCF4922V
	170	80	2	156.3	605	840	**NNCF5022V**
120	165	45	1.1	153.8	278	480	NNCF4924V
	180	80	2	167.58	615	885	**NNCF5024V**
130	180	50	1.5	165.7	320	555	NNCF4926V
	200	95	2	183.81	875	1 260	NNCF5026V
140	190	50	1.5	176.2	335	595	NNCF4928V
	210	95	2	197.82	920	1 360	**NNCF5028V**
150	210	60	2	191.6	485	865	NNCF4930V
	225	100	2.1	206.82	965	1 420	**NNCF5030V**
160	220	60	2	204.1	500	930	NNCF4932V
	240	109	2.1	224.8	1 100	1 620	**NNCF5032V**
170	230	60	2	212.4	515	975	**NNCF4934V**
	260	122	2.1	242.87	1 430	2 140	**NNCF5034V**
180	250	69	2	230.5	675	1 230	**NNCF4936V**
	280	136	2.1	260.3	1 650	2 510	**NNCF5036V**
190	260	69	2	240.7	695	1 290	**NNCF4938V**
	290	136	2.1	269.9	1 690	2 630	NNCF5038V
200	250	50	1.5	235.9	395	825	NNCF4840V
	280	80	2.1	259.5	820	1 500	NNCF4940V
	310	150	2.1	287.75	1 920	3 000	NNCF5040V
220	270	50	1.5	256.9	415	905	NNCF4844V
	300	80	2.1	277	855	1 620	NNCF4944V
	340	160	3	312.3	2 320	3 650	**NNCF5044V**
240	300	60	2	282.6	605	1 340	NNCF4848V
	320	80	2.1	300	895	1 770	NNCF4948V
	360	160	3	335.25	2 440	4 000	**NNCF5048V**
260	320	60	2	303.6	630	1 450	NNCF4852V
	360	100	2.1	331.5	1 290	2 530	NNCF4952V
	400	190	4	376.1	3 300	5 200	NNCF5052V

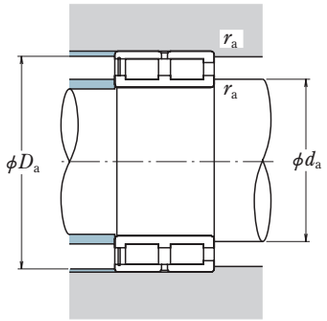
Abutment and Fillet Dimensions (mm)			Mass (kg)
d_a	D_a	r_a max.	approx.
109	130	1	2.0
111	140	1.5	3.8
119	140	1	2.1
122	157	2	6.1
130	155	1	2.9
132	168	2	6.5
141	168	1.5	3.9
142	187	2	10.3
151	178	1.5	4.2
152	198	2	10.8
163	196	2	6.6
165	209	2	13
173	206	2	7.0
175	225	2	15.8
183	216	2	7.3
185	244	2	22.1
193	236	2	10.7
195	263	2	29.4
203	245	2	11.1
206	273	2	30.8
213	237	1.5	5.9
216	263	2	15.7
216	293	2	39.7
233	257	1.5	6.4
236	283	2	17
238	320	2.5	50.7
254	285	2	10.3
257	302	2	18.4
259	340	2.5	54.3
275	304	2	11
277	342	2	32
282	377	3	82.7

Remark Full complement cylindrical roller bearings are designed for specific applications; when using them, please contact NSK.

FULL COMPLEMENT CYLINDRICAL ROLLER BEARINGS

NNCF Type, Double-Row
Bore Diameter 280 – 500 mm





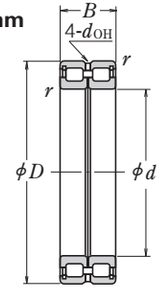
Boundary Dimensions (mm)					Basic Load Ratings (kN)		Bearing Designation
d	D	B	r min.	E_W	C_r	C_{0r}	
280	350	69	2	332.5	840	1 860	NNCF4856V
	380	100	2.1	352.5	1 340	2 720	NNCF4956V
	420	190	4	390.5	3 400	5 450	NNCF5056V
300	380	80	2.1	357.2	990	2 160	NNCF4860V
	420	118	3	386.5	1 870	3 600	NNCF4960V
	460	218	4	431.7	4 200	7 000	NNCF5060V
320	400	80	2.1	380.2	1 030	2 310	NNCF4864V
	440	118	3	404.5	2 000	4 000	NNCF4964V
	480	218	4	446.9	4 300	7 350	NNCF5064V
340	420	80	2.1	397.4	1 050	2 430	NNCF4868V
	460	118	3	431	2 080	4 300	NNCF4968V
	520	243	5	485.8	5 250	8 750	NNCF5068V
360	440	80	2.1	420.4	1 190	2 500	NNCF4872V
	480	118	3	449	2 130	4 500	NNCF4972V
	540	243	5	503.6	5 400	9 150	NNCF5072V
380	480	100	2.1	450.6	1 550	3 600	NNCF4876V
	520	140	4	482.5	2 690	5 650	NNCF4976V
	560	243	5	521.4	5 500	9 600	NNCF5076V
400	500	100	2.1	471.7	1 590	3 750	NNCF4880V
	540	140	4	503	2 760	5 900	NNCF4980V
	600	272	5	558.7	6 200	10 900	NNCF5080V
420	520	100	2.1	492	1 630	3 950	NNCF4884V
	560	140	4	523	2 820	6 200	NNCF4984V
	620	272	5	577.7	6 350	11 300	**NNCF5084V**
440	540	100	2.1	513	1 670	4 150	NNCF4888V
	600	160	4	560.5	3 700	7 850	NNCF4988V
460	580	118	3	549.2	2 130	5 150	NNCF4892V
	620	160	4	573	3 750	8 050	NNCF4992V
480	600	118	3	565.8	2 170	5 300	NNCF4896V
	650	170	5	603	4 100	8 900	NNCF4996V
500	620	118	3	590.7	2 220	5 600	NNCF48/500V
	670	170	5	629	4 200	9 350	NNCF49/500V

Abutment and Fillet Dimensions (mm)			Mass (kg)
d_a	D_a	r_a max.	approx.
295	334	2	16
297	361	2	34
302	395	3	87.7
318	361	2	23
320	398	2.5	52
323	435	3	125
338	381	2	24.3
340	418	2.5	55
343	454	3	131
359	400	2	25.6
361	438	2.5	58
368	490	4	177
379	421	2	27
381	457	2.5	61
388	509	4	186
399	459	2	45.5
404	493	3	90.5
408	529	4	194
420	479	2	47.5
425	513	3	94.5
429	568	4	256
440	498	2	49.5
445	533	3	98.5
449	588	4	267
461	518	2	51.5
466	572	3	136
483	555	2.5	77.5
486	591	3	142
503	575	2.5	80.5
510	617	4	167
524	594	2.5	83.5
531	637	4	173

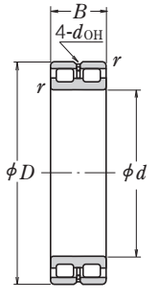
Remark Full complement cylindrical roller bearings are designed for specific applications; when using them, please contact NSK.

FULL COMPLEMENT CYLINDRICAL ROLLER BEARINGS FOR SHEAVES

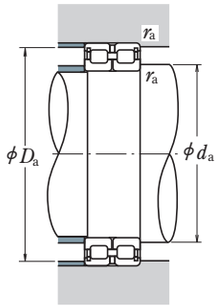
RS-48 · RS-49 Types
RSF-48 · RSF-49 Types
Bore Diameter 50 – 220 mm



Fixed-End Bearing
RS



Free-End Bearing
RSF



Boundary Dimensions (mm)				Basic Load Ratings (N)		Limiting Speeds (min^{-1})	
d	D	B	r min.	C_r	C_{0r}	Grease	Oil
50	72	22	0.6	59 500	75 500	2 000	4 000
60	85	25	1	84 000	118 000	1 600	3 200
65	90	25	1	86 500	125 000	1 600	3 200
70	100	30	1	125 000	168 000	1 400	2 800
80	110	30	1	134 000	191 000	1 300	2 600
90	125	35	1.1	181 000	268 000	1 100	2 200
100	125	25	1	108 000	189 000	1 100	2 200
	140	40	1.1	239 000	400 000	1 000	2 000
105	130	25	1	109 000	196 000	1 000	2 000
	145	40	1.1	245 000	420 000	950	1 900
110	150	40	1.1	248 000	430 000	900	1 800
120	150	30	1	147 000	283 000	900	1 800
	165	45	1.1	278 000	480 000	800	1 600
130	165	35	1.1	199 000	390 000	800	1 600
	180	50	1.5	320 000	555 000	750	1 500
140	175	35	1.1	206 000	415 000	750	1 500
	190	50	1.5	335 000	595 000	710	1 400
150	190	40	1.1	288 000	575 000	670	1 400
	210	60	2	485 000	865 000	670	1 300
160	200	40	1.1	299 000	615 000	630	1 300
	220	60	2	500 000	930 000	600	1 200
170	215	45	1.1	325 000	650 000	600	1 200
	230	60	2	515 000	975 000	600	1 200
180	225	45	1.1	335 000	685 000	560	1 100
	250	69	2	610 000	1 130 000	530	1 100
190	240	50	1.5	385 000	785 000	530	1 100
	260	69	2	625 000	1 180 000	500	1 000
200	250	50	1.5	395 000	825 000	500	1 000
	280	80	2.1	820 000	1 500 000	480	950
220	270	50	1.5	415 000	905 000	450	900
	300	80	2.1	855 000	1 620 000	430	850

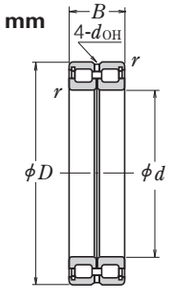
Bearing Designations[1]		Dimensions (mm)		Abutment and Fillet Dimensions (mm)			Mass (kg)
Fixed-End Bearing	Free-End Bearing	d_{OH}[2]	Axial Disp.[3]	d_a min.	D_a max.	r_a max.	approx.
RS-4910E4	**RSF-4910E4**	2.5	1.5	54	68	0.6	0.30
RS-4912E4	**RSF-4912E4**	2.5	1.5	65	80	1	0.46
RS-4913E4	**RSF-4913E4**	2.5	2	70	85	1	0.50
RS-4914E4	**RSF-4914E4**	3	2	75	95	1	0.79
RS-4916E4	**RSF-4916E4**	3	2	85	105	1	0.89
RS-4918E4	**RSF-4918E4**	3	2	96.5	118.5	1	1.35
RS-4820E4	**RSF-4820E4**	2.5	1.5	105	120	1	0.74
RS-4920E4	**RSF-4920E4**	3	2	106.5	133.5	1	1.97
RS-4821E4	**RSF-4821E4**	2.5	1.5	110	125	1	0.77
RS-4921E4	**RSF-4921E4**	3	2	111.5	138.5	1	2.05
RS-4922E4	**RSF-4922E4**	3	2	116.5	143.5	1	2.15
RS-4824E4	**RSF-4824E4**	3	2	125	145	1	1.28
RS-4924E4	**RSF-4924E4**	4	3	126.5	158.5	1	2.95
RS-4826E4	**RSF-4826E4**	3	2	136.5	158.5	1	1.9
RS-4926E4	**RSF-4926E4**	5	3.5	138	172	1.5	3.95
RS-4828E4	**RSF-4828E4**	3	2	146.5	168.5	1	2.03
RS-4928E4	**RSF-4928E4**	5	3.5	148	182	1.5	4.25
RS-4830E4	**RSF-4830E4**	3	2	156.5	183.5	1	2.85
RS-4930E4	**RSF-4930E4**	5	3.5	159	201	2	6.65
RS-4832E4	**RSF-4832E4**	3	2	166.5	193.5	1	3.05
RS-4932E4	**RSF-4932E4**	5	3.5	169	211	2	7.0
RS-4834E4	**RSF-4834E4**	4	3	176.5	208.5	1	4.1
RS-4934E4	**RSF-4934E4**	4	3.5	179	221	2	7.35
RS-4836E4	**RSF-4836E4**	4	3	186.5	218.5	1	4.3
RS-4936E4	**RSF-4936E4**	6	4.5	189	241	2	10.7
RS-4838E4	**RSF-4838E4**	5	3.5	198	232	1.5	5.65
RS-4938E4	**RSF-4938E4**	6	4.5	199	251	2	11.1
RS-4840E4	**RSF-4840E4**	5	3.5	208	242	1.5	5.95
RS-4940E4	**RSF-4940E4**	7	5	211	269	2	15.7
RS-4844E4	**RSF-4844E4**	5	3.5	228	262	1.5	6.45
RS-4944E4	**RSF-4944E4**	7	5	231	289	2	17

Remark Cylindrical roller bearings for sheaves are designed for specific applications; when using them, please contact NSK.

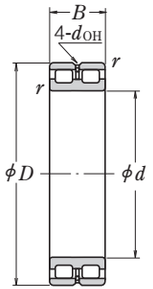
Notes (1) Suffix E4 indicates that the outer ring contains oil holes and an oil groove.
(2) d_{OH} represents the oil hole diameter in the outer ring.
(3) Axial Disp. refers to permissible axial displacement for free-end bearings.

FULL COMPLEMENT CYLINDRICAL ROLLER BEARINGS FOR SHEAVES

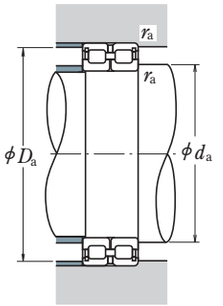
RS-48 · RS-49 Types
RSF-48 · RSF-49 Types
Bore Diameter 240 – 530 mm



Fixed-End Bearing
RS



Free-End Bearing
RSF



Boundary Dimensions (mm)				Basic Load Ratings (N)		Limiting Speeds (min^{-1})	
d	D	B	r min.	C_r	C_{0r}	Grease	Oil
240	300	60	2	605 000	1 340 000	430	850
	320	80	2.1	895 000	1 770 000	400	800
260	320	60	2	630 000	1 450 000	380	750
	360	100	2.1	1 290 000	2 530 000	360	710
280	350	69	2	755 000	1 690 000	340	710
	380	100	2.1	1 340 000	2 720 000	340	670
300	380	80	2.1	990 000	2 160 000	320	630
	420	118	3	1 800 000	3 400 000	300	600
320	400	80	2.1	1 030 000	2 310 000	300	600
	440	118	3	1 850 000	3 600 000	280	560
340	420	80	2.1	1 050 000	2 430 000	280	560
	460	118	3	1 920 000	3 900 000	260	530
360	440	80	2.1	1 090 000	2 580 000	260	530
	480	118	3	1 970 000	4 050 000	260	500
380	480	100	2.1	1 550 000	3 600 000	240	500
	520	140	4	2 520 000	5 200 000	240	450
400	500	100	2.1	1 590 000	3 750 000	240	480
	540	140	4	2 580 000	5 450 000	220	450
420	520	100	2.1	1 630 000	3 950 000	220	450
	560	140	4	2 640 000	5 700 000	200	430
440	540	100	2.1	1 670 000	4 150 000	200	430
	600	160	4	3 500 000	7 350 000	190	380
460	580	118	3	2 130 000	5 150 000	190	380
	620	160	4	3 550 000	7 500 000	190	380
480	600	118	3	2 170 000	5 300 000	190	380
	650	170	5	3 950 000	8 500 000	180	360
500	620	118	3	2 220 000	5 600 000	180	360
	670	170	5	4 050 000	8 900 000	170	340
530	710	180	5	4 200 000	9 200 000	160	320

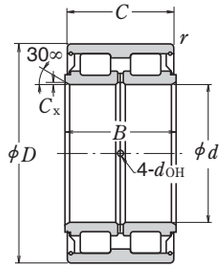
Remark Cylindrical roller bearings for sheaves are designed for specific applications; when using them, please contact NSK.

Bearing Designations[1]		Dimensions (mm)		Abutment and Fillet Dimensions (mm)			Mass (kg)
Fixed-End Bearing	Free-End Bearing	d_{OH}[2]	Axial Disp.[3]	d_a min.	D_a max.	r_a max.	approx.
RS-4848E4	**RSF-4848E4**	5	3.5	249	291	2	10.3
RS-4948E4	**RSF-4948E4**	7	5	251	309	2	18.4
RS-4852E4	**RSF-4852E4**	5	3.5	269	311	2	11
RS-4952E4	**RSF-4952E4**	8	6	271	349	2	32
RS-4856E4	**RSF-4856E4**	6	4.5	289	341	2	16
RS-4956E4	**RSF-4956E4**	8	6	291	369	2	34
RS-4860E4	**RSF-4860E4**	6	5	311	369	2	23
RS-4960E4	**RSF-4960E4**	9	7	313	407	2.5	52
RS-4864E4	**RSF-4864E4**	6	5	331	389	2	24.3
RS-4964E4	**RSF-4964E4**	9	7	333	427	2.5	55
RS-4868E4	**RSF-4868E4**	6	5	351	409	2	25.6
RS-4968E4	**RSF-4968E4**	9	7	353	447	2.5	58
RS-4872E4	**RSF-4872E4**	6	5	371	429	2	27
RS-4972E4	**RSF-4972E4**	9	7	373	467	2.5	61
RS-4876E4	**RSF-4876E4**	8	6	391	469	2	45.5
RS-4976E4	**RSF-4976E4**	11	8	396	504	3	90.5
RS-4880E4	**RSF-4880E4**	8	6	411	489	2	47.5
RS-4980E4	**RSF-4980E4**	11	8	416	524	3	94.5
RS-4884E4	**RSF-4884E4**	8	6	431	509	2	49.5
RS-4984E4	**RSF-4984E4**	11	8	436	544	3	98.5
RS-4888E4	**RSF-4888E4**	8	6	451	529	2	51.5
RS-4988E4	**RSF-4988E4**	11	8	456	584	3	136
RS-4892E4	**RSF-4892E4**	9	7	473	567	2.5	77.5
RS-4992E4	**RSF-4992E4**	11	8	476	604	3	142
RS-4896E4	**RSF-4896E4**	9	7	493	587	2.5	80.5
RS-4996E4	**RSF-4996E4**	12	9	500	630	4	167
RS-48/500E4	**RSF-48/500E4**	9	7	513	607	2.5	83.5
RS-49/500E4	**RSF-49/500E4**	12	9	520	650	4	173
RS-49/530E4	**RSF-49/530E4**	12	11	550	690	4	206

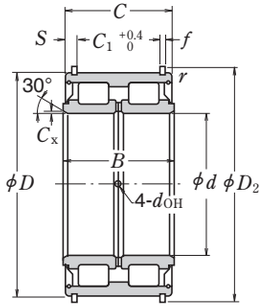
Notes (1) Suffix E4 indicates that the outer ring contains oil holes and an oil groove.
(2) d_{OH} represents the oil hole diameter in the outer ring.
(3) Axial Disp. refers to permissible axial displacement for free-end bearings.

FULL COMPLEMENT CYLINDRICAL ROLLER BEARINGS FOR SHEAVES

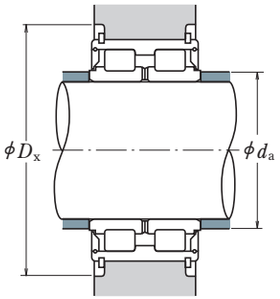
RS-50 Type (Prelubricated)
Bore Diameter 40 – 400 mm



Without Locating Ring



With Locating Ring



Boundary Dimensions (mm)						Basic Load Ratings (N)		Limiting Speeds (min^{-1})
d	D	B	C	C_x (1) min.	r min.	C_r	C_{0r}	Grease
40	68	38	37	0.4	0.6	98 000	116 000	2 400
45	75	40	39	0.4	0.6	117 000	144 000	2 200
50	80	40	39	0.4	0.6	123 000	158 000	2 000
55	90	46	45	0.6	0.6	145 000	193 000	1 800
60	95	46	45	0.6	0.6	152 000	208 000	1 700
65	100	46	45	0.6	0.6	158 000	224 000	1 600
70	110	54	53	0.6	0.6	211 000	285 000	1 400
75	115	54	53	0.6	0.6	220 000	305 000	1 400
80	125	60	59	0.6	0.6	310 000	430 000	1 200
85	130	60	59	0.6	0.6	315 000	445 000	1 200
90	140	67	66	1	0.6	375 000	540 000	1 100
95	145	67	66	1	0.6	385 000	565 000	1 100
100	150	67	66	1	0.6	390 000	585 000	1 000
110	170	80	79	1.1	1	470 000	695 000	900
120	180	80	79	1.1	1	490 000	750 000	850
130	200	95	94	1.1	1	660 000	1 000 000	750
140	210	95	94	1.1	1	675 000	1 040 000	710
150	225	100	99	1.3	1	765 000	1 210 000	670
160	240	109	108	1.3	1.1	855 000	1 370 000	630
170	260	122	121	1.3	1.1	1 060 000	1 680 000	600
180	280	136	135	1.3	1.1	1 200 000	1 910 000	530
190	290	136	135	1.3	1.1	1 370 000	2 230 000	500
200	310	150	149	1.3	1.1	1 610 000	2 650 000	480
220	340	160	159	1.5	1.1	1 860 000	3 100 000	430
240	360	160	159	1.5	1.1	1 940 000	3 350 000	400
260	400	190	189	2	1.5	2 620 000	4 500 000	360
280	420	190	189	2	1.5	2 670 000	4 700 000	340
300	460	218	216	2	1.5	3 300 000	5 850 000	300
320	480	218	216	2	1.5	3 350 000	6 100 000	300
340	520	243	241	2.1	2	4 150 000	7 550 000	260
360	540	243	241	2.1	2	4 200 000	7 850 000	260
380	560	243	241	2.1	2	4 400 000	8 400 000	240
400	600	272	270	2.1	2	5 250 000	9 950 000	220

Bearing Designations		Locating Ring Dimensions (mm)				Oil Holes (mm)	Abutment and Fillet Dimensions (mm)		Mass (kg)
Without Locating Ring	With Locating Ring	C_1	S	D_2	f	d_{OH}	d_a min.	D_x min.	approx.
RS-5008	**RS-5008NR**	28	4.5	71.8	2	2.5	43.5	77.5	0.56
RS-5009	**RS-5009NR**	30	4.5	78.8	2	2.5	48.5	84.5	0.70
RS-5010	**RS-5010NR**	30	4.5	83.8	2	2.5	53.5	89.5	0.76
RS-5011	**RS-5011NR**	34	5.5	94.8	2.5	3	60	101	1.17
RS-5012	**RS-5012NR**	34	5.5	99.8	2.5	3	65	106	1.25
RS-5013	**RS-5013NR**	34	5.5	104.8	2.5	3	70	111	1.32
RS-5014	**RS-5014NR**	42	5.5	114.5	2.5	3	75	121	1.87
RS-5015	**RS-5015NR**	42	5.5	119.5	2.5	3	80	126	2.0
RS-5016	**RS-5016NR**	48	5.5	129.5	2.5	3	85	136	2.65
RS-5017	**RS-5017NR**	48	5.5	134.5	2.5	3	90	141	2.75
RS-5018	**RS-5018NR**	54	6	145.4	2.5	4	96	153.5	3.75
RS-5019	**RS-5019NR**	54	6	150.4	2.5	4	101	158.5	3.95
RS-5020	**RS-5020NR**	54	6	155.4	2.5	4	106	163.5	4.05
RS-5022	**RS-5022NR**	65	7	175.4	2.5	5	116.5	183.5	6.1
RS-5024	**RS-5024NR**	65	7	188	3	5	126.5	197	7.0
RS-5026	**RS-5026NR**	77	8.5	207	3	5	136.5	217	10.6
RS-5028	**RS-5028NR**	77	8.5	217	3	5	146.5	227	11.3
RS-5030	**RS-5030NR**	81	9	232	3	6	157	242	13.7
RS-5032	**RS-5032NR**	89	9.5	247	3	6	167	257	16.8
RS-5034	**RS-5034NR**	99	11	270	4	6	177	285	22.2
RS-5036	**RS-5036NR**	110	12.5	294	5	6	187	318	30
RS-5038	**RS-5038NR**	110	12.5	304	5	6	197	328	32
RS-5040	**RS-5040NR**	120	14.5	324	5	6	207	352	41
RS-5044	**RS-5044NR**	130	14.5	356	6	7	228.5	382	53
RS-5048	**RS-5048NR**	130	14.5	376	6	7	248.5	402	57
RS-5052	**RS-5052NR**	154	17.5	416	7	8	270	444	86
RS-5056	**RS-5056NR**	154	17.5	436	7	8	290	472	92
RS-5060	**RS-5060NR**	178	19	476	7	8	310	512	130
RS-5064	—	—	—	—	—	8	330	—	135
RS-5068	—	—	—	—	—	10	352	—	185
RS-5072	—	—	—	—	—	10	372	—	192
RS-5076	—	—	—	—	—	10	392	—	196
RS-5080	—	—	—	—	—	10	412	—	280

Note (1) These values represent chamfer dimensions of the inner ring in the radial direction.

Remarks 1. Quality grease is prepacked in the bearings.
2. Grease can be supplied through oil holes in the inner rings.

Remarks 3. Cylindrical roller bearings for sheaves are designed for specific applications; when using them, please contact NSK.
4. For shields with outside diameters larger than 180 mm, the above figure is different from the actual shape. For detailed drawings, please contact NSK.



6. TAPERED ROLLER BEARINGS

INTRODUCTION ..... C 182

TECHNICAL DATA

Free Space of Tapered Roller Bearings ..... C 188

BEARING TABLES

METRIC SERIES TAPERED ROLLER BEARINGS

Bore Diameter 15 – 100 mm ..... C 190
Bore Diameter 105 – 240 mm ..... C 202
Bore Diameter 260 – 440 mm ..... C 208

INCH SERIES TAPERED ROLLER BEARINGS

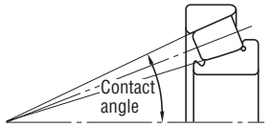
Bore Diameter 12.000 – 47.625 mm ..... C 210
Bore Diameter 48.412 – 69.850 mm ..... C 224
Bore Diameter 70.000 – 206.375 mm ..... C 232

Appendix 14 (Page E020) contains the index for inch series tapered roller bearings.

DOUBLE-ROW TAPERED ROLLER BEARINGS

Bore Diameter 40 – 260 mm ..... C 246

DESIGN, TYPES, AND FEATURES

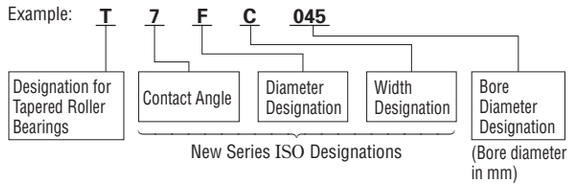


Tapered roller bearings are designed so the apices of the cones formed by the raceways of the inner and outer rings and the inner ring rollers all coincide at one point on the axis of the bearing. When a radial load is imposed, a component axial force occurs; therefore, it is necessary to use two bearings in opposition or some other multiple-bearing arrangement.

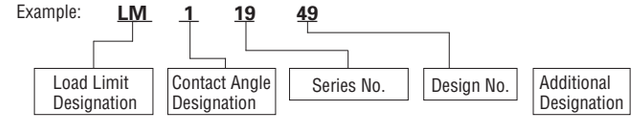
For Metric Series medium-angle or steep-angle tapered roller bearings, the respective contact angle designation C or D is added after the bore number. For normal-angle tapered roller bearings, no contact angle designation is used. Medium-angle tapered roller bearings are primarily used for the pinion shafts of differential gears in automobiles.

Some bearings with high load capacity (HR Series) contain a J suffix that indicates they conform to ISO specifications for outer ring back face raceway diameter, outer ring width, and contact angle. Therefore, the inner ring assembly and outer ring of bearings with a J suffix are internationally interchangeable.

Some Metric Series tapered roller bearings specified by ISO 355 have different dimensions from past Series 3XX bearings. Some of these are listed in the bearing tables. These conform to ISO specifications for the small-end diameter of the inner ring and contact angle. The inner and outer ring assemblies are internationally interchangeable. The bearing designation structure, which has changed from the past, is listed below:



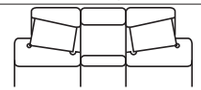
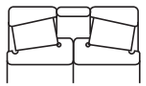
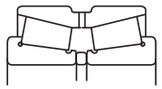
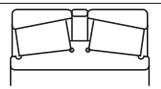
Inch Series bearings also exist. Inner ring assemblies and outer rings are approximately formulated as follows (excluding four-row tapered roller bearings):



Various arrangements of tapered roller bearings (excluding single-row bearings) are available.

The cages of tapered roller bearings are usually made of pressed steel.

Table 1 Design and Features of Tapered Roller Bearing Arrangements

Design	Arrangement	Ex. Bearing Designation	Features
	Back-to-back	HR30210JDB+KLR10	Two standard bearings are combined. The bearing clearances are adjusted by inner ring spacers or outer ring spacers. The inner rings, outer rings, and spacers are marked with serial numbers and mating marks. Components with the same serial number can be assembled by referring to the matching indications.
	Face-to-face	HR30210JDF+KR	
	KBE Type	100KBE31+L	The KBE type is a back-to-back arrangement of bearings with an integrated outer ring spacer. The KH type is a face-to-face arrangement in which the inner rings are integrated. Since the bearing clearance is adjusted using spacers, components must have the same serial number for assembly with reference to the matching indications.
	KH Type	110KH31+K	

TOLERANCES AND RUNNING ACCURACY

METRIC SERIES TAPERED ROLLER BEARINGS ..... Table 7.3 (Pages A132 to A135)
INCH SERIES TAPERED ROLLER BEARINGS ..... Table 7.4 (Pages A136 and A137)

The following precision classes apply to some Inch Series tapered roller bearings. For more details, please consult with NSK.

(1) J line bearings (bearings preceeded by ▲ in the bearing tables)

Table 2 Tolerances for Inner Rings (CLASS K)

Units : μm

Nominal Bore Diameter d (mm)		Δ_{dmp}		V_{dp}	V_{dmp}	K_{ia}
over	incl.	high	low	max.	max.	max.
10	18	0	−12	12	9	15
18	30	0	−12	12	9	18
30	50	0	−12	12	9	20
50	80	0	−15	15	11	25
80	120	0	−20	20	15	30
120	180	0	−25	25	19	35
180	250	0	−30	30	23	50
250	315	0	−35	35	26	60
315	400	0	−40	40	30	70

Table 3 Tolerances for Outer Rings (CLASS K)

Units : μm

Nominal Outside Diameter D (mm)		Δ_{Dmp}		V_{Dp}	V_{Dmp}	K_{ea}
over	incl.	high	low	max.	max.	max.
18	30	0	−12	12	9	18
30	50	0	−14	14	11	20
50	80	0	−16	16	12	25
80	120	0	−18	18	14	35
120	150	0	−20	20	15	40
150	180	0	−25	25	19	45
180	250	0	−30	30	23	50
250	315	0	−35	35	26	60
315	400	0	−40	40	30	70
400	500	0	−45	45	34	80

Table 4 Deviations of Actual Bearing Width and Actual Effective Widths of Inner Subunit and Outer Ring (CLASS K)

Units : μm

Nominal Bore Diameter d (mm)		Deviation of Actual Effective Width of Inner Subunit Δ_{T1s}		Deviation of Actual Effective Width of Outer Ring Δ_{T2s}		Deviation of Actual Bearing Width Δ_{Ts}	
over	incl.	high	low	high	low	high	low
10	80	+100	0	+100	0	+200	0
80	120	+100	−100	+100	−100	+200	−200
120	315	+150	−150	+200	−100	+350	−250
315	400	+200	−200	+200	−200	+400	−400

(2) Bearings for Front Axles of Automobiles

(In the bearing tables, these are preceded by "T")

Table 5 Tolerances for Deviations of a Single Bore Diameter and Actual Bearing Width

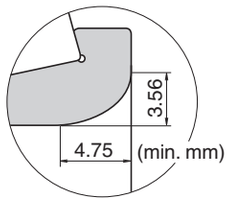
Units : μm

Nominal Bore Diameter d				Deviation of a Single Bore Diameter Δ_{ds}		Deviation of Actual Bearing Width Δ_{Ts}	
over		incl.					
(mm)	1/25.4	(mm)	1/25.4	high	low	high	low
—		76.200	3.0000	+20	0	+356	0

The tolerances for outside diameter and those for radial runout of the inner rings and outer rings conform to Table 7.4.2 (Pages A136 and A137).

(3) Special Chamfer Dimensions

For bearings marked “spec.” in the r column of the bearing tables have inner ring back-face side dimensions as shown in the following figure:



RECOMMENDED FITS

METRIC SERIES TAPERED ROLLER BEARINGS ..... Table 8.3 (Page A164)
Table 8.5 (Page A165)

INCH SERIES TAPERED ROLLER BEARINGS ..... Table 8.7 (Page A166)
Table 8.8 (Page A167)

INTERNAL CLEARANCE

METRIC SERIES TAPERED ROLLER BEARINGS (Matched and Double-Row) ..... Table 8.17 (Page A173)

INCH SERIES TAPERED ROLLER BEARINGS (Matched and Double-Row) ..... Table 8.17 (Page A173)

DIMENSIONS RELATED TO MOUNTING

The dimensions related to mounting tapered roller bearings are listed in the bearing tables. Since the cages protrude from the ring faces of tapered roller bearings, please use care when designing shafts and housings.

When heavy axial loads are imposed, the shaft shoulder dimensions and strength must be sufficient to support the inner ring rib.

PERMISSIBLE MISALIGNMENT

The permissible misalignment angle for tapered roller bearings is approximately 0.0009 radian (3′).

LIMITING SPEEDS (GREASE/OIL)

The limiting speeds (grease) and limiting speeds (oil) listed in the bearing tables should be adjusted depending on bearing load conditions. Furthermore, higher speeds are attainable by making changes in the lubrication method, cage design, etc. Refer to page A098 for more detailed information.

PRECAUTIONS FOR USE OF TAPERED ROLLER BEARINGS

1. If the load on tapered roller bearings becomes too small, or if the ratio of the axial and radial loads for matched bearings during operation exceeds 'e' as listed in the bearing tables, slippage between the rollers and raceways occurs, which may result in smearing. This is especially prevalent with large bearings since the weight of the rollers and cage is high. If such load conditions are expected, please contact NSK for selection of the bearings.

2. Confirm the dimensions of D_a, D_b, S_a, and S_b when adopting HR Series bearings.

TECHNICAL DATA

Free Space of Tapered Roller Bearings

Tapered roller bearings can carry radial loads and unidirectional axial loads and offer high capacity. These bearings are used widely in machines with relatively severe loading conditions, usually in various combinations of opposed or combined single-row bearings.

Tapered roller bearings are usually lubricated with grease to facilitate easier maintenance and inspection. Be sure to select a grease appropriate for operating conditions and use the proper amount of grease in the housing space. The necessary free space for various bearing Series are listed in Table 6.

The free space of a tapered roller bearing is measured as the outer volume of the bearing less the inner ring, outer ring, and cage, as shown in Figure 1. The bearing is filled so that grease reaches the inner ring rib surface and pocket surface sufficiently. Take care regarding the fill amount and state of the grease, especially if grease leakage occurs or if maintaining low running torque is important.

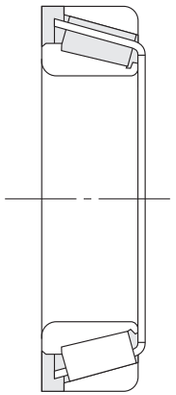


Fig. 1 Free Space in a Tapered Roller Bearing

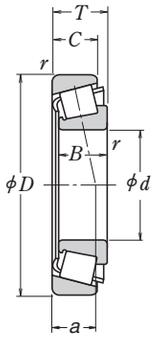
Table 6 Free Space of Tapered Roller Bearings

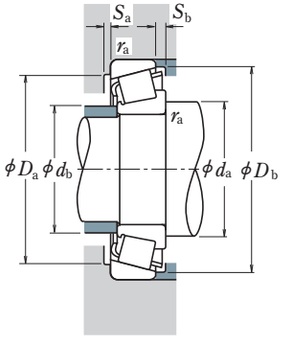
Units: cm^3

Bearing Bore No.	Bearing Free Space									
	Bearing Series									
	HR329-J	HR320-XJ	HR330-J	HR331-J	HR302-J	HR322-J	HR332-J	HR303-J	HR303-DJ	HR323-J
02	—	—	—	—	—	—	—	4.5	—	—
03	—	—	—	—	3.3	4.3	—	5.7	—	—
04	—	3.5	—	—	5.3	6.6	—	7.2	—	9.2
/22	—	3.6	—	—	—	7.3	—	9.1	—	—
05	—	3.7	4.3	—	6.3	7.4	7.5	11	13	15
/28	—	5.3	—	—	8.8	9.8	10	16	—	—
06	—	6.2	6.7	—	9.2	11	12	18	21	23
/32	—	6.6	—	—	11	13	14	20	—	—
07	4.0	7.5	8.9	—	13	17	18	23	26	35
08	5.8	9.1	11	—	18	23	25	31	35	45
09	—	11	—	18	22	24	26	41	48	58
10	—	12	15	20	23	26	29	55	59	77
11	8.8	19	21	29	30	36	40	72	78	99
12	9.0	20	23	—	39	47	53	88	95	130
13	—	21	25	—	45	62	65	110	120	150
14	17	29	33	—	53	67	69	130	150	190
15	—	30	34	—	58	73	74	160	180	230
16	—	40	—	—	75	91	100	200	200	270
17	—	43	49	76	92	120	130	230	250	320
18	28	58	—	110	110	150	—	260	310	370
19	29	60	—	—	140	170	—	310	350	430
20	37	64	—	150	160	210	240	380	460	580

SINGLE-ROW TAPERED ROLLER BEARINGS

Bore Diameter 15 – 28 mm





Dynamic Equivalent Load

$P = XF_r + YF_a$

$F_a/F_r \leqq e$		$F_a/F_r > e$	
X	Y	X	Y
1	0	0.4	Y_1

Static Equivalent Load

$P_0 = 0.5F_r + Y_0F_a$

When $F_r > 0.5F_r + Y_0F_a$, use $P_0 = F_r$

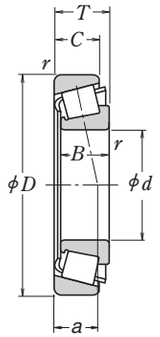
The values of e, Y_1, and Y_0 are given in the table below.

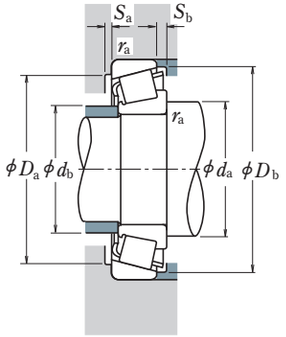
Boundary Dimensions (mm)						Basic Load Ratings (N)		Limiting Speeds (min^{-1})		Bearing Designation	ISO355 Dimension Series	Abutment and Fillet Dimensions (mm)								Eff. Load Center (mm)	Constant	Axial Load Factors		Mass (kg)
					Ring: Inner Outer													Ring: Inner Outer						
d	D	T	B	C	r min.	C_r	C_{0r}	Grease	Oil		approx.	d_a min.	d_b max.	D_a max.	D_a min.	D_b min.	S_a min.	S_b min.	r_a max.	a	e	Y_1	Y_0	approx.
15	35	11.75	11	10	0.6 0.6	18 200	13 200	11 000	15 000	**30202**	—	23	19	30	30	33	2	1.5	0.6 0.6	8.2	0.32	1.9	1.0	0.053
	42	14.25	13	11	1 1	29 000	21 100	9 500	13 000	**HR 30302 J**	2FB	24	22	36	36	38.5	2	3	1 1	9.5	0.29	2.1	1.2	0.098
17	40	13.25	12	11	1 1	24 800	19 900	9 500	13 000	**HR 30203 J**	2DB	26	23	34	34	37.5	2	2	1 1	9.7	0.35	1.7	0.96	0.079
	40	17.25	16	14	1 1	33 500	28 000	9 500	13 000	**HR 32203 J**	2DD	26	22	34	34	37	2	3	1 1	11.2	0.31	1.9	1.1	0.103
	47	15.25	14	12	1 1	36 000	26 700	8 500	12 000	**HR 30303 J**	2FB	26	24	41	40	43	2	3	1 1	10.4	0.29	2.1	1.2	0.134
	47	15.25	14	10.5	1 1	27 000	20 300	8 000	11 000	**30303 D**	—	29	23	41	34	44	2	4.5	1 1	15.4	0.81	0.74	0.41	0.129
	47	20.25	19	16	1 1	46 000	36 500	8 500	11 000	**HR 32303 J**	2FD	28	23	41	39	43	2	4	1 1	12.5	0.29	2.1	1.2	0.178
20	42	15	15	12	0.6 0.6	30 500	27 400	9 000	12 000	**HR 32004 XJ**	3CC	28	24	37	35	40	3	3	0.6 0.6	10.6	0.37	1.6	0.88	0.097
	47	15.25	14	12	1 1	34 500	28 500	8 000	11 000	**HR 30204 J**	2DB	29	27	41	40	44	2	3	1 1	11.0	0.35	1.7	0.96	0.127
	47	15.25	14	12	0.3 1	29 400	24 000	8 000	11 000	**HR 30204 C-A-**	—	29	26	41	37	44	2	3	0.3 1	13.0	0.55	1.1	0.60	0.126
	47	19.25	18	15	1 1	44 000	37 500	8 500	11 000	**HR 32204 J**	2DD	29	25	41	38	44.5	3	4	1 1	12.6	0.33	1.8	1.0	0.161
	47	19.25	18	15	1 1	38 500	33 500	8 000	11 000	**HR 32204 CJ**	5DD	29	25	41	36	44	2	4	1 1	14.5	0.52	1.2	0.64	0.166
	52	16.25	15	13	1.5 1.5	43 000	33 500	7 500	10 000	**HR 30304 J**	2FB	31	27	44	44	47.5	2	3	1.5 1.5	11.6	0.30	2.0	1.1	0.172
	52	16.25	15	12	1.5 1.5	31 000	24 500	7 100	10 000	**30304 D**	—	34	26	43	37	49	2	4	1.5 1.5	16.7	0.81	0.74	0.41	0.168
	52	22.25	21	18	1.5 1.5	56 000	47 500	8 000	11 000	**HR 32304 J**	2FD	33	26	43	42	48	3	4	1.5 1.5	13.9	0.30	2.0	1.1	0.241
22	44	15	15	11.5	0.6 0.6	31 500	29 400	8 500	11 000	**HR 320/22 XJ**	3CC	30	27	39	37	42	3	3.5	0.6 0.6	11.1	0.40	1.5	0.83	0.103
	50	15.25	14	12	1 1	36 000	30 500	7 500	10 000	**HR 302/22**	—	31	29	44	42	47	2	3	1 1	11.6	0.37	1.6	0.90	0.139
	50	15.25	14	12	1 1	33 500	29 500	7 500	10 000	**HR 302/22 C**	—	31	29	44	40	47	2	3	1 1	13.0	0.49	1.2	0.67	0.144
	50	19.25	18	15	1 1	45 000	40 500	7 500	11 000	**HR 322/22**	—	31	28	44	41	47	2	4	1 1	13.5	0.37	1.6	0.89	0.18
	50	19.25	18	15	1 1	41 500	39 500	7 500	10 000	**HR 322/22 C**	—	31	29	44	39	48	2	4	1 1	15.2	0.51	1.2	0.65	0.185
	56	17.25	16	14	1.5 1.5	45 500	36 500	7 100	9 500	**HR 303/22**	—	33	30	47	46	50	2	3	1.5 1.5	12.4	0.32	1.9	1.0	0.208
	56	17.25	16	13	1.5 1.5	42 500	34 000	6 700	9 500	**HR 303/22 C**	—	33	30	47	44	52.5	3	4	1.5 1.5	15.9	0.59	1.0	0.56	0.207
25	47	15	15	11.5	0.6 0.6	34 000	33 000	8 000	11 000	**HR 32005 XJ**	4CC	33	30	42	40	45	3	3.5	0.6 0.6	11.8	0.43	1.4	0.77	0.116
	47	17	17	14	0.6 0.6	38 000	38 000	8 000	11 000	**HR 33005 J**	2CE	33	29	42	41	44	3	3	0.6 0.6	11.0	0.29	2.1	1.1	0.131
	52	16.25	15	13	1 1	39 500	35 000	7 100	10 000	**HR 30205 J**	3CC	34	31	46	44	48.5	2	3	1 1	12.7	0.37	1.6	0.88	0.157
	52	16.25	15	12	1 1	34 500	31 500	9 700	9 500	**HR 30205 C**	—	34	32	46	43	49.5	2	4	1 1	14.4	0.53	1.1	0.62	0.155
	52	19.25	18	16	1 1	49 000	45 000	7 100	10 000	**HR 32205 J**	2CD	34	30	46	44	50	2	3	1 1	13.5	0.36	1.7	0.92	0.189
	52	19.25	18	15	1 1	43 000	42 000	7 100	9 500	**HR 32205 C**	—	34	30	46	40	50	2	4	1 1	15.8	0.53	1.1	0.62	0.19
	52	22	22	18	1 1	58 500	56 500	7 500	10 000	**HR 33205 J**	2DE	34	29	46	43	49.5	4	4	1 1	14.1	0.35	1.7	0.94	0.221
	62	18.25	17	15	1.5 1.5	58 500	46 000	6 300	8 500	**HR 30305 J**	2FB	36	34	54	54	57	2	3	1.5 1.5	13.2	0.30	2.0	1.1	0.27
	62	18.25	17	14	1.5 1.5	52 000	45 000	6 000	8 500	**HR 30305 C**	—	36	35	53	49	58.5	3	4	1.5 1.5	16.4	0.55	1.1	0.60	0.276
	62	18.25	17	13	1.5 1.5	47 000	40 500	5 600	8 000	**HR 30305 DJ**	(7FB)	39	34	53	47	59	2	5	1.5 1.5	19.9	0.83	0.73	0.40	0.265
	62	18.25	17	13	1.5 1.5	47 000	40 500	5 600	8 000	**HR 31305 J**	7FB	39	33	53	47	59	3	5	1.5 1.5	19.9	0.83	0.73	0.40	0.265
	62	25.25	24	20	1.5 1.5	77 000	66 000	6 300	8 500	**HR 32305 J**	2FD	38	32	53	51	57	3	5	1.5 1.5	15.6	0.30	2.0	1.1	0.376
28	52	16	16	12	1 1	39 500	39 000	7 100	9 500	**HR 320/28 XJ**	4CC	37	33	46	44	50	3	4	1 1	12.8	0.43	1.4	0.77	0.146
	58	17.25	16	14	1 1	48 500	41 500	6 300	9 000	**HR 302/28**	—	37	34	52	50	55	2	3	1 1	13.2	0.35	1.7	0.93	0.203
	58	17.25	16	12	1 1	42 000	38 500	6 300	8 500	**HR 302/28 C**	—	37	34	52	48	54	2	5	1 1	16.9	0.64	0.94	0.52	0.198
	58	20.25	19	16	1 1	58 500	54 000	6 300	9 000	**HR 322/28**	—	37	34	52	49	55	2	4	1 1	14.6	0.37	1.6	0.89	0.243
	58	20.25	19	16	1 1	52 000	49 500	6 300	9 000	**HR 322/28 CJ**	5DD	37	33	52	45	55	2	4	1 1	16.8	0.56	1.1	0.59	0.251
	68	19.75	18	15	1.5 1.5	68 000	55 500	6 000	8 000	**HR 303/28**	—	39	37	59	58	61	2	4.5	1.5 1.5	14.5	0.31	1.9	1.1	0.341
	68	19.75	18	14	1.5 1.5	60 500	50 500	5 600	7 500	**HR 303/28 C**	—	39	38	59	57	63	3	5.5	1.5 1.5	17.4	0.52	1.2	0.64	0.335

Remark Suffix C represents medium-angle tapered roller bearings. Since they are designed for specific applications, please consult NSK when using bearings with suffix C.

SINGLE-ROW TAPERED ROLLER BEARINGS

Bore Diameter 30 – 35 mm





Dynamic Equivalent Load

$P = XF_r + YF_a$

$F_a/F_r \leqq e$		$F_a/F_r > e$	
X	Y	X	Y
1	0	0.4	Y_1

Static Equivalent Load

$P_0 = 0.5F_r + Y_0F_a$

When $F_r > 0.5F_r + Y_0F_a$, use $P_0 = F_r$

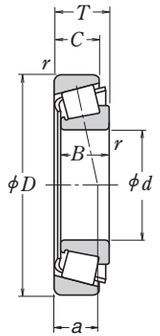
The values of e, Y_1, and Y_0 are given in the table below.

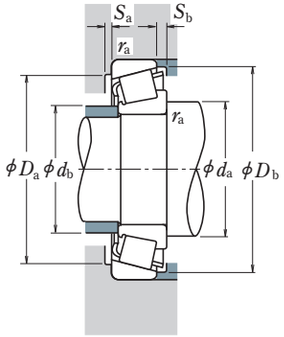
Boundary Dimensions (mm)						Basic Load Ratings (N)		Limiting Speeds (min^{-1})		Bearing Designation	ISO355 Dimension Series	Abutment and Fillet Dimensions (mm)								Eff. Load Center (mm)	Constant	Axial Load Factors		Mass (kg)
					Ring: Inner Outer												Ring: Inner Outer							
d	D	T	B	C	r min.	C_r	C_{0r}	Grease	Oil		approx.	d_a min.	d_b max.	D_a max.	D_a min.	D_b min.	S_a min.	S_b min.	r_a max.		a	e	Y_1	Y_0	approx.
30	47	12	12	9	0.3	0.3	21 700	24 400	7 500	10 000	**HR 32906 J**	2BD	34	34	44	42	44	3	3	0.3	0.3	9.2	0.32	1.9	1.0	0.074
	55	17	17	13	1	1	44 500	44 500	6 700	9 000	**HR 32006 XJ**	4CC	39	35	49	47	53	3	4	1	1	13.5	0.43	1.4	0.77	0.172
	55	20	20	16	1	1	51 500	54 000	6 700	9 000	**HR 33006 J**	2CE	39	35	49	48	52	3	4	1	1	13.1	0.29	2.1	1.1	0.208
	62	17.25	16	14	1	1	53 000	47 500	6 000	8 000	**HR 30206 J**	3DB	39	37	56	52	58	2	3	1	1	13.9	0.37	1.6	0.88	0.238
	62	17.25	16	12	1	1	44 000	37 000	5 600	7 500	**HR 30206 C**	—	39	36	56	49	59	2	5	1	1	17.8	0.68	0.88	0.49	0.221
	62	21.25	20	17	1	1	64 000	60 000	6 000	8 500	**HR 32206 J**	3DC	39	36	56	51	58.5	2	4	1	1	15.4	0.37	1.6	0.88	0.297
	62	21.25	20	16	1	1	59 000	56 000	6 000	8 000	**HR 32206 C**	—	39	35	56	48	59	2	5	1	1	17.8	0.55	1.1	0.60	0.293
	62	25	25	19.5	1	1	82 000	79 500	6 000	8 000	**HR 33206 J**	2DE	39	35	56	52	59.5	5	5.5	1	1	16.1	0.34	1.8	0.97	0.355
	72	20.75	19	16	1.5	1.5	73 000	60 000	5 300	7 500	**HR 30306 J**	2FB	41	40	63	62	66	3	4.5	1.5	1.5	15.1	0.32	1.9	1.1	0.403
	72	20.75	19	14	1.5	1.5	70 000	55 500	5 300	7 100	**HR 30306 C**	—	41	38	63	59	67	3	6.5	1.5	1.5	18.5	0.55	1.1	0.60	0.383
	72	20.75	19	14	1.5	1.5	60 500	52 500	4 800	6 700	**HR 30306 DJ**	(7FB)	44	40	63	55	68	3	6.5	1.5	1.5	23.1	0.83	0.73	0.40	0.393
	72	20.75	19	14	1.5	1.5	60 500	52 500	4 800	6 800	**HR 31306 J**	7FB	44	40	63	55	68	3	6.5	1.5	1.5	23.1	0.83	0.73	0.40	0.393
	72	28.75	27	23	1.5	1.5	98 000	88 500	5 600	7 500	**HR 32306 J**	2FD	43	38	63	59	66	3	5.5	1.5	1.5	18.0	0.32	1.9	1.1	0.57
	72	28.75	27	23	1.5	1.5	93 500	86 500	5 600	7 500	**HR 32306 CJ**	5FD	43	36	63	54	68	3	5.5	1.5	1.5	22.0	0.55	1.1	0.60	0.583
32	58	17	17	13	1	1	46 000	47 000	6 300	8 500	**HR 320/32 XJ**	4CC	41	37	52	49	55	3	4	1	1	14.2	0.45	1.3	0.73	0.191
	58	21	20	16	1	1	50 500	50 000	6 300	8 500	**330/32**	—	41	37	52	50	55	2	4	1	1	13.8	0.31	1.9	1.1	0.225
	65	18.25	17	15	1	1	59 500	54 000	5 600	8 000	**HR 302/32**	—	41	39	59	56	61	3	3	1	1	14.7	0.37	1.6	0.88	0.277
	65	18.25	17	14	1	1	56 500	52 500	5 600	7 500	**HR 302/32 C**	—	41	39	59	54	62	3	4	1	1	16.9	0.55	1.1	0.60	0.273
	65	22.25	21	18	1	1	69 000	65 000	6 000	8 000	**HR 322/32**	—	41	38	59	54	61	3	4	1	1	15.9	0.37	1.6	0.88	0.336
	65	22.25	21	17	1	1	60 500	60 000	5 600	7 500	**HR 322/32 C**	—	41	39	59	51	62	3	5	1	1	20.2	0.59	1.0	0.56	0.335
	65	26	26	20.5	1	1	86 000	86 500	5 600	8 000	**HR 332/32 J**	2DE	41	38	59	55	62	5	5.5	1	1	17.0	0.35	1.7	0.95	0.40
	75	21.75	20	17	1.5	1.5	69 000	56 000	5 300	7 100	**303/32**	—	44	42	66	64	68	3	4.5	1.5	1.5	15.9	0.33	1.8	1.0	0.435
35	55	14	14	11.5	0.6	0.6	33 500	39 000	6 300	8 500	**HR 32907 J**	2BD	43	40	50	50	52.5	3	2.5	0.6	0.6	10.7	0.29	2.1	1.1	0.123
	62	18	18	14	1	1	53 000	55 500	5 600	8 000	**HR 32007 XJ**	4CC	44	40	56	54	60	4	4	1	1	15.0	0.45	1.3	0.73	0.229
	62	21	21	17	1	1	60 000	65 000	5 600	8 000	**HR 33007 J**	2CE	44	40	56	55	59	4	4	1	1	14.1	0.31	2.0	1.1	0.267
	72	18.25	17	15	1.5	1.5	66 500	59 500	5 300	7 100	**HR 30207 J**	3DB	46	43	63	62	67	3	3	1.5	1.5	15.0	0.37	1.6	0.88	0.34
	72	18.25	17	13	1.5	1.5	57 500	54 500	5 000	6 700	**HR 30207 C**	—	46	44	63	59	68	3	5	1.5	1.5	19.6	0.66	0.91	0.50	0.331
	72	24.25	23	19	1.5	1.5	86 500	83 500	5 300	7 100	**HR 32207 J**	3DC	46	42	63	61	67.5	3	5	1.5	1.5	17.9	0.37	1.6	0.88	0.456
	72	24.25	23	18	1.5	1.5	74 500	71 500	5 000	7 100	**HR 32207 C**	—	46	42	63	58	68.5	3	6	1.5	1.5	20.6	0.55	1.1	0.60	0.442
	72	28	28	22	1.5	1.5	107 000	108 000	5 300	7 100	**HR 33207 J**	2DE	46	41	63	61	68	5	6	1.5	1.5	18.3	0.35	1.7	0.93	0.54
	80	22.75	21	18	2	1.5	93 500	79 000	4 800	6 700	**HR 30307 J**	2FB	47	45	71	69	74	3	4.5	2	1.5	16.7	0.32	1.9	1.1	0.538
	80	22.75	21	16	2	1.5	83 500	70 500	4 800	6 300	**HR 30307 C**	—	47	44	71	65	74	3	6.5	2	1.5	20.3	0.55	1.1	0.60	0.518
	80	22.75	21	15	2	1.5	76 500	68 000	4 300	6 000	**HR 30307 DJ**	7FB	51	44	71	62	77	3	7.5	2	1.5	25.2	0.83	0.73	0.40	0.519
	80	22.75	21	15	2	1.5	76 500	68 000	4 300	6 000	**HR 31307 J**	7FB	51	44	71	62	77	3	7.5	2	1.5	25.2	0.83	0.73	0.40	0.52
	80	32.75	31	25	2	1.5	122 000	111 000	5 000	6 700	**HR 32307 J**	2FE	49	43	71	66	74	3	7.5	2	1.5	20.7	0.32	1.9	1.1	0.765

Remark Suffix C represents medium-angle tapered roller bearings. Since they are designed for specific applications, please consult NSK when using bearings with suffix C.

SINGLE-ROW TAPERED ROLLER BEARINGS

Bore Diameter 40 – 50 mm





Dynamic Equivalent Load

$P = XF_r + YF_a$

$F_a/F_r \leqq e$		$F_a/F_r > e$	
X	Y	X	Y
1	0	0.4	Y_1

Static Equivalent Load

$P_0 = 0.5F_r + Y_0F_a$

When $F_r > 0.5F_r + Y_0F_a$, use $P_0 = F_r$

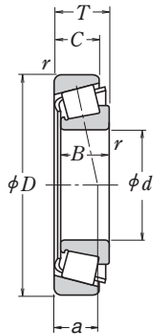
The values of e, Y_1, and Y_0 are given in the table below.

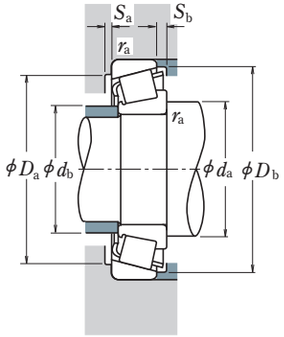
Boundary Dimensions (mm)						Basic Load Ratings (N)		Limiting Speeds (min^{-1})		Bearing Designation	ISO355 Dimension Series	Abutment and Fillet Dimensions (mm)								Eff. Load Center (mm)	Constant	Axial Load Factors		Mass (kg)
					Ring: Inner Outer													Ring: Inner Outer						
d	D	T	B	C	r min.		C_r	C_{0r}	Grease	Oil		approx.	d_a min.	d_b max.	D_a max.	D_a min.	D_b min.	S_a min.	S_b min.	r_a max.		a	e	Y_1	Y_0	approx.
40	62	15	15	12	0.6	0.6	41 500	47 000	5 600	7 500	**HR 32908 J**	2BC	48	44	57	57	59	3	3	0.6	0.6	11.5	0.29	2.1	1.1	0.161
	68	19	19	14.5	1	1	65 000	71 000	5 300	7 100	**HR 32008 XJ**	3CD	49	45	62	60	65.5	4	4.5	1	1	15.0	0.38	1.6	0.87	0.28
	68	22	22	18	1	1	72 500	81 500	5 300	7 100	**HR 33008 J**	2BE	49	45	62	61	65	4	4	1	1	14.6	0.28	2.1	1.2	0.322
	75	26	26	20.5	1.5	1.5	96 500	101 000	4 800	6 700	**HR 33108 J**	2CE	51	46	66	65	71	4	5.5	1.5	1.5	18.0	0.36	1.7	0.93	0.503
	80	19.75	18	16	1.5	1.5	78 000	70 000	4 800	6 300	**HR 30208 J**	3DB	51	48	71	69	75	3	3.5	1.5	1.5	16.6	0.37	1.6	0.88	0.437
	80	24.75	23	19	1.5	1.5	95 000	90 500	4 800	6 300	**HR 32208 J**	3DC	51	48	71	68	75	3	5.5	1.5	1.5	18.9	0.37	1.6	0.88	0.548
	80	24.75	23	19	1.5	1.5	91 000	90 500	4 500	6 300	**HR 32208 CJ**	5DC	51	47	71	65	76	3	5.5	1.5	1.5	21.9	0.55	1.1	0.60	0.558
	80	32	32	25	1.5	1.5	131 000	137 000	4 800	6 300	**HR 33208 J**	2DE	51	46	71	67	76	5	7	1.5	1.5	20.8	0.36	1.7	0.92	0.744
	90	25.25	23	20	2	1.5	111 000	101 000	4 300	5 600	**HR 30308 J**	2FB	52	52	81	76	82	3	5	2	1.5	19.5	0.35	1.7	0.96	0.758
	90	25.25	23	18	2	1.5	104 000	93 500	4 300	5 600	**HR 30308 C**	—	52	50	81	72	84	3	7	2	1.5	22.8	0.53	1.1	0.62	0.735
	90	25.25	23	17	2	1.5	98 000	89 500	3 800	5 300	**HR 30308 DJ**	7FB	56	50	81	70	87	3	8	2	1.5	28.7	0.83	0.73	0.40	0.728
	90	25.25	23	17	2	1.5	98 000	89 500	3 800	5 300	**HR 31308 J**	7FB	56	50	81	70	87	3	8	2	1.5	28.7	0.83	0.73	0.40	0.728
	90	35.25	33	27	2	1.5	147 000	145 000	4 300	6 000	**HR 32308 J**	2FD	54	50	81	73	82	3	8	2	1.5	23.4	0.35	1.7	0.96	1.05
45	68	15	15	12	0.6	0.6	42 500	50 500	5 000	6 700	**HR 32909 J**	2BC	53	50	63	62	64	3	3	0.6	0.6	12.3	0.32	1.9	1.0	0.187
	75	20	20	15.5	1	1	74 000	83 000	4 500	6 300	**HR 32009 XJ**	3CC	54	51	69	67	72	4	4.5	1	1	16.6	0.39	1.5	0.84	0.354
	75	24	24	19	1	1	85 000	99 000	4 800	6 300	**HR 33009 J**	2CE	54	51	69	67	71	4	5	1	1	16.3	0.29	2.0	1.1	0.414
	80	26	26	20.5	1.5	1.5	103 000	113 000	4 500	6 000	**HR 33109 J**	3CE	56	51	71	69	77	4	5.5	1.5	1.5	19.1	0.38	1.6	0.86	0.552
	85	20.75	19	16	1.5	1.5	84 000	79 500	4 300	6 000	**HR 30209 J**	3DB	56	53	76	74	80	3	4.5	1.5	1.5	18.3	0.41	1.5	0.81	0.488
	85	24.75	23	19	1.5	1.5	102 000	102 000	4 300	6 000	**HR 32209 J**	3DC	56	53	76	73	81	3	5.5	1.5	1.5	20.1	0.41	1.5	0.81	0.602
	85	24.75	23	19	1.5	1.5	91 500	95 500	4 300	5 600	**HR 32209 CJ**	5DC	56	52	76	70	82	3	5.5	1.5	1.5	23.6	0.59	1.0	0.56	0.603
	85	32	32	25	1.5	1.5	136 000	147 000	4 300	6 000	**HR 33209 J**	3DE	56	51	76	72	81	5	7	1.5	1.5	22.0	0.39	1.6	0.86	0.817
	95	29	26.5	20	2.5	2.5	109 000	109 000	3 600	5 000	**T 7 FC045**	7FC	60	53	83	71	91	3	9	2	2	32.1	0.87	0.69	0.38	0.918
	95	36	35	30	2.5	2.5	171 000	174 000	4 000	5 300	**T 2 ED045**	2ED	60	54	83	79	89	5	6	2	2	23.5	0.32	1.9	1.02	1.22
	100	27.25	25	22	2	1.5	138 000	127 000	3 800	5 300	**HR 30309 J**	2FB	57	58	91	86	93	3	5	2	1.5	21.1	0.35	1.7	0.96	1.01
	100	27.25	25	18	2	1.5	118 000	109 000	3 400	4 800	**HR 30309 DJ**	7FB	61	57	91	79	96	3	9	2	1.5	31.5	0.83	0.73	0.40	0.957
	100	27.25	25	18	2	1.5	118 000	109 000	3 400	4 800	**HR 31309 J**	7FB	61	57	91	79	96	3	9	2	1.5	31.5	0.83	0.73	0.40	0.947
	100	38.25	36	30	2	1.5	177 000	177 000	3 800	5 300	**HR 32309 J**	2FD	59	56	91	82	93	3	8	2	1.5	25.0	0.35	1.7	0.96	1.42
50	100	36	35	30	2.5	2.5	177 000	185 000	3 800	5 000	**T 2 ED050**	2ED	65	59	88	83	94	6	6	2	2	24.2	0.34	1.8	0.96	1.3
	72	15	15	12	0.6	0.6	44 000	54 000	4 500	6 300	**HR 32910 J**	2BC	58	54	67	66	69	3	3	0.6	0.6	13.5	0.34	1.8	0.97	0.193
	80	20	20	15.5	1	1	75 500	87 000	4 300	6 000	**HR 32010 XJ**	3CC	59	56	74	71	77	4	4.5	1	1	17.9	0.42	1.4	0.78	0.38
	80	24	24	19	1	1	86 500	104 000	4 300	6 000	**HR 33010 J**	2CE	59	55	74	71	76	4	5	1	1	17.4	0.32	1.9	1.0	0.452
	85	26	26	20	1.5	1.5	110 000	126 000	4 300	5 600	**HR 33110 J**	3CE	61	56	76	74	82	4	6	1.5	1.5	20.3	0.41	1.5	0.8	0.597
	90	21.75	20	17	1.5	1.5	94 000	91 500	4 000	5 300	**HR 30210 J**	3DB	61	58	81	79	85	3	4.5	1.5	1.5	19.6	0.42	1.4	0.79	0.557
	90	24.75	23	19	1.5	1.5	108 000	109 000	4 000	5 300	**HR 32210 J**	3DC	61	57	81	78	86	3	5.5	1.5	1.5	21.0	0.42	1.4	0.79	0.642
	90	24.75	23	18	1.5	1.5	95 000	102 000	3 800	5 300	**HR 32210 CJ**	5DC	61	58	81	76	87	3	6.5	1.5	1.5	24.6	0.59	1.0	0.56	0.655
	90	32	32	24.5	1.5	1.5	146 000	165 000	4 000	5 300	**HR 33210 J**	3DE	61	56	81	76	87	5	7.5	1.5	1.5	23.2	0.41	1.5	0.80	0.867
	105	32	29	22	3	3	134 000	133 000	3 200	4 500	**T 7 FC050**	7FC	74	59	91	78	100	5	10	2.5	2.5	36.4	0.87	0.69	0.38	1.22
	110	29.25	27	23	2.5	2	160 000	148 000	3 400	4 800	**HR 30310 J**	2FB	65	65	100	95	102	3	6	2	2	23.1	0.35	1.7	0.96	1.28
	110	29.25	27	19	2.5	2	141 000	132 000	3 200	4 300	**HR 30310 DJ**	7FB	70	62	100	87	105	3	10	2	2	34.3	0.83	0.73	0.40	1.26
	110	29.25	27	19	2.5	2	141 000	132 000	3 200	4 300	**HR 31310 J**	7FB	70	62	100	87	105	3	10	2	2	34.3	0.83	0.73	0.40	1.26
	110	42.25	40	33	2.5	2	216 000	220 000	3 600	4 800	**HR 32310 J**	2FD	68	62	100	91	102	3	9	2	2	28.0	0.35	1.7	0.96	1.88
	110	42.25	40	33	2.5	2	202 000	218 000	3 400	4 800	**HR 32310 CJ**	5FD	68	59	100	82	103	3	9	2	2	32.8	0.55	1.1	0.60	1.93

Remark Suffix C represents medium-angle tapered roller bearings. Since they are designed for specific applications, please consult NSK when using bearings with suffix C.

SINGLE-ROW TAPERED ROLLER BEARINGS

Bore Diameter 55 – 65 mm





Dynamic Equivalent Load

$P = XF_r + YF_a$

$F_a/F_r \leqq e$		$F_a/F_r > e$	
X	Y	X	Y
1	0	0.4	Y_1

Static Equivalent Load

$P_0 = 0.5F_r + Y_0F_a$

When $F_r > 0.5F_r + Y_0F_a$, use $P_0 = F_r$

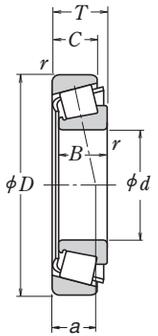
The values of e, Y_1, and Y_0 are given in the table below.

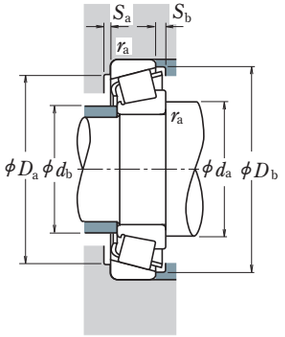
Boundary Dimensions (mm)						Basic Load Ratings (N)		Limiting Speeds (min⁻¹)		Bearing Designation	ISO355 Dimension Series	Abutment and Fillet Dimensions (mm)								Eff. Load Center (mm)	Constant	Axial Load Factors		Mass (kg)
d	D	T	B	C	Ring: Inner r min.	Ring: Outer r min.	C_r	C_{0r}	Grease	Oil		approx.	d_a min.	d_b max.	D_a max.	D_a min.	D_b min.	S_a min.	S_b min.	Ring: Inner r_a max.	Ring: Outer r_a max.	a	e	Y_1	Y_0	approx.
55	80	17	17	14	1	1	55 500	74 500	4 300	5 600	**HR 32911 J**	2BC	64	60	74	73	76	4	3	1	1	14.6	0.31	1.9	1.1	0.282
	90	23	23	17.5	1.5	1.5	100 000	117 000	3 800	5 300	**HR 32011 XJ**	3CC	66	62	81	80	86	4	5.5	1.5	1.5	19.7	0.41	1.5	0.81	0.568
	90	27	27	21	1.5	1.5	112 000	138 000	3 800	5 300	**HR 33011 J**	2CE	66	62	81	80	86	5	6	1.5	1.5	19.2	0.31	1.9	1.1	0.657
	95	30	30	23	1.5	1.5	138 000	158 000	3 800	5 000	**HR 33111 J**	3CE	66	62	86	82	91	5	7	1.5	1.5	22.4	0.37	1.6	0.88	0.877
	100	22.75	21	18	2	1.5	116 000	113 000	3 600	5 000	**HR 30211 J**	3DB	67	64	91	89	94	4	4.5	2	1.5	20.9	0.41	1.5	0.81	0.736
	100	26.75	25	21	2	1.5	135 000	137 000	3 600	5 000	**HR 32211 J**	3DC	67	63	91	87	95	4	5.5	2	1.5	22.7	0.41	1.5	0.81	0.859
	100	35	35	27	2	1.5	174 000	193 000	3 600	5 000	**HR 33211 J**	3DE	67	62	91	86	96	6	8	2	1.5	25.2	0.40	1.5	0.83	1.18
	115	34	31	23.5	3	3	155 000	164 000	3 000	4 300	**T 7 FC055**	7FC	73	66	101	86	109	4	10.5	2.5	2.5	39.0	0.87	0.69	0.38	1.58
	120	31.5	29	25	2.5	2	184 000	171 000	3 200	4 300	**HR 30311 J**	2FB	70	71	110	104	111	4	6.5	2	2	24.6	0.35	1.7	0.96	1.63
	120	31.5	29	21	2.5	2	161 000	153 000	2 800	4 000	**HR 30311 DJ**	7FB	75	67	110	94	114	4	10.5	2	2	37.0	0.83	0.73	0.40	1.58
	120	31.5	29	21	2.5	2	161 000	153 000	2 800	4 000	**HR 31311 J**	7FB	75	67	110	94	114	4	10.5	2	2	37.0	0.83	0.73	0.40	1.58
	120	45.5	43	35	2.5	2	251 000	258 000	3 200	4 300	**HR 32311 J**	2FD	73	67	110	99	111	4	10.5	2	2	29.9	0.35	1.7	0.96	2.39
	120	45.5	43	35	2.5	2	240 000	262 000	3 200	4 300	**HR 32311 CJ**	5FD	73	65	110	91	112	4	10.5	2	2	35.8	0.55	1.1	0.60	2.47
60	85	17	17	14	1	1	60 000	84 500	3 800	5 300	**HR 32912 J**	2BC	69	65	79	78	81	4	3	1	1	15.5	0.33	1.8	1.0	0.306
	95	23	23	17.5	1.5	1.5	105 000	127 000	3 600	5 000	**HR 32012 XJ**	4CC	71	66	86	85	91	4	5.5	1.5	1.5	20.9	0.43	1.4	0.77	0.608
	95	27	27	21	1.5	1.5	118 000	150 000	3 600	5 000	**HR 33012 J**	2CE	71	66	86	85	90	5	6	1.5	1.5	20.0	0.33	1.8	1.0	0.713
	100	30	30	23	1.5	1.5	142 000	166 000	3 400	4 800	**HR 33112 J**	3CE	71	68	91	88	96	5	7	1.5	1.5	23.6	0.40	1.5	0.83	0.91
	110	23.75	22	19	2	1.5	127 000	123 000	3 400	4 500	**HR 30212 J**	3EB	72	69	101	96	103	4	4.5	2	1.5	22.0	0.41	1.5	0.81	0.930
	110	29.75	28	24	2	1.5	161 000	167 000	3 400	4 500	**HR 32212 J**	3EC	72	68	101	95	104	4	5.5	2	1.5	24.1	0.41	1.5	0.81	1.18
	110	38	38	29	2	1.5	204 000	231 000	3 400	4 500	**HR 33212 J**	3EE	72	68	101	94	105	6	9	2	1.5	27.6	0.40	1.5	0.82	1.56
	125	37	33.5	26	3	3	186 000	197 000	2 800	3 800	**T 7 FC060**	7FC	78	72	111	94	119	4	11	2.5	2.5	41.4	0.82	0.73	0.40	2.03
	130	33.5	31	26	3	2.5	214 000	201 000	3 000	4 000	**HR 30312 J**	2FB	78	77	118	112	120	4	7.5	2.5	2	26.0	0.35	1.7	0.96	2.03
	130	33.5	31	22	3	2.5	186 000	177 000	2 600	3 800	**HR 30312 DJ**	7FB	84	74	118	103	125	4	11.5	2.5	2	40.3	0.83	0.73	0.40	1.98
	130	33.5	31	22	3	2.5	186 000	177 000	2 600	3 800	**HR 31312 J**	7FB	84	74	118	103	125	4	11.5	2.5	2	40.3	0.83	0.73	0.40	1.98
	130	48.5	46	37	3	2.5	286 000	295 000	3 000	4 000	**HR 32312 J**	2FD	81	74	118	107	120	4	11.5	2.5	2	31.4	0.35	1.7	0.96	2.96
	130	48.5	46	35	3	2.5	241 000	249 000	2 800	3 800	**32312 C**	—	81	74	116	102	125	4	13.5	2.5	2	39.9	0.58	1.0	0.57	2.86
65	90	17	17	14	1	1	60 000	86 500	3 600	5 000	**HR 32913 J**	2BC	74	70	84	82	86	4	3	1	1	16.8	0.35	1.7	0.93	0.323
	100	23	23	17.5	1.5	1.5	106 000	132 000	3 400	4 500	**HR 32013 XJ**	4CC	76	71	91	90	97	4	5.5	1.5	1.5	22.4	0.46	1.3	0.72	0.646
	100	27	27	21	1.5	1.5	120 000	156 000	3 400	4 500	**HR 33013 J**	2CE	76	71	91	90	96	5	6	1.5	1.5	21.1	0.35	1.7	0.95	0.76
	110	34	34	26.5	1.5	1.5	182 000	218 000	3 200	4 300	**HR 33113 J**	3DE	76	73	101	96	106	6	7.5	1.5	1.5	26.0	0.39	1.5	0.85	1.32
	120	24.75	23	20	2	1.5	151 000	151 000	3 000	4 000	**HR 30213 J**	3EB	77	78	111	106	113	4	4.5	2	1.5	23.8	0.41	1.5	0.81	1.18
	120	32.75	31	27	2	1.5	193 000	202 000	3 000	4 000	**HR 32213 J**	3EC	77	75	111	104	115	4	5.5	2	1.5	27.1	0.41	1.5	0.81	1.55
	120	41	41	32	2	1.5	249 000	282 000	3 000	4 000	**HR 33213 J**	3EE	77	74	111	102	115	6	9	2	1.5	29.2	0.39	1.5	0.85	2.04
	140	36	33	28	3	2.5	245 000	233 000	2 600	3 600	**HR 30313 J**	2GB	83	83	128	121	130	4	8	2.5	2	27.9	0.35	1.7	0.96	2.51
	140	36	33	23	3	2.5	213 000	205 000	2 400	3 400	**HR 30313 DJ**	7GB	89	80	128	111	133	4	13	2.5	2	43.2	0.83	0.73	0.40	2.43
	140	36	33	23	3	2.5	213 000	205 000	2 400	3 400	**HR 31313 J**	7GB	89	80	128	111	133	4	13	2.5	2	43.2	0.83	0.73	0.40	2.43
	140	51	48	39	3	2.5	330 000	340 000	2 800	3 800	**HR 32313 J**	2GD	86	80	128	116	130	4	12	2.5	2	34.0	0.35	1.7	0.96	3.6

Remark Suffix C represents medium-angle tapered roller bearings. Since they are designed for specific applications, please consult NSK when using bearings with suffix C.

SINGLE-ROW TAPERED ROLLER BEARINGS

Bore Diameter 70 – 80 mm





Dynamic Equivalent Load

$P = XF_r + YF_a$

$F_a/F_r \leqq e$		$F_a/F_r > e$	
X	Y	X	Y
1	0	0.4	Y_1

Static Equivalent Load

$P_0 = 0.5F_r + Y_0F_a$

When $F_r > 0.5F_r + Y_0F_a$, use $P_0 = F_r$

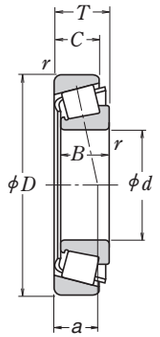
The values of e, Y_1, and Y_0 are given in the table below.

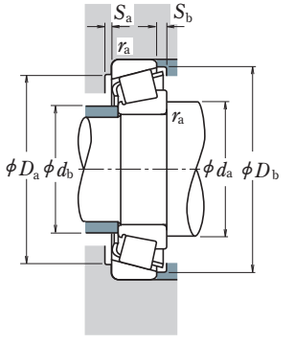
Boundary Dimensions (mm)						Basic Load Ratings (N)		Limiting Speeds (min^{-1})		Bearing Designation	ISO355 Dimension Series	Abutment and Fillet Dimensions (mm)								Eff. Load Center (mm)	Constant	Axial Load Factors		Mass (kg)
					Ring: Inner Outer													Ring: Inner Outer						
d	D	T	B	C	r min.	C_r	C_{0r}	Grease	Oil		approx.	d_a min.	d_b max.	D_a max.	D_a min.	D_b min.	S_a min.	S_b min.	r_a max.	a	e	Y_1	Y_0	approx.
70	100	20	20	16	1 1	86 000	113 000	3 200	4 500	**HR 32914 J**	2BC	79	76	94	93	96	4	4	1 1	17.6	0.32	1.9	1.1	0.494
	110	25	25	19	1.5 1.5	128 000	158 000	3 200	4 300	**HR 32014 XJ**	4CC	81	77	101	98	105	5	6	1.5 1.5	23.7	0.43	1.4	0.76	0.869
	110	31	31	25.5	1.5 1.5	156 000	204 000	3 000	4 300	**HR 33014 J**	2CE	81	78	101	100	105	5	5.5	1.5 1.5	22.2	0.28	2.1	1.2	1.11
	120	37	37	29	2 1.5	218 000	262 000	3 000	4 000	**HR 33114 J**	3DE	82	79	111	104	115	6	8	2 1.5	27.9	0.38	1.6	0.87	1.71
	125	26.25	24	21	2 1.5	163 000	163 000	2 800	4 000	**HR 30214 J**	3EB	82	81	116	110	118	4	5	2 1.5	25.6	0.42	1.4	0.79	1.3
	125	33.25	31	27	2 1.5	194 000	205 000	2 800	4 000	**HR 32214 J**	3EC	82	80	116	108	119	4	6	2 1.5	28.6	0.42	1.4	0.79	1.66
	125	41	41	32	2 1.5	257 000	299 000	2 800	4 000	**HR 33214 J**	3EE	82	78	116	107	120	7	9	2 1.5	30.4	0.41	1.5	0.81	2.15
	140	39	35.5	27	3 3	219 000	235 000	2 400	3 400	**T 7 FC070**	7FC	88	81	126	106	133	5	12	2.5 2.5	46.4	0.87	0.69	0.38	2.58
	150	38	35	30	3 2.5	279 000	268 000	2 400	3 400	**HR 30314 J**	2GB	88	89	138	132	140	4	8	2.5 2	29.7	0.35	1.7	0.96	3.03
	150	38	35	25	3 2.5	236 000	229 000	2 200	3 200	**HR 30314 DJ**	7GB	94	85	138	118	142	4	13	2.5 2	45.8	0.83	0.73	0.40	2.94
	150	38	35	25	3 2.5	236 000	229 000	2 200	3 200	**HR 31314 J**	7GB	94	85	138	118	142	4	13	2.5 2	45.8	0.83	0.73	0.40	2.94
	150	54	51	42	3 2.5	370 000	390 000	2 600	3 400	**HR 32314 J**	2GD	91	86	138	124	140	4	12	2.5 2	36.1	0.35	1.7	0.96	4.35
	150	54	51	42	3 2.5	345 000	390 000	2 400	3 400	**HR 32314 CJ**	5GD	91	84	138	115	141	4	12	2.5 2	43.3	0.55	1.1	0.60	4.47
75	105	20	20	16	1 1	89 000	120 000	3 200	4 300	**HR 32915 J**	2BC	84	81	99	98	101	4	4	1 1	18.7	0.33	1.8	0.99	0.53
	115	25	25	19	1.5 1.5	134 000	171 000	3 000	4 000	**HR 32015 XJ**	4CC	86	82	106	103	110	5	6	1.5 1.5	25.1	0.46	1.3	0.72	0.925
	115	31	31	25.5	1.5 1.5	163 000	220 000	3 000	4 000	**HR 33015 J**	2CE	86	83	106	104	110	6	5.5	1.5 1.5	23.0	0.30	2.0	1.1	1.18
	125	37	37	29	2 2	224 000	275 000	2 800	3 800	**HR 33115 J**	3DE	87	83	115	109	120	6	8	2 2	29.2	0.40	1.5	0.83	1.8
	130	27.25	25	22	2 1.5	176 000	182 000	2 800	3 800	**HR 30215 J**	4DB	87	85	121	115	124	4	5	2 1.5	27.0	0.44	1.4	0.76	1.43
	130	33.25	31	27	2 1.5	203 000	219 000	2 800	3 800	**HR 32215 J**	4DC	87	84	121	113	125	4	6	2 1.5	29.8	0.44	1.4	0.76	1.72
	130	41	41	31	2 1.5	265 000	315 000	2 800	3 800	**HR 33215 J**	3EE	87	83	121	111	125	7	10	2 1.5	31.6	0.43	1.4	0.77	2.25
	160	40	37	31	3 2.5	310 000	300 000	2 400	3 200	**HR 30315 J**	2GB	93	95	148	141	149	4	9	2.5 2	31.8	0.35	1.7	0.96	3.63
	160	40	37	26	3 2.5	259 000	251 000	2 200	3 000	**HR 30315 DJ**	7GB	99	91	148	129	152	6	14	2.5 2	48.8	0.83	0.73	0.40	3.47
	160	40	37	26	3 2.5	259 000	251 000	2 200	3 000	**HR 31315 J**	7GB	99	91	148	129	152	6	14	2.5 2	48.8	0.83	0.73	0.40	3.47
	160	58	55	45	3 2.5	420 000	445 000	2 400	3 200	**HR 32315 J**	2GD	96	91	148	134	149	4	13	2.5 2	38.9	0.35	1.7	0.96	5.31
	160	58	55	43	3 2.5	385 000	420 000	2 200	3 200	**32315 CA**	—	96	90	148	124	153	4	15	2.5 2	47.7	0.58	1.0	0.57	5.3
80	110	20	20	16	1 1	92 000	128 000	3 000	4 000	**HR 32916 J**	2BC	89	85	104	102	106	4	4	1 1	19.8	0.35	1.7	0.94	0.56
	125	29	29	22	1.5 1.5	173 000	222 000	2 800	3 600	**HR 32016 XJ**	3CC	91	89	116	112	120	6	7	1.5 1.5	26.9	0.42	1.4	0.78	1.32
	125	36	36	29.5	1.5 1.5	211 000	282 000	2 800	3 600	**HR 33016 J**	2CE	91	88	116	112	119	6	6.5	1.5 1.5	25.5	0.28	2.2	1.2	1.66
	130	37	37	29	2 1.5	229 000	289 000	2 600	3 600	**HR 33116 J**	3DE	82	88	121	113	126	6	8	2 1.5	30.4	0.42	1.4	0.79	1.88
	140	28.25	26	22	2.5 2	193 000	195 000	2 600	3 400	**HR 30216 J**	3EB	95	91	130	124	132	4	6	2 2	28.1	0.42	1.4	0.79	1.68
	140	28.25	26	20	2.5 2	181 000	190 000	2 400	3 400	**30216 CA**	—	95	92	130	122	133	4	8	2 2	33.8	0.58	1.0	0.57	1.66
	140	35.25	33	28	2.5 2	237 000	254 000	2 600	3 400	**HR 32216 J**	3EC	95	90	130	122	134	4	7	2 2	30.6	0.42	1.4	0.79	2.13
	140	46	46	35	2.5 2	315 000	385 000	2 600	3 400	**HR 33216 J**	3EE	95	89	130	119	135	7	11	2 2	34.8	0.43	1.4	0.78	2.93
	170	42.5	39	33	3 2.5	340 000	330 000	2 200	3 000	**HR 30316 J**	2GB	98	102	158	150	159	4	9.5	2.5 2	34.0	0.35	1.7	0.96	4.27
	170	42.5	39	27	3 2.5	290 000	283 000	2 000	2 800	**HR 30316 DJ**	7GB	104	97	158	136	159	6	15.5	2.5 2	51.8	0.83	0.73	0.40	4.07
	170	42.5	39	27	3 2.5	290 000	283 000	2 000	2 800	**HR 31316 J**	7GB	104	97	158	136	159	6	15.5	2.5 2	51.8	0.83	0.73	0.40	4.07
	170	61.5	58	48	3 2.5	470 000	505 000	2 200	3 000	**HR 32316 J**	2GD	101	98	158	143	159	4	13.5	2.5 2	41.4	0.35	1.7	0.96	6.35
	170	61.5	58	48	3 2.5	450 000	530 000	2 200	3 000	**HR 32316 CJ**	5GD	101	95	158	132	160	4	13.5	2.5 2	49.3	0.55	1.1	0.60	6.59

Remark Suffix CA represents medium-angle tapered roller bearings. Since they are designed for specific applications, please consult NSK when using bearings with suffix CA.

SINGLE-ROW TAPERED ROLLER BEARINGS

Bore Diameter 85 – 100 mm





Dynamic Equivalent Load

$P = XF_r + YF_a$

$F_a/F_r \leqq e$		$F_a/F_r > e$	
X	Y	X	Y
1	0	0.4	Y_1

Static Equivalent Load

$P_0 = 0.5F_r + Y_0F_a$

When $F_r > 0.5F_r + Y_0F_a$, use $P_0 = F_r$

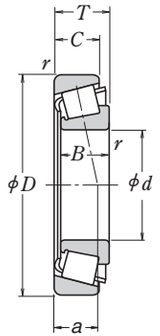
The values of e, Y_1, and Y_0 are given in the table below.

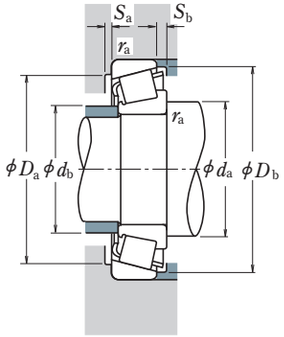
Boundary Dimensions (mm)						Basic Load Ratings (N)		Limiting Speeds (min^{-1})		Bearing Designation	ISO355 Dimension Series	Abutment and Fillet Dimensions (mm)								Eff. Load Center (mm)	Constant	Axial Load Factors		Mass (kg)
					Ring: Inner Outer													Ring: Inner Outer						
d	D	T	B	C	r min.		C_r	C_{0r}	Grease	Oil		approx.	d_a min.	d_b max.	D_a max.	D_a min.	D_b min.	S_a min.	S_b min.	r_a max.		a	e	Y_1	Y_0	approx.
85	120	23	23	18	1.5	1.5	115 000	157 000	2 800	3 800	**HR 32917 J**	2BC	96	92	111	111	115	5	5	1.5	1.5	20.9	0.33	1.8	1.0	0.8
	130	29	29	22	1.5	1.5	176 000	231 000	2 600	3 600	**HR 32017 XJ**	4CC	96	94	121	116	125	6	7	1.5	1.5	28.2	0.44	1.4	0.75	1.38
	130	36	36	29.5	1.5	1.5	221 000	305 000	2 600	3 600	**HR 33017 J**	2CE	96	94	121	117	125	6	6.5	1.5	1.5	26.5	0.29	2.1	1.1	1.75
	140	41	41	32	2.5	2	283 000	365 000	2 400	3 400	**HR 33117 J**	3DE	100	94	130	122	135	7	9	2	2	32.7	0.41	1.5	0.81	2.51
	150	30.5	28	24	2.5	2	226 000	233 000	2 400	3 200	**HR 30217 J**	3EB	100	97	140	133	141	5	6.5	2	2	30.3	0.42	1.4	0.79	2.12
	150	30.5	28	22	2.5	2	211 000	226 000	2 200	3 200	**30217 CA**	—	100	98	140	131	142	5	8.5	2	2	36.2	0.58	1.0	0.57	2.07
	150	38.5	36	30	2.5	2	259 000	277 000	2 200	3 200	**HR 32217 J**	3EC	100	96	140	131	142	5	8.5	2	2	33.9	0.42	1.4	0.79	2.64
	150	49	49	37	2.5	2	345 000	415 000	2 400	3 200	**HR 33217 J**	3EE	100	95	140	129	144	7	12	2	2	37.3	0.42	1.4	0.79	3.57
	180	44.5	41	34	4	3	380 000	375 000	2 000	2 800	**HR 30317 J**	2GB	106	108	166	157	167	5	10.5	3	2.5	35.8	0.35	1.7	0.96	5.08
	180	44.5	41	28	4	3	320 000	315 000	1 900	2 600	**HR 30317 DJ**	7GB	113	103	166	144	169	6	16.5	3	2.5	55.4	0.83	0.73	0.40	4.88
	180	44.5	41	28	4	3	320 000	315 000	1 900	2 600	**HR 31317 J**	7GB	113	103	166	144	169	6	16.5	3	2.5	55.4	0.83	0.73	0.40	4.88
	180	63.5	60	49	4	3	505 000	535 000	2 000	2 800	**HR 32317 J**	2GD	110	104	166	151	167	5	14.5	3	2.5	43.6	0.35	1.7	0.96	7.31
90	125	23	23	18	1.5	1.5	119 000	167 000	2 600	3 600	**HR 32918 J**	2BC	101	97	116	116	120	5	5	1.5	1.5	22.0	0.34	1.8	0.96	0.838
	140	32	32	24	2	1.5	209 000	273 000	2 400	3 200	**HR 32018 XJ**	3CC	102	99	131	124	134	6	8	2	1.5	29.7	0.42	1.4	0.78	1.78
	140	39	39	32.5	2	1.5	270 000	360 000	2 400	3 200	**HR 33018 J**	2CE	102	99	131	129	135	7	6.5	2	1.5	27.9	0.27	2.2	1.2	2.21
	150	45	45	35	2.5	2	320 000	405 000	2 400	3 200	**HR 33118 J**	3DE	105	100	140	132	144	7	10	2	2	35.2	0.40	1.5	0.83	3.14
	160	32.5	30	26	2.5	2	247 000	256 000	2 200	3 000	**HR 30218 J**	3FB	105	103	150	141	150	5	6.5	2	2	31.7	0.42	1.4	0.79	2.6
	160	42.5	40	34	2.5	2	315 000	350 000	2 200	3 000	**HR 32218 J**	3FC	105	102	150	139	152	5	8.5	2	2	36.2	0.42	1.4	0.79	3.41
	190	46.5	43	36	4	3	425 000	425 000	1 900	2 600	**HR 30318 J**	2GB	111	114	176	176	176	5	10.5	3	2.5	37.3	0.35	1.7	0.96	5.91
	190	46.5	43	30	4	3	325 000	315 000	1 800	2 400	**HR 30318 DJ**	7GB	118	110	176	152	179	6	16.5	3	2.5	58.7	0.83	0.73	0.40	5.52
	190	46.5	43	30	4	3	325 000	315 000	1 800	2 400	**HR 31318 J**	7GB	118	110	176	152	179	6	16.5	3	2.5	58.7	0.83	0.73	0.40	5.52
	190	67.5	64	53	4	3	555 000	590 000	2 000	2 600	**HR 32318 J**	2GD	115	109	176	158	177	5	14.5	3	2.5	46.5	0.35	1.7	0.96	8.6
95	130	23	23	18	1.5	1.5	120 000	172 000	2 400	3 400	**HR 32919 J**	2BC	106	102	121	121	125	5	5	1.5	1.5	23.2	0.36	1.7	0.92	0.877
	145	32	32	24	2	1.5	212 000	283 000	2 400	3 200	**HR 32019 XJ**	4CC	107	104	136	131	140	6	8	2	1.5	31.2	0.44	1.4	0.75	1.88
	145	39	39	32.5	2	1.5	284 000	390 000	2 400	3 200	**HR 33019 J**	2CE	107	103	136	133	139	7	6.5	2	1.5	28.6	0.28	2.2	1.2	2.3
	160	46	46	38	3	3	350 000	445 000	2 200	3 000	**T 2 ED095**	2ED	113	108	146	141	152	6	8	2.5	2.5	34.5	0.34	1.8	0.97	3.74
	170	34.5	32	27	3	2.5	275 000	286 000	2 200	2 800	**HR 30219 J**	3FB	113	110	158	150	159	5	7.5	2.5	2	33.7	0.42	1.4	0.79	3.13
	170	45.5	43	37	3	2.5	355 000	400 000	2 200	2 800	**HR 32219 J**	3FC	113	108	158	147	161	5	8.5	2.5	2	39.3	0.42	1.4	0.79	4.22
	200	49.5	45	38	4	3	460 000	455 000	1 900	2 600	**HR 30319 J**	2GB	116	119	186	172	184	5	11.5	3	2.5	38.6	0.35	1.7	0.96	6.92
	200	49.5	45	36	4	3	430 000	435 000	1 800	2 400	**30319 CA**	—	116	119	186	168	188	5	13.5	3	2.5	48.6	0.54	1.1	0.61	6.71
	200	49.5	45	32	4	3	380 000	375 000	1 700	2 400	**HR 30319 DJ**	7GB	123	115	186	158	187	6	17.5	3	2.5	61.9	0.83	0.73	0.40	6.64
	200	49.5	45	32	4	3	380 000	375 000	1 700	2 400	**HR 31319 J**	7GB	123	115	186	158	187	6	17.5	3	2.5	61.9	0.83	0.73	0.40	6.64
	200	71.5	67	55	4	3	645 000	710 000	1 900	2 600	**HR 32319 J**	2GD	120	115	186	167	186	5	16.5	3	2.5	48.6	0.35	1.7	0.96	10.4
100	140	25	25	20	1.5	1.5	144 000	205 000	2 200	3 200	**HR 32920 J**	2CC	111	109	132	132	134	5	5	1.5	1.5	24.2	0.33	1.8	1.0	1.18
	145	24	22.5	17.5	3	3	139 000	163 000	2 200	3 000	**T 4 CB100**	4CB	118	108	135	135	142	6	6.5	2.5	2.5	30.1	0.47	1.3	0.70	1.18
	150	32	32	24	2	1.5	216 000	294 000	2 200	3 000	**HR 32020 XJ**	4CC	112	109	141	136	144	6	8	2	1.5	32.5	0.46	1.3	0.72	1.95
	150	39	39	32.5	2	1.5	290 000	405 000	2 200	3 000	**HR 33020 J**	2CE	112	107	141	137	143	7	6.5	2	1.5	29.3	0.29	2.1	1.2	2.38
	165	52	52	40	2.5	2	390 000	515 000	2 000	2 800	**HR 33120 J**	3EE	115	110	155	144	159	8	12	2	2	40.5	0.41	1.5	0.81	4.32
	180	37	34	29	3	2.5	315 000	330 000	2 000	2 600	**HR 30220 J**	3FB	118	116	168	158	168	5	8	2.5	2	36.1	0.42	1.4	0.79	3.78
	180	49	46	39	3	2.5	400 000	450 000	2 000	2 600	**HR 32220 J**	3FC	118	115	168	155	171	5	10	2.5	2	41.5	0.42	1.4	0.79	5.05
	180	63	63	48	3	2.5	505 000	635 000	2 000	2 600	**HR 33220 J**	3FE	118	113	168	152	172	10	15	2.5	2	46.0	0.40	1.5	0.82	6.76
	215	51.5	47	39	4	3	520 000	525 000	1 700	2 400	**HR 30320 J**	2GB	121	128	201	185	197	5	12.5	3	2.5	41.4	0.35	1.7	0.96	8.41
	215	56.5	51	35	4	3	475 000	505 000	1 500	2 200	**HR 31320 J**	7GB	136	125	201	169	202	7	21.5	3	2.5	67.7	0.83	0.73	0.40	9.02
	215	77.5	73	60	4	3	695 000	755 000	1 700	2 400	**HR 32320 J**	2GD	125	125	201	178	200	5	17.5	3	2.5	53.2	0.35	1.7	0.96	12.7

Remark Suffix CA represents medium-angle tapered roller bearings. Since they are designed for specific applications, please consult NSK when using bearings with suffix CA.

SINGLE-ROW TAPERED ROLLER BEARINGS

Bore Diameter 105 – 130 mm





Dynamic Equivalent Load

$P = XF_r + YF_a$

$F_a/F_r \leqq e$		$F_a/F_r > e$	
X	Y	X	Y
1	0	0.4	Y_1

Static Equivalent Load

$P_0 = 0.5F_r + Y_0F_a$

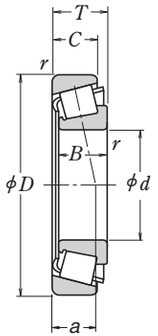
When $F_r > 0.5F_r + Y_0F_a$, use $P_0 = F_r$

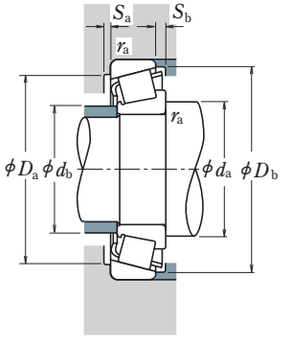
The values of e, Y_1, and Y_0 are given in the table below.

Boundary Dimensions (mm)						Basic Load Ratings (N)		Limiting Speeds (min^{-1})		Bearing Designation	ISO355 Dimension Series	Abutment and Fillet Dimensions (mm)								Eff. Load Center (mm)	Constant	Axial Load Factors		Mass (kg)
					Ring: Inner / Outer r min.							d_a min.	d_b max.	D_a max.	D_a min.	D_b min.	S_a min.	S_b min.	Ring: Inner / Outer r_a max.		a	e	Y_1	Y_0	
d	D	T	B	C		C_r	C_{0r}	Grease	Oil		approx.														approx.
105	145	25	25	20	1.5	1.5	146 000	212 000	2 200	3 000	**HR 32921 J**	2CC	116	114	137	137	140	5	5	1.5	1.5	25.3	0.34	1.8	0.96	1.23
	160	35	35	26	2.5	2	250 000	340 000	2 000	2 800	**HR 32021 XJ**	4DC	120	115	150	144	154	6	9	2	2	34.3	0.44	1.4	0.74	2.48
	160	43	43	34	2.5	2	315 000	435 000	2 000	2 800	**HR 33021 J**	2DE	120	115	150	146	153	7	9	2	2	30.9	0.28	2.1	1.2	3.03
	190	39	36	30	3	2.5	345 000	365 000	1 900	2 600	**HR 30221 J**	3FB	123	123	178	166	177	6	9	2.5	2	38.1	0.42	1.4	0.79	4.51
	190	53	50	43	3	2.5	445 000	510 000	1 900	2 600	**HR 32221 J**	3FC	123	120	178	162	180	5	10	2.5	2	44.8	0.42	1.4	0.79	6.25
	225	53.5	49	41	4	3	560 000	565 000	1 600	2 200	**HR 30321 J**	2GB	126	133	211	195	206	6	12.5	3	2.5	43.3	0.35	1.7	0.96	9.52
	225	58	53	36	4	3	510 000	540 000	1 500	2 000	**HR 31321 J**	7GB	141	130	211	177	211	7	22	3	2.5	70.2	0.83	0.73	0.40	10
	225	81.5	77	63	4	3	820 000	925 000	1 700	2 200	**HR 32321 J**	2GD	130	129	211	186	209	6	18.5	3	2.5	55.2	0.35	1.7	0.96	14.9
110	150	25	25	20	1.5	1.5	151 000	224 000	2 200	2 800	**HR 32922 J**	2CC	121	119	142	142	145	5	5	1.5	1.5	26.5	0.36	1.7	0.93	1.29
	170	38	38	29	2.5	2	290 000	390 000	2 000	2 600	**HR 32022 XJ**	4DC	125	121	160	153	163	7	9	2	2	35.9	0.43	1.4	0.77	3.09
	170	47	47	37	2.5	2	360 000	515 000	2 000	2 600	**HR 33022 J**	2DE	125	121	160	153	161	7	10	2	2	33.7	0.29	2.1	1.2	3.84
	180	56	56	43	2.5	2	450 000	610 000	1 900	2 600	**HR 33122 J**	3EE	125	121	170	156	174	9	13	2	2	44.1	0.42	1.4	0.79	5.54
	200	41	38	32	3	2.5	390 000	420 000	1 800	2 400	**HR 30222 J**	3FB	128	129	188	175	187	6	9	2.5	2	40.2	0.42	1.4	0.79	5.28
	200	56	53	46	3	2.5	490 000	565 000	1 800	2 400	**HR 32222 J**	3FC	128	127	188	171	190	5	10	2.5	2	47.2	0.42	1.4	0.79	7.35
	240	54.5	50	42	4	3	595 000	595 000	1 500	2 000	**HR 30322 J**	2GB	131	143	226	208	220	6	12.5	3	2.5	45.1	0.35	1.7	0.96	11
	240	63	57	38	4	3	580 000	605 000	1 400	1 900	**HR 31322 J**	7GB	146	136	226	191	224	7	25	3	2.5	74.8	0.83	0.73	0.40	12.3
	240	84.5	80	65	4	3	830 000	910 000	1 500	2 000	**HR 32322 J**	2GD	135	139	226	201	222	6	19.5	3	2.5	58.6	0.35	1.7	0.96	17.1
120	165	29	29	23	1.5	1.5	198 000	291 000	1 900	2 600	**HR 32924 J**	2CC	131	129	156	155	160	6	6	1.5	1.5	29.2	0.35	1.7	0.95	1.8
	170	27	25	19.5	3	3	188 000	243 000	1 800	2 600	**T 4 CB120**	4CB	138	129	158	158	164	7	7.5	2.5	2.5	35.0	0.47	1.3	0.70	1.78
	180	38	38	29	2.5	2	297 000	405 000	1 800	2 400	**HR 32024 XJ**	4DC	135	131	170	162	173	7	9	2	2	39.7	0.46	1.3	0.72	3.27
	180	48	48	38	2.5	2	370 000	540 000	1 800	2 600	**HR 33024 J**	2DE	135	130	168	161	171	6	10	2	2	36.0	0.31	2.0	1.1	4.2
	200	62	62	48	2.5	2	565 000	755 000	1 700	2 400	**HR 33124 J**	3FE	135	133	190	173	192	9	14	2	2	47.9	0.40	1.5	0.83	7.67
	215	43.5	40	34	3	2.5	410 000	450 000	1 600	2 200	**HR 30224 J**	4FB	138	141	203	190	201	6	9.5	2.5	2	44.4	0.44	1.4	0.76	6.28
	215	61.5	58	50	3	2.5	540 000	635 000	1 600	2 200	**HR 32224 J**	4FD	138	137	203	181	204	6	11.5	2.5	2	52.1	0.44	1.4	0.76	9.0
	260	59.5	55	46	4	3	660 000	655 000	1 400	1 900	**HR 30324 J**	2GB	141	154	246	223	237	6	13.5	3	2.5	50.0	0.35	1.7	0.96	13.9
	260	68	62	42	4	3	685 000	730 000	1 300	1 800	**HR 31324 J**	7GB	156	148	246	206	244	9	26	3	2.5	81.7	0.83	0.73	0.40	15.6
	260	90.5	86	69	4	3	950 000	1 060 000	1 400	1 900	**HR 32324 J**	2GD	145	149	246	216	239	6	21.5	3	2.5	62.5	0.35	1.7	0.96	21.8
130	180	32	30	26	2	1.5	205 000	281 000	1 800	2 400	**32926**	—	142	141	171	168	175	6	6	2	1.5	34.7	0.36	1.7	0.92	2.25
	180	32	32	25	2	1.5	246 000	365 000	1 800	2 400	**HR 32926 J**	2CC	142	140	170	168	173	6	7	2	1.5	31.4	0.34	1.8	0.97	2.46
	185	29	27	21	3	3	225 000	296 000	1 700	2 400	**T 4 CB130**	4CB	148	141	171	171	179	8	8	2.5	2.5	37.5	0.47	1.3	0.70	2.32
	200	45	45	34	2.5	2	395 000	535 000	1 600	2 200	**HR 32026 XJ**	4EC	145	144	190	179	192	8	11	2	2	43.9	0.43	1.4	0.76	5.06
	200	55	55	43	2.5	2	485 000	715 000	1 700	2 200	**HR 33026 J**	2EE	145	144	188	179	192	8	12	2	2	42.4	0.34	1.8	0.97	6.25
	230	43.75	40	34	4	3	460 000	505 000	1 500	2 000	**HR 30226 J**	4FB	151	151	216	205	217	7	9.5	3	2.5	45.9	0.44	1.4	0.76	7.25
	230	67.75	64	54	4	3	650 000	790 000	1 500	2 000	**HR 32226 J**	4FD	151	147	216	196	219	7	13.5	3	2.5	57.0	0.44	1.4	0.76	11.3
	280	63.75	58	49	5	4	675 000	675 000	1 300	1 800	**30326**	—	157	168	262	239	255	8	14.5	4	3	53.9	0.36	1.7	0.92	16.6
	280	63.75	58	49	5	4	795 000	820 000	1 300	1 800	**HR 30326 J**	2GB	157	166	262	241	255	8	14.5	4	3	52.8	0.35	1.7	0.96	17.2
	280	72	66	44	5	4	770 000	820 000	1 200	1 700	**HR 31326 J**	7GB	174	159	262	220	261	9	28	4	3	87.1	0.83	0.73	0.40	18.8
	280	98.75	93	78	5	4	1 020 000	1 150 000	1 300	1 800	**32326**	—	162	165	262	233	263	8	20.5	4	3	69.2	0.36	1.7	0.92	26.6

SINGLE-ROW TAPERED ROLLER BEARINGS

Bore Diameter 140 – 170 mm





Dynamic Equivalent Load

$P = XF_r + YF_a$

$F_a/F_r \leqq e$		$F_a/F_r > e$	
X	Y	X	Y
1	0	0.4	Y_1

Static Equivalent Load

$P_0 = 0.5F_r + Y_0F_a$

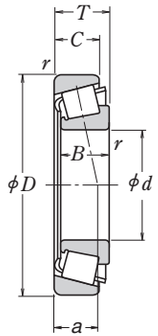
When $F_r > 0.5F_r + Y_0F_a$, use $P_0 = F_r$

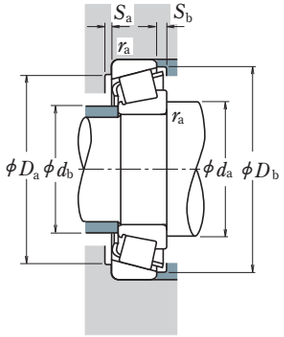
The values of e, Y_1, and Y_0 are given in the table below.

Boundary Dimensions (mm)						Basic Load Ratings (N)		Limiting Speeds (min^{-1})		Bearing Designation	ISO355 Dimension Series	Abutment and Fillet Dimensions (mm)									Eff. Load Center (mm)	Constant	Axial Load Factors		Mass (kg)
					Ring: Inner / Outer r min.							d_a	d_b	D_a	D_b	S_a	S_b	Ring: Inner / Outer r_a		a	e	Y_1	Y_0	
d	D	T	B	C		C_r	C_{0r}	Grease	Oil		approx.	min.	max.	max.	min.	min.	min.	max.						approx.
140	190	32	32	25	2	1.5	253 000	390 000	1 700	2 200	**HR 32928 J**	2CC	152	150	180	178	184	6	7	2	1.5	33.6	0.36	1.7	0.92	2.64
	210	45	45	34	2.5	2	400 000	555 000	1 600	2 200	**HR 32028 XJ**	4DC	155	152	200	189	202	8	11	2	2	46.6	0.46	1.3	0.72	5.32
	210	56	56	44	2.5	2	505 000	770 000	1 600	2 200	**HR 33028 J**	2DE	155	153	198	189	202	7	12	2	2	45.5	0.36	1.7	0.92	6.74
	250	45.75	42	36	4	3	480 000	515 000	1 400	1 900	**HR 30228 J**	4FB	161	164	236	221	234	7	9.5	3	2.5	48.9	0.44	1.4	0.76	8.74
	250	71.75	68	58	4	3	750 000	915 000	1 400	1 900	**HR 32228 J**	4FD	161	159	236	213	238	9	13.5	3	2.5	60.5	0.44	1.4	0.76	14.3
	300	67.75	62	53	5	4	910 000	945 000	1 200	1 700	**HR 30328 J**	2GB	167	177	282	256	273	9	14.5	4	3	55.7	0.35	1.7	0.96	21.1
	300	77	70	47	5	4	855 000	955 000	1 100	1 500	**HR 31328 J**	7GB	184	174	282	236	280	9	30	4	3	92.9	0.83	0.73	0.40	23.1
	300	107.75	102	85	5	4	1 210 000	1 440 000	1 200	1 600	**32328**	—	172	177	282	246	281	9	22.5	4	3	76.4	0.37	1.6	0.88	33.9
150	210	38	36	31	2.5	2	305 000	440 000	1 500	2 000	**32930**	—	165	162	200	195	201	7	7	2	2	36.7	0.33	1.8	1.0	3.8
	210	38	38	30	2.5	2	345 000	520 000	1 500	2 000	**HR 32930 J**	2DC	165	163	198	196	202	7	8	2	2	36.5	0.33	1.8	1.0	4.05
	225	48	48	36	3	2.5	460 000	650 000	1 400	2 000	**HR 32030 XJ**	4EC	168	164	213	202	216	8	12	2.5	2	49.8	0.46	1.3	0.72	6.6
	225	59	59	46	3	2.5	535 000	805 000	1 400	2 000	**HR 33030 J**	2EE	168	165	213	203	217	8	13	2.5	2	48.7	0.36	1.7	0.90	8.07
	270	49	45	38	4	3	595 000	665 000	1 300	1 800	**HR 32230 J**	2GB	171	175	256	236	250	7	11	3	2.5	51.3	0.44	1.4	0.76	11.2
	270	77	73	60	4	3	865 000	1 080 000	1 300	1 800	**HR 32230 J**	4GD	171	171	256	228	254	8	17	3	2.5	64.7	0.44	1.4	0.76	17.8
	320	72	65	55	5	4	845 000	860 000	1 100	1 500	**30330**	—	177	193	302	275	292	8	17	4	3	61.4	0.36	1.7	0.92	24.2
	320	72	65	55	5	4	1 020 000	1 060 000	1 100	1 600	**HR 30330 J**	2GB	177	190	302	276	292	8	17	4	3	60.0	0.35	1.7	0.96	25
	320	82	75	50	5	4	975 000	1 100 000	1 000	1 400	**HR 31330 J**	7GB	194	187	302	253	300	9	32	4	3	99.3	0.83	0.73	0.40	28.5
	320	114	108	90	5	4	1 370 000	1 700 000	1 100	1 500	**32330**	—	182	191	302	262	297	8	24	4	3	81.5	0.37	1.6	0.88	41.4
160	220	38	38	30	2.5	2	365 000	570 000	1 400	1 900	**HR 32932 J**	2DC	175	173	208	206	212	7	8	2	2	38.7	0.35	1.7	0.95	4.32
	240	51	51	38	3	2.5	525 000	750 000	1 300	1 800	**HR 32032 XJ**	4EC	178	175	228	216	231	8	13	2.5	2	53.0	0.46	1.3	0.72	7.93
	290	52	48	40	4	3	655 000	730 000	1 200	1 600	**HR 30232 J**	4GB	181	189	276	253	269	8	12	3	2.5	55.0	0.44	1.4	0.76	13.7
	290	84	80	67	4	3	975 000	1 220 000	1 200	1 600	**HR 32232 J**	4GD	181	184	276	243	274	10	17	3	2.5	70.5	0.44	1.4	0.76	22.5
	340	75	68	58	5	4	940 000	960 000	1 000	1 400	**30332**	—	187	205	322	293	311	10	17	4	3	64.6	0.36	1.7	0.92	28.4
	340	75	68	58	5	4	1 120 000	1 180 000	1 100	1 400	**HR 30332 J**	2GB	187	201	322	293	310	10	17	4	3	62.9	0.35	1.7	0.96	29.7
	340	75	68	48	5	4	830 000	875 000	950	1 300	**30332 D**	—	196	198	322	270	313	9	27	4	3	99.4	0.81	0.74	0.41	27.5
	340	121	114	95	5	4	1 480 000	1 770 000	1 000	1 400	**32332**	—	192	202	322	281	319	10	26	4	3	87.1	0.37	1.6	0.88	48.3
170	230	38	36	31	2.5	2.5	315 000	485 000	1 300	1 800	**32934**	—	185	183	220	216	223	7	7	2	2	41.6	0.36	1.7	0.90	4.3
	230	38	38	30	2.5	2	360 000	560 000	1 400	1 800	**HR 32934 J**	3DC	185	180	218	215	222	7	8	2	2	41.7	0.38	1.6	0.86	4.44
	260	57	57	43	3	2.5	620 000	890 000	1 200	1 700	**HR 32034 XJ**	4EC	188	187	248	232	249	10	14	2.5	2	56.6	0.44	1.4	0.74	10.6
	310	57	52	43	5	4	775 000	885 000	1 100	1 500	**HR 30234 J**	4GB	197	202	292	273	288	8	14	4	3	59.4	0.44	1.4	0.76	17.1
	310	91	86	71	5	4	1 140 000	1 450 000	1 100	1 500	**HR 32234 J**	4GD	197	197	292	262	294	10	20	4	3	76.4	0.44	1.4	0.76	28
	360	80	72	62	5	4	1 040 000	1 080 000	950	1 300	**30334**	—	197	221	342	312	332	10	18	4	3	70.1	0.37	1.6	0.90	33.5
	360	80	72	62	5	4	1 240 000	1 230 000	1 000	1 300	**HR 30334 J**	2GB	197	214	342	310	329	10	18	4	3	67.3	0.35	1.7	0.96	34.5
	360	80	72	50	5	4	935 000	1 040 000	900	1 200	**30334 D**	—	206	215	342	288	332	10	30	4	3	107.3	0.81	0.74	0.41	33.4
	360	127	120	100	5	4	1 690 000	2 050 000	1 000	1 300	**32334**	—	202	213	342	297	337	10	27	4	3	91.3	0.37	1.6	0.88	57

■SINGLE-ROW TAPERED ROLLER BEARINGS

Bore Diameter 180 – 240 mm





Dynamic Equivalent Load

$P = XF_r + YF_a$

$F_a/F_r \leqq e$		$F_a/F_r > e$	
X	Y	X	Y
1	0	0.4	Y_1

Static Equivalent Load

$P_0 = 0.5F_r + Y_0F_a$

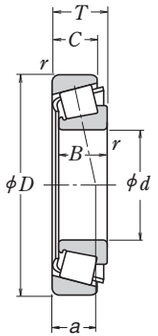
When $F_r > 0.5F_r + Y_0F_a$, use $P_0 = F_r$

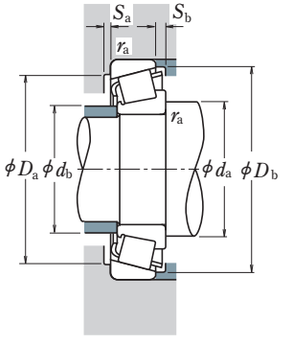
The values of e, Y_1, and Y_0 are given in the table below.

Boundary Dimensions (mm)						Basic Load Ratings (N)		Limiting Speeds (min^{-1})		Bearing Designation	ISO355 Dimension Series	Abutment and Fillet Dimensions (mm)								Eff. Load Center (mm)	Constant	Axial Load Factors		Mass (kg)
					Ring: Inner Outer													Ring: Inner Outer						
d	D	T	B	C	r min.	C_r	C_{0r}	Grease	Oil		approx.	d_a min.	d_b max.	D_a max.	D_a min.	D_b min.	S_a min.	S_b min.	r_a max.	a	e	Y_1	Y_0	approx.
180	250	45	45	34	2.5 2	435 000	685 000	1 300	1 700	**HR 32936 J**	4DC	195	192	240	227	241	8	11	2 2	53.9	0.48	1.3	0.69	6.56
	280	64	64	48	3 2.5	785 000	1 130 000	1 200	1 600	**HR 32036 XJ**	3FD	198	199	268	248	267	10	16	2.5 2	60.4	0.42	1.4	0.78	14.3
	320	57	52	43	5 4	800 000	930 000	1 100	1 400	**HR 30236 J**	4GB	207	210	302	281	297	9	14	4 3	61.8	0.45	1.3	0.73	17.8
	320	91	86	71	5 4	1 180 000	1 540 000	1 100	1 400	**HR 32236 J**	4GD	207	205	302	270	303	10	20	4 3	78.9	0.45	1.3	0.73	29.8
	380	83	75	64	5 4	1 150 000	1 230 000	900	1 300	**30336**	—	207	233	362	324	345	10	19	4 3	72.5	0.36	1.7	0.92	39.3
	380	83	75	53	5 4	1 010 000	1 120 000	850	1 200	**30336 D**	—	216	229	362	304	352	10	30	4 3	113.1	0.81	0.74	0.41	38.5
	380	134	126	106	5 4	1 870 000	2 290 000	950	1 300	**32336**	—	212	225	362	310	353	10	28	4 3	96.6	0.37	1.6	0.88	66.8
190	260	45	45	34	2.5 2	445 000	715 000	1 200	1 600	**HR 32938 J**	4DC	205	201	250	237	251	8	11	2 2	55.3	0.48	1.3	0.69	6.83
	290	64	64	48	3 2.5	800 000	1 170 000	1 100	1 500	**HR 32038 XJ**	4FD	208	209	278	258	279	10	16	2.5 2	63.4	0.44	1.4	0.75	14.9
	340	60	55	46	5 4	880 000	1 020 000	1 000	1 300	**HR 30238 J**	4GB	217	223	322	302	318	9	14	4 3	65.6	0.44	1.4	0.76	21.4
	340	97	92	75	5 4	1 370 000	1 770 000	1 000	1 400	**HR 32238 J**	4GD	217	216	322	290	323	10	22	4 3	80.5	0.44	1.4	0.76	35.2
	400	86	78	65	6 5	1 250 000	1 340 000	850	1 200	**30338**	—	223	248	378	346	366	11	21	5 4	76.1	0.36	1.7	0.92	46
	400	140	132	109	6 5	2 040 000	2 580 000	850	1 200	**32338**	—	229	243	378	332	375	11	31	5 4	102.7	0.37	1.6	0.88	78.9
200	280	51	48	41	3 2.5	505 000	780 000	1 100	1 500	**32940**	—	218	217	268	256	269	9	10	2.5 2	53.4	0.37	1.6	0.88	9.26
	280	51	51	39	3 2.5	590 000	935 000	1 100	1 500	**HR 32940 J**	3EC	218	216	268	258	271	9	12	2.5 2	54.2	0.39	1.5	0.84	9.65
	310	70	70	53	3 2.5	935 000	1 370 000	1 000	1 400	**HR 32040 XJ**	4FD	218	221	298	277	297	11	17	2.5 2	67.4	0.43	1.4	0.77	18.9
	360	64	58	48	5 4	975 000	1 120 000	950	1 300	**HR 30240 J**	4GB	227	236	342	318	336	10	16	4 3	69.1	0.44	1.4	0.76	25.5
	360	104	98	82	5 4	1 480 000	1 920 000	950	1 300	**HR 32240 J**	3GD	227	230	342	305	340	11	22	4 3	85.1	0.41	1.5	0.81	42.6
	420	89	80	67	6 5	1 260 000	1 390 000	850	1 200	**30340**	—	233	253	398	346	368	11	22	5 4	81.4	0.37	1.6	0.88	52.3
	420	89	80	56	6 5	1 190 000	1 330 000	750	1 000	**30340 D**	—	244	253	398	336	385	11	33	5 4	122.9	0.81	0.74	0.41	49.6
	420	146	138	115	6 5	2 240 000	2 870 000	800	1 100	**32340**	—	239	253	398	346	392	11	31	5 4	106.7	0.37	1.6	0.88	90.9
220	300	51	51	39	3 2.5	600 000	990 000	1 000	1 400	**HR 32944 J**	3EC	238	235	288	278	293	9	12	2.5 2	59.2	0.43	1.4	0.78	10.3
	340	76	76	57	4 3	1 090 000	1 610 000	950	1 300	**HR 32044 XJ**	4FD	241	244	326	303	326	12	19	3 2.5	73.6	0.43	1.4	0.77	24.4
	400	72	65	54	5 4	995 000	1 150 000	850	1 100	**30244**	—	247	267	382	350	367	11	18	4 3	74.7	0.40	1.5	0.82	33.6
	400	114	108	90	5 4	1 650 000	2 210 000	850	1 100	**32244**	—	247	260	382	340	377	12	24	4 3	93.0	0.40	1.5	0.82	57.4
	460	97	88	73	6 5	1 760 000	1 990 000	750	1 000	**30344**	—	253	283	438	390	414	12	24	5 4	85.4	0.36	1.7	0.92	72.4
	460	154	145	122	6 5	2 480 000	3 200 000	750	1 000	**32344**	—	259	274	438	372	421	12	32	5 4	114.9	0.37	1.6	0.88	114
240	320	51	51	39	3 2.5	615 000	1 040 000	950	1 300	**HR 32948 J**	4EC	258	255	308	297	314	9	12	2.5 2	65.1	0.46	1.3	0.72	11.1
	360	76	76	57	4 3	1 130 000	1 730 000	850	1 200	**HR 32048 XJ**	4FD	261	262	346	321	346	12	19	3 2.5	79.1	0.46	1.3	0.72	26.2
	440	79	72	60	5 4	1 220 000	1 400 000	750	1 000	**30248**	—	267	288	422	384	408	11	19	4 3	85.1	0.44	1.4	0.74	45.2
	440	127	120	100	5 4	2 000 000	2 730 000	750	1 000	**32248**	—	267	285	422	374	416	12	27	4 3	102.5	0.40	1.5	0.82	78
	500	105	95	80	6 5	2 040 000	2 340 000	670	950	**30348**	—	273	308	478	422	447	12	25	5 4	92.8	0.36	1.7	0.92	92.6
	500	165	155	132	6 5	3 100 000	4 100 000	670	900	**32348**	—	279	301	478	410	464	12	33	5 4	123.2	0.37	1.6	0.88	145

SINGLE-ROW TAPERED ROLLER BEARINGS

Bore Diameter 260 – 440 mm





Dynamic Equivalent Load

$P = XF_r + YF_a$

$F_a/F_r \leqq e$		$F_a/F_r > e$	
X	Y	X	Y
1	0	0.4	Y_1

Static Equivalent Load

$P_0 = 0.5F_r + Y_0F_a$

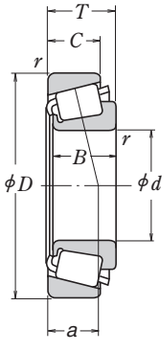
When $F_r > 0.5F_r + Y_0F_a$, use $P_0 = F_r$

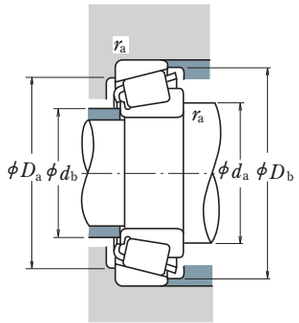
The values of e, Y_1, and Y_0 are given in the table below.

Boundary Dimensions (mm)						Basic Load Ratings (N)		Limiting Speeds (min^{-1})		Bearing Designation	ISO355 Dimension Series	Abutment and Fillet Dimensions (mm)									Eff. Load Center (mm)	Constant	Axial Load Factors		Mass (kg)
					Ring: Inner Outer													Ring: Inner Outer							
d	D	T	B	C	r min.	C_r	C_{0r}	Grease	Oil		approx.	d_a min.	d_b max.	D_a max.	D_a min.	D_b min.	S_a min.	S_b min.	r_a max.		a	e	Y_1	Y_0	approx.
260	360	63.5	63.5	48	3	2.5	900 000	1 450 000	850	1 100	**HR 32952 J**	3EC	278	278	348	333	347	11	15.5	2.5	2	69.8	0.41	1.5	0.81	18.6
	400	87	87	65	5	4	1 430 000	2 160 000	800	1 100	**HR 32052 XJ**	4FC	287	287	382	357	383	14	22	4	3	86.3	0.43	1.4	0.76	38.5
	480	89	80	67	6	5	1 460 000	1 700 000	670	900	**30252**	—	293	316	458	421	447	12	22	5	4	94.6	0.44	1.4	0.74	60.7
	480	137	130	106	6	5	2 340 000	3 300 000	670	950	**32252**	—	293	305	458	394	446	14	31	5	4	116.0	0.45	1.3	0.73	103
	540	113	102	85	6	6	2 300 000	2 640 000	630	850	**30352**	—	293	336	512	460	487	16	28	5	5	101.6	0.36	1.7	0.92	114
280	380	63.5	63.5	48	3	2.5	945 000	1 580 000	800	1 100	**HR 32956 J**	4EC	298	297	368	352	368	12	15.5	2.5	2	75.3	0.43	1.4	0.76	20
	420	87	87	65	5	4	1 450 000	2 240 000	710	1 000	**HR 32056 XJ**	4FC	307	305	402	374	402	14	22	4	3	91.6	0.46	1.3	0.72	40.6
	500	89	80	67	6	5	1 530 000	1 900 000	630	850	**30256**	—	313	339	478	436	462	12	22	5	4	98.5	0.44	1.4	0.74	66.3
	500	137	130	106	6	5	2 400 000	3 450 000	630	850	**32256**	—	313	325	478	412	467	14	31	5	4	123.1	0.47	1.3	0.70	109
	580	187	175	145	6	6	4 050 000	5 400 000	560	800	**32356**	—	319	353	552	475	532	14	42	5	5	139.6	0.37	1.6	0.89	224
300	420	76	72	62	4	3	1 100 000	1 820 000	710	950	**32960**	—	321	326	406	386	405	13	14	3	2.5	79.3	0.37	1.6	0.88	30.5
	420	76	76	57	4	3	1 240 000	2 100 000	710	950	**HR 32960 J**	3FD	321	324	406	387	405	13	19	3	2.5	79.9	0.39	1.5	0.84	31.4
	460	100	100	74	5	4	1 770 000	2 700 000	670	900	**HR 32060 XJ**	4GD	327	330	442	408	439	15	26	4	3	98.4	0.43	1.4	0.76	56.6
	540	96	85	71	6	5	1 770 000	2 100 000	600	800	**30260**	—	333	355	518	470	499	14	25	5	4	105.1	0.44	1.4	0.74	80.6
	540	149	140	115	6	5	2 730 000	3 700 000	600	800	**32260**	—	333	352	518	458	514	15	34	5	4	131.7	0.46	1.3	0.72	132
320	440	76	72	63	4	3	1 110 000	1 880 000	670	900	**32964**	—	341	345	426	404	425	13	13	3	2.5	84.3	0.39	1.5	0.84	32
	440	76	76	57	4	3	1 280 000	2 220 000	670	900	**HR 32964 J**	3FD	341	344	426	406	426	13	19	3	2.5	85.0	0.42	1.4	0.79	33.3
	480	100	100	74	5	4	1 850 000	2 910 000	630	850	**HR 32064 XJ**	4GD	347	350	462	430	461	15	26	4	3	104.5	0.46	1.3	0.72	60
	580	104	92	75	6	5	2 020 000	2 420 000	530	750	**30264**	—	353	381	558	503	533	14	29	5	4	113.7	0.44	1.4	0.74	99.3
	580	159	150	125	6	5	3 500 000	5 050 000	530	750	**32264**	—	353	383	558	487	550	15	34	5	4	141.7	0.46	1.3	0.72	175
	670	210	200	170	7.5	7.5	5 150 000	7 100 000	480	670	**32364**	—	383	412	634	547	616	14	42	6	6	157.5	0.37	1.6	0.88	343
340	460	76	72	63	4	3	1 120 000	1 940 000	630	850	**32968**	—	361	364	446	426	446	13	13	3	2.5	89.2	0.41	1.5	0.80	33.6
	460	76	76	57	4	3	1 290 000	2 220 000	630	850	**HR 32968 J**	4FD	361	362	446	427	446	13	19	3	2.5	91.0	0.44	1.4	0.75	34.3
	520	112	106	92	6	5	2 030 000	3 400 000	560	750	**32068**	—	373	386	498	464	496	3.5	22	5	4	104.5	0.37	1.6	0.89	83.7
360	480	76	72	62	4	3	1 160 000	2 100 000	600	800	**32972**	—	381	386	466	445	465	14	14	3	2.5	91.4	0.40	1.5	0.82	35.8
	480	76	76	57	4	3	1 330 000	2 340 000	560	800	**HR 32972 J**	4FD	381	381	466	445	466	13	19	3	2.5	96.8	0.46	1.3	0.72	36.1
	540	112	106	92	6	5	2 060 000	3 500 000	530	750	**32072**	—	393	402	518	480	514	5.5	22	5	4	108.6	0.38	1.6	0.86	86.5
380	520	87	82	71	5	4	1 490 000	2 550 000	560	750	**32976**	—	407	406	502	478	501	16	16	4	3	95.2	0.39	1.6	0.86	49.5
400	540	87	82	71	5	4	1 540 000	2 700 000	530	710	**32980**	—	427	428	522	499	524	16	16	4	3	100.8	0.40	1.5	0.82	52.7
	600	125	118	100	6	5	2 410 000	4 050 000	480	670	**32080**	—	433	443	578	533	565	5	25	5	4	115.3	0.36	1.7	0.92	116
420	560	87	82	72	5	4	1 590 000	2 810 000	500	670	**32984**	—	447	448	542	521	544	3.5	15	4	3	106.1	0.41	1.5	0.81	54.8
	620	125	118	100	6	5	2 460 000	4 200 000	450	630	**32084**	—	453	463	598	552	586	6.5	25	5	4	120.0	0.37	1.6	0.88	121
440	650	130	122	104	6	6	2 740 000	4 600 000	430	600	**32088**	—	473	487	622	582	616	5	26	5	5	126.3	0.36	1.7	0.92	136

■SINGLE-ROW TAPERED ROLLER BEARINGS (INCH SERIES)

Bore Diameter 12.000 – 22.225 mm





Dynamic Equivalent Load

$P = XF_r + YF_a$

$F_a/F_r \leqq e$		$F_a/F_r > e$	
X	Y	X	Y
1	0	0.4	Y_1

Static Equivalent Load

$P_0 = 0.5F_r + Y_0F_a$

When $F_r > 0.5F_r + Y_0F_a$, use $P_0 = F_r$

The values of e, Y_1, and Y_0 are given in the table below.

Boundary Dimensions (mm)					Ring: Inner Outer		Basic Load Ratings (N)		Limiting Speeds (min^{-1})		Bearing Designations		Abutment and Fillet Dimensions (mm)				Ring: Inner Outer		Eff. Load Center (mm)	Constant	Axial Load Factors		Mass (kg)	
d	D	T	B	C	r min.		C_r	C_{0r}	Grease	Oil	INNER RING	OUTER RING	d_a	d_b	D_a	D_b	r_a max.		a	e	Y_1	Y_0	approx. Inner Ring	Outer Ring
12.000	31.991	10.008	10.785	7.938	0.8	1.3	12 700	8 900	13 000	18 000	***A 2047**	**A 2126**	16.5	15.5	26	29	0.8	1.3	6.8	0.41	1.5	0.81	0.023	0.017
12.700	34.988	10.998	10.988	8.730	1.3	1.3	14 400	10 900	12 000	16 000	**A 4050**	**A 4138**	18.5	17	29	32	1.3	1.3	8.2	0.45	1.3	0.73	0.033	0.022
15.000	34.988	10.998	10.988	8.730	0.8	1.3	14 400	10 900	12 000	16 000	***A 4059**	**A 4138**	19.5	19	29	32	0.8	1.3	8.2	0.45	1.3	0.73	0.029	0.022
15.875	34.988	10.998	10.998	8.712	1.3	1.3	17 000	13 400	11 000	15 000	**L 21549**	**L 21511**	21.5	19.5	29	32.5	1.3	1.3	7.7	0.32	1.9	1.0	0.031	0.018
	39.992	12.014	11.153	9.525	1.3	1.3	18 400	15 700	9 500	13 000	**A 6062**	**A 6157**	22	20.5	34	37	1.3	1.3	10.3	0.53	1.1	0.63	0.044	0.031
	41.275	14.288	14.681	11.112	1.3	2.0	26 200	19 900	10 000	13 000	**03062**	**03162**	21.5	20	34	37.5	1.3	2	9.1	0.31	1.9	1.1	0.061	0.035
	42.862	14.288	14.288	9.525	1.5	1.5	21 300	17 200	8 500	12 000	**11590**	**11520**	24.5	22.5	34.5	39.5	1.5	1.5	13.0	0.70	0.85	0.47	0.061	0.040
	42.862	16.670	16.670	13.495	1.5	1.5	33 000	26 300	9 500	13 000	**17580**	**17520**	23	21	36.5	39	1.5	1.5	10.6	0.33	1.8	1.0	0.075	0.048
	44.450	15.494	14.381	11.430	1.5	1.5	29 300	23 900	8 500	11 000	**05062**	**05175**	23.5	21	38	42	1.5	1.5	11.2	0.36	1.7	0.93	0.081	0.039
	49.225	19.845	21.539	14.288	0.8	1.3	46 000	37 000	8 500	11 000	**09062**	**09195**	22	21.5	42	44.5	0.8	1.3	10.7	0.27	2.3	1.2	0.139	0.065
16.000	47.000	21.000	21.000	16.000	1.0	2.0	43 000	36 500	9 000	12 000	***HM 81649**	****HM 81610**	27.5	23	37.5	43	1	2	14.9	0.55	1.1	0.60	0.115	0.082
16.993	39.992	12.014	11.153	9.525	0.8	1.3	18 400	15 700	9 500	13 000	**A 6067**	**A 6157**	22	21	34	37	0.8	1.3	10.3	0.53	1.1	0.63	0.042	0.031
17.455	36.525	11.112	11.112	7.938	1.5	1.5	14 300	11 000	10 000	14 000	**A 5069**	**A 5144**	23.5	21.5	30	33.5	1.5	1.5	8.9	0.49	1.2	0.68	0.030	0.020
17.462	39.878	13.843	14.605	10.668	1.3	1.3	27 700	22 500	10 000	13 000	**† LM 11749**	**† LM 11710**	23	21.5	34	37	1.3	1.3	8.7	0.29	2.1	1.2	0.055	0.028
	47.000	14.381	14.381	11.112	0.8	1.3	29 300	23 900	8 500	11 000	**05068**	**05185**	23	22.5	40.5	42.5	0.8	1.3	10.1	0.36	1.7	0.93	0.082	0.047
19.050	39.992	12.014	11.153	9.525	1.0	1.3	18 400	15 700	9 500	13 000	**A 6075**	**A 6157**	24	23	34	37	1	1.3	10.3	0.53	1.1	0.63	0.037	0.031
	45.237	15.494	16.637	12.065	1.3	1.3	35 000	28 900	9 000	12 000	**† LM 11949**	**† LM 11910**	25	23.5	39.5	41.5	1.3	1.3	9.5	0.30	2.0	1.1	0.081	0.044
	47.000	14.381	14.381	11.112	1.3	1.3	29 300	23 900	8 500	11 000	**05075**	**05185**	25	23.5	40.5	42.5	1.3	1.3	10.1	0.36	1.7	0.93	0.077	0.047
	49.225	18.034	19.050	14.288	1.3	1.3	46 000	37 000	8 500	11 000	**09067**	**09195**	25.5	24	42	44.5	1.3	1.3	10.7	0.27	2.3	1.2	0.115	0.065
	49.225	19.845	21.539	14.288	1.2	1.3	46 000	37 000	8 500	11 000	**09078**	**09195**	25.5	24	42	44.5	1.2	1.3	10.7	0.27	2.3	1.2	0.124	0.065
	49.225	21.209	19.050	17.462	1.3	1.5	46 000	37 000	8 500	11 000	**09067**	**09196**	25.5	24	41.5	44.5	1.3	1.5	13.8	0.27	2.3	1.2	0.115	0.085
	49.225	23.020	21.539	17.462	C1.5	3.5	46 000	37 000	8 500	11 000	**09074**	**09194**	26	24	39	44.5	1.5	3.5	13.8	0.27	2.3	1.2	0.124	0.082
	53.975	22.225	21.839	15.875	1.5	2.3	50 000	39 500	7 500	10 000	**21075**	**21212**	31.5	26	43	50	1.5	2.3	16.3	0.59	1.0	0.56	0.156	0.097
19.990	47.000	14.381	14.381	11.112	1.5	1.3	29 300	23 900	8 500	11 000	**05079**	**05185**	26.5	24	40.5	42.5	1.5	1.3	10.1	0.36	1.7	0.93	0.073	0.047
20.000	51.994	15.011	14.260	12.700	1.5	1.3	32 000	27 900	7 500	10 000	**07079**	**07204**	27.5	27	45	48	1.5	1.3	12.1	0.40	1.5	0.82	0.105	0.061
20.625	49.225	23.020	21.539	17.462	1.5	1.5	46 000	37 000	8 500	11 000	**09081**	**09196**	27.5	25.5	41.5	44.5	1.5	1.5	13.8	0.27	2.3	1.2	0.115	0.085
20.638	49.225	19.845	19.845	15.875	1.5	1.5	44 000	37 000	8 000	11 000	**12580**	**12520**	28.5	26	42.5	45.5	1.5	1.5	12.9	0.32	1.9	1.0	0.114	0.067
21.430	50.005	17.526	18.288	13.970	1.3	1.3	47 500	40 000	8 000	11 000	**† M 12649**	**† M 12610**	27.5	25.5	44	46	1.3	1.3	10.9	0.28	2.2	1.2	0.115	0.059
22.000	45.237	15.494	16.637	12.065	1.3	1.3	36 000	33 500	8 500	11 000	***† LM 12749**	**† LM 12710**	27.5	26	39.5	42.5	1.3	1.3	10.0	0.31	2.0	1.1	0.078	0.038
	45.975	15.494	16.637	12.065	1.3	1.3	36 000	33 500	8 500	11 000	***† LM 12749**	**† LM 12711**	27.5	26	40	42.5	1.3	1.3	10.0	0.31	2.0	1.1	0.078	0.043
22.225	50.005	13.495	14.260	9.525	1.3	1.0	32 000	27 900	7 500	10 000	**07087**	**07196**	28.5	27	44.5	47	1.3	1	10.6	0.40	1.5	0.82	0.097	0.035
	50.005	17.526	18.288	13.970	1.3	1.3	47 500	40 000	8 000	11 000	**† M 12648**	**† M 12610**	28.5	26.5	44	46	1.3	1.3	10.9	0.28	2.2	1.2	0.111	0.059
	52.388	19.368	20.168	14.288	1.5	1.5	50 000	43 000	7 500	10 000	**1380**	**1328**	29.5	27	45	48.5	1.5	1.5	11.3	0.29	2.1	1.1	0.137	0.067
	53.975	19.368	20.168	14.288	1.5	1.5	50 000	43 000	7 500	10 000	**1380**	**1329**	29.5	27	46	49	1.5	1.5	11.3	0.29	2.1	1.1	0.137	0.082
	56.896	19.368	19.837	15.875	1.3	1.3	47 000	40 500	7 100	9 500	**1755**	**1729**	29	27.5	49	51	1.3	1.3	12.2	0.31	2.0	1.1	0.152	0.102
	57.150	22.225	22.225	17.462	0.8	1.5	59 000	50 000	7 100	9 500	**1280**	**1220**	29.5	29	49	52	0.8	1.5	15.1	0.35	1.7	0.95	0.183	0.106

Notes

* The maximum bore diameter is listed and its tolerance is negative (see Table 7.4.1 on Page A136).

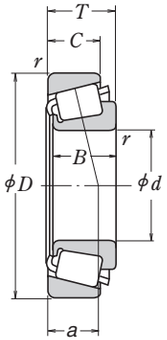
** The maximum outside diameter is listed and its tolerance is negative (see Table 7.4.2 on Pages A136 and A137).

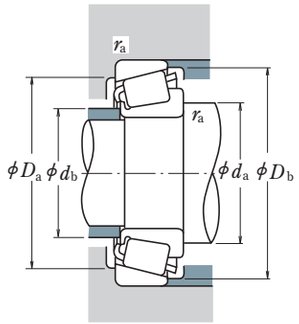
† The tolerances for the bore diameter and overall bearing width differ from the standard (see Table 5 on Page C185).

*† The tolerance for the bore diameter is 0 to −20 μm, and the tolerance for overall bearing width is +356 to 0 μm.

■SINGLE-ROW TAPERED ROLLER BEARINGS (INCH SERIES)

Bore Diameter 22.606 – 28.575 mm





Dynamic Equivalent Load

$P = XF_r + YF_a$

$F_a/F_r \leqq e$		$F_a/F_r > e$	
X	Y	X	Y
1	0	0.4	Y_1

Static Equivalent Load

$P_0 = 0.5F_r + Y_0F_a$

When $F_r > 0.5F_r + Y_0F_a$, use $P_0 = F_r$

The values of e, Y_1, and Y_0 are given in the table below.

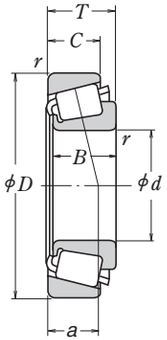
Boundary Dimensions (mm)							Basic Load Ratings (N)		Limiting Speeds (min^{-1})		Bearing Designations		Abutment and Fillet Dimensions (mm)						Eff. Load Center (mm)	Constant	Axial Load Factors		Mass (kg)	
d	D	T	B	C	Ring: Inner r min.	Ring: Outer r min.	C_r	C_{0r}	Grease	Oil	INNER RING	OUTER RING	d_a	d_b	D_a	D_b	Cone r_a max.	Cup r_a max.	a	e	Y_1	Y_0	approx. Inner Ring	approx. Outer Ring
22.606	47.000	15.500	15.500	12.000	1.5	1.0	32 500	30 000	8 000	11 000	**LM 72849**	**LM 72810**	29	27	40.5	44.5	1.5	1	12.2	0.47	1.3	0.70	0.086	0.046
23.812	50.292	14.224	14.732	10.668	1.5	1.3	34 000	32 000	7 100	10 000	**† L 44640**	**† L 44610**	30.5	28.5	44.5	47	1.5	1.3	10.9	0.37	1.6	0.88	0.097	0.039
	56.896	19.368	19.837	15.875	0.8	1.3	47 000	40 500	7 100	9 500	**1779**	**1729**	29.5	28.5	49	51	0.8	1.3	12.2	0.31	2.0	1.1	0.143	0.102
24.000	55.000	25.000	25.000	21.000	2.0	2.0	61 000	55 000	7 100	9 500	**▲JHM 33449**	**▲JHM 33410**	35	30	47	52	2	2	15.8	0.35	1.7	0.93	0.181	0.107
24.981	51.994	15.011	14.260	12.700	1.5	1.3	32 000	27 900	7 500	10 000	**07098**	**07204**	31	29	45	48	1.5	1.3	12.1	0.40	1.5	0.82	0.085	0.061
	52.001	15.011	14.260	12.700	1.5	2.0	32 000	27 900	7 500	10 000	**07098**	**07205**	31	29	44.5	48	1.5	2	12.1	0.40	1.5	0.82	0.085	0.061
	62.000	16.002	16.566	14.288	1.5	1.5	45 500	39 500	6 300	8 500	**17098**	**17244**	33	30.5	54	57	1.5	1.5	12.8	0.38	1.6	0.86	0.165	0.091
25.000	50.005	13.495	14.260	9.525	1.5	1.0	32 000	27 900	7 500	10 000	**07097**	**07196**	31	29	44.5	47	1.5	1	10.6	0.40	1.5	0.82	0.085	0.035
	51.994	15.011	14.260	12.700	1.5	1.3	32 000	27 900	7 500	10 000	**07097**	**07204**	31	29	45	48	1.5	1.3	12.1	0.40	1.5	0.82	0.085	0.061
25.400	50.005	13.495	14.260	9.525	3.3	1.0	32 000	27 900	7 500	10 000	**07100 SA**	**07196**	35	29.5	44.5	47	3.3	1	10.6	0.40	1.5	0.82	0.082	0.035
	50.005	13.495	14.260	9.525	1.0	1.0	32 000	27 900	7 500	10 000	**07100**	**07196**	30.5	29.5	44.5	47	1	1	10.6	0.40	1.5	0.82	0.084	0.035
	50.292	14.224	14.732	10.668	1.3	1.3	34 000	32 000	7 100	10 000	**† L 44643**	**† L 44610**	31.5	29.5	44.5	47	1.3	1.3	10.9	0.37	1.6	0.88	0.090	0.039
	57.150	17.462	17.462	13.495	1.3	1.5	49 000	45 500	6 700	9 000	**15578**	**15520**	32.5	30.5	51	53	1.3	1.5	12.4	0.35	1.7	0.95	0.151	0.070
	57.150	19.431	19.431	14.732	1.5	1.5	52 000	49 000	6 700	9 000	**M 84548**	**M 84510**	36	33	48.5	54	1.5	1.5	16.1	0.55	1.1	0.60	0.156	0.089
	59.530	23.368	23.114	18.288	0.8	1.5	61 500	58 000	6 300	9 000	**M 84249**	**M 84210**	36	32.5	49.5	56	0.8	1.5	18.3	0.55	1.1	0.60	0.194	0.13
	62.000	19.050	20.638	14.288	0.8	1.3	56 500	53 000	6 000	8 000	**15101**	**15245**	32.5	31.5	55	58	0.8	1.3	13.3	0.35	1.7	0.94	0.222	0.081
	63.500	20.638	20.638	15.875	3.5	1.5	56 500	53 000	6 000	8 000	**15100**	**15250 X**	38	31.5	55	59	3.5	1.5	14.9	0.35	1.7	0.94	0.22	0.113
	64.292	21.433	21.433	16.670	1.5	1.5	63 000	64 500	5 600	8 000	**M 86643**	**M 86610**	38	36.5	54	61	1.5	1.5	17.7	0.55	1.1	0.60	0.246	0.128
	65.088	22.225	21.463	15.875	1.5	1.5	55 500	47 500	5 600	8 000	**23100**	**23256**	39	34.5	53	61	1.5	1.5	20.0	0.73	0.82	0.45	0.214	0.142
	68.262	22.225	22.225	17.462	0.8	1.5	68 000	64 000	5 600	7 500	**02473**	**02420**	34.5	33.5	59	63	0.8	1.5	16.9	0.42	1.4	0.79	0.28	0.152
	72.233	25.400	25.400	19.842	0.8	2.3	78 000	83 500	5 000	7 100	**HM 88630**	**HM 88610**	39.5	39.5	60	69	0.8	2.3	20.7	0.55	1.1	0.60	0.398	0.188
	72.626	24.608	24.257	17.462	2.3	1.5	73 500	58 000	5 600	7 500	**41100**	**41286**	41	36.5	61	68	2.3	1.5	20.7	0.60	1.0	0.55	0.32	0.177
26.988	50.292	14.224	14.732	10.668	3.5	1.3	34 000	32 000	7 100	10 000	**† L 44649**	**† L 44610**	37.5	31	44.5	47	3.5	1.3	10.9	0.37	1.6	0.88	0.081	0.039
	57.150	19.845	19.355	15.875	3.3	1.5	49 500	44 500	6 700	9 000	**1997 X**	**1922**	37.5	31.5	51	53.5	3.3	1.5	13.9	0.33	1.8	1.0	0.152	0.077
	60.325	19.842	17.462	15.875	3.5	1.5	49 000	45 500	6 700	9 000	**15580**	**15523**	38.5	32	51	54	3.5	1.5	14.7	0.35	1.7	0.95	0.141	0.123
	62.000	19.050	20.638	14.288	0.8	1.3	56 500	53 000	6 000	8 000	**15106**	**15245**	33.5	33	55	58	0.8	1.3	13.3	0.35	1.7	0.94	0.211	0.081
28.575	57.150	19.845	19.355	15.875	3.5	1.5	49 500	44 500	6 700	9 000	**1988**	**1922**	39.5	33.5	51	53.5	3.5	1.5	13.9	0.33	1.8	1.0	0.141	0.077
	59.131	15.875	16.764	11.811	spec.	1.3	42 500	41 500	6 300	8 500	**† LM 67043**	**† LM 67010**	40	33.5	52	56	3.5	1.3	12.6	0.41	1.5	0.80	0.147	0.062
	62.000	19.050	20.638	14.288	3.5	1.3	56 500	53 000	6 000	8 000	**15112**	**15245**	40	34	55	58	3.5	1.3	13.3	0.35	1.7	0.94	0.199	0.081
	62.000	19.050	20.638	14.288	0.8	1.3	56 500	53 000	6 000	8 000	**15113**	**15245**	34.5	34	55	58	0.8	1.3	13.3	0.35	1.7	0.94	0.20	0.081
	64.292	21.433	21.433	16.670	1.5	1.5	63 000	64 500	5 600	8 000	**M 86647**	**M 86610**	40	38	54	61	1.5	1.5	17.7	0.55	1.1	0.60	0.223	0.128
	68.262	22.225	22.225	17.462	0.8	1.5	68 000	64 000	5 600	7 500	**02474**	**02420**	36.5	36	59	63	0.8	1.5	16.9	0.42	1.4	0.79	0.257	0.152
	72.626	24.608	24.257	17.462	4.8	1.5	73 500	58 000	5 600	7 500	**41125**	**41286**	48	36.5	61	68	4.8	1.5	20.7	0.60	1.0	0.55	0.292	0.177
	72.626	24.608	24.257	17.462	1.5	1.5	73 500	58 000	5 600	7 500	**41126**	**41286**	41.5	36.5	61	68	1.5	1.5	20.7	0.60	1.0	0.55	0.295	0.177
	73.025	22.225	22.225	17.462	0.8	3.3	67 000	64 500	5 300	7 100	**02872**	**02820**	37.5	37	62	68	0.8	3.3	18.3	0.45	1.3	0.73	0.321	0.16

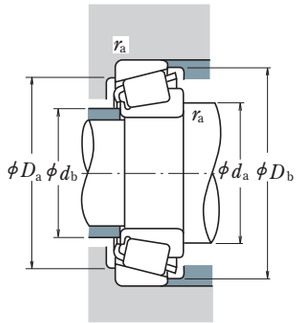
Notes † The tolerances for the bore diameter and overall bearing width differ from the standard (see Table 5 on Page C185).

▲ Tolerances are listed in Tables 2, 3, and 4 on Pages C184 and C185.

■SINGLE-ROW TAPERED ROLLER BEARINGS (INCH SERIES)

Bore Diameter 29.000 – 32.000 mm





Dynamic Equivalent Load

$P = XF_r + YF_a$

$F_a/F_r \leqq e$		$F_a/F_r > e$	
X	Y	X	Y
1	0	0.4	Y_1

Static Equivalent Load

$P_0 = 0.5F_r + Y_0F_a$

When $F_r > 0.5F_r + Y_0F_a$, use $P_0 = F_r$

The values of e, Y_1, and Y_0 are given in the table below.

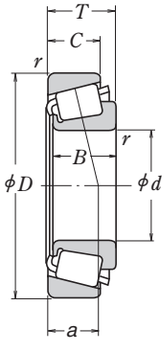
Boundary Dimensions (mm)					Ring:		Basic Load Ratings (N)		Limiting Speeds (min^{-1})		Bearing Designations		Abutment and Fillet Dimensions (mm)				Ring:		Eff. Load Center (mm)	Constant	Axial Load Factors		Mass (kg)	
d	D	T	B	C	Inner r min.	Outer r min.	C_r	C_{0r}	Grease	Oil	INNER RING	OUTER RING	d_a	d_b	D_a	D_b	Inner r_a max.	Outer r_a max.	a	e	Y_1	Y_0	approx. Inner Ring	approx. Outer Ring
29.000	50.292	14.224	14.732	10.668	3.5	1.3	33 000	34 000	7 100	9 500	**† L 45449**	**† L 45410**	39.5	33	44.5	48	3.5	1.3	10.8	0.37	1.6	0.89	0.079	0.036
29.367	66.421	23.812	25.433	19.050	3.5	1.3	80 000	73 000	6 000	8 000	**2690**	**2631**	41	35	58	60	3.5	1.3	14.3	0.25	2.4	1.3	0.242	0.165
30.000	62.000	16.002	16.566	14.288	1.5	1.5	45 500	39 500	6 300	8 500	**∗ 17118**	**17244**	37	34.5	54	57	1.5	1.5	12.8	0.38	1.6	0.86	0.136	0.091
	62.000	19.050	20.638	14.288	1.3	1.3	56 500	53 000	6 000	8 000	**∗ 15117**	**15245**	36.5	35	55	58	1.3	1.3	13.3	0.35	1.7	0.94	0.189	0.081
	63.500	20.638	20.638	15.875	1.3	1.3	56 500	53 000	6 000	8 000	**∗ 15117**	**15250**	36.5	35	56	59	1.3	1.3	14.9	0.35	1.7	0.94	0.189	0.113
	72.000	19.000	18.923	15.875	1.5	1.5	64 000	56 000	5 600	7 500	**∗ 26118**	**26283**	38	36	62	65	1.5	1.5	14.8	0.36	1.7	0.92	0.225	0.163
30.112	62.000	19.050	20.638	14.288	0.8	1.3	56 500	53 000	6 000	8 000	**15116**	**15245**	36	35.5	55	58	0.8	1.3	13.3	0.35	1.7	0.94	0.189	0.081
30.162	58.738	14.684	15.080	10.716	3.5	1.0	35 500	33 500	6 000	8 000	**08118**	**08231**	41.5	35	52	55	3.5	1	13.3	0.47	1.3	0.70	0.12	0.057
	64.292	21.433	21.433	16.670	1.5	1.5	63 000	64 500	5 600	8 000	**M 86649**	**M 86610**	41	38	54	61	1.5	1.5	17.7	0.55	1.1	0.60	0.211	0.128
	68.262	22.225	22.225	17.462	2.3	1.5	68 000	70 500	5 300	7 500	**M 88043**	**M 88010**	43.5	39.5	58	65	2.3	1.5	19.1	0.55	1.1	0.60	0.263	0.146
	69.850	23.812	25.357	19.050	2.3	1.3	87 000	84 000	5 600	7 500	**2558**	**2523**	40	36.5	61	64	2.3	1.3	14.5	0.27	2.2	1.2	0.297	0.169
	69.850	23.812	25.357	19.050	0.8	1.3	87 000	84 000	5 600	7 500	**2559**	**2523**	37	36.5	61	64	0.8	1.3	14.5	0.27	2.2	1.2	0.298	0.169
	76.200	24.608	24.074	16.670	1.5	C3.3	83 000	69 500	5 000	6 700	**43118**	**43300**	45	42	64	73	1.5	3.3	22.9	0.67	0.90	0.49	0.383	0.146
30.213	62.000	19.050	20.638	14.288	3.5	1.3	56 500	53 000	6 000	8 000	**15118**	**15245**	41.5	35.5	55	58	3.5	1.3	13.3	0.35	1.7	0.94	0.186	0.081
	62.000	19.050	20.638	14.288	0.8	1.3	56 500	53 000	6 000	8 000	**15120**	**15245**	36	35.5	55	58	0.8	1.3	13.3	0.35	1.7	0.94	0.188	0.081
	62.000	19.050	20.638	14.288	1.5	1.3	56 500	53 000	6 000	8 000	**15119**	**15245**	37.5	35.5	55	58	1.5	1.3	13.3	0.35	1.7	0.94	0.188	0.081
30.955	64.292	21.433	21.433	16.670	1.5	1.5	63 000	64 500	5 600	8 000	**M 86648 A**	**M 86610**	42	38	54	61	1.5	1.5	17.7	0.55	1.1	0.60	0.205	0.128
31.750	58.738	14.684	15.080	10.716	1.0	1.0	35 500	33 500	6 000	8 000	**08125**	**08231**	37.5	36	52	55	1	1	13.3	0.47	1.3	0.70	0.113	0.057
	59.131	15.875	16.764	11.811	spec.	1.3	42 500	41 500	6 300	8 500	**† LM 67048**	**† LM 67010**	42.5	36	52	56	3.5	1.3	12.6	0.41	1.5	0.80	0.127	0.062
	62.000	18.161	19.050	14.288	spec.	1.3	56 500	53 000	6 000	8 000	**15123**	**15245**	42.5	36.5	55	58	3.5	1.3	13.3	0.35	1.7	0.94	0.165	0.081
	62.000	19.050	20.638	14.288	0.8	1.3	56 500	53 000	6 000	8 000	**15126**	**15245**	37	36.5	55	58	0.8	1.3	13.3	0.35	1.7	0.94	0.176	0.081
	62.000	19.050	20.638	14.288	3.5	1.3	56 500	53 000	6 000	8 000	**15125**	**15245**	42.5	36.5	55	58	3.5	1.3	13.3	0.35	1.7	0.94	0.174	0.081
	63.500	20.638	20.638	15.875	0.8	1.3	56 500	53 000	6 000	8 000	**15126**	**15250**	37	36.5	56	59	0.8	1.3	14.9	0.35	1.7	0.94	0.176	0.113
	68.262	22.225	22.225	17.462	3.5	1.5	68 000	64 000	5 600	7 500	**02475**	**02420**	44.5	38.5	59	63	3.5	1.5	16.9	0.42	1.4	0.79	0.229	0.152
	68.262	22.225	22.225	17.462	1.5	1.5	68 000	70 500	5 300	7 500	**M 88046**	**M 88010**	43	40.5	58	65	1.5	1.5	19.1	0.55	1.1	0.60	0.25	0.146
	69.012	19.845	19.583	15.875	3.5	1.3	58 000	56 000	5 600	7 500	**14125 A**	**14276**	44	37.5	60	63	3.5	1.3	15.3	0.38	1.6	0.86	0.219	0.135
	69.012	26.982	26.721	15.875	4.3	3.3	58 000	56 000	5 600	7 500	**14123 A**	**14274**	41.5	37.5	59	63	4.3	3.3	15.1	0.38	1.6	0.87	0.289	0.132
	69.850	23.812	25.357	19.050	0.8	1.3	87 000	84 000	5 600	7 500	**2580**	**2523**	38.5	37.5	61	64	0.8	1.3	14.5	0.27	2.2	1.2	0.282	0.169
	69.850	23.812	25.357	19.050	3.5	1.3	87 000	84 000	5 600	7 500	**2582**	**2523**	44	37.5	61	64	3.5	1.3	14.5	0.27	2.2	1.2	0.28	0.169
	72.626	30.162	29.997	23.812	0.8	3.3	97 500	90 000	5 300	7 500	**3188**	**3120**	39.5	39.5	61	67	0.8	3.3	19.6	0.33	1.8	0.99	0.368	0.225
	73.025	29.370	27.783	23.020	1.3	3.3	91 000	100 000	5 000	7 100	**HM 88542**	**HM 88510**	45.5	42.5	59	70	1.3	3.3	23.5	0.55	1.1	0.60	0.379	0.242
	80.000	21.000	22.403	17.826	0.8	1.3	84 000	75 500	4 500	6 300	**346**	**332**	40	39.5	73	75	0.8	1.3	14.6	0.27	2.2	1.2	0.419	0.146
32.000	72.233	25.400	25.400	19.842	3.3	2.3	78 000	83 500	5 000	7 100	**∗HM 88638**	**HM 88610**	48.5	42.5	60	69	3.3	2.3	20.7	0.55	1.1	0.60	0.337	0.188

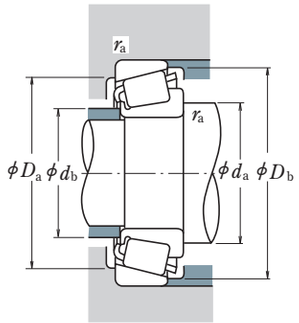
Notes ∗ The maximum bore diameter is listed and its tolerance is negative (see Table 7.4.1 on Page A136).

† The tolerances for the bore diameter and overall bearing width differ from the standard (see Table 5 on Page C185).

SINGLE-ROW TAPERED ROLLER BEARINGS (INCH SERIES)

Bore Diameter 33.338 – 35.000 mm





Dynamic Equivalent Load

$P = XF_r + YF_a$

$F_a/F_r \leqq e$		$F_a/F_r > e$	
X	Y	X	Y
1	0	0.4	Y_1

Static Equivalent Load

$P_0 = 0.5F_r + Y_0F_a$

When $F_r > 0.5F_r + Y_0F_a$, use $P_0 = F_r$

The values of e, Y_1, and Y_0 are given in the table below.

Boundary Dimensions (mm)							Basic Load Ratings (N)		Limiting Speeds (min^{-1})		Bearing Designations		Abutment and Fillet Dimensions (mm)						Eff. Load Center (mm)	Constant	Axial Load Factors		Mass (kg)	
d	D	T	B	C	Ring: Inner r min.	Ring: Outer r min.	C_r	C_{0r}	Grease	Oil	INNER RING	OUTER RING	d_a	d_b	D_a	D_b	Cone r_a max.	Cup r_a max.	a	e	Y_1	Y_0	approx. Inner Ring	approx. Outer Ring
33.338	66.675	20.638	20.638	15.875	3.5	1.5	56 500	53 500	5 600	7 500	**1680**	**1620**	44.5	38.5	58	61	3.5	1.5	15.2	0.37	1.6	0.89	0.196	0.121
	68.262	22.225	22.225	17.462	0.8	1.5	68 000	70 500	5 300	7 500	**M 88048**	**M 88010**	42.5	41	58	65	0.8	1.5	19.0	0.55	1.1	0.60	0.236	0.146
	69.012	19.845	19.583	15.875	3.5	3.3	58 000	56 000	5 600	7 500	**14130**	**14274**	45	38.5	59	63	3.5	3.3	15.3	0.38	1.6	0.86	0.207	0.132
	69.012	19.845	19.583	15.875	0.8	1.3	58 000	56 000	5 600	7 500	**14131**	**14276**	39.5	38.5	60	63	0.8	1.3	15.3	0.38	1.6	0.86	0.209	0.135
	69.850	23.812	25.357	19.050	3.5	1.3	87 000	84 000	5 600	7 500	**2585**	**2523**	45	39	61	64	3.5	1.3	14.5	0.27	2.2	1.2	0.263	0.169
	72.000	19.000	18.923	15.875	3.5	1.5	64 000	56 000	5 600	7 500	**26131**	**26283**	44.5	38.5	62	65	3.5	1.5	14.7	0.36	1.7	0.92	0.20	0.163
	72.626	30.162	29.997	23.812	0.8	3.3	97 500	90 000	5 300	7 500	**3197**	**3120**	41.5	40.5	61	67	0.8	3.3	19.6	0.33	1.8	0.99	0.348	0.225
	73.025	29.370	27.783	23.020	0.8	3.3	91 000	100 000	5 000	7 100	**HM 88547**	**HM 88510**	45.5	42.5	59	70	0.8	3.3	23.5	0.55	1.1	0.60	0.362	0.242
	76.200	29.370	28.575	23.020	3.8	0.8	96 500	106 000	4 800	6 700	**HM 89444**	**HM 89411**	53	44.5	65	73	3.8	0.8	23.6	0.55	1.1	0.60	0.419	0.261
	76.200	29.370	28.575	23.020	0.8	3.3	96 500	106 000	4 800	6 700	**HM 89443**	**HM 89410**	46.5	44.5	62	73	0.8	3.3	23.6	0.55	1.1	0.60	0.421	0.257
	79.375	25.400	24.074	17.462	3.5	1.5	83 000	69 500	5 000	6 700	**43131**	**43312**	51	42	67	74	3.5	1.5	23.7	0.67	0.90	0.49	0.348	0.22
34.925	65.088	18.034	18.288	13.970	spec.	1.3	58 500	57 500	5 600	7 500	**† LM 48548**	**† LM 48510**	46	40	58	61	3.5	1.3	14.1	0.38	1.6	0.88	0.172	0.087
	65.088	20.320	18.288	16.256	spec.	1.3	58 500	57 500	5 600	7 500	**† LM 48548**	**† LM 48511**	46	40	58	61	3.5	1.3	16.4	0.38	1.6	0.88	0.172	0.108
	66.675	20.638	20.638	16.670	3.5	2.3	65 500	62 500	5 600	7 500	**M 38549**	**M 38510**	46.5	40	58	62	3.5	2.3	15.2	0.35	1.7	0.94	0.194	0.112
	69.012	19.845	19.583	15.875	3.5	1.3	58 000	56 000	5 600	7 500	**14138 A**	**14276**	46	40	60	63	3.5	1.3	15.3	0.38	1.6	0.86	0.194	0.135
	69.012	19.845	19.583	15.875	1.5	1.3	58 000	56 000	5 600	7 500	**14137 A**	**14276**	42	40	60	63	1.5	1.3	15.1	0.38	1.6	0.86	0.196	0.135
	72.233	25.400	25.400	19.842	2.3	2.3	78 000	83 500	5 000	7 100	**HM 88649**	**HM 88610**	48.5	42.5	60	69	2.3	2.3	20.7	0.55	1.1	0.60	0.307	0.188
	73.025	22.225	22.225	17.462	0.8	3.3	67 000	64 500	5 300	7 100	**02878**	**02820**	42.5	42	62	68	0.8	3.3	18.3	0.45	1.3	0.73	0.266	0.16
	73.025	22.225	23.812	17.462	3.5	3.3	78 000	77 000	5 300	7 100	**2877**	**2820**	47	41.5	63	68	3.5	3.3	16.1	0.37	1.6	0.90	0.291	0.15
	73.025	23.812	24.608	19.050	1.5	0.8	87 500	86 000	5 300	7 100	**25877**	**25821**	43	40.5	65	68	1.5	0.8	15.7	0.29	2.1	1.1	0.306	0.167
	73.025	23.812	24.608	19.050	3.5	2.3	87 500	86 000	5 300	7 100	**25878**	**25820**	47	40.5	64	68	3.5	2.3	15.7	0.29	2.1	1.1	0.304	0.165
	76.200	29.370	28.575	23.020	0.8	0.8	96 500	106 000	4 800	6 700	**HM 89446 A**	**HM 89411**	47.5	44.5	65	73	0.8	0.8	23.6	0.55	1.1	0.60	0.403	0.261
	76.200	29.370	28.575	23.020	3.5	0.8	96 500	106 000	4 800	6 700	**HM 89446**	**HM 89411**	53	44.5	65	73	3.5	0.8	23.6	0.55	1.1	0.60	0.40	0.261
	76.200	29.370	28.575	23.020	3.5	3.3	96 500	106 000	4 800	6 700	**HM 89446**	**HM 89410**	53	44.5	62	73	3.5	3.3	23.6	0.55	1.1	0.60	0.40	0.257
	76.200	29.370	28.575	23.812	1.5	3.3	99 000	96 500	5 000	6 700	**31594**	**31520**	46	43.5	64	72	1.5	3.3	21.6	0.40	1.5	0.82	0.404	0.235
	79.375	29.370	29.771	23.812	3.5	3.3	108 000	106 000	4 800	6 700	**3478**	**3420**	50	43.5	67	74	3.5	3.3	20.0	0.37	1.6	0.90	0.448	0.259
34.976	68.262	15.875	16.520	11.908	1.5	1.5	55 500	53 500	5 300	7 100	**19138**	**19268**	42.5	40.5	61	65	1.5	1.5	14.5	0.44	1.4	0.74	0.196	0.073
	72.085	22.385	19.583	18.415	1.3	2.3	58 000	56 000	5 600	7 500	**14139**	**14283**	41.5	40	60	65	1.3	2.3	17.7	0.38	1.6	0.87	0.198	0.21
	80.000	21.006	20.940	15.875	1.5	1.5	69 500	64 500	5 000	6 700	**28138**	**28315**	43.5	41	69	73	1.5	1.5	16.0	0.40	1.5	0.82	0.308	0.199
35.000	59.131	15.875	16.764	11.938	spec.	1.3	43 000	47 000	6 000	8 000	***† L 68149**	**† L 68110**	45.5	39	52	56	3.5	1.3	13.2	0.42	1.4	0.79	0.117	0.056
	59.975	15.875	16.764	11.938	spec.	1.3	43 000	47 000	6 000	8 000	***† L 68149**	**† L 68111**	45.5	39	53	56	3.5	1.3	13.2	0.42	1.4	0.79	0.117	0.064
	62.000	16.700	17.000	13.600	spec.	1.0	47 000	50 000	5 600	8 000	*** LM 78349**	**** LM 78310**	46	40	55	59	3.5	1	14.4	0.44	1.4	0.74	0.137	0.074
	62.000	16.700	17.000	13.600	spec.	1.5	47 000	50 000	5 600	8 000	*** LM 78349**	**** LM 78310 A**	46	40	54	59	3.5	1.5	14.4	0.44	1.4	0.74	0.138	0.073
	65.987	20.638	20.638	16.670	3.5	2.3	65 500	62 500	5 600	7 500	**M 38547**	**M 38511**	46	39.5	59	61	3.5	2.3	15.2	0.35	1.7	0.94	0.193	0.103
	73.025	26.988	26.975	22.225	3.5	0.8	92 500	88 500	5 300	7 500	**23691**	**23621**	49	42	63	68	3.5	0.8	18.1	0.37	1.6	0.89	0.309	0.212

Notes

* The maximum bore diameter is listed and its tolerance is negative (see Table 7.4.1 on Page A136).

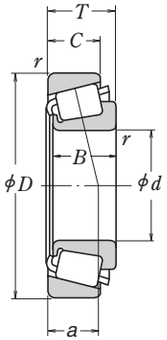
** The maximum outside diameter is listed and its tolerance is negative (see Table 7.4.2 on Pages A136 and A137).

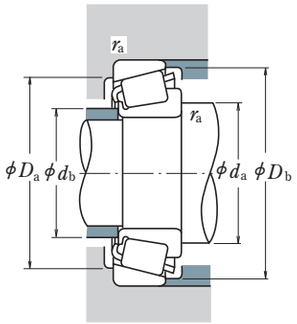
† The tolerances for the bore diameter and overall bearing width differ from the standard (see Table 5 on Page C185).

*† The tolerance for the bore diameter is 0 to −20 μm, and the tolerance for overall bearing width is +356 to 0 μm.

■SINGLE-ROW TAPERED ROLLER BEARINGS (INCH SERIES)

Bore Diameter 35.717 – 41.275 mm





Dynamic Equivalent Load

$P = XF_r + YF_a$

$F_a/F_r \leqq e$		$F_a/F_r > e$	
X	Y	X	Y
1	0	0.4	Y_1

Static Equivalent Load

$P_0 = 0.5F_r + Y_0F_a$

When $F_r > 0.5F_r + Y_0F_a$, use $P_0 = F_r$

The values of e, Y_1, and Y_0 are given in the table below.

Boundary Dimensions (mm)					Ring: Inner	Ring: Outer	Basic Load Ratings (N)		Limiting Speeds (min^{-1})		Bearing Designations		Abutment and Fillet Dimensions (mm)				Ring: Inner	Ring: Outer	Eff. Load Center (mm)	Constant	Axial Load Factors		Mass (kg)	
d	D	T	B	C	r min.		C_r	C_{0r}	Grease	Oil	INNER RING	OUTER RING	d_a	d_b	D_a	D_b	r_a max.		a	e	Y_1	Y_0	approx. Inner Ring	Outer Ring
35.717	72.233	25.400	25.400	19.842	3.5	2.3	78 000	83 500	5 000	7 100	**HM 88648**	**HM 88610**	52	43	60	69	3.5	2.3	20.7	0.55	1.1	0.60	0.298	0.188
36.487	73.025	23.812	24.608	19.050	1.5	0.8	87 500	86 000	5 300	7 100	**25880**	**25821**	44	42	65	68	1.5	0.8	15.7	0.29	2.1	1.1	0.291	0.167
36.512	76.200	29.370	28.575	23.020	3.5	3.3	96 500	106 000	4 800	6 700	**HM 89449**	**HM 89410**	54	44.5	62	73	3.5	3.3	23.6	0.55	1.1	0.60	0.38	0.257
	79.375	29.370	29.771	23.812	0.8	3.3	108 000	106 000	4 800	6 700	**3479**	**3420**	45.5	44.5	67	74	0.8	3.3	20.0	0.37	1.6	0.90	0.429	0.259
	88.501	25.400	23.698	17.462	2.3	1.5	89 500	81 000	4 000	5 600	**44143**	**44348**	54	50	75	84	2.3	1.5	27.9	0.78	0.77	0.42	0.502	0.245
	93.662	31.750	31.750	26.195	1.5	3.3	129 000	133 000	4 000	5 600	**46143**	**46368**	48.5	46.5	79	87	1.5	3.3	24.0	0.40	1.5	0.82	0.765	0.405
38.000	63.000	17.000	17.000	13.500	spec.	1.3	47 000	52 000	5 600	7 500	▲**JL 69349**	▲**JL 69310**	49	42.5	56	60	3.5	1.3	14.6	0.42	1.4	0.79	0.132	0.071
38.100	63.500	12.700	11.908	9.525	1.5	0.8	29 700	30 500	5 300	7 100	**13889**	**13830**	45	42.5	59	60	1.5	0.8	11.9	0.35	1.7	0.95	0.109	0.046
	65.088	18.034	18.288	13.970	2.3	1.3	52 000	55 000	5 300	7 500	**LM 29749**	**LM 29710**	46	42.5	59	62	2.3	1.3	13.7	0.33	1.8	0.99	0.16	0.079
	65.088	18.034	18.288	13.970	spec.	1.3	52 000	55 000	5 300	7 500	**LM 29748**	**LM 29710**	49	42.5	59	62	3.5	1.3	13.7	0.33	1.8	0.99	0.158	0.079
	65.088	19.812	18.288	15.748	2.3	1.3	52 000	55 000	5 300	7 500	**LM 29749**	**LM 29711**	46	42.5	58	62	2.3	1.3	15.5	0.33	1.8	0.99	0.16	0.094
	68.262	15.875	16.520	11.908	1.5	1.5	55 500	53 500	5 300	7 100	**19150**	**19268**	45	43	61	65	1.5	1.5	14.5	0.44	1.4	0.74	0.173	0.073
	69.012	19.050	19.050	15.083	2.0	2.3	60 000	61 000	5 300	7 100	**13687**	**13621**	46.5	43	61	65	2	2.3	15.8	0.40	1.5	0.82	0.193	0.104
	69.012	19.050	19.050	15.083	3.5	0.8	60 000	61 000	5 300	7 100	**13685**	**13620**	49.5	43	62	65	3.5	0.8	15.8	0.40	1.5	0.82	0.191	0.105
	72.238	20.638	20.638	15.875	3.5	1.3	60 000	59 500	5 300	7 100	**16150**	**16284**	49.5	43	63	67	3.5	1.3	16.0	0.40	1.5	0.82	0.212	0.146
	73.025	23.812	25.654	19.050	3.5	0.8	90 500	91 000	5 000	6 700	**2788**	**2735 X**	50	43.5	66	69	3.5	0.8	15.9	0.30	2.0	1.1	0.312	0.135
	76.200	23.812	25.654	19.050	3.5	3.3	90 500	91 000	5 000	6 700	**2788**	**2720**	50	43.5	66	70	3.5	3.3	15.9	0.30	2.0	1.1	0.312	0.187
	76.200	23.812	25.654	19.050	3.5	0.8	90 500	91 000	5 000	6 700	**2788**	**2729**	50	43.5	68	70	3.5	0.8	15.9	0.30	2.0	1.1	0.312	0.191
	79.375	29.370	29.771	23.812	3.5	3.3	108 000	106 000	4 800	6 700	**3490**	**3420**	52	45.5	67	74	3.5	3.3	20.0	0.37	1.6	0.90	0.404	0.259
	80.035	24.608	23.698	18.512	0.8	1.5	84 500	84 500	4 500	6 300	**27880**	**27820**	48	47	68	75	0.8	1.5	21.5	0.56	1.1	0.59	0.362	0.209
	82.550	29.370	28.575	23.020	0.8	3.3	107 000	117 000	4 500	6 000	**HM 801346**	**HM 801310**	51	49	68	78	0.8	3.3	24.2	0.55	1.1	0.60	0.483	0.282
	88.501	25.400	23.698	17.462	2.3	1.5	85 000	81 000	4 000	5 600	**44150**	**44348**	55	51	75	84	2.3	1.5	27.9	0.78	0.77	0.42	0.484	0.245
	88.501	26.988	29.083	22.225	3.5	1.5	118 000	109 000	4 500	6 000	**418**	**414**	51	44.5	77	80	3.5	1.5	17.1	0.26	2.3	1.3	0.50	0.329
	95.250	30.958	28.301	20.638	1.5	0.8	96 000	93 000	3 600	5 300	**53150**	**53375**	55	53	81	89	1.5	0.8	30.7	0.74	0.81	0.45	0.665	0.365
39.688	73.025	25.654	22.098	21.336	0.8	2.3	77 000	80 000	5 000	6 700	**M 201047**	**M 201011**	45.5	48	64	69	0.8	2.3	19.7	0.33	1.8	0.99	0.266	0.169
	76.200	23.812	25.654	19.050	3.5	3.3	90 500	91 000	5 000	6 700	**2789**	**2720**	52	45	66	70	3.5	3.3	15.9	0.30	2.0	1.1	0.292	0.187
	80.167	29.370	30.391	23.812	0.8	3.3	114 000	108 000	4 800	6 300	**3386**	**3320**	46.5	45.5	70	75	0.8	3.3	18.4	0.27	2.2	1.2	0.442	0.217
40.000	80.000	21.000	22.403	17.826	3.5	1.3	84 000	75 500	4 500	6 300	**344**	**332**	52	45.5	73	75	3.5	1.3	14.5	0.27	2.2	1.2	0.338	0.146
	80.000	21.000	22.403	17.826	0.8	1.3	84 000	75 500	4 500	6 300	**344 A**	**332**	46	45.5	73	75	0.8	1.3	14.5	0.27	2.2	1.2	0.339	0.146
	88.501	25.400	23.698	17.462	2.3	1.5	85 000	75 500	4 000	5 600	**44157**	**44348**	56	51	75	84	2.3	1.5	27.9	0.78	0.77	0.42	0.463	0.245
41.000	68.000	17.500	18.000	13.500	spec.	1.5	53 500	58 000	5 300	7 100	∗ **LM 300849**	∗∗ **LM 300811**	52	45	61	65	3.5	1.5	13.9	0.35	1.7	0.95	0.16	0.082
41.275	73.025	16.667	17.462	12.700	3.5	1.5	55 000	54 000	4 800	6 700	**18590**	**18520**	53	46	66	69	3.5	1.5	14.0	0.35	1.7	0.94	0.199	0.086
	73.431	19.558	19.812	14.732	3.5	0.8	67 000	67 000	4 800	6 700	**LM 501349**	**LM 501310**	53	46.5	67	70	3.5	0.8	16.3	0.40	1.5	0.83	0.226	0.108
	73.431	21.430	19.812	16.604	3.5	0.8	67 000	67 000	4 800	6 700	**LM 501349**	**LM 501314**	53	46.5	66	70	3.5	0.8	18.2	0.40	1.5	0.83	0.226	0.129

Notes

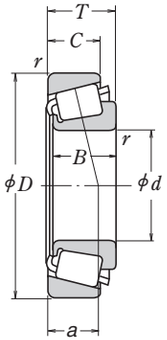
∗ The maximum bore diameter is listed and its tolerance is negative (see Table 7.4.1 on Page A136).

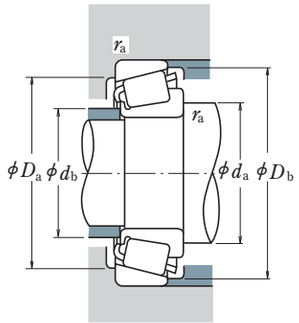
∗∗ The maximum outside diameter is listed and its tolerance is negative (see Table 7.4.2 on Pages A136 and A137).

▲ Tolerances are listed in Tables 2, 3, and 4 on Pages C184 and C185.

■SINGLE-ROW TAPERED ROLLER BEARINGS (INCH SERIES)

Bore Diameter 41.275 – 44.450 mm





Dynamic Equivalent Load

$P = XF_r + YF_a$

$F_a/F_r \leqq e$		$F_a/F_r > e$	
X	Y	X	Y
1	0	0.4	Y_1

Static Equivalent Load

$P_0 = 0.5F_r + Y_0F_a$

When $F_r > 0.5F_r + Y_0F_a$, use $P_0 = F_r$

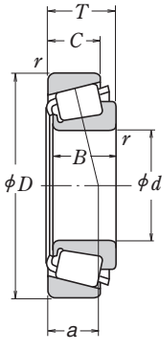
The values of e, Y_1, and Y_0 are given in the table below.

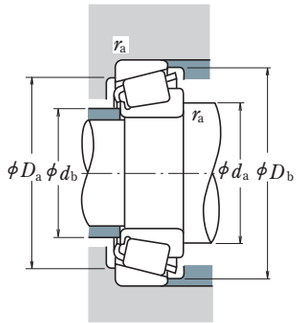
Boundary Dimensions (mm)					Ring: Inner / Outer r min.		Basic Load Ratings (N)		Limiting Speeds (min⁻¹)		Bearing Designations		Abutment and Fillet Dimensions (mm)				Ring: Inner / Outer ra max.		Eff. Load Center (mm)	Constant	Axial Load Factors		Mass (kg)	
d	D	T	B	C			Cr	C0r	Grease	Oil	INNER RING	OUTER RING	da	db	Da	Db			a	e	Y1	Y0	approx. Inner Ring	approx. Outer Ring
41.275	76.200	18.009	17.384	14.288	1.5	1.5	52 000	51 000	4 500	6 300	**11162**	**11300**	49	46.5	67	71	1.5	1.5	17.4	0.49	1.2	0.68	0.212	0.129
	76.200	22.225	23.020	17.462	3.5	0.8	81 000	82 000	4 800	6 700	**24780**	**24720**	53	47.5	68	72	3.5	0.8	17.0	0.39	1.5	0.84	0.279	0.15
	76.200	25.400	23.020	20.638	3.5	2.3	81 000	82 000	4 800	6 700	**24780**	**24721**	54	47	66	72	3.5	2.3	20.2	0.39	1.5	0.84	0.279	0.189
	79.375	23.812	25.400	19.050	3.5	0.8	95 000	98 500	4 800	6 300	**26882**	**26822**	54	47	71	74	3.5	0.8	16.4	0.32	1.9	1.0	0.349	0.186
	80.000	21.000	22.403	17.826	0.8	1.3	84 000	75 500	4 500	6 300	**336**	**332**	47	46	73	75	0.8	1.3	14.5	0.27	2.2	1.2	0.325	0.146
	80.000	21.000	22.403	17.826	3.5	1.3	84 000	75 500	4 500	6 300	**342**	**332**	53	46	73	75	3.5	1.3	14.5	0.27	2.2	1.2	0.323	0.146
	80.167	25.400	25.400	20.638	3.5	3.3	95 000	98 500	4 800	6 300	**26882**	**26820**	54	47	69	74	3.5	3.3	18.0	0.32	1.9	1.0	0.349	0.219
	82.550	26.543	25.654	20.193	3.5	3.3	96 500	102 000	4 300	6 000	**M 802048**	**M 802011**	57	51	70	79	3.5	3.3	22.9	0.55	1.1	0.60	0.406	0.23
	85.725	30.162	30.162	23.812	3.5	3.3	112 000	115 000	4 300	6 000	**3877**	**3820**	57	50	73	81	3.5	3.3	21.8	0.40	1.5	0.82	0.506	0.285
	87.312	30.162	30.886	23.812	0.8	3.3	118 000	120 000	4 300	6 000	**3576**	**3525**	49	48	75	81	0.8	3.3	19.5	0.31	2.0	1.1	0.532	0.304
	88.501	25.400	23.698	17.462	2.3	1.5	85 000	75 500	4 000	5 600	**44162**	**44348**	57	51	75	84	2.3	1.5	28.0	0.78	0.77	0.42	0.447	0.245
	88.900	30.162	29.370	23.020	3.5	3.3	118 000	129 000	4 000	5 600	**HM 803146**	**HM 803110**	60	53	74	85	3.5	3.3	25.6	0.55	1.1	0.60	0.579	0.322
	88.900	30.162	29.370	23.020	0.8	3.3	118 000	129 000	4 000	5 600	**HM 803145**	**HM 803110**	54	53	74	85	0.8	3.3	25.6	0.55	1.1	0.60	0.582	0.322
	90.488	39.688	40.386	33.338	3.5	3.3	171 000	180 000	4 300	5 600	**4388**	**4335**	57	51	77	85	3.5	3.3	24.6	0.28	2.1	1.2	0.789	0.459
	93.662	31.750	31.750	26.195	0.8	3.3	135 000	142 000	4 000	5 600	**46162**	**46368**	52	51	79	87	0.8	3.3	24.0	0.40	1.5	0.82	0.695	0.405
	95.250	30.162	29.370	23.020	3.5	3.3	130 000	143 000	3 800	5 300	**HM 804840**	**HM 804810**	61	54	81	91	3.5	3.3	26.1	0.55	1.1	0.60	0.726	0.354
	98.425	30.958	28.301	20.638	1.5	0.8	96 000	93 000	3 600	5 300	**53162**	**53387**	57	53	82	91	1.5	0.8	30.7	0.74	0.81	0.45	0.618	0.442
42.862	76.992	17.462	17.145	11.908	1.5	1.5	54 000	54 000	4 500	6 000	**12168**	**12303**	51	48.5	68	73	1.5	1.5	17.7	0.51	1.2	0.65	0.228	0.098
	82.550	19.842	19.837	15.080	2.3	1.5	71 500	69 000	4 500	6 300	**22168**	**22325**	52	48.5	73	76	2.3	1.5	17.6	0.43	1.4	0.77	0.283	0.176
	82.931	23.812	25.400	19.050	2.3	0.8	94 000	99 000	4 500	6 000	**25578**	**25520**	53	49.5	74	77	2.3	0.8	17.6	0.33	1.8	0.99	0.383	0.203
	82.931	26.988	25.400	22.225	2.3	2.3	94 000	99 000	4 500	6 000	**25578**	**25523**	53	49.5	72	77	2.3	2.3	20.8	0.33	1.8	0.99	0.383	0.248
42.875	76.200	25.400	25.400	20.638	3.5	1.5	95 000	98 500	4 800	6 300	**26884**	**26823**	55	48.5	69	73	3.5	1.5	18.0	0.32	1.9	1.0	0.337	0.136
	80.000	21.000	22.403	17.826	3.5	1.3	84 000	75 500	4 500	6 300	**342 S**	**332**	54	47.5	73	75	3.5	1.3	14.5	0.27	2.2	1.2	0.305	0.146
	82.931	26.988	25.400	22.225	3.5	2.3	94 000	99 000	4 500	6 000	**25577**	**25523**	55	49	72	77	3.5	2.3	20.8	0.33	1.8	0.99	0.381	0.248
	83.058	23.812	25.400	19.050	3.5	3.3	94 000	99 000	4 500	6 000	**25577**	**25521**	55	49	72	77	3.5	3.3	17.6	0.33	1.8	0.99	0.381	0.201
43.000	74.988	19.368	19.837	14.288	1.5	1.3	64 500	68 000	4 800	6 300	*** 16986**	**16929**	51	48.5	67	71	1.5	1.3	17.2	0.44	1.4	0.74	0.24	0.106
44.450	80.962	19.050	17.462	14.288	0.3	1.5	55 500	57 000	4 300	6 000	**13175**	**13318**	50	50	72	76	0.3	1.5	20.1	0.53	1.1	0.63	0.252	0.144
	82.931	23.812	25.400	19.050	3.5	0.8	94 000	99 000	4 500	6 000	**25580**	**25520**	57	50	74	77	3.5	0.8	17.6	0.33	1.8	0.99	0.359	0.203
	83.058	23.812	25.400	19.050	3.5	3.3	94 000	99 000	4 500	6 000	**25580**	**25521**	56	51	72	78	3.5	3.3	17.6	0.33	1.8	0.99	0.359	0.201
	87.312	30.162	30.886	23.812	3.5	3.3	118 000	120 000	4 300	6 000	**3578**	**3525**	57	51	75	81	3.5	3.3	19.5	0.31	2.0	1.1	0.477	0.304
	88.900	30.162	29.370	23.020	3.5	3.3	118 000	129 000	4 000	5 600	**HM 803149**	**HM 803110**	62	53	74	85	3.5	3.3	25.6	0.55	1.1	0.60	0.528	0.322
	93.264	30.162	30.302	23.812	3.5	3.2	127 000	136 000	3 800	5 300	**3782**	**3720**	58	52	82	88	3.5	3.2	22.4	0.34	1.8	0.97	0.678	0.292
	93.662	31.750	31.750	25.400	0.8	3.3	147 000	147 000	4 000	5 600	**49176**	**49368**	54	53	82	87	0.8	3.3	21.6	0.36	1.7	0.92	0.648	0.371
	93.662	31.750	31.750	25.400	3.5	3.3	147 000	147 000	4 000	5 600	**49175**	**49368**	59	53	82	87	3.5	3.3	21.6	0.36	1.7	0.92	0.645	0.371
	93.662	31.750	31.750	26.195	3.5	3.3	129 000	133 000	4 000	5 600	**46176**	**46368**	60	54	79	87	3.5	3.3	24.0	0.40	1.5	0.82	0.635	0.405
	95.250	27.783	29.901	22.225	3.5	2.3	131 000	126 000	4 300	5 600	**438**	**432**	57	51	83	87	3.5	2.3	18.6	0.28	2.1	1.2	0.555	0.384

Note ∗ The maximum bore diameter is listed and its tolerance is negative (see Table 7.4.1 on Page A136).

■SINGLE-ROW TAPERED ROLLER BEARINGS (INCH SERIES)

Bore Diameter 44.450 – 47.625 mm





Dynamic Equivalent Load

$P = XF_r + YF_a$

$F_a/F_r \leqq e$		$F_a/F_r > e$	
X	Y	X	Y
1	0	0.4	Y_1

Static Equivalent Load

$P_0 = 0.5F_r + Y_0F_a$

When $F_r > 0.5F_r + Y_0F_a$, use $P_0 = F_r$

The values of e, Y_1, and Y_0 are given in the table below.

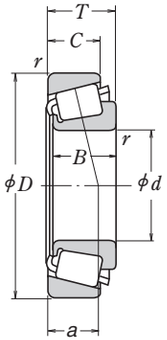
Boundary Dimensions (mm)							Basic Load Ratings (N)		Limiting Speeds (min^{-1})		Bearing Designations		Abutment and Fillet Dimensions (mm)						Eff. Load Center (mm)	Constant	Axial Load Factors		Mass (kg)	
					Ring: Inner	Outer											Ring: Inner	Outer					approx.	
d	D	T	B	C	r min.		C_r	C_{0r}	Grease	Oil	INNER RING	OUTER RING	d_a	d_b	D_a	D_b	r_a max.		a	e	Y_1	Y_0	Inner Ring	Outer Ring
44.450	95.250	30.162	29.370	23.020	3.5	3.3	130 000	143 000	3 800	5 300	**HM 804843**	**HM 804810**	63	57	81	91	3.5	3.3	26.1	0.55	1.1	0.60	0.677	0.354
	95.250	30.958	28.301	20.638	3.5	0.8	96 000	93 000	3 600	5 300	**53177**	**53375**	63	53	81	89	3.5	0.8	30.7	0.74	0.81	0.45	0.572	0.365
	95.250	30.958	28.301	20.638	1.3	0.8	96 000	93 000	3 600	5 300	**53176**	**53375**	59	53	81	89	1.3	0.8	30.7	0.74	0.81	0.45	0.574	0.365
	95.250	30.958	28.301	20.638	2.0	0.8	96 000	93 000	3 600	5 300	**53178**	**53375**	60	53	81	89	2	0.8	30.7	0.74	0.81	0.45	0.574	0.365
	95.250	30.958	28.301	22.225	1.3	0.8	123 000	122 000	3 600	5 000	**HM 903247**	**HM 903210**	61	54	81	91	1.3	0.8	31.5	0.74	0.81	0.45	0.651	0.389
	95.250	30.958	28.575	22.225	3.5	0.8	123 000	122 000	3 600	5 000	**HM 903249**	**HM 903210**	65	54	81	91	3.5	0.8	31.5	0.74	0.81	0.45	0.635	0.389
	98.425	30.958	28.301	20.638	3.5	0.8	96 000	93 000	3 600	5 300	**53177**	**53387**	63	53	82	91	3.5	0.8	30.7	0.74	0.81	0.45	0.568	0.442
	103.188	43.658	44.475	36.512	1.3	3.3	219 000	238 000	3 800	5 000	**5356**	**5335**	58	56	89	97	1.3	3.3	27.0	0.30	2.0	1.1	1.23	0.637
	104.775	36.512	36.512	28.575	3.5	3.3	171 000	192 000	3 400	4 800	**HM 807040**	**HM 807010**	66	59	89	100	3.5	3.3	29.7	0.49	1.2	0.68	1.14	0.502
	107.950	27.783	29.317	22.225	3.5	0.8	143 000	149 000	3 400	4 800	**460**	**453 A**	60	54	97	100	3.5	0.8	20.7	0.34	1.8	0.98	0.93	0.42
	111.125	30.162	26.909	20.638	3.5	3.3	114 000	110 000	3 200	4 300	**55175**	**55437**	67	60	92	105	3.5	3.3	37.3	0.88	0.68	0.37	0.867	0.514
	114.300	44.450	44.450	34.925	3.5	3.3	211 000	205 000	3 600	4 800	**65385**	**65320**	65	59	97	107	3.5	3.3	32.2	0.43	1.4	0.77	1.39	0.894
44.983	82.931	23.812	25.400	19.050	1.5	0.8	94 000	99 000	4 500	6 000	**25584**	**25520**	53	51	74	77	1.5	0.8	17.6	0.33	1.8	0.99	0.354	0.203
45.000	93.264	20.638	22.225	15.082	0.8	1.3	95 000	93 000	3 800	5 300	**376**	**374**	54	54	85	88	0.8	1.3	17.1	0.34	1.8	0.97	0.492	0.174
45.230	79.985	19.842	20.638	15.080	2.0	1.3	76 000	78 500	4 500	6 000	**17887**	**17831**	57	52	68	74	2	1.3	15.9	0.37	1.6	0.90	0.274	0.136
45.242	73.431	19.558	19.812	15.748	3.5	0.8	66 000	75 000	4 800	6 300	**LM 102949**	**LM 102910**	56	50	68	70	3.5	0.8	14.6	0.31	2.0	1.1	0.213	0.102
	77.788	19.842	19.842	15.080	3.5	0.8	69 000	71 000	4 500	6 300	**LM 603049**	**LM 603011**	57	50	71	74	3.5	0.8	17.2	0.43	1.4	0.77	0.249	0.119
	77.788	21.430	19.842	16.667	3.5	0.8	69 000	71 000	4 500	6 300	**LM 603049**	**LM 603012**	57	50	70	74	3.5	0.8	18.8	0.43	1.4	0.77	0.249	0.137
45.618	82.931	23.812	25.400	19.050	3.5	0.8	94 000	99 000	4 500	6 000	**25590**	**25520**	58	51	74	77	3.5	0.8	17.6	0.33	1.8	0.99	0.343	0.203
	82.931	26.988	25.400	22.225	3.5	2.3	94 000	99 000	4 500	6 000	**25590**	**25523**	58	51	72	77	3.5	2.3	20.8	0.33	1.8	0.99	0.343	0.248
46.000	75.000	18.000	18.000	14.000	2.3	1.5	63 000	71 500	4 500	6 300	* **LM 503349**	** **LM 503310**	55	51	67	71	2.3	1.5	15.9	0.40	1.5	0.82	0.209	0.096
46.038	79.375	17.462	17.462	13.495	2.8	1.5	56 500	57 000	4 500	6 000	**18690**	**18620**	56	51	71	74	2.8	1.5	15.5	0.37	1.6	0.88	0.211	0.126
	80.962	19.050	17.462	14.288	0.8	1.5	55 500	57 000	4 300	6 000	**13181**	**13318**	52	52	72	76	0.8	1.5	20.1	0.53	1.1	0.63	0.236	0.144
	85.000	20.638	21.692	17.462	2.3	1.3	88 000	81 500	4 300	6 000	**359 S**	**354 A**	55	51	77	80	2.3	1.3	15.4	0.31	2.0	1.1	0.343	0.162
	85.000	25.400	25.608	20.638	3.5	1.3	97 500	105 000	4 300	6 000	**2984**	**2924**	58	52	76	80	3.5	1.3	19.0	0.35	1.7	0.95	0.397	0.223
	95.250	27.783	29.901	22.225	3.5	0.8	131 000	126 000	4 300	5 600	**436**	**432 A**	59	52	84	87	3.5	0.8	18.6	0.28	2.1	1.2	0.536	0.381
47.625	88.900	20.638	22.225	16.513	3.5	1.3	90 000	85 000	4 000	5 600	**369 A**	**362 A**	60	53	81	84	3.5	1.3	16.6	0.32	1.9	1.0	0.381	0.166
	88.900	25.400	25.400	19.050	3.5	3.3	106 000	107 000	4 000	5 600	**M 804049**	**M 804010**	63	56	77	85	3.5	3.3	23.8	0.55	1.1	0.60	0.455	0.218
	95.250	30.162	29.370	23.020	3.5	3.3	130 000	143 000	3 800	5 300	**HM 804846**	**HM 804810**	66	57	81	91	3.5	3.3	26.1	0.55	1.1	0.60	0.626	0.354
	101.600	34.925	36.068	26.988	3.5	3.3	169 000	169 000	3 800	5 000	**528**	**522**	62	55	89	95	3.5	3.3	22.1	0.29	2.1	1.2	0.894	0.416
	111.125	30.162	26.909	20.638	3.5	3.3	114 000	110 000	3 200	4 300	**55187**	**55437**	69	62	92	105	3.5	3.3	37.3	0.88	0.68	0.37	0.817	0.514
	112.712	30.162	26.909	20.638	3.5	3.3	114 000	110 000	3 200	4 300	**55187**	**55443**	69	62	92	106	3.5	3.3	37.3	0.88	0.68	0.37	0.816	0.554
	117.475	33.338	31.750	23.812	3.5	3.3	168 000	156 000	3 200	4 300	**66187**	**66462**	66	62	100	111	3.5	3.3	32.1	0.63	0.96	0.53	1.19	0.552
	123.825	36.512	32.791	25.400	3.5	3.3	176 000	160 000	3 000	4 000	**72187**	**72487**	72	66	102	116	3.5	3.3	37.0	0.74	0.81	0.45	1.29	0.79

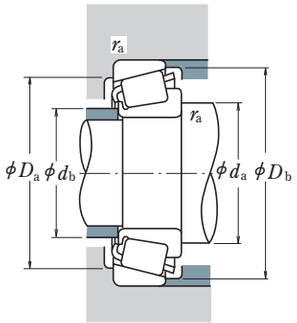
Notes * The maximum bore diameter is listed and its tolerance is negative (see Table 7.4.1 on Page A136).

** The maximum outside diameter is listed and its tolerance is negative (see Table 7.4.2 on Pages A136 and A137).

■SINGLE-ROW TAPERED ROLLER BEARINGS (INCH SERIES)

Bore Diameter 48.412 – 52.388 mm





Dynamic Equivalent Load

$P = XF_r + YF_a$

$F_a/F_r \leqq e$		$F_a/F_r > e$	
X	Y	X	Y
1	0	0.4	Y_1

Static Equivalent Load

$P_0 = 0.5F_r + Y_0F_a$

When $F_r > 0.5F_r + Y_0F_a$, use $P_0 = F_r$

The values of e, Y_1, and Y_0 are given in the table below.

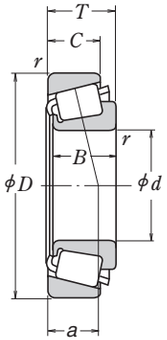
d	Boundary Dimensions (mm) D	T	B	C	Ring: Inner r min.	Ring: Outer r min.	Basic Load Ratings (N) C_r	C_{0r}	Limiting Speeds (min^{-1}) Grease	Oil	Bearing Designations INNER RING	OUTER RING	Abutment and Fillet Dimensions (mm) d_a	d_b	D_a	D_b	Ring: Inner r_a max.	Ring: Outer r_a max.	Eff. Load Center (mm) a	Constant e	Axial Load Factors Y_1	Y_0	Mass (kg) approx. Inner Ring	Outer Ring
48.412	95.250	30.162	29.370	23.020	3.5	3.3	130 000	143 000	3 800	5 300	**HM 804849**	**HM 804810**	66	57	81	91	3.5	3.3	26.1	0.55	1.1	0.60	0.61	0.354
	95.250	30.162	29.370	23.020	2.3	3.3	130 000	143 000	3 800	5 300	**HM 804848**	**HM 804810**	63	57	81	91	2.3	3.3	26.1	0.55	1.1	0.60	0.614	0.354
49.212	104.775	36.512	36.512	28.575	3.5	0.8	171 000	192 000	3 400	4 800	**HM 807044**	**HM 807011**	69	63	91	100	3.5	0.8	29.7	0.49	1.2	0.68	1.03	0.508
	114.300	44.450	44.450	36.068	3.5	3.3	242 000	243 000	3 400	4 800	**HH 506348**	**HH 506310**	71	61	97	107	3.5	3.3	30.8	0.40	1.5	0.82	1.43	0.837
50.000	82.000	21.500	21.500	17.000	3.0	0.5	87 500	96 000	4 300	5 600	▲**JLM 104948**	▲**JLM 104910**	60	55	76	78	3	0.5	16.1	0.31	2.0	1.1	0.306	0.129
	82.550	21.590	22.225	16.510	0.5	1.3	87 500	96 000	4 300	5 600	✻**LM 104947 A**	**LM 104911**	55	55	75	78	0.5	1.3	15.7	0.31	2.0	1.1	0.316	0.133
	88.900	20.638	22.225	16.513	2.3	1.3	90 000	85 000	4 000	5 600	**366**	**362 A**	59	55	81	84	2.3	1.3	16.6	0.32	1.9	1.0	0.351	0.166
	90.000	28.000	28.000	23.000	3.0	2.5	128 000	136 000	4 000	5 600	▲**JM 205149**	▲**JM 205110**	62	57	80	85	3	2.5	19.9	0.33	1.8	1.0	0.507	0.246
	105.000	37.000	36.000	29.000	3.0	2.5	171 000	192 000	3 400	4 800	▲**JHM 807045**	▲**JHM 807012**	69	63	90	100	3	2.5	29.7	0.49	1.2	0.68	1.01	0.523
50.800	80.962	18.258	18.258	14.288	1.5	1.5	65 500	81 000	4 300	5 600	**L 305649**	**L 305610**	58	56	73	77	1.5	1.5	15.7	0.36	1.7	0.93	0.239	0.119
	82.550	23.622	22.225	18.542	3.5	0.8	87 500	96 000	4 300	5 600	**LM 104949**	**LM 104911 A**	62	55	75	78	3.5	0.8	17.8	0.31	2.0	1.1	0.303	0.156
	82.931	21.590	22.225	16.510	3.5	1.3	87 500	96 000	4 300	5 600	**LM 104949**	**LM 104912**	62	55	75	78	3.5	1.3	15.7	0.31	2.0	1.1	0.301	0.14
	85.000	17.462	17.462	13.495	3.5	1.5	59 500	63 000	4 300	5 600	**18790**	**18720**	62	56	77	80	3.5	1.5	16.7	0.41	1.5	0.81	0.239	0.136
	85.725	19.050	18.263	12.700	1.5	1.5	52 500	54 000	4 000	5 300	**18200**	**18337**	59	56	76	81	1.5	1.5	21.0	0.57	1.1	0.58	0.268	0.136
	88.900	20.638	22.225	16.513	3.5	1.3	90 000	85 000	4 000	5 600	**368 A**	**362 A**	62	56	81	84	3.5	1.3	16.6	0.32	1.9	1.0	0.338	0.166
	88.900	20.638	22.225	16.513	1.5	1.3	90 000	85 000	4 000	5 600	**368**	**362 A**	58	56	81	84	1.5	1.3	16.6	0.32	1.9	1.0	0.341	0.166
	92.075	24.608	25.400	19.845	3.5	0.8	104 000	117 000	4 000	5 300	**28580**	**28521**	63	57	83	87	3.5	0.8	20.0	0.38	1.6	0.87	0.46	0.247
	93.264	30.162	30.302	23.812	0.8	0.8	127 000	136 000	3 800	5 300	**3775**	**3730**	58	58	84	88	0.8	0.8	22.4	0.34	1.8	0.97	0.568	0.297
	93.264	30.162	30.302	23.812	3.5	0.8	127 000	136 000	3 800	5 300	**3780**	**3730**	64	58	84	88	3.5	0.8	22.4	0.34	1.8	0.97	0.564	0.297
	95.250	27.783	28.575	22.225	3.5	2.3	135 000	144 000	3 800	5 300	**33889**	**33821**	64	58	85	90	3.5	2.3	19.8	0.33	1.8	1.0	0.601	0.267
	101.600	31.750	31.750	25.400	3.5	3.3	146 000	150 000	3 600	5 000	**49585**	**49520**	66	59	88	96	3.5	3.3	23.4	0.40	1.5	0.82	0.744	0.389
	101.600	34.925	36.068	26.988	0.8	3.3	169 000	169 000	3 800	5 000	**529**	**522**	59	58	89	95	0.8	3.3	22.1	0.29	2.1	1.2	0.822	0.416
	101.600	34.925	36.068	26.988	3.5	3.3	169 000	169 000	3 800	5 000	**529 X**	**522**	65	58	89	95	3.5	3.3	22.1	0.29	2.1	1.2	0.819	0.416
	104.775	36.512	36.512	28.575	3.5	0.8	171 000	192 000	3 400	4 800	**HM 807046**	**HM 807011**	70	63	91	100	3.5	0.8	29.7	0.49	1.2	0.68	0.992	0.508
	104.775	36.512	36.512	28.575	3.5	3.3	171 000	192 000	3 400	4 800	**HM 807046**	**HM 807010**	70	63	89	100	3.5	3.3	29.7	0.49	1.2	0.68	0.993	0.502
	108.966	34.925	36.512	26.988	3.5	3.3	178 000	181 000	3 600	4 800	**59200**	**59429**	68	61	93	101	3.5	3.3	25.4	0.40	1.5	0.82	0.943	0.594
	111.125	30.162	26.909	20.638	3.5	3.3	139 000	152 000	3 000	4 300	**55200 C**	**55437**	71	65	92	105	3.5	3.3	37.6	0.88	0.68	0.37	0.845	0.514
	111.125	30.162	26.909	20.638	3.5	3.3	114 000	110 000	3 200	4 300	**55200**	**55437**	71	64	92	105	3.5	3.3	37.3	0.88	0.68	0.37	0.767	0.514
	123.825	36.512	32.791	25.400	3.5	3.3	199 000	199 000	2 800	4 000	**72200 C**	**72487**	77	67	102	116	3.5	3.3	38.0	0.74	0.81	0.45	1.33	0.79
	123.825	36.512	32.791	25.400	3.5	3.3	176 000	160 000	3 000	4 000	**72200**	**72487**	74	66	102	116	3.5	3.3	37.0	0.74	0.81	0.45	1.22	0.79
	127.000	44.450	44.450	34.925	3.5	3.3	244 000	258 000	3 000	4 000	**65200**	**65500**	75	69	107	119	3.5	3.3	35.0	0.49	1.2	0.68	1.86	1.03
	127.000	50.800	52.388	41.275	3.5	3.3	290 000	300 000	3 200	4 300	**6279**	**6220**	71	65	108	117	3.5	3.3	30.7	0.30	2.0	1.1	2.08	1.22
52.388	92.075	24.608	25.400	19.845	3.5	0.8	104 000	117 000	4 000	5 300	**28584**	**28521**	65	58	83	87	3.5	0.8	20.0	0.38	1.6	0.87	0.435	0.247
	100.000	25.000	22.225	21.824	2.3	2.0	95 000	93 000	3 800	5 300	**377**	**372**	62	58	86	90	2.3	2	21.4	0.34	1.8	0.97	0.392	0.435
	111.125	30.162	26.909	20.638	3.5	3.3	114 000	110 000	3 200	4 300	**55206**	**55437**	72	64	92	105	3.5	3.3	37.3	0.88	0.68	0.37	0.737	0.514

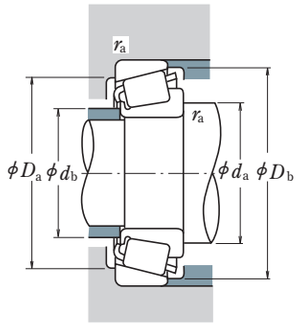
Notes ✻ The maximum bore diameter is listed and its tolerance is negative (see Table 7.4.1 on Page A136).

▲ Tolerances are listed in Tables 2, 3, and 4 on Pages C184 and C185.

SINGLE-ROW TAPERED ROLLER BEARINGS (INCH SERIES)

Bore Diameter 53.975 – 58.738 mm





Dynamic Equivalent Load

$P = XF_r + YF_a$

$F_a/F_r \leqq e$		$F_a/F_r > e$	
X	Y	X	Y
1	0	0.4	Y_1

Static Equivalent Load

$P_0 = 0.5F_r + Y_0F_a$

When $F_r > 0.5F_r + Y_0F_a$, use $P_0 = F_r$

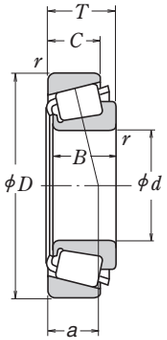
The values of e, Y_1, and Y_0 are given in the table below.

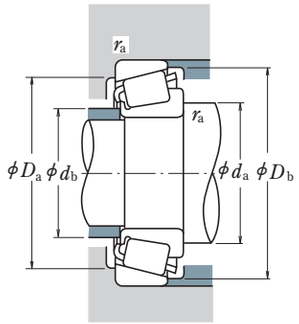
Boundary Dimensions (mm)					Ring: Inner Outer	Basic Load Ratings (N)		Limiting Speeds (min^{-1})		Bearing Designations		Abutment and Fillet Dimensions (mm)				Ring: Inner Outer	Eff. Load Center (mm)	Constant	Axial Load Factors		Mass (kg)	
d	D	T	B	C	r min.	C_r	C_{0r}	Grease	Oil	INNER RING	OUTER RING	d_a	d_b	D_a	D_b	r_a max.	a	e	Y_1	Y_0	approx. Inner Ring	Outer Ring
53.975	104.775	39.688	40.157	33.338	3.5	3.3	185 000	210 000	3 600	4 800	**4595**	**4535**	70	63	90	99	3.5	3.3	27.4	0.34	1.79	0.98	0.989	0.589
	107.950	36.512	36.957	28.575	3.5	3.3	177 000	182 000	3 600	4 800	**539**	**532 X**	68	61	94	100	3.5	3.3	24.3	0.30	2.0	1.1	0.88	0.57
	122.238	33.338	31.750	23.812	3.5	3.3	166 000	156 000	3 000	4 000	**66584**	**66520**	75	68	105	116	3.5	3.3	34.3	0.67	0.90	0.50	1.2	0.558
	123.825	36.512	32.791	25.400	3.5	3.3	176 000	160 000	3 000	4 000	**72212**	**72487**	77	66	102	116	3.5	3.3	37.0	0.74	0.81	0.45	1.16	0.79
	123.825	36.512	32.791	25.400	3.5	3.3	199 000	199 000	2 800	4 000	**72212 C**	**72487**	79	67	102	116	3.5	3.3	38.0	0.74	0.81	0.45	1.27	0.79
	123.825	38.100	36.678	30.162	3.5	3.3	198 000	221 000	3 000	4 000	**557 S**	**552 A**	71	65	109	116	3.5	3.3	28.8	0.35	1.7	0.95	1.49	0.764
	127.000	44.450	44.450	34.925	3.5	3.3	244 000	258 000	3 000	4 000	**65212**	**65500**	77	71	107	119	3.5	3.3	35.0	0.49	1.2	0.68	1.76	1.03
	127.000	50.800	52.388	41.275	3.5	3.3	290 000	300 000	3 200	4 300	**6280**	**6220**	74	67	108	117	3.5	3.3	30.7	0.30	2.0	1.1	1.97	1.22
	130.175	36.512	33.338	23.812	3.5	3.3	164 000	154 000	2 600	3 600	**HM911242**	**HM911210**	79	74	109	124	3.5	3.3	42.2	0.82	0.73	0.40	1.45	0.725
55.000	90.000	23.000	23.000	18.500	1.5	0.5	97 500	111 000	3 800	5 300	▲ **JLM506849**	▲ **JLM506810**	63	61	82	86	1.5	0.5	19.7	0.40	1.5	0.82	0.378	0.186
	95.000	29.000	29.000	23.500	1.5	2.5	136 000	152 000	3 800	5 000	▲ **JM207049**	▲ **JM207010**	64	62	85	91	1.5	2.5	21.3	0.33	1.8	0.99	0.59	0.26
	96.838	21.000	21.946	15.875	2.3	0.8	99 000	100 000	3 600	5 000	**385**	**382 A**	65	61	89	92	2.3	0.8	17.6	0.35	1.7	0.93	0.455	0.179
	110.000	39.000	39.000	32.000	3.0	2.5	217 000	225 000	3 400	4 500	▲ **JH307749**	▲ **JH307710**	71	64	97	104	3	2.5	27.2	0.35	1.7	0.95	1.13	0.567
	115.000	41.021	41.275	31.496	3.0	3.0	212 000	214 000	3 200	4 500	**622 X**	**614 X**	70	64	101	108	3	3	26.6	0.31	1.9	1.1	1.3	0.597
55.562	97.630	24.608	24.608	19.446	3.5	0.8	110 000	129 000	3 600	5 000	**28680**	**28622**	68	62	88	92	3.5	0.8	21.3	0.40	1.5	0.82	0.499	0.27
	122.238	43.658	43.764	36.512	1.3	3.3	243 000	292 000	3 000	4 000	**5566**	**5535**	70	68	106	116	1.3	3.3	29.9	0.36	1.7	0.92	1.76	0.815
	123.825	36.512	32.791	25.400	3.5	3.3	176 000	160 000	3 000	4 000	**72218**	**72487**	78	66	102	116	3.5	3.3	37.0	0.74	0.81	0.45	1.12	0.79
	123.825	36.512	32.791	25.400	3.5	3.3	199 000	199 000	2 800	4 000	**72218 C**	**72487**	80	67	102	116	3.5	3.3	38.0	0.74	0.81	0.45	1.23	0.79
57.150	96.838	21.000	21.946	15.875	3.5	0.8	99 000	100 000	3 600	5 000	**387 A**	**382 A**	69	62	89	92	3.5	0.8	17.6	0.35	1.7	0.93	0.42	0.179
	96.838	21.000	21.946	15.875	2.3	0.8	99 000	100 000	3 600	5 000	**387**	**382 A**	66	62	89	92	2.3	0.8	17.6	0.35	1.7	0.93	0.423	0.179
	96.838	25.400	21.946	20.275	3.5	2.3	99 000	100 000	3 600	5 000	**387 A**	**382 S**	69	62	87	91	3.5	2.3	22.0	0.35	1.7	0.93	0.42	0.249
	98.425	21.000	21.946	17.826	3.5	0.8	99 000	100 000	3 600	5 000	**387 A**	**382**	69	62	90	92	3.5	0.8	17.6	0.35	1.7	0.93	0.42	0.226
	104.775	30.162	29.317	24.605	3.5	3.3	143 000	149 000	3 400	4 800	**469**	**453 X**	70	63	92	98	3.5	3.3	23.1	0.34	1.8	0.98	0.692	0.376
	104.775	30.162	29.317	24.605	2.3	3.3	143 000	149 000	3 400	4 800	**462**	**453 X**	67	63	92	98	2.3	3.3	23.1	0.34	1.8	0.98	0.694	0.376
	104.775	30.162	30.958	23.812	0.8	3.3	160 000	170 000	3 400	4 800	**45289**	**45220**	65	65	93	99	0.8	3.3	21.9	0.33	1.8	0.99	0.752	0.347
	104.775	30.162	30.958	23.812	0.8	0.8	160 000	170 000	3 400	4 800	**45289**	**45221**	65	65	95	99	0.8	0.8	21.9	0.33	1.8	0.99	0.76	0.35
	122.238	33.338	31.750	23.812	3.5	3.3	166 000	156 000	3 000	4 000	**66587**	**66520**	77	71	105	116	3.5	3.3	34.3	0.67	0.90	0.50	1.14	0.558
	123.825	36.512	32.791	25.400	3.5	3.3	199 000	199 000	2 800	4 000	**72225 C**	**72487**	81	67	102	116	3.5	3.3	38.0	0.74	0.81	0.45	1.19	0.79
	123.825	38.100	36.678	30.162	3.5	3.3	198 000	221 000	3 000	4 000	**555 S**	**552 A**	83	68	109	116	3.5	3.3	28.8	0.35	1.7	0.95	1.41	0.764
	140.030	36.512	33.236	23.520	3.5	2.3	187 000	183 000	2 600	3 600	**78225**	**78551**	83	77	117	132	3.5	2.3	44.2	0.87	0.69	0.38	1.67	0.926
	144.983	36.000	33.236	23.007	3.5	3.5	187 000	183 000	2 600	3 600	**78225**	**78571**	83	77	118	132	3.5	3.5	43.6	0.87	0.69	0.38	1.68	1.08
	149.225	53.975	54.229	44.450	3.5	3.3	335 000	385 000	2 600	3 400	**6455**	**6420**	81	75	129	140	3.5	3.3	39.0	0.36	1.7	0.91	3.49	1.63
57.531	96.838	21.000	21.946	15.875	3.5	0.8	99 000	100 000	3 600	5 000	**388 A**	**382 A**	69	63	89	92	3.5	0.8	17.6	0.35	1.7	0.93	0.416	0.179
58.738	112.712	33.338	30.048	26.988	3.5	3.3	147 000	173 000	3 200	4 300	**3981**	**3926**	73	67	98	106	3.5	3.3	28.7	0.40	1.5	0.82	0.899	0.541

Note ▲ Tolerances are listed in Tables 2, 3, and 4 on Pages C184 and C185.

■SINGLE-ROW TAPERED ROLLER BEARINGS (INCH SERIES)

Bore Diameter 60.000 – 64.963 mm





Dynamic Equivalent Load

$P = XF_r + YF_a$

$F_a/F_r \leqq e$		$F_a/F_r > e$	
X	Y	X	Y
1	0	0.4	Y_1

Static Equivalent Load

$P_0 = 0.5F_r + Y_0F_a$

When $F_r > 0.5F_r + Y_0F_a$, use $P_0 = F_r$

The values of e, Y_1, and Y_0 are given in the table below.

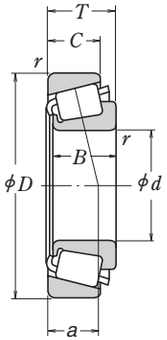
d	Boundary Dimensions (mm) D	T	B	C	Ring: Inner r min.	Ring: Outer r min.	Basic Load Ratings (N) C_r	C_{0r}	Limiting Speeds (min^{-1}) Grease	Oil	Bearing Designations INNER RING	OUTER RING	Abutment and Fillet Dimensions (mm) d_a	d_b	D_a	D_b	Cone r_a max.	Cup r_a max.	Eff. Load Center (mm) a	Constant e	Axial Load Factors Y_1	Y_0	Mass (kg) approx. Inner Ring	Outer Ring
60.000	95.000	24.000	24.000	19.000	5.0	2.5	106 000	125 000	3 600	5 000	▲ **JLM 508748**	▲ **JLM 508710**	75	66	85	91	5	2.5	21.6	0.40	1.5	0.82	0.43	0.20
	104.775	21.433	22.000	15.875	2.3	2.0	102 000	107 000	3 400	4 500	* **39236**	**39412**	71	67	96	100	2.3	2	20.0	0.39	1.5	0.85	0.559	0.186
	110.000	22.000	21.996	18.824	0.8	1.3	105 000	113 000	3 200	4 300	**397**	**394 A**	69	68	101	104	0.8	1.3	20.9	0.40	1.5	0.82	0.642	0.263
	122.238	33.338	31.750	23.812	3.5	3.3	166 000	156 000	3 000	4 000	**66585**	**66520**	79	73	105	116	3.5	3.3	34.3	0.67	0.90	0.50	1.07	0.558
60.325	100.000	25.400	25.400	19.845	3.5	3.3	112 000	135 000	3 400	4 800	**28985**	**28921**	73	67	89	96	3.5	3.3	22.9	0.43	1.4	0.78	0.538	0.232
	101.600	25.400	25.400	19.845	3.5	3.3	112 000	135 000	3 400	4 800	**28985**	**28920**	73	67	90	97	3.5	3.3	22.9	0.43	1.4	0.78	0.538	0.272
	122.238	38.100	36.678	30.162	2.3	3.3	198 000	221 000	3 000	4 000	**558**	**553 X**	73	69	108	115	2.3	3.3	28.8	0.35	1.7	0.95	1.33	0.692
	122.238	38.100	38.354	29.718	8.0	1.5	231 000	245 000	3 000	4 000	**HM 212044**	**HM 212010**	85	70	110	116	8	1.5	27.0	0.34	1.8	0.98	1.43	0.604
	122.238	43.658	43.764	36.512	0.8	3.3	243 000	292 000	3 000	4 000	**5582**	**5535**	73	72	106	116	0.8	3.3	29.9	0.36	1.7	0.92	1.61	0.815
	127.000	44.450	44.450	34.925	3.5	3.3	244 000	258 000	3 000	4 000	**65237**	**65500**	82	71	107	119	3.5	3.3	35.0	0.49	1.2	0.68	1.56	1.03
	130.175	41.275	41.275	31.750	3.5	3.3	239 000	263 000	2 800	3 800	**637**	**633**	78	72	116	124	3.5	3.3	29.9	0.36	1.7	0.91	1.87	0.712
	135.755	53.975	56.007	44.450	3.5	3.3	320 000	355 000	2 800	3 800	**6376**	**6320**	81	74	117	126	3.5	3.3	35.0	0.32	1.8	1.0	2.45	1.39
61.912	136.525	46.038	46.038	36.512	3.5	3.3	287 000	370 000	2 600	3 400	**H 715334**	**H 715311**	84	78	119	132	3.5	3.3	37.1	0.47	1.3	0.70	2.51	0.961
	146.050	41.275	39.688	25.400	3.5	3.3	214 000	195 000	2 400	3 400	**H 913842**	**H 913810**	90	82	124	138	3.5	3.3	44.4	0.78	0.77	0.42	2.2	0.898
	152.400	47.625	46.038	31.750	3.5	3.3	292 000	267 000	2 400	3 400	**9180**	**9121**	90	81	130	145	3.5	3.3	44.3	0.66	0.92	0.50	2.77	1.21
63.500	94.458	19.050	19.050	15.083	1.5	1.5	73 000	100 000	3 600	4 800	**L 610549**	**L 610510**	71	69	86	91	1.5	1.5	19.6	0.42	1.4	0.78	0.306	0.154
	104.775	21.433	22.000	15.875	2.0	2.0	88 000	91 500	3 400	4 500	**39250**	**39412**	73	69	96	100	2	2	20.0	0.39	1.5	0.85	0.501	0.186
	107.950	25.400	25.400	19.050	1.5	3.3	111 000	138 000	3 200	4 300	**29586**	**29520**	73	71	96	103	1.5	3.3	24.0	0.46	1.3	0.72	0.661	0.281
	110.000	22.000	21.996	18.824	3.5	1.3	105 000	113 000	3 200	4 300	**395**	**394 A**	77	70	101	104	3.5	1.3	20.9	0.40	1.5	0.82	0.58	0.263
	110.000	22.000	21.996	18.824	1.5	1.3	105 000	113 000	3 200	4 300	**390 A**	**394 A**	73	70	101	104	1.5	1.3	20.9	0.40	1.5	0.82	0.583	0.263
	112.712	30.162	30.048	23.812	3.5	3.2	147 000	173 000	3 200	4 300	**3982**	**3920**	77	71	99	106	3.5	3.2	25.5	0.40	1.5	0.82	0.789	0.454
	112.712	30.162	30.162	23.812	3.5	3.3	175 000	202 000	3 200	4 300	**39585**	**39520**	77	71	101	107	3.5	3.3	23.5	0.34	1.8	0.97	0.899	0.359
	112.712	33.338	30.048	26.988	3.5	3.3	147 000	173 000	3 200	4 300	**3982**	**3926**	78	71	98	106	3.5	3.3	28.7	0.40	1.5	0.82	0.789	0.541
	122.238	38.100	38.354	29.718	7.0	3.3	231 000	245 000	3 000	4 000	**HM 212047**	**HM 212011**	87	73	108	116	7	3.3	26.9	0.34	1.8	0.98	1.34	0.598
	122.238	38.100	38.354	29.718	7.0	1.5	231 000	245 000	3 000	4 000	**HM 212047**	**HM 212010**	87	73	110	116	7	1.5	26.9	0.34	1.8	0.98	1.34	0.604
	122.238	38.100	38.354	29.718	3.5	1.5	231 000	245 000	3 000	4 000	**HM 212046**	**HM 212010**	80	73	110	116	3.5	1.5	26.9	0.34	1.8	0.98	1.35	0.604
	122.238	43.658	43.764	36.512	3.5	3.3	243 000	292 000	3 000	4 000	**5584**	**5535**	81	75	106	116	3.5	3.3	29.9	0.36	1.7	0.92	1.5	0.815
	123.825	38.100	36.678	30.162	3.5	3.3	198 000	221 000	3 000	4 000	**559**	**522 A**	78	73	109	116	3.5	3.3	28.8	0.35	1.7	0.95	1.23	0.764
	127.000	36.512	36.170	28.575	3.5	3.3	204 000	234 000	2 800	3 800	**565**	**563**	80	73	112	120	3.5	3.3	28.3	0.36	1.6	0.91	1.46	0.655
	130.175	41.275	41.275	31.750	3.5	3.3	239 000	263 000	2 800	3 800	**639**	**633**	81	74	116	124	3.5	3.3	29.9	0.36	1.7	0.91	1.77	0.712
	136.525	36.512	33.236	23.520	2.3	3.3	187 000	183 000	2 600	3 600	**78250**	**78537**	85	79	115	130	2.3	3.3	44.2	0.87	0.69	0.38	1.51	0.782
	136.525	41.275	41.275	31.750	3.5	3.3	239 000	263 000	2 800	3 800	**639**	**632**	79	76	119	125	3.5	3.3	29.9	0.36	1.7	0.91	1.77	1.04
	140.030	36.512	33.236	23.520	2.3	2.3	187 000	183 000	2 600	3 600	**78250**	**78551**	85	79	117	132	2.3	2.3	44.2	0.87	0.69	0.38	1.51	0.926
64.963	127.000	36.512	36.170	28.575	3.5	3.3	204 000	234 000	2 800	3 800	**569**	**563**	81	74	112	120	3.5	3.3	28.3	0.36	1.6	0.91	1.41	0.655

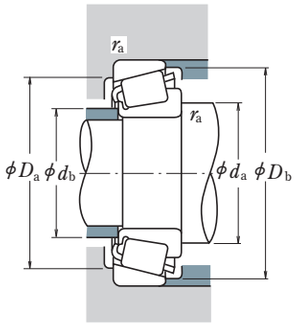
Notes * The maximum bore diameter is listed and its tolerance is negative (see Table 7.4.1 on Page A136).

▲ Tolerances are listed in Tables 2, 3, and 4 on Pages C184 and C185.

■SINGLE-ROW TAPERED ROLLER BEARINGS (INCH SERIES)

Bore Diameter 65.000 – 69.850 mm





Dynamic Equivalent Load

$P = XF_r + YF_a$

$F_a/F_r \leqq e$		$F_a/F_r > e$	
X	Y	X	Y
1	0	0.4	Y_1

Static Equivalent Load

$P_0 = 0.5F_r + Y_0F_a$

When $F_r > 0.5F_r + Y_0F_a$, use $P_0 = F_r$

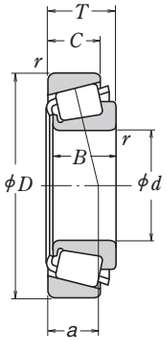
The values of e, Y_1, and Y_0 are given in the table below.

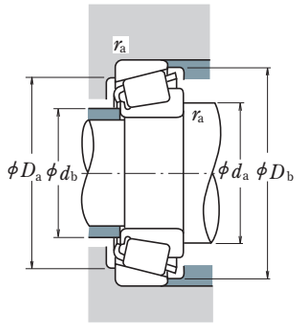
Boundary Dimensions (mm)					Ring: Inner / Outer		Basic Load Ratings (N)		Limiting Speeds (min^{-1})		Bearing Designations		Abutment and Fillet Dimensions (mm)						Eff. Load Center (mm)	Constant	Axial Load Factors		Mass (kg)	
d	D	T	B	C	r min.		C_r	C_{0r}	Grease	Oil	INNER RING	OUTER RING	d_a	d_b	D_a	D_b	r_a max.		a	e	Y_1	Y_0	approx. Inner Ring	Outer Ring
65.000	105.000	24.000	23.000	18.500	3.0	1.0	114 000	126 000	3 400	4 500	▲**JLM 710949**	▲**JLM 710910**	77	71	96	101	3	1	23.7	0.45	1.3	0.73	0.526	0.237
	110.000	28.000	28.000	22.500	3.0	2.5	147 000	173 000	3 200	4 300	▲**JM 511946**	▲**JM 511910**	78	72	99	105	3	2.5	24.5	0.40	1.5	0.82	0.72	0.342
	120.000	29.002	29.007	23.444	2.3	3.3	151 000	169 000	3 000	4 000	**478**	**472 A**	77	73	106	114	2.3	3.3	24.3	0.38	1.6	0.86	0.942	0.466
	120.000	39.000	38.500	32.000	3.0	2.5	227 000	249 000	3 000	4 000	▲**JH 211749**	▲**JH 211710**	80	74	107	114	3	2.5	27.9	0.34	1.8	0.98	1.25	0.625
65.088	135.755	53.975	56.007	44.450	3.5	3.3	320 000	355 000	2 800	3 800	**6379**	**6320**	84	77	117	126	3.5	3.3	35.0	0.32	1.8	1.0	2.25	1.39
	136.525	46.038	46.038	36.512	3.5	3.3	287 000	370 000	2 600	3 400	**H 715340**	**H 715311**	88	82	118	132	3.5	3.3	37.1	0.47	1.3	0.70	2.4	0.961
66.675	110.000	22.000	21.996	18.824	0.8	1.3	105 000	113 000	3 200	4 300	**395 A**	**394 A**	73	73	101	104	0.8	1.3	20.9	0.40	1.5	0.82	0.528	0.263
	110.000	22.000	21.996	18.824	3.5	1.3	105 000	113 000	3 200	4 300	**395 S**	**394 A**	79	73	101	104	3.5	1.3	20.9	0.40	1.5	0.82	0.524	0.263
	112.712	30.162	30.048	23.812	3.5	3.2	147 000	173 000	3 200	4 300	**3984**	**3920**	80	74	99	106	3.5	3.2	25.5	0.40	1.5	0.82	0.712	0.454
	112.712	30.162	30.048	23.812	5.5	3.2	147 000	173 000	3 200	4 300	**3994**	**3920**	84	74	99	106	5.5	3.2	25.5	0.40	1.5	0.82	0.706	0.454
	112.712	30.162	30.162	23.812	3.5	0.8	175 000	202 000	3 200	4 300	**39590**	**39521**	80	74	103	107	3.5	0.8	23.5	0.34	1.8	0.97	0.822	0.365
	112.712	30.162	30.162	23.812	3.5	3.3	175 000	202 000	3 200	4 300	**39590**	**39520**	80	74	101	107	3.5	3.3	23.5	0.34	1.8	0.97	0.822	0.359
	117.475	30.162	30.162	23.812	3.5	3.3	147 000	179 000	3 000	4 000	**33262**	**33462**	81	75	104	112	3.5	3.3	26.8	0.44	1.4	0.76	0.911	0.442
	122.238	38.100	36.678	30.162	3.5	3.3	198 000	221 000	3 000	4 000	**560**	**553 X**	81	75	108	115	3.5	3.3	28.8	0.35	1.7	0.95	1.14	0.692
	122.238	38.100	38.354	29.718	3.5	1.5	231 000	245 000	3 000	4 000	**HM 212049**	**HM 212010**	82	75	110	116	3.5	1.5	26.9	0.34	1.8	0.98	1.25	0.604
	122.238	38.100	38.354	29.718	3.5	3.3	231 000	245 000	3 000	4 000	**HM 212049**	**HM 212011**	81	74	108	116	3.5	3.3	26.9	0.34	1.8	0.98	1.25	0.598
	123.825	38.100	36.678	30.162	3.5	3.3	198 000	221 000	3 000	4 000	**560**	**552 A**	81	75	109	116	3.5	3.3	28.8	0.35	1.7	0.95	1.14	0.764
	136.525	46.038	46.038	36.512	3.5	3.3	287 000	370 000	2 600	3 400	**H 715341**	**H 715311**	89	83	118	132	3.5	3.3	37.1	0.47	1.3	0.70	2.34	0.961
68.262	110.000	22.000	21.996	18.824	2.3	1.3	105 000	113 000	3 200	4 300	**399 A**	**394 A**	78	74	101	104	2.3	1.3	20.9	0.40	1.5	0.82	0.497	0.263
	120.000	29.795	29.007	24.237	3.5	2.0	151 000	169 000	3 000	4 000	**480**	**472**	83	76	106	113	3.5	2	25.1	0.38	1.6	0.86	0.862	0.493
	122.238	38.100	36.678	30.162	3.5	3.3	198 000	221 000	3 000	4 000	**560 S**	**553 X**	83	76	108	115	3.5	3.3	28.8	0.35	1.7	0.95	1.09	0.692
	127.000	36.512	36.170	28.575	3.5	3.3	204 000	234 000	2 800	3 800	**570**	**563**	83	77	112	120	3.5	3.3	28.3	0.36	1.6	0.91	1.32	0.655
	136.525	41.275	41.275	31.750	3.5	3.3	282 000	297 000	2 600	3 600	**H 414245**	**H 414210**	86	82	121	129	3.5	3.3	30.6	0.36	1.7	0.92	1.95	0.796
	136.525	46.038	46.038	36.512	3.5	3.3	287 000	370 000	2 600	3 400	**H 715343**	**H 715311**	90	84	118	132	3.5	3.3	37.1	0.47	1.3	0.70	2.28	0.961
	152.400	47.625	46.038	31.750	3.5	3.3	292 000	267 000	2 400	3 400	**9185**	**9121**	94	81	130	145	3.5	3.3	44.3	0.66	0.92	0.50	2.53	1.21
69.850	112.712	22.225	21.996	15.875	1.5	0.8	105 000	113 000	3 000	4 000	**LM 613449**	**LM 613410**	78	76	104	107	1.5	0.8	22.1	0.42	1.4	0.79	0.562	0.238
	112.712	25.400	25.400	19.050	1.5	3.3	118 000	152 000	2 800	4 000	**29675**	**29620**	80	77	101	109	1.5	3.3	26.3	0.49	1.2	0.68	0.695	0.273
	117.475	30.162	30.162	23.812	3.5	3.3	147 000	179 000	3 000	4 000	**33275**	**33462**	84	77	104	112	3.5	3.3	26.8	0.44	1.4	0.76	0.83	0.442
	120.000	32.545	32.545	26.195	3.5	3.3	178 000	215 000	3 000	4 000	**47487**	**47420**	84	78	107	114	3.5	3.3	26.0	0.36	1.7	0.92	1.02	0.477
	120.650	25.400	25.400	19.050	1.5	3.3	118 000	152 000	2 800	4 000	**29675**	**29630**	79	78	105	113	1.5	3.3	26.3	0.49	1.2	0.68	0.695	0.489
	127.000	36.512	36.170	28.575	3.5	0.8	204 000	234 000	2 800	3 800	**566**	**563 X**	85	78	114	120	3.5	0.8	28.3	0.36	1.6	0.91	1.27	0.658
	130.175	41.275	41.275	31.750	3.5	3.3	239 000	263 000	2 800	3 800	**643**	**633**	86	80	116	124	3.5	3.3	29.9	0.36	1.7	0.91	1.56	0.712
	146.050	41.275	39.688	25.400	3.5	3.3	238 000	225 000	2 400	3 400	**H 913849**	**H 913810**	95	82	124	138	3.5	3.3	44.4	0.78	0.77	0.42	1.95	0.898
	146.050	41.275	41.275	31.750	3.5	3.3	254 000	296 000	2 400	3 200	**655**	**653**	88	82	131	139	3.5	3.3	33.2	0.41	1.5	0.81	2.35	0.891
	149.225	53.975	54.229	44.450	5.0	3.3	335 000	385 000	2 600	3 400	**6454**	**6420**	94	85	129	140	5	3.3	39.0	0.36	1.7	0.91	2.95	1.63
	150.089	44.450	46.672	36.512	3.5	3.3	325 000	370 000	2 400	3 200	**745 A**	**742**	88	82	134	142	3.5	3.3	32.5	0.33	1.8	1.0	2.82	1.07

Note ▲ Tolerances are listed in Tables 2, 3, and 4 on Pages C184 and C185.

■SINGLE-ROW TAPERED ROLLER BEARINGS (INCH SERIES)

Bore Diameter 70.000 – 76.200 mm





Dynamic Equivalent Load

$P = XF_r + YF_a$

$F_a/F_r \leqq e$		$F_a/F_r > e$	
X	Y	X	Y
1	0	0.4	Y_1

Static Equivalent Load

$P_0 = 0.5F_r + Y_0F_a$

When $F_r > 0.5F_r + Y_0F_a$, use $P_0 = F_r$

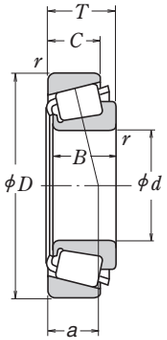
The values of e, Y_1, and Y_0 are given in the table below.

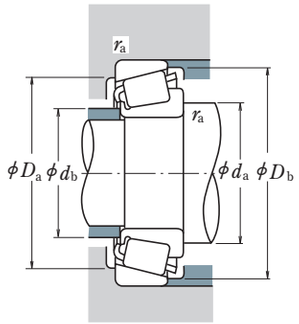
Boundary Dimensions (mm)					Ring:		Basic Load Ratings (N)		Limiting Speeds (min^{-1})		Bearing Designations		Abutment and Fillet Dimensions (mm)				Ring:		Eff. Load Center (mm)	Constant	Axial Load Factors		Mass (kg)	
d	D	T	B	C	Inner r min.	Outer r min.	C_r	C_{0r}	Grease	Oil	INNER RING	OUTER RING	d_a	d_b	D_a	D_b	Inner r_a max.	Outer r_a max.	a	e	Y_1	Y_0	approx. Inner Ring	approx. Outer Ring
70.000	110.000	26.000	25.000	20.500	1.0	2.5	121 000	152 000	3 000	4 000	▲**JLM 813049**	▲**JLM 813010**	78	77	98	105	1	2.5	26.2	0.49	1.2	0.68	0.604	0.304
	115.000	29.000	29.000	23.000	3.0	2.5	155 000	177 000	3 000	4 000	▲**JM 612949**	▲**JM 612910**	83	77	103	110	3	2.5	26.4	0.43	1.4	0.77	0.800	0.362
	120.000	29.795	29.007	24.237	2.0	2.0	151 000	169 000	3 000	4 000	**484**	**472**	80	78	106	113	2	2	25.1	0.38	1.6	0.86	0.822	0.493
71.438	117.475	30.162	30.162	23.812	3.5	3.3	147 000	179 000	3 000	4 000	**33281**	**33462**	85	79	104	112	3.5	3.3	26.8	0.44	1.4	0.76	0.789	0.442
	120.000	32.545	32.545	26.195	3.5	3.3	178 000	215 000	3 000	4 000	**47490**	**47420**	86	79	107	114	3.5	3.3	26.0	0.36	1.7	0.92	0.983	0.477
	127.000	36.512	36.170	28.575	6.4	3.3	204 000	234 000	2 800	3 800	**567 S**	**563**	92	80	112	120	6.4	3.3	28.3	0.36	1.6	0.91	1.21	0.655
	127.000	36.512	36.170	28.575	3.5	3.3	204 000	234 000	2 800	3 800	**567 A**	**563**	86	80	112	120	3.5	3.3	28.3	0.36	1.6	0.91	1.23	0.655
	130.175	41.275	41.275	31.750	6.4	3.3	239 000	263 000	2 800	3 800	**645**	**633**	93	81	116	124	6.4	3.3	29.9	0.36	1.7	0.91	1.49	0.712
	136.525	41.275	41.275	31.750	3.5	3.3	239 000	263 000	2 800	3 800	**644**	**632**	87	81	118	125	3.5	3.3	29.9	0.36	1.7	0.91	1.5	1.04
	136.525	41.275	41.275	31.750	3.5	3.3	282 000	297 000	2 600	3 600	**H 414249**	**H 414210**	89	83	121	129	3.5	3.3	30.6	0.36	1.7	0.92	1.83	0.796
	136.525	46.038	46.038	36.512	3.5	3.3	287 000	370 000	2 600	3 400	**H 715345**	**H 715311**	92	84	119	132	3.5	3.3	37.1	0.47	1.3	0.70	2.15	0.961
73.025	112.712	25.400	25.400	19.050	3.5	3.3	118 000	152 000	2 800	4 000	**29685**	**29620**	86	80	101	109	3.5	3.3	26.3	0.49	1.2	0.68	0.62	0.273
	117.475	30.162	30.162	23.812	3.5	3.3	147 000	179 000	3 000	4 000	**33287**	**33462**	87	80	104	112	3.5	3.3	26.8	0.44	1.4	0.76	0.746	0.442
	127.000	36.512	36.170	28.575	3.5	3.3	204 000	234 000	2 800	3 800	**567**	**563**	88	81	112	120	3.5	3.3	28.3	0.36	1.6	0.91	1.17	0.655
	146.050	41.275	41.275	31.750	3.5	3.3	254 000	296 000	2 400	3 200	**657**	**653**	91	85	131	139	3.5	3.3	33.2	0.41	1.5	0.81	2.24	0.891
	149.225	53.975	54.229	44.450	3.5	3.3	355 000	410 000	2 600	3 400	**6460**	**6420**	93	87	129	140	3.5	3.3	39.0	0.36	1.7	0.91	2.8	1.63
73.817	127.000	36.512	36.170	28.575	0.8	3.3	204 000	234 000	2 800	3 800	**568**	**563**	83	82	112	120	0.8	3.3	28.3	0.36	1.6	0.91	1.15	0.655
74.612	150.000	41.275	41.275	31.750	3.5	3.0	254 000	296 000	2 400	3 200	**658**	**653 X**	92	86	133	141	3.5	3	33.2	0.41	1.5	0.81	2.37	0.932
75.000	115.000	25.000	25.000	19.000	3.0	2.5	125 000	150 000	3 000	4 000	▲**JLM 714149**	▲**JLM 714110**	87	81	104	110	3	2.5	25.3	0.46	1.3	0.72	0.638	0.272
	120.000	31.000	29.500	25.000	3.0	2.5	158 000	198 000	2 800	3 800	▲**JM 714249**	▲**JM 714210**	88	83	108	115	3	2.5	28.8	0.44	1.4	0.74	0.863	0.436
	145.000	51.000	51.000	42.000	3.0	2.5	350 000	410 000	2 600	3 400	▲**JH 415647**	▲**JH 415610**	94	89	129	139	3	2.5	36.7	0.36	1.7	0.91	2.64	1.19
76.200	121.442	24.608	23.012	17.462	2.0	2.0	110 000	124 000	2 800	3 800	**34300**	**34478**	86	84	111	116	2	2	26.3	0.45	1.3	0.73	0.65	0.316
	127.000	30.162	31.000	22.225	3.5	3.3	170 000	194 000	2 800	3 800	**42687**	**42620**	90	84	114	121	3.5	3.3	27.3	0.42	1.4	0.79	1.03	0.438
	127.000	30.162	31.001	22.225	6.4	3.3	170 000	194 000	2 800	3 800	**42688**	**42620**	94	84	114	121	6.4	3.3	27.3	0.42	1.4	0.79	1.01	0.438
	133.350	33.338	33.338	26.195	0.8	3.3	185 000	236 000	2 600	3 600	**47680**	**47620**	86	85	119	128	0.8	3.3	29.0	0.40	1.5	0.82	1.39	0.577
	135.733	44.450	46.101	34.925	3.5	3.3	266 000	340 000	2 600	3 600	**5760**	**5735**	94	88	119	130	3.5	3.3	32.9	0.41	1.5	0.81	1.86	0.887
	136.525	30.162	29.769	22.225	3.5	3.3	160 000	192 000	2 600	3 400	**495 A**	**493**	92	86	122	130	3.5	3.3	28.7	0.44	1.4	0.74	1.27	0.55
	136.525	30.162	29.769	22.225	6.4	3.3	160 000	192 000	2 600	3 400	**495 AX**	**493**	98	86	122	130	6.4	3.3	28.7	0.44	1.4	0.74	1.26	0.55
	139.992	36.512	36.098	28.575	3.5	3.3	215 000	260 000	2 600	3 400	**575**	**572**	92	86	125	133	3.5	3.3	31.1	0.40	1.5	0.82	1.61	0.788
	149.225	53.975	54.229	44.450	3.5	3.3	335 000	385 000	2 600	3 400	**6461**	**6420**	96	89	129	140	3.5	3.3	39.0	0.36	1.7	0.91	2.45	1.67
	152.400	39.688	36.322	30.162	3.5	3.2	225 000	285 000	2 200	3 200	**590 A**	**592 A**	95	89	135	145	3.5	3.2	37.1	0.44	1.4	0.75	2.2	1.06
	152.400	41.275	41.275	31.750	3.5	3.3	254 000	296 000	2 400	3 200	**659**	**652**	93	87	134	141	3.5	3.3	33.2	0.41	1.5	0.81	2.11	1.26
	161.925	49.212	46.038	31.750	3.5	3.3	305 000	290 000	2 200	3 000	**9285**	**9220**	103	90	138	153	3.5	3.3	49.8	0.71	0.85	0.47	2.82	1.4
	161.925	53.975	55.100	42.862	3.5	3.3	400 000	480 000	2 200	3 000	**6576**	**6535**	99	92	141	154	3.5	3.3	40.7	0.40	1.5	0.82	3.74	1.67
	161.925	53.975	55.100	42.862	6.4	3.3	400 000	480 000	2 200	3 000	**6575**	**6535**	104	92	141	154	6.4	3.3	40.7	0.40	1.5	0.82	3.73	1.67
	161.925	53.975	55.100	42.862	6.4	0.8	400 000	480 000	2 200	3 000	**6575**	**6536**	104	92	144	154	6.4	0.8	40.7	0.40	1.5	0.82	3.73	1.68

Note ▲ Tolerances are listed in Tables 2, 3, and 4 on Pages C184 and C185.

■SINGLE-ROW TAPERED ROLLER BEARINGS (INCH SERIES)

Bore Diameter 76.200 – 83.345 mm





Dynamic Equivalent Load

$P = XF_r + YF_a$

$F_a/F_r \leqq e$		$F_a/F_r > e$	
X	Y	X	Y
1	0	0.4	Y_1

Static Equivalent Load

$P_0 = 0.5F_r + Y_0F_a$

When $F_r > 0.5F_r + Y_0F_a$, use $P_0 = F_r$

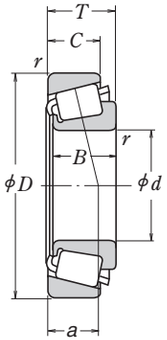
The values of e, Y_1, and Y_0 are given in the table below.

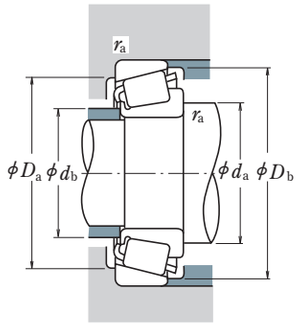
Boundary Dimensions (mm)							Basic Load Ratings (N)		Limiting Speeds (min⁻¹)		Bearing Designations		Abutment and Fillet Dimensions (mm)						Eff. Load Center (mm)	Constant	Axial Load Factors		Mass (kg)	
					Ring: Inner	Outer											Ring: Inner	Outer					approx.	
d	D	T	B	C	r min.		C_r	C_{0r}	Grease	Oil	INNER RING	OUTER RING	d_a	d_b	D_a	D_b	r_a max.		a	e	Y_1	Y_0	Inner Ring	Outer Ring
76.200	168.275	53.975	56.363	41.275	6.4	3.3	425 000	470 000	2 200	3 000	**843**	**832**	101	89	149	155	6.4	3.3	35.2	0.30	2.0	1.1	4.11	1.74
	168.275	53.975	56.363	41.275	0.8	3.3	425 000	470 000	2 200	3 000	**837**	**832**	90	89	149	155	0.8	3.3	35.2	0.30	2.0	1.1	4.13	1.74
	171.450	49.212	46.038	31.750	3.5	3.3	315 000	310 000	2 000	2 800	**9380**	**9321**	105	98	147	164	3.5	3.3	54.1	0.76	0.79	0.43	3.47	1.51
	177.800	55.562	50.800	34.925	3.5	3.3	315 000	310 000	2 000	2 800	**9378**	**9320**	105	98	148	164	3.5	3.3	57.3	0.76	0.79	0.43	3.71	2.24
77.788	121.442	24.608	23.012	17.462	3.5	2.0	110 000	124 000	2 800	3 800	**34306**	**34478**	90	84	110	116	3.5	2	26.3	0.45	1.3	0.73	0.612	0.316
	127.000	30.162	31.000	22.225	3.5	3.3	170 000	194 000	2 800	3 800	**42690**	**42620**	91	85	114	121	3.5	3.3	27.3	0.42	1.4	0.79	0.976	0.438
	135.733	44.450	46.101	34.925	3.5	3.3	266 000	340 000	2 600	3 600	**5795**	**5735**	96	89	119	130	3.5	3.3	32.9	0.41	1.5	0.81	1.79	0.887
79.375	146.050	41.275	41.275	31.750	3.5	3.3	254 000	296 000	2 400	3 200	**661**	**653**	96	90	131	139	3.5	3.3	33.2	0.41	1.5	0.81	1.99	0.891
	150.089	44.450	46.672	36.512	3.5	3.3	325 000	370 000	2 400	3 200	**750**	**742**	96	90	134	142	3.5	3.3	32.5	0.33	1.8	1.0	2.42	1.07
80.000	130.000	35.000	34.000	28.500	3.0	2.5	205 000	252 000	2 600	3 600	▲ **JM 515649**	▲ **JM 515610**	94	88	117	125	3	2.5	29.9	0.39	1.5	0.85	1.18	0.583
80.962	136.525	30.162	29.769	22.225	3.5	3.3	160 000	192 000	2 600	3 400	**496**	**493**	95	89	122	130	3.5	3.3	28.7	0.44	1.4	0.74	1.13	0.55
	139.700	36.512	36.098	28.575	3.5	3.3	215 000	260 000	2 600	3 400	**581**	**572 X**	96	90	125	133	3.5	3.3	31.1	0.40	1.5	0.82	1.44	0.774
	139.992	36.512	36.098	28.575	3.5	3.3	215 000	260 000	2 600	3 400	**581**	**572**	96	90	125	133	3.5	3.3	31.1	0.40	1.5	0.82	1.44	0.788
82.550	125.412	25.400	25.400	19.845	3.5	1.5	126 000	164 000	2 600	3 600	**27687**	**27620**	96	89	115	120	3.5	1.5	25.7	0.42	1.4	0.79	0.747	0.348
	133.350	30.162	29.769	22.225	3.5	3.3	160 000	192 000	2 600	3 400	**495**	**492 A**	97	90	120	128	3.5	3.3	28.7	0.44	1.4	0.74	1.08	0.434
	133.350	33.338	33.338	26.195	3.5	3.3	189 000	237 000	2 600	3 600	**47686**	**47620**	97	90	119	128	3.5	3.3	29.0	0.40	1.5	0.82	1.18	0.577
	133.350	33.338	33.338	26.195	0.8	3.3	189 000	237 000	2 600	3 600	**47685**	**47620**	90	90	119	128	0.8	3.3	29.0	0.40	1.5	0.82	1.18	0.577
	133.350	33.338	33.338	26.195	6.8	3.3	189 000	237 000	2 600	3 600	**47687**	**47620**	103	90	119	128	6.8	3.3	29.0	0.40	1.5	0.82	1.16	0.577
	133.350	39.688	39.688	32.545	6.8	3.3	221 000	310 000	2 600	3 600	**HM 516448**	**HM 516410**	105	92	118	128	6.8	3.3	32.4	0.40	1.5	0.82	1.35	0.767
	136.525	30.162	29.769	22.225	3.5	3.3	160 000	192 000	2 600	3 400	**495**	**493**	97	90	122	130	3.5	3.3	28.7	0.44	1.4	0.74	1.08	0.55
	139.700	36.512	36.098	28.575	3.5	3.3	215 000	260 000	2 600	3 400	**580**	**572 X**	98	91	125	133	3.5	3.3	31.1	0.40	1.5	0.82	1.39	0.774
	139.992	36.512	36.098	28.575	3.5	3.3	215 000	260 000	2 600	3 400	**580**	**572**	98	91	125	133	3.5	3.3	31.1	0.40	1.5	0.82	1.39	0.788
	139.992	36.512	36.098	28.575	6.8	3.3	215 000	260 000	2 600	3 400	**582**	**572**	104	91	125	133	6.8	3.3	31.1	0.40	1.5	0.82	1.37	0.788
	146.050	41.275	41.275	31.750	3.5	3.3	254 000	296 000	2 400	3 200	**663**	**653**	99	92	131	139	3.5	3.3	33.2	0.41	1.5	0.81	1.85	0.891
	150.000	44.455	46.672	35.000	3.5	3.3	325 000	370 000	2 400	3 200	**749 A**	**743**	99	93	134	142	3.5	3.3	32.5	0.33	1.8	1.0	2.26	1.04
	150.089	44.450	46.672	36.512	3.5	3.3	325 000	370 000	2 400	3 200	**749 A**	**742**	98	93	135	143	3.5	3.3	32.5	0.33	1.8	1.0	2.26	1.07
	152.400	41.275	41.275	31.750	3.5	3.3	254 000	296 000	2 400	3 200	**663**	**652**	99	92	134	141	3.5	3.3	33.2	0.41	1.5	0.81	1.85	1.26
	161.925	47.625	48.260	38.100	3.5	3.3	340 000	390 000	2 200	3 000	**757**	**752**	100	94	144	150	3.5	3.3	35.6	0.34	1.8	0.97	2.79	1.61
	161.925	53.975	55.100	42.862	3.5	3.3	400 000	480 000	2 200	3 000	**6559**	**6535**	104	98	141	154	3.5	3.3	40.7	0.40	1.5	0.82	3.4	1.67
	168.275	47.625	48.260	38.100	3.5	3.3	340 000	390 000	2 200	3 000	**757**	**753**	100	94	147	150	3.5	3.3	35.6	0.34	1.8	0.97	2.79	2.1
	168.275	53.975	56.363	41.275	3.5	3.3	425 000	470 000	2 200	3 000	**842**	**832**	101	94	149	155	3.5	3.3	35.2	0.30	2.0	1.1	3.76	1.74
83.345	125.412	25.400	25.400	19.845	3.5	1.5	126 000	164 000	2 600	3 600	**27690**	**27620**	96	90	115	120	3.5	1.5	25.7	0.42	1.4	0.79	0.727	0.348
	125.412	25.400	25.400	19.845	0.8	1.5	126 000	164 000	2 600	3 600	**27689**	**27620**	90	90	115	120	0.8	1.5	25.7	0.42	1.4	0.79	0.732	0.348

Note ▲ Tolerances are listed in Tables 2, 3, and 4 on Pages C184 and C185.

SINGLE-ROW TAPERED ROLLER BEARINGS (INCH SERIES)

Bore Diameter 84.138 – 90.488 mm





Dynamic Equivalent Load

$P = XF_r + YF_a$

$F_a/F_r \leqq e$		$F_a/F_r > e$	
X	Y	X	Y
1	0	0.4	Y_1

Static Equivalent Load

$P_0 = 0.5F_r + Y_0F_a$

When $F_r > 0.5F_r + Y_0F_a$, use $P_0 = F_r$

The values of e, Y_1, and Y_0 are given in the table below.

Boundary Dimensions (mm)					Ring: Inner Outer	Basic Load Ratings (N)		Limiting Speeds (min^{-1})		Bearing Designations		Abutment and Fillet Dimensions (mm)				Ring: Inner Outer	Eff. Load Center (mm)	Constant	Axial Load Factors		Mass (kg)	
d	D	T	B	C	r min.	C_r	C_{0r}	Grease	Oil	INNER RING	OUTER RING	d_a	d_b	D_a	D_b	r_a max.	a	e	Y_1	Y_0	approx. Inner Ring	approx. Outer Ring
84.138	136.525	30.162	29.769	22.225	3.5 3.3	160 000	192 000	2 600	3 400	**498**	**493**	98	91	122	130	3.5 3.3	28.7	0.44	1.4	0.74	1.04	0.55
	146.050	41.275	41.275	31.750	3.5 3.3	254 000	296 000	2 400	3 200	**664**	**653**	99	93	131	139	3.5 3.3	33.2	0.41	1.5	0.81	1.79	0.891
	171.450	49.212	46.038	31.750	3.5 3.3	315 000	310 000	2 000	2 800	**9385**	**9321**	111	98	147	164	3.5 3.3	54.1	0.76	0.79	0.43	3.11	1.51
85.000	130.000	30.000	29.000	24.000	6.0 2.5	170 000	222 000	2 600	3 600	▲**JM 716648**	▲**JM 716610**	104	92	117	125	6 2.5	29.5	0.44	1.4	0.74	0.931	0.461
	130.000	30.000	29.000	24.000	3.0 2.5	170 000	222 000	2 600	3 600	▲**JM 716649**	▲**JM 716610**	98	92	117	125	3 2.5	29.5	0.44	1.4	0.74	0.943	0.461
	140.000	39.000	38.000	31.500	3.0 2.5	248 000	305 000	2 400	3 400	▲**JHM 516849**	▲**JHM 516810**	100	94	125	134	3 2.5	33.3	0.41	1.5	0.81	1.55	0.768
	150.000	46.000	46.000	38.000	3.0 2.5	340 000	390 000	2 400	3 200	▲**JH 217249**	▲**JH 217210**	101	95	134	142	3 2.5	33.9	0.33	1.8	0.99	2.29	1.09
85.026	150.089	44.450	46.672	36.512	3.5 3.3	325 000	370 000	2 400	3 200	**749**	**742**	101	95	134	142	3.5 3.3	32.5	0.33	1.8	1.0	2.14	1.07
	150.089	44.450	46.672	36.512	5.0 3.3	325 000	370 000	2 400	3 200	**749 S**	**742**	104	95	134	142	5 3.3	32.5	0.33	1.8	1.0	2.14	1.07
85.725	133.350	30.162	29.769	22.225	3.5 3.3	160 000	192 000	2 600	3 400	**497**	**492 A**	99	93	120	128	3.5 3.3	28.7	0.44	1.4	0.74	0.987	0.434
	136.525	30.162	29.769	22.225	3.5 3.3	160 000	192 000	2 600	3 400	**497**	**493**	99	93	122	130	3.5 3.3	28.7	0.44	1.4	0.74	0.987	0.55
	142.138	42.862	42.862	34.133	4.8 3.3	272 000	360 000	2 400	3 400	**HM 617049**	**HM 617010**	106	95	125	137	4.8 3.3	35.4	0.43	1.4	0.76	1.77	0.911
	146.050	41.275	41.275	31.750	6.4 3.3	254 000	296 000	2 400	3 200	**665 A**	**653**	107	95	131	139	6.4 3.3	33.2	0.41	1.5	0.81	1.71	0.891
	146.050	41.275	41.275	31.750	3.5 3.3	254 000	296 000	2 400	3 200	**665**	**653**	102	95	131	139	3.5 3.3	33.2	0.41	1.5	0.81	1.72	0.891
	152.400	39.688	36.322	30.162	3.5 3.2	225 000	285 000	2 200	3 200	**596**	**592 A**	102	96	135	144	3.5 3.2	37.1	0.44	1.4	0.75	1.85	1.06
	161.925	47.625	48.260	38.100	3.5 3.3	340 000	390 000	2 200	3 000	**758**	**752**	103	97	144	150	3.5 3.3	35.6	0.34	1.8	0.97	2.63	1.61
	168.275	41.275	41.275	30.162	3.5 3.3	274 000	345 000	2 000	2 800	**677**	**672**	105	99	149	160	3.5 3.3	38.3	0.47	1.3	0.70	2.91	1.24
87.312	190.500	57.150	57.531	46.038	8.0 3.3	480 000	520 000	1 900	2 600	**HH 221432**	**HH 221410**	118	103	171	179	8 3.3	42.3	0.33	1.8	0.99	5.51	2.24
88.900	149.225	31.750	28.971	24.608	3.0 3.3	172 000	218 000	2 200	3 000	**42350**	**42587**	104	98	134	143	3 3.3	34.9	0.49	1.2	0.67	1.39	0.711
	152.400	39.688	36.322	30.162	3.5 3.2	225 000	285 000	2 200	3 200	**593**	**592 A**	104	98	135	144	3.5 3.2	37.1	0.44	1.4	0.75	1.73	1.06
	152.400	39.688	39.688	30.162	6.4 3.3	310 000	365 000	2 200	3 200	**HM 518445**	**HM 518410**	107	96	137	148	6.4 3.3	33.1	0.40	1.5	0.82	2.11	0.776
	161.925	47.625	48.260	38.100	3.5 3.3	340 000	390 000	2 200	3 000	**759**	**752**	106	99	144	150	3.5 3.3	35.6	0.34	1.8	0.97	2.47	1.61
	161.925	47.625	48.260	38.100	7.0 3.3	340 000	390 000	2 200	3 000	**766**	**752**	113	99	144	150	7 3.3	35.6	0.34	1.8	0.97	2.45	1.61
	161.925	53.975	55.100	42.862	3.5 3.3	400 000	480 000	2 200	3 000	**6580**	**6535**	109	102	141	154	3.5 3.3	40.7	0.40	1.5	0.82	3.03	1.67
	168.275	47.625	48.260	38.100	3.5 3.3	340 000	390 000	2 200	3 000	**759**	**753**	106	99	147	150	3.5 3.3	35.6	0.34	1.8	0.97	2.47	2.1
	168.275	53.975	56.363	41.275	3.5 3.3	425 000	470 000	2 200	3 000	**850**	**832**	106	100	149	155	3.5 3.3	35.2	0.30	2.0	1.1	3.39	1.74
	190.500	57.150	57.531	44.450	8.0 3.3	435 000	500 000	1 900	2 600	**855**	**854**	118	103	170	174	8 3.3	41.8	0.33	1.8	0.99	4.99	2.55
	190.500	57.150	57.531	46.038	8.0 3.3	480 000	520 000	1 900	2 600	**HH 221434**	**HH 221410**	120	105	171	179	8 3.3	42.3	0.33	1.8	0.99	5.41	2.24
90.000	145.000	35.000	34.000	27.000	3.0 2.5	234 000	285 000	2 400	3 200	▲**JM 718149**	▲**JM 718110**	105	99	131	139	3 2.5	33.0	0.44	1.4	0.74	1.49	0.66
	147.000	40.000	40.000	32.500	7.0 3.5	282 000	345 000	2 400	3 200	***HM 218248**	****HM 218210**	111	98	133	141	7 3.5	30.8	0.33	1.8	0.99	1.77	0.796
	155.000	44.000	44.000	35.500	3.0 2.5	340 000	390 000	2 200	3 000	▲**JHM 318448**	▲**JHM 318410**	106	100	140	148	3 2.5	34.1	0.34	1.7	0.96	2.32	1.01
90.488	161.925	47.625	48.260	38.100	3.5 3.3	340 000	390 000	2 200	3 000	**760**	**752**	107	101	144	150	3.5 3.3	35.6	0.34	1.8	0.97	2.38	1.61

Notes

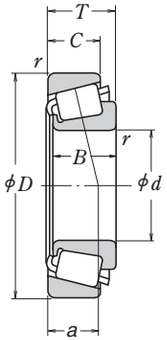
* The maximum bore diameter is listed and its tolerance is negative (see Table 7.4.1 on Page A136).

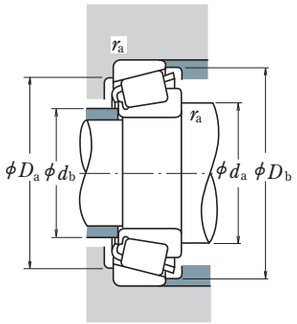
** The maximum outside diameter is listed and its tolerance is negative (see Table 7.4.2 on Pages A136 and A137).

▲ Tolerances are listed in Tables 2, 3, and 4 on Pages C184 and C185.

■SINGLE-ROW TAPERED ROLLER BEARINGS (INCH SERIES)

Bore Diameter 92.075 – 100.012 mm





Dynamic Equivalent Load

$P = XF_r + YF_a$

$F_a/F_r \leqq e$		$F_a/F_r > e$	
X	Y	X	Y
1	0	0.4	Y_1

Static Equivalent Load

$P_0 = 0.5F_r + Y_0F_a$

When $F_r > 0.5F_r + Y_0F_a$, use $P_0 = F_r$

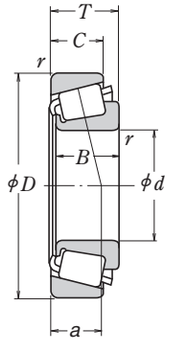
The values of e, Y_1, and Y_0 are given in the table below.

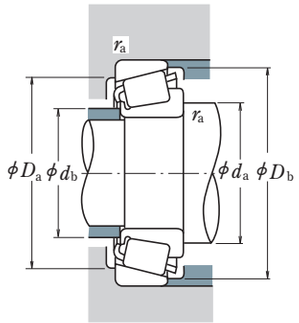
Boundary Dimensions (mm)					Ring: Inner Outer	Basic Load Ratings (N)		Limiting Speeds (min^{-1})		Bearing Designations		Abutment and Fillet Dimensions (mm)				Ring: Inner Outer	Eff. Load Center (mm)	Constant	Axial Load Factors		Mass (kg)	
d	D	T	B	C	r min.	C_r	C_{0r}	Grease	Oil	INNER RING	OUTER RING	d_a	d_b	D_a	D_b	r_a max.	a	e	Y_1	Y_0	approx. Inner Ring	approx. Outer Ring
92.075	146.050	33.338	34.925	26.195	3.5 3.3	208 000	280 000	2 400	3 200	**47890**	**47820**	107	101	131	140	3.5 3.3	32.3	0.45	1.3	0.74	1.46	0.664
	148.430	28.575	28.971	21.433	3.5 3.0	172 000	218 000	2 200	3 000	**42362**	**42584**	107	101	134	142	3.5 3	31.8	0.49	1.2	0.67	1.29	0.553
	152.400	39.688	36.322	30.162	3.5 3.2	225 000	285 000	2 200	3 200	**598**	**592 A**	107	101	135	144	3.5 3.2	37.1	0.44	1.4	0.75	1.6	1.06
	152.400	39.688	36.322	30.162	6.4 3.2	225 000	285 000	2 200	3 200	**598 A**	**592 A**	113	101	135	144	6.4 3.2	37.1	0.44	1.4	0.75	1.59	1.06
	168.275	41.275	41.275	30.162	3.5 3.3	274 000	345 000	2 000	2 800	**681**	**672**	110	104	149	160	3.5 3.3	38.3	0.47	1.3	0.70	2.62	1.24
	190.500	57.150	57.531	44.450	8.0 3.3	435 000	500 000	1 900	2 600	**857**	**854**	121	106	170	174	8 3.3	41.8	0.33	1.8	0.99	4.78	2.55
93.662	148.430	28.575	28.971	21.433	3.0 3.0	172 000	218 000	2 200	3 000	**42368**	**42584**	107	102	134	142	3 3	31.8	0.49	1.2	0.67	1.24	0.553
	149.225	31.750	28.971	24.608	3.0 3.3	172 000	218 000	2 200	3 000	**42368**	**42587**	107	102	134	143	3 3.3	34.9	0.49	1.2	0.67	1.24	0.711
	152.400	39.688	36.322	30.162	3.5 3.2	225 000	285 000	2 200	3 200	**597**	**592 A**	109	102	135	144	3.5 3.2	37.1	0.44	1.4	0.75	1.54	1.06
95.000	150.000	35.000	34.000	27.000	3.0 2.5	225 000	285 000	2 200	3 200	▲**JM 719149**	▲**JM 719113**	109	104	135	143	3 2.5	33.4	0.44	1.4	0.75	1.46	0.765
95.250	146.050	33.338	34.925	26.195	3.5 3.3	208 000	280 000	2 400	3 200	**47896**	**47820**	110	103	131	140	3.5 3.3	32.3	0.45	1.3	0.74	1.33	0.664
	148.430	28.575	28.971	21.433	3.0 3.0	172 000	218 000	2 200	3 000	**42375**	**42584**	108	103	134	142	3 3	31.8	0.49	1.2	0.67	1.18	0.553
	149.225	31.750	28.971	24.608	3.5 3.3	172 000	218 000	2 200	3 000	**42376**	**42587**	109	103	134	143	3.5 3.3	34.9	0.49	1.2	0.67	1.18	0.711
	152.400	39.688	36.322	30.162	3.5 3.2	225 000	285 000	2 200	3 200	**594**	**592 A**	110	104	135	144	3.5 3.2	37.1	0.44	1.4	0.75	1.47	1.06
	152.400	39.688	36.322	33.338	3.5 3.3	225 000	285 000	2 200	3 200	**594**	**592**	109	103	135	145	3.5 3.3	37.1	0.44	1.4	0.75	1.47	1.12
	168.275	41.275	41.275	30.162	3.5 3.3	274 000	345 000	2 000	2 800	**683**	**672**	113	106	149	160	3.5 3.3	38.3	0.47	1.3	0.70	2.47	1.24
	171.450	47.625	48.260	38.100	3.5 3.3	345 000	415 000	2 000	2 800	**77375**	**77675**	117	105	152	159	3.5 3.3	37.8	0.37	1.6	0.90	2.91	1.67
	180.975	47.625	48.006	38.100	3.5 3.3	315 000	375 000	2 000	2 600	**776**	**772**	114	107	161	168	3.5 3.3	39.1	0.39	1.6	0.86	3.25	1.99
	190.500	57.150	57.531	44.450	8.0 3.3	435 000	500 000	1 900	2 600	**864**	**854**	123	108	170	174	8 3.3	41.8	0.33	1.8	0.99	4.57	2.55
	190.500	57.150	57.531	46.038	8.0 3.3	480 000	520 000	1 900	2 600	**HH 221440**	**HH 221410**	125	110	171	179	8 3.3	42.3	0.33	1.8	0.99	5.0	2.24
96.838	148.430	28.575	28.971	21.433	3.5 3.0	172 000	218 000	2 200	3 000	**42381**	**42584**	110	104	134	142	3.5 3	31.8	0.49	1.2	0.67	1.13	0.553
	149.225	31.750	28.971	24.606	3.5 3.3	172 000	218 000	2 200	3 000	**42381**	**42587**	111	105	135	143	3.5 3.3	34.9	0.49	1.2	0.67	1.13	0.711
98.425	161.925	36.512	36.116	26.195	3.5 3.3	222 000	310 000	2 000	2 800	**52387**	**52637**	114	108	144	154	3.5 3.3	36.1	0.47	1.3	0.69	1.89	0.942
	168.275	41.275	41.275	30.162	3.5 3.3	274 000	345 000	2 000	2 800	**685**	**672**	116	109	149	160	3.5 3.3	38.3	0.47	1.3	0.70	2.32	1.24
	180.975	47.625	48.006	38.100	3.5 3.3	315 000	375 000	2 000	2 600	**779**	**772**	116	110	161	168	3.5 3.3	39.1	0.39	1.6	0.86	3.06	1.99
	190.500	57.150	57.531	44.450	3.5 3.3	435 000	500 000	1 900	2 600	**866**	**854**	118	111	170	174	3.5 3.3	41.8	0.33	1.8	0.99	4.38	2.55
	190.500	57.150	57.531	46.038	3.5 3.3	480 000	520 000	1 900	2 600	**HH 221442**	**HH 221410**	119	113	171	179	3.5 3.3	42.3	0.33	1.8	0.99	4.81	2.24
99.982	190.500	57.150	57.531	46.038	6.4 3.3	480 000	520 000	1 900	2 600	**HH 221447**	**HH 221410**	126	114	171	179	6.4 3.3	42.3	0.33	1.8	0.99	4.68	2.24
100.000	150.000	32.000	30.000	26.000	2.3 2.3	179 000	235 000	2 200	3 000	▲**JLM 820048**	▲**JLM 820012**	111	107	135	144	2.3 2.3	36.8	0.50	1.2	0.66	1.27	0.616
	155.000	36.000	35.000	28.000	3.0 2.5	235 000	325 000	2 000	2 800	▲**JM 720249**	▲**JM 720210**	115	109	140	149	3 2.5	36.8	0.47	1.3	0.70	1.68	0.772
	160.000	41.000	40.000	32.000	3.0 2.5	294 000	380 000	2 000	2 800	▲**JHM 720249**	▲**JHM 720210**	117	109	143	154	3 2.5	38.2	0.47	1.3	0.70	2.09	0.974
100.012	157.162	36.512	36.116	26.195	3.5 3.3	222 000	286 000	2 000	2 800	**52393**	**52618**	116	109	142	152	3.5 3.3	36.1	0.47	1.3	0.69	1.81	0.702

Note ▲ Tolerances are listed in Tables 2, 3, and 4 on Pages C184 and C185.

■SINGLE-ROW TAPERED ROLLER BEARINGS (INCH SERIES)

Bore Diameter 101.600 – 117.475 mm





Dynamic Equivalent Load

$P = XF_r + YF_a$

$F_a/F_r \leqq e$		$F_a/F_r > e$	
X	Y	X	Y
1	0	0.4	Y_1

Static Equivalent Load

$P_0 = 0.5F_r + Y_0F_a$

When $F_r > 0.5F_r + Y_0F_a$, use $P_0 = F_r$

The values of e, Y_1, and Y_0 are given in the table below.

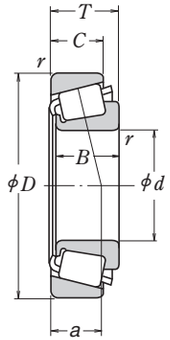
Boundary Dimensions (mm)					Ring: Inner Outer	Basic Load Ratings (N)		Limiting Speeds (min⁻¹)		Bearing Designations		Abutment and Fillet Dimensions (mm)				Ring: Inner Outer		Eff. Load Center (mm)	Constant	Axial Load Factors		Mass (kg)	
d	D	T	B	C	r min.	C_r	C_{0r}	Grease	Oil	INNER RING	OUTER RING	d_a	d_b	D_a	D_b	r_a max.		a	e	Y_1	Y_0	approx. Inner Ring	approx. Outer Ring
101.600	157.162	36.512	36.116	26.195	3.5	3.3	222 000	286 000	2 000	2 800	**52400**	**52618**	117	111	142	152	3.5	3.3	36.1	0.47	1.3	0.69	1.75	0.702
	161.925	36.512	36.116	26.195	3.5	3.3	222 000	286 000	2 000	2 800	**52400**	**52637**	117	111	144	154	3.5	3.3	36.1	0.47	1.3	0.69	1.75	0.942
	168.275	41.275	41.275	30.162	3.5	3.3	274 000	345 000	2 000	2 800	**687**	**672**	118	112	149	160	3.5	3.3	38.3	0.47	1.3	0.70	2.15	1.24
	180.975	47.625	48.006	38.100	3.5	3.3	315 000	375 000	2 000	2 600	**780**	**772**	119	113	161	168	3.5	3.3	39.1	0.39	1.6	0.86	2.88	1.99
	190.500	57.150	57.531	44.450	8.0	3.3	435 000	500 000	1 900	2 600	**861**	**854**	129	114	170	174	8	3.3	41.8	0.33	1.8	0.99	4.13	2.55
	190.500	57.150	57.531	46.038	8.0	3.3	480 000	520 000	1 900	2 600	**HH 221449**	**HH 221410**	131	116	171	179	8	3.3	42.3	0.33	1.8	0.99	4.55	2.24
	212.725	66.675	66.675	53.975	7.0	3.3	700 000	810 000	1 700	2 200	**HH 224335**	**HH 224310**	132	121	192	202	7	3.3	47.3	0.33	1.8	1.0	8.14	3.06
104.775	180.975	47.625	48.006	38.100	7.0	3.3	315 000	375 000	2 000	2 600	**787**	**772**	129	116	161	168	7	3.3	39.1	0.39	1.6	0.86	2.66	1.99
	180.975	47.625	48.006	38.100	3.5	3.3	315 000	375 000	2 000	2 600	**782**	**772**	122	116	161	168	3.5	3.3	39.1	0.39	1.6	0.86	2.68	1.99
	190.500	47.625	49.212	34.925	3.5	3.3	365 000	465 000	1 800	2 400	**71412**	**71750**	124	118	171	181	3.5	3.3	40.1	0.42	1.4	0.79	4.0	1.71
106.362	165.100	36.512	36.512	26.988	3.5	3.3	239 000	320 000	2 000	2 600	**56418**	**56650**	122	116	149	159	3.5	3.3	38.6	0.50	1.2	0.66	1.87	0.861
107.950	158.750	23.020	21.438	15.875	3.5	3.3	126 000	165 000	2 000	2 800	**37425**	**37625**	122	115	143	152	3.5	3.3	37.0	0.61	0.99	0.54	0.886	0.488
	159.987	34.925	34.925	26.988	3.5	3.3	201 000	315 000	2 000	2 800	**LM 522546**	**LM 522510**	122	116	146	154	3.5	3.3	33.7	0.40	1.5	0.82	1.65	0.784
	161.925	34.925	34.925	26.988	3.5	3.3	202 000	280 000	2 000	2 800	**48190**	**48120**	122	116	146	156	3.5	3.3	38.7	0.51	1.2	0.65	1.59	0.83
	165.100	36.512	36.512	26.988	3.5	3.3	239 000	320 000	2 000	2 600	**56425**	**56650**	123	117	149	159	3.5	3.3	38.6	0.50	1.2	0.66	1.8	0.861
	190.500	47.625	49.212	34.925	3.5	3.3	365 000	465 000	1 800	2 400	**71425**	**71750**	126	120	171	181	3.5	3.3	40.1	0.42	1.4	0.79	3.79	1.71
	212.725	66.675	66.675	53.975	8.0	3.3	700 000	810 000	1 700	2 200	**HH 224340**	**HH 224310**	139	126	192	202	8	3.3	47.3	0.33	1.8	1.0	7.58	3.06
109.987	159.987	34.925	34.925	26.988	3.5	3.3	201 000	315 000	2 000	2 800	**LM 522549**	**LM 522510**	124	118	146	154	3.5	3.3	33.7	0.40	1.5	0.82	1.55	0.784
	159.987	34.925	34.925	26.988	8.0	3.3	201 000	315 000	2 000	2 800	**LM 522548**	**LM 522510**	133	118	146	154	8	3.3	33.7	0.40	1.5	0.82	1.53	0.784
109.992	177.800	41.275	41.275	30.162	3.5	3.3	286 000	375 000	1 800	2 600	**64433**	**64700**	128	121	160	172	3.5	3.3	42.4	0.52	1.2	0.64	2.64	1.11
110.000	165.000	35.000	35.000	26.500	3.0	2.5	239 000	320 000	2 000	2 600	▲ **JM 822049**	▲ **JM 822010**	124	119	149	159	3	2.5	38.3	0.50	1.2	0.66	1.64	0.842
	180.000	47.000	46.000	38.000	3.0	2.5	380 000	490 000	1 900	2 600	▲ **JHM 522649**	▲ **JHM 522610**	127	122	162	172	3	2.5	40.9	0.41	1.5	0.81	3.12	1.51
111.125	190.500	47.625	49.212	34.925	3.5	3.3	365 000	465 000	1 800	2 400	**71437**	**71750**	129	123	171	181	3.5	3.3	40.1	0.42	1.4	0.79	3.58	1.71
114.300	152.400	21.433	21.433	16.670	1.5	1.5	110 000	178 000	2 000	2 800	**L 623149**	**L 623110**	123	121	143	148	1.5	1.5	27.4	0.41	1.5	0.80	0.725	0.344
	177.800	41.275	41.275	30.162	3.5	3.3	286 000	375 000	1 800	2 600	**64450**	**64700**	131	125	160	172	3.5	3.3	42.4	0.52	1.2	0.64	2.39	1.11
	180.000	34.925	31.750	25.400	3.5	0.8	214 000	254 000	1 800	2 400	**68450**	** **68709**	130	123	165	172	3.5	0.8	40.0	0.50	1.2	0.66	1.95	1.0
	190.500	47.625	49.212	34.925	3.5	3.3	365 000	465 000	1 800	2 400	**71450**	**71750**	132	125	171	181	3.5	3.3	40.1	0.42	1.4	0.79	3.37	1.71
	212.725	66.675	66.675	53.975	7.0	3.3	585 000	700 000	1 700	2 400	**938**	**932**	141	128	187	193	7	3.3	46.9	0.33	1.8	1.0	6.01	4.11
	212.725	66.675	66.675	53.975	7.0	3.3	700 000	810 000	1 700	2 200	**HH 224346**	**HH 224310**	143	131	192	202	7	3.3	47.3	0.33	1.8	1.0	7.01	3.06
115.087	190.500	47.625	49.212	34.925	3.5	3.3	365 000	465 000	1 800	2 400	**71453**	**71750**	133	126	171	181	3.5	3.3	40.1	0.42	1.4	0.79	3.31	1.71
117.475	180.975	34.925	31.750	25.400	3.5	3.3	214 000	254 000	1 800	2 400	**68462**	**68712**	132	125	163	172	3.5	3.3	40.0	0.50	1.2	0.66	1.73	1.05

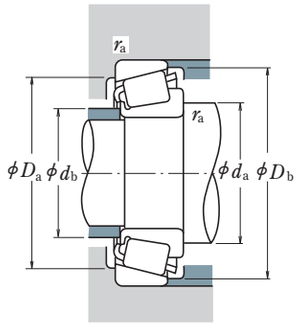
Notes ** The maximum outside diameter is listed and its tolerance is negative (see Table 7.4.2 on Pages A136 and A137).

▲ Tolerances are listed in Tables 2, 3, and 4 on Pages C184 and C185.

■SINGLE-ROW TAPERED ROLLER BEARINGS (INCH SERIES)

Bore Diameter 120.000 – 165.100 mm





Dynamic Equivalent Load

$P = XF_r + YF_a$

$F_a/F_r \leqq e$		$F_a/F_r > e$	
X	Y	X	Y
1	0	0.4	Y_1

Static Equivalent Load

$P_0 = 0.5F_r + Y_0F_a$

When $F_r > 0.5F_r + Y_0F_a$, use $P_0 = F_r$

The values of e, Y_1, and Y_0 are given in the table below.

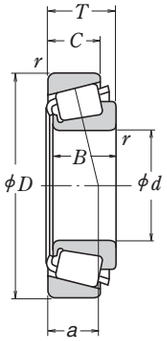
Boundary Dimensions (mm)					Ring: Inner Outer	Basic Load Ratings (N)		Limiting Speeds (min^{-1})		Bearing Designations		Abutment and Fillet Dimensions (mm)				Ring: Inner Outer		Eff. Load Center (mm)	Constant	Axial Load Factors		Mass (kg)	
d	D	T	B	C	r min.	C_r	C_{0r}	Grease	Oil	INNER RING	OUTER RING	d_a	d_b	D_a	D_b	r_a max.		a	e	Y_1	Y_0	approx. Inner Ring	Outer Ring
120.000	170.000	25.400	25.400	19.050	3.3	3.3	160 000	219 000	1 900	2 600	▲ **JL 724348**	▲ **JL 724314**	132	127	156	163	3.3	3.3	32.9	0.46	1.3	0.72	1.08	0.591
	174.625	35.720	36.512	27.783	3.5	1.5	261 000	385 000	1 900	2 600	✻ **M 224748**	**M 224710**	135	129	163	168	3.5	1.5	32.2	0.33	1.8	0.99	1.9	0.866
120.650	182.562	39.688	38.100	33.338	3.5	3.3	280 000	445 000	1 800	2 400	**48282**	**48220**	136	133	168	176	3.5	3.3	34.2	0.31	2.0	1.1	2.56	1.14
	206.375	47.625	47.625	34.925	3.3	3.3	390 000	530 000	1 600	2 200	**795**	**792**	139	134	186	198	3.3	3.3	45.7	0.46	1.3	0.72	4.44	1.9
123.825	182.562	39.688	38.100	33.338	3.5	3.3	280 000	445 000	1 800	2 400	**48286**	**48220**	139	133	168	176	3.5	3.3	34.2	0.31	2.0	1.1	2.37	1.14
125.000	175.000	25.400	25.400	18.288	3.3	3.3	165 000	232 000	1 800	2 400	▲ **JL 725346**	▲ **JL 725316**	138	133	161	168	3.3	3.3	34.3	0.48	1.3	0.69	1.19	0.573
127.000	165.895	18.258	17.462	13.495	1.5	1.5	104 000	149 000	1 900	2 600	**LL 225749**	**LL 225710**	135	132	158	160	1.5	1.5	24.2	0.33	1.8	0.99	0.647	0.288
	182.562	39.688	38.100	33.338	3.5	3.3	280 000	445 000	1 800	2 400	**48290**	**48220**	141	135	168	176	3.5	3.3	34.2	0.31	2.0	1.1	2.19	1.14
	196.850	46.038	46.038	38.100	3.5	3.3	385 000	560 000	1 700	2 200	**67388**	**67322**	144	138	180	189	3.5	3.3	39.7	0.34	1.7	0.96	3.74	1.46
	215.900	47.625	47.625	34.925	3.5	3.3	355 000	495 000	1 500	2 000	**74500**	**74850**	148	141	196	208	3.5	3.3	48.4	0.49	1.2	0.68	4.92	1.99
128.588	206.375	47.625	47.625	34.925	3.3	3.3	390 000	530 000	1 600	2 200	**799**	**792**	146	140	186	198	3.3	3.3	45.7	0.46	1.3	0.72	3.86	1.9
130.000	206.375	47.625	47.625	34.925	3.5	3.3	390 000	530 000	1 600	2 200	**797**	**792**	148	141	186	198	3.5	3.3	45.7	0.46	1.3	0.72	3.76	1.9
130.175	203.200	46.038	46.038	38.100	3.5	3.3	385 000	560 000	1 700	2 200	**67389**	**67320**	146	141	183	191	3.5	3.3	39.7	0.34	1.7	0.96	3.51	2.06
	206.375	47.625	47.625	34.925	3.5	3.3	390 000	530 000	1 600	2 200	**799 A**	**792**	148	142	186	198	3.5	3.3	45.7	0.46	1.3	0.72	3.74	1.9
133.350	177.008	25.400	26.195	20.638	1.5	1.5	153 000	258 000	1 800	2 400	**L 327249**	**L 327210**	143	141	167	171	1.5	1.5	29.5	0.35	1.7	0.95	1.18	0.55
	190.500	39.688	39.688	33.338	3.5	3.3	265 000	440 000	1 700	2 200	**48385**	**48320**	148	142	177	184	3.5	3.3	35.9	0.32	1.9	1.0	2.58	1.16
	196.850	46.038	46.038	38.100	3.5	3.3	385 000	560 000	1 700	2 200	**67390**	**67322**	149	143	180	189	3.5	3.3	39.7	0.34	1.7	0.96	3.27	1.46
	215.900	47.625	47.625	34.925	3.5	3.3	355 000	495 000	1 500	2 000	**74525**	**74850**	152	146	196	208	3.5	3.3	48.4	0.49	1.2	0.68	4.44	1.99
136.525	190.500	39.688	39.688	33.338	3.5	3.3	265 000	440 000	1 700	2 200	**48393**	**48320**	151	144	177	184	3.5	3.3	35.9	0.32	1.9	1.0	2.31	1.16
	217.488	47.625	47.625	34.925	3.5	3.3	355 000	495 000	1 500	2 000	**74537**	**74856**	155	148	197	210	3.5	3.3	48.4	0.49	1.2	0.68	4.19	2.13
139.700	187.325	28.575	29.370	23.020	1.5	1.5	189 000	305 000	1 700	2 200	**LM 328448**	**LM 328410**	149	147	176	182	1.5	1.5	31.7	0.36	1.7	0.93	1.59	0.67
	215.900	47.625	47.625	34.925	3.5	3.3	355 000	495 000	1 500	2 000	**74550**	**74850**	158	151	196	208	3.5	3.3	48.4	0.49	1.2	0.68	3.93	1.99
	254.000	66.675	66.675	47.625	7.0	3.3	635 000	830 000	1 300	1 800	**99550**	**99100**	170	156	227	238	7	3.3	55.3	0.41	1.5	0.81	9.99	3.83
142.875	200.025	41.275	39.688	34.130	3.5	3.3	279 000	460 000	1 600	2 200	**48685**	**48620**	158	151	185	193	3.5	3.3	37.6	0.34	1.8	0.98	2.63	1.19
146.050	193.675	28.575	28.575	23.020	1.5	1.5	205 000	345 000	1 600	2 200	**36690**	**36620**	155	154	182	188	1.5	1.5	33.5	0.37	1.6	0.90	1.64	0.725
	236.538	57.150	56.642	44.450	3.5	3.3	555 000	720 000	1 400	1 900	**HM 231140**	**HM 231110**	164	160	217	224	3.5	3.3	45.9	0.32	1.9	1.0	6.07	2.93
	254.000	66.675	66.675	47.625	7.0	3.3	635 000	830 000	1 300	1 800	**99575**	**99100**	175	162	227	238	7	3.3	55.3	0.41	1.5	0.81	9.24	3.83
149.225	254.000	66.675	66.675	47.625	7.0	3.3	635 000	830 000	1 300	1 800	**99587**	**99100**	178	165	227	238	7	3.3	55.3	0.41	1.5	0.81	8.86	3.83
152.400	254.000	66.675	66.675	47.625	7.0	3.3	635 000	830 000	1 300	1 800	**99600**	**99100**	181	167	227	238	7	3.3	55.3	0.41	1.5	0.81	8.46	3.83
158.750	225.425	41.275	39.688	33.338	3.5	3.3	295 000	540 000	1 400	1 900	**46780**	**46720**	176	169	209	218	3.5	3.3	44.3	0.38	1.6	0.86	3.69	1.66
165.100	247.650	47.625	47.625	38.100	3.5	3.3	425 000	705 000	1 300	1 700	**67780**	**67720**	185	179	229	240	3.5	3.3	52.4	0.44	1.4	0.75	5.83	2.33

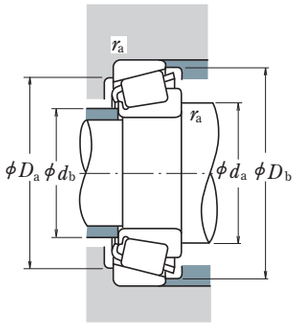
Notes ✻ The maximum bore diameter is listed and its tolerance is negative (see Table 7.4.1 on Page A136).

▲ Tolerances are listed in Tables 2, 3, and 4 on Pages C184 and C185.

■SINGLE-ROW TAPERED ROLLER BEARINGS (INCH SERIES)

Bore Diameter 170.000 – 206.375 mm





Dynamic Equivalent Load

$P = XF_r + YF_a$

$F_a/F_r \leqq e$		$F_a/F_r > e$	
X	Y	X	Y
1	0	0.4	Y_1

Static Equivalent Load

$P_0 = 0.5F_r + Y_0F_a$

When $F_r > 0.5F_r + Y_0F_a$, use $P_0 = F_r$

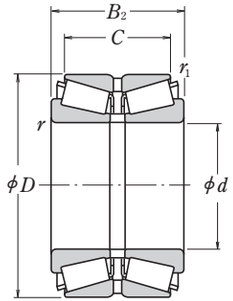
The values of e, Y_1, and Y_0 are given in the table below.

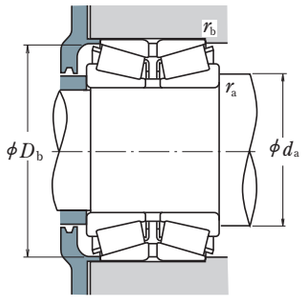
Boundary Dimensions (mm)							Basic Load Ratings (N)		Limiting Speeds (min⁻¹)		Bearing Designations		Abutment and Fillet Dimensions (mm)						Eff. Load Center (mm)	Constant	Axial Load Factors		Mass (kg)	
					Ring: Inner	Outer											Ring: Inner	Outer					approx. Inner Ring	Outer Ring
d	D	T	B	C	r min.		C_r	C_{0r}	Grease	Oil	INNER RING	OUTER RING	d_a	d_b	D_a	D_b	r_a max.		a	e	Y_1	Y_0		
170.000	230.000	39.000	38.000	31.000	3.0	2.5	340 000	520 000	1 300	1 800	◮ **JHM 534149**	◮ **JHM 534110**	184	178	217	224	3	2.5	43.2	0.38	1.6	0.86	3.1	1.3
	240.000	46.000	44.500	37.000	3.0	2.5	470 000	720 000	1 300	1 800	◮ **JM 734449**	◮ **JM 734410**	185	180	222	232	3	2.5	50.5	0.44	1.4	0.75	4.42	2.02
174.625	247.650	47.625	47.625	38.100	3.5	3.3	425 000	705 000	1 300	1 700	**67787**	**67720**	192	185	229	240	3.5	3.3	52.4	0.44	1.4	0.75	4.88	2.33
177.800	227.012	30.162	30.162	23.020	1.5	1.5	215 000	395 000	1 300	1 800	**36990**	**36920**	189	186	214	221	1.5	1.5	42.9	0.44	1.4	0.75	2.1	0.907
	247.650	47.625	47.625	38.100	3.5	3.3	425 000	705 000	1 300	1 700	**67790**	**67720**	194	188	229	240	3.5	3.3	52.4	0.44	1.4	0.75	4.56	2.33
	260.350	53.975	53.975	41.275	3.5	3.3	560 000	835 000	1 200	1 700	**M 236849**	**M 236810**	195	192	241	249	3.5	3.3	47.5	0.33	1.8	0.99	6.49	2.86
190.000	260.000	46.000	44.000	36.500	3.0	2.5	455 000	730 000	1 100	1 600	◮ **JM 738249**	◮ **JM 738210**	206	200	242	252	3	2.5	56.4	0.48	1.3	0.69	4.73	2.2
190.500	266.700	47.625	46.833	38.100	3.5	3.3	425 000	720 000	1 100	1 500	**67885**	**67820**	209	203	246	259	3.5	3.3	57.9	0.48	1.3	0.69	5.4	2.64
200.000	300.000	65.000	62.000	51.000	3.5	2.5	755 000	1 130 000	1 000	1 400	◮ **JHM 840449**	◮ **JHM 840410**	223	215	273	289	3.5	2.5	73.1	0.52	1.2	0.63	10.3	5.19
203.200	282.575	46.038	46.038	36.512	3.5	3.3	450 000	800 000	1 000	1 400	**67983**	**67920**	222	216	260	275	3.5	3.3	61.9	0.51	1.2	0.65	6.03	2.82
206.375	282.575	46.038	46.038	36.512	3.5	3.3	450 000	800 000	1 000	1 400	**67985**	**67920**	224	219	260	275	3.5	3.3	61.9	0.51	1.2	0.65	5.66	2.82

Note ◮ Tolerances are listed in Tables 2, 3, and 4 on Pages C184 and C185.

DOUBLE-ROW TAPERED ROLLER BEARINGS

Bore Diameter 40 – 90 mm





Dynamic Equivalent Load

$P = XF_r + YF_a$

$F_a/F_r \leqq e$		$F_a/F_r > e$	
X	Y	X	Y
1	Y_3	0.67	Y_2

Static Equivalent Load

$P_0 = F_r + Y_0 F_a$

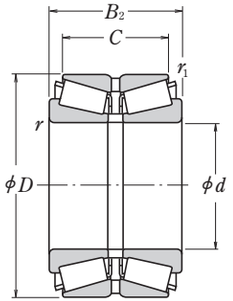
The values of e, Y_2, Y_3, and Y_0 are given in the table below.

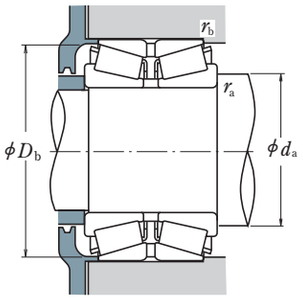
Boundary Dimensions (mm)						Basic Load Ratings (N)		Limiting Speeds (min^{-1})		Bearing Designation	Abutment and Fillet Dimensions (mm)				Constant	Axial Load Factors			Mass (kg)
d	D	B_2	C	r min.	r_1 min.	C_r	C_{0r}	Grease	Oil		d_a min.	D_b min.	r_a max.	r_b max.	e	Y_2	Y_3	Y_0	approx.
40	80	45	37.5	1.5	0.6	134 000	140 000	3 700	5 100	**HR 40 KBE 42+L**	51	75	1.5	0.6	0.37	2.7	1.8	1.8	0.97
45	85	47	37.5	1.5	0.6	144 000	159 000	3 400	4 700	**HR 45 KBE 42+L**	56	81	1.5	0.6	0.40	2.5	1.7	1.6	1.08
	85	55	43.5	1.5	0.6	175 000	204 000	3 400	4 700	**HR 45 KBE 52X+L**	56	81	1.5	0.6	0.40	2.5	1.7	1.6	1.31
50	90	48	38.5	1.5	0.6	161 000	183 000	3 200	4 400	**HR 50 KBE 042+L**	61	87	1.5	0.6	0.42	2.4	1.6	1.6	1.20
	90	49	39.5	1.5	0.6	161 000	183 000	3 200	4 400	**HR 50 KBE 42+L**	61	87	1.5	0.6	0.42	2.4	1.6	1.6	1.22
	90	55	43.5	1.5	0.6	184 000	218 000	3 200	4 400	**HR 50 KBE 52X+L**	61	87	1.5	0.6	0.42	2.4	1.6	1.6	1.39
	110	64	51.5	2.5	0.6	275 000	297 000	2 700	3 700	**HR 50 KBE 043+L**	65	104	2	0.6	0.35	2.9	2.0	1.9	2.77
55	100	51	41.5	2	0.6	200 000	226 000	2 900	3 900	**HR 55 KBE 042+L**	67	96	2	0.6	0.40	2.5	1.7	1.6	1.59
	100	52	42.5	2	0.6	200 000	226 000	2 900	3 900	**HR 55 KBE 1003+L**	67	96	2	0.6	0.40	2.5	1.7	1.6	1.63
	100	60	48.5	2	0.6	232 000	274 000	2 900	3 900	**HR 55 KBE 52X+L**	67	97	2	0.6	0.40	2.5	1.7	1.6	1.88
	120	70	57	2.5	0.6	315 000	340 000	2 500	3 400	**HR 55 KBE 43+L**	70	113	2	0.6	0.35	2.9	2.0	1.9	3.52
60	110	53	43.5	2	0.6	218 000	246 000	2 700	3 600	**HR 60 KBE 042+L**	72	105	2	0.6	0.40	2.5	1.7	1.6	2.03
	110	66	54.5	2	0.6	276 000	335 000	2 700	3 600	**HR 60 KBE 52X+L**	72	106	2	0.6	0.40	2.5	1.7	1.6	2.52
	130	74	59	3	1	365 000	405 000	2 300	3 200	**HR 60 KBE 43+L**	78	122	2.5	1	0.35	2.9	2.0	1.9	4.40
65	120	56	46.5	2	0.6	258 000	300 000	2 400	3 200	**HR 65 KBE 42+L**	77	115	2	0.6	0.40	2.5	1.7	1.6	2.58
	120	57	47.5	2	0.6	258 000	300 000	2 400	3 200	**HR 65 KBE 1202+L**	77	115	2	0.6	0.40	2.5	1.7	1.6	2.61
	120	73	61.5	2	0.6	330 000	405 000	2 400	3 300	**HR 65 KBE 52X+L**	77	117	2	0.6	0.40	2.5	1.7	1.6	3.35
	140	79	63	3	1	420 000	465 000	2 100	2 900	**HR 65 KBE 43+L**	83	132	2.5	1	0.35	2.9	2.0	1.9	5.42
70	125	57	46.5	2	0.6	279 000	325 000	2 300	3 100	**HR 70 KBE 042+L**	82	120	2	0.6	0.42	2.4	1.6	1.6	2.79
	125	59	48.5	2	0.6	330 000	325 000	2 300	3 100	**HR 70 KBE 42+L**	82	120	2	0.6	0.42	2.4	1.6	1.6	2.85
	125	74	61.5	2	0.6	270 000	410 000	2 300	3 100	**HR 70 KBE 52X+L**	82	121	2	0.6	0.42	2.4	1.6	1.6	3.58
	150	83	67	3	1	480 000	535 000	2 000	2 700	**HR 70 KBE 43+L**	88	142	2.5	1	0.35	2.9	2.0	1.9	6.45
75	130	62	51.5	2	0.6	300 000	365 000	2 200	3 000	**HR 75 KBE 42+L**	87	126	2	0.6	0.44	2.3	1.6	1.5	3.15
	130	74	61.5	2	0.6	350 000	440 000	2 200	3 000	**HR 75 KBE 52X+L**	87	127	2	0.6	0.44	2.3	1.6	1.5	3.73
	160	87	69	3	1	535 000	600 000	1 900	2 500	**HR 75 KBE 043+L**	93	151	2.5	1	0.35	2.9	2.0	1.9	7.66
80	140	61	49	2.5	0.6	330 000	390 000	2 000	2 800	**HR 80 KBE 042+L**	95	134	2	0.6	0.42	2.4	1.6	1.6	3.70
	140	64	51.5	2.5	0.6	330 000	390 000	2 000	2 800	**HR 80 KBE 42+L**	95	134	2	0.6	0.42	2.4	1.6	1.6	3.70
	140	78	63.5	2.5	0.6	405 000	505 000	2 000	2 800	**HR 80 KBE 52X+L**	95	136	2	0.6	0.42	2.4	1.6	1.6	4.59
	170	92	73	3	1	585 000	655 000	1 700	2 400	**HR 80 KBE 043+L**	98	161	2.5	1	0.35	2.9	2.0	1.9	9.02
85	150	70	57	2.5	0.6	385 000	465 000	1 900	2 600	**HR 85 KBE 42+L**	100	143	2	0.6	0.42	2.4	1.6	1.6	4.69
	150	86	69	2.5	0.6	445 000	555 000	1 900	2 600	**HR 85 KBE 52X+L**	100	144	2	0.6	0.42	2.4	1.6	1.6	5.70
	180	98	77	4	1	655 000	745 000	1 600	2 200	**HR 85 KBE 043+L**	106	169	3	1	0.35	2.9	2.0	1.9	10.8
90	160	71	58	2.5	0.6	425 000	510 000	1 800	2 400	**HR 90 KBE 042+L**	105	152	2	0.6	0.42	2.4	1.6	1.6	5.53
	160	74	61	2.5	0.6	425 000	510 000	1 800	2 400	**HR 90 KBE 42+L**	105	152	2	0.6	0.42	2.4	1.6	1.6	5.71
	160	94	77	2.5	0.6	540 000	700 000	1 800	2 400	**HR 90 KBE 52X+L**	105	154	2	0.6	0.42	2.4	1.6	1.6	7.26

Remark For other double-row tapered roller bearings not listed above, please contact NSK.

DOUBLE-ROW TAPERED ROLLER BEARINGS

Bore Diameter 90 – 120 mm





Dynamic Equivalent Load

$P = XF_r + YF_a$

$F_a/F_r \leqq e$		$F_a/F_r > e$	
X	Y	X	Y
1	Y_3	0.67	Y_2

Static Equivalent Load

$P_0 = F_r + Y_0 F_a$

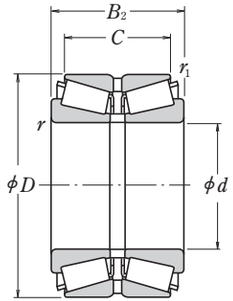
The values of e, Y_2, Y_3, and Y_0 are given in the table below.

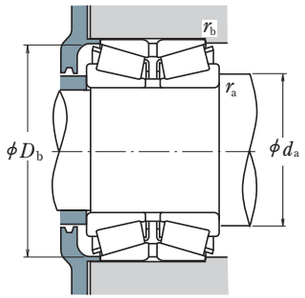
Boundary Dimensions (mm)						Basic Load Ratings (N)		Limiting Speeds (min^{-1})		Bearing Designation	Abutment and Fillet Dimensions (mm)				Constant	Axial Load Factors			Mass (kg)
d	D	B_2	C	r min.	r_1 min.	C_r	C_{0r}	Grease	Oil		d_a min.	D_b min.	r_a max.	r_b max.	e	Y_2	Y_3	Y_0	approx.
90	190	102	81	4	1	730 000	845 000	1 600	2 100	**HR 90 KBE 043+L**	111	178	3	1	0.35	2.9	2.0	1.9	12.7
	190	144	115	4	1	950 000	1 180 000	1 600	2 200	**HR 90 KBE 1901+L**	111	179	3	1	0.35	2.9	2.0	1.9	17.9
95	170	78	63	3	1	470 000	570 000	1 700	2 300	**HR 95 KBE 42+L**	113	161	2.5	1	0.42	2.4	1.6	1.6	6.75
	170	100	83	3	1	610 000	800 000	1 700	2 300	**HR 95 KBE 52+L**	113	163	2.5	1	0.42	2.4	1.6	1.6	8.60
	200	108	85	4	1	785 000	910 000	1 500	2 000	**HR 95 KBE 43+L**	116	187	3	1	0.35	2.9	2.0	1.9	14.7
100	165	52	46	2.5	0.6	273 000	340 000	1 700	2 300	**100 KBE 31+L**	115	156	2	0.6	0.33	3.0	2.0	2.0	4.04
	180	81	64	3	1	540 000	665 000	1 600	2 200	**HR100 KBE 1805+L**	118	170	2.5	1	0.42	2.4	1.6	1.6	8.16
	180	81	65	3	1	540 000	665 000	1 600	2 200	**HR100 KBE 042+L**	118	170	2.5	1	0.42	2.4	1.6	1.6	8.13
	180	82	66	3	1	540 000	665 000	1 600	2 200	**HR100 KBE 1801+L**	118	170	2.5	1	0.42	2.4	1.6	1.6	8.22
	180	83	67	3	1	540 000	665 000	1 600	2 200	**HR100 KBE 42+L**	118	170	2.5	1	0.42	2.4	1.6	1.6	8.7
	180	105	85	3	1	685 000	905 000	1 600	2 200	**HR100 KBE 1802+L**	118	173	2.5	1	0.42	2.4	1.6	1.6	10.6
	180	107	87	3	1	685 000	905 000	1 600	2 200	**HR100 KBE 52X+L**	118	173	2.5	1	0.42	2.4	1.6	1.6	10.7
	180	110	90	3	1	685 000	905 000	1 600	2 200	**HR100 KBE 1804+L**	118	173	2.5	1	0.42	2.4	1.6	1.6	11
	215	112	87	4	1	895 000	1 050 000	1 400	1 900	HR100 KBE 043+L	121	200	3	1	0.35	2.9	2.0	1.9	18.1
105	190	88	70	3	1	590 000	735 000	1 500	2 000	**HR105 KBE 42X+L**	123	179	2.5	1	0.42	2.4	1.6	1.6	9.76
	190	117	96	3	1	765 000	1 020 000	1 500	2 000	**HR105 KBE 1902+L**	123	182	2.5	1	0.42	2.4	1.6	1.6	13.4
	190	115	95	3	1	765 000	1 020 000	1 500	2 000	**HR105 KBE 52+L**	123	182	2.5	1	0.42	2.4	1.6	1.6	13.1
110	180	56	50	2.5	0.6	325 000	400 000	1 500	2 000	**110 KBE 31+L**	125	172	2	0.6	0.39	2.6	1.7	1.7	5.11
	180	70	56	2.5	0.6	420 000	555 000	1 500	2 000	**110 KBE 031+L**	125	172	2	0.6	0.39	2.6	1.7	1.7	6.33
	180	125	100	2.5	0.6	675 000	1 060 000	1 500	2 100	**110 KBE 1802+L**	125	172	2	0.6	0.26	3.8	2.6	2.5	11.4
	200	90	72	3	1	665 000	840 000	1 400	1 900	**HR110 KBE 42+L**	128	190	2.5	1	0.42	2.4	1.6	1.6	11.2
	200	92	74	3	1	665 000	840 000	1 400	1 900	**HR110 KBE 42X+L**	128	190	2.5	1	0.42	2.4	1.6	1.6	11.5
	200	120	100	3	1	840 000	1 130 000	1 400	1 900	**HR110 KBE 2001+L**	128	193	2.5	1	0.42	2.4	1.6	1.6	15.4
	200	121	101	3	1	840 000	1 130 000	1 400	1 900	**HR110 KBE 52X+L**	128	193	2.5	1	0.42	2.4	1.6	1.6	15.2
120	180	46	41	2.5	0.6	227 000	296 000	1 500	2 000	**120 KBE 30+L**	135	172	2	0.6	0.40	2.5	1.7	1.6	3.75
	180	58	46	2.5	0.6	320 000	450 000	1 500	2 000	**120 KBE 030+L**	135	172	2	0.6	0.39	2.6	1.7	1.7	4.64
	200	62	55	2.5	0.6	385 000	500 000	1 400	1 800	**120 KBE 31+L**	135	190	2	0.6	0.39	2.6	1.7	1.7	7.35
	200	78	62	2.5	0.6	510 000	690 000	1 400	1 900	**120 KBE 031+L**	135	190	2	0.6	0.39	2.6	1.7	1.7	8.97
	200	100	84	2.5	0.6	635 000	885 000	1 400	1 800	**120 KBE 2001+L**	135	193	2	0.6	0.37	2.7	1.8	1.8	11.3
	215	97	78	3	1	705 000	900 000	1 300	1 800	**HR120 KBE 42X+L**	138	204	2.5	1	0.44	2.3	1.6	1.5	13.7
	215	132	109	3	1	925 000	1 270 000	1 300	1 800	**HR120 KBE 52X+L**	138	207	2.5	1	0.44	2.3	1.6	1.5	18.8
	260	128	101	4	1	1 130 000	1 310 000	1 100	1 500	**HR120 KBE 43+L**	141	240	3	1	0.35	2.9	2.0	1.9	29.4
	260	188	145	4	1	1 630 000	2 110 000	1 100	1 500	**HR120 KBE 2601+L**	141	242	3	1	0.35	2.9	2.0	1.9	44.6

Remark For other double-row tapered roller bearings not listed above, please contact NSK.

DOUBLE-ROW TAPERED ROLLER BEARINGS

Bore Diameter 125 – 150 mm





Dynamic Equivalent Load

$P = XF_r + YF_a$

$F_a/F_r \leqq e$		$F_a/F_r > e$	
X	Y	X	Y
1	Y_3	0.67	Y_2

Static Equivalent Load

$P_0 = F_r + Y_0 F_a$

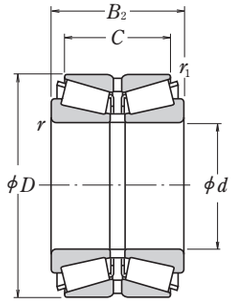
The values of e, Y_2, Y_3, and Y_0 are given in the table below.

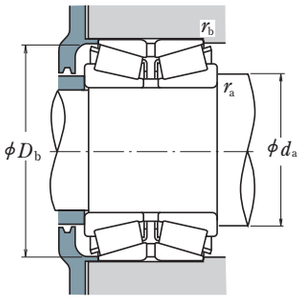
Boundary Dimensions (mm)						Basic Load Ratings (N)		Limiting Speeds (min^{-1})		Bearing Designation	Abutment and Fillet Dimensions (mm)				Constant	Axial Load Factors			Mass (kg)
d	D	B_2	C	r min.	r_1 min.	C_r	C_{0r}	Grease	Oil		d_a min.	D_b min.	r_a max.	r_b max.	e	Y_2	Y_3	Y_0	approx.
125	210	110	88	4	1	690 000	1 030 000	1 300	1 800	**125 KBE 2101+L**	146	201	3	1	0.43	2.3	1.6	1.5	14.5
130	230	98	78.5	4	1	790 000	1 010 000	1 200	1 600	**HR130 KBE 42+L**	151	220	3	1	0.44	2.3	1.6	1.5	15.8
	230	100	80.5	4	1	790 000	1 010 000	1 200	1 600	**HR130 KBE 2301+L**	151	220	3	1	0.44	2.3	1.6	1.5	15.9
	280	137	107.5	5	1.5	1 150 000	1 350 000	1 000	1 400	**130 KBE 43+L**	157	258	4	1.5	0.36	2.8	1.9	1.8	35
	230	145	115	4	1	1 120 000	1 580 000	1 200	1 700	**HR130 KBE 2302+L**	151	221	3	1	0.44	2.3	1.6	1.5	24.1
	230	145	117.5	4	1	1 120 000	1 580 000	1 200	1 700	**HR130 KBE 52+L**	151	222	3	1	0.44	2.3	1.6	1.5	23.8
	230	150	120	4	1	1 120 000	1 580 000	1 200	1 700	**HR130 KBE 2303+L**	151	221	3	1	0.44	2.3	1.6	1.5	24.2
140	210	53	47	2.5	0.6	345 000	495 000	1 200	1 700	**140 KBE 30+L**	155	202	2	0.6	0.39	2.6	1.7	1.7	6.02
	210	66	53	2.5	1	370 000	530 000	1 200	1 700	**140 KBE 030+L**	155	202	2	1	0.40	2.5	1.7	1.6	7.02
	210	106	94	2.5	0.6	685 000	1 200 000	1 300	1 700	**140 KBE 2101+L**	155	202	2	0.6	0.33	3.0	2.0	2.0	12.3
	225	68	61	3	1	490 000	630 000	1 200	1 600	**140 KBE 31+L**	158	216	2.5	1	0.39	2.6	1.7	1.7	9.31
	225	84	68	3	1	605 000	850 000	1 200	1 600	**140 KBE 031+L**	158	215	2.5	1	0.39	2.6	1.7	1.7	11.6
	225	85	68	3	1	605 000	850 000	1 200	1 600	**140 KBE 2201+L**	158	215	2.5	1	0.39	2.6	1.7	1.7	11.7
	230	120	94	3	1	840 000	1 270 000	1 200	1 600	**140 KBE 2301+L**	158	220	2.5	1	0.33	3.0	2.0	2.0	17.6
	230	140	110	3	1	1 010 000	1 550 000	1 200	1 600	**140 KBE 2302+L**	158	221	2.5	1	0.35	2.9	2.0	1.9	20.7
	240	132	106	4	1.5	845 000	1 360 000	1 100	1 500	**140 KBE 2401+L**	161	227	3	1.5	0.44	2.3	1.5	1.5	22.7
	250	102	82.5	4	1	825 000	1 030 000	1 100	1 500	**HR140 KBE 42+L**	161	237	3	1	0.44	2.3	1.6	1.5	18.9
	250	153	125.5	4	1	1 280 000	1 830 000	1 100	1 500	**HR140 KBE 52X+L**	161	241	3	1	0.44	2.3	1.6	1.5	29.6
	300	145	115.5	5	1.5	1 270 000	1 480 000	1 000	1 300	**140 KBE 43+L**	167	275	4	1.5	0.36	2.8	1.9	1.8	42.6
150	225	56	50	3	1	370 000	545 000	1 200	1 600	**150 KBE 30+L**	168	213	2.5	1	0.35	2.9	2.0	1.9	7.41
	225	70	56	3	1	485 000	685 000	1 200	1 600	**150 KBE 030+L**	168	215	2.5	1	0.35	2.9	2.0	1.9	8.70
	250	80	71	3	1	625 000	810 000	1 100	1 400	**150 KBE 31+L**	168	240	2.5	1	0.40	2.5	1.7	1.6	14.2
	250	100	80	3	1	775 000	1 090 000	1 100	1 400	**150 KBE 031+L**	168	238	2.5	1	0.39	2.6	1.7	1.7	17.8
	250	115	95	3	1	920 000	1 320 000	1 100	1 500	**150 KBE 2502+L**	168	238	2.5	1	0.37	2.7	1.8	1.8	20.9
	260	150	115	4	1	1 000 000	1 520 000	1 100	1 400	**150 KBE 2601+L**	171	242	3	1	0.43	2.3	1.6	1.5	30.0
	270	109	87	4	1	1 020 000	1 330 000	1 000	1 400	**HR150 KBE 42+L**	171	253	3	1	0.44	2.3	1.6	1.5	24.3
	270	164	130	4	1	1 480 000	2 150 000	1 000	1 400	**HR150 KBE 52X+L**	171	257	3	1	0.44	2.3	1.6	1.5	37.3
	270	174	140	4	1	1 480 000	2 150 000	1 000	1 400	**HR150 KBE 2701+L**	171	257	3	1	0.44	2.3	1.6	1.5	39.7
	320	154	120	5	1.5	1 740 000	2 130 000	900	1 200	HR150 KBE 43+L	177	295	4	1.5	0.35	2.9	2.0	1.9	53.4

Remark For other double-row tapered roller bearings not listed above, please contact NSK.

DOUBLE-ROW TAPERED ROLLER BEARINGS

Bore Diameter 160 – 200 mm





Dynamic Equivalent Load

$P = XF_r + YF_a$

$F_a/F_r \leqq e$		$F_a/F_r > e$	
X	Y	X	Y
1	Y_3	0.67	Y_2

Static Equivalent Load

$P_0 = F_r + Y_0 F_a$

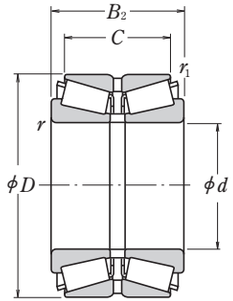
The values of e, Y_2, Y_3, and Y_0 are given in the table below.

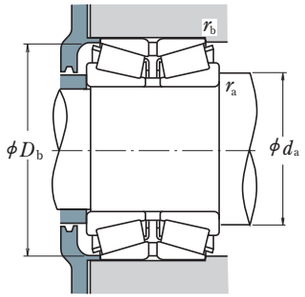
Boundary Dimensions (mm)						Basic Load Ratings (N)		Limiting Speeds (min^{-1})		Bearing Designation	Abutment and Fillet Dimensions (mm)				Constant	Axial Load Factors			Mass (kg)
d	D	B_2	C	r min.	r_1 min.	C_r	C_{0r}	Grease	Oil		d_a min.	D_b min.	r_a max.	r_b max.	e	Y_2	Y_3	Y_0	approx.
160	240	60	53	3	1	435 000	580 000	1 100	1 500	**160 KBE 30+L**	178	231	2.5	1	0.37	2.7	1.8	1.8	8.56
	240	75	60	3	1	485 000	710 000	1 100	1 500	**160 KBE 030+L**	178	230	2.5	1	0.40	2.5	1.7	1.6	10.5
	240	110	90	3	1	800 000	1 290 000	1 100	1 500	**160 KBE 2401+L**	178	232	2.5	1	0.38	2.6	1.8	1.7	16.2
	270	86	76	3	1	660 000	885 000	1 000	1 300	**160 KBE 31+L**	178	255	2.5	1	0.40	2.5	1.7	1.6	18.6
	270	108	86	3	1	955 000	1 380 000	1 000	1 300	**160 KBE 031+L**	178	256	2.5	1	0.39	2.6	1.7	1.7	23.1
	270	140	120	3	1	1 220 000	1 880 000	1 000	1 300	**160 KBE 2701+L**	178	261	2.5	1	0.39	2.6	1.7	1.7	30.6
	280	150	125	4	1	1 360 000	2 020 000	1 000	1 300	**160 KBE 2801+L**	181	266	3	1	0.32	3.2	2.1	2.1	35.9
	290	115	91	4	1	985 000	1 220 000	900	1 300	**160 KBE 42+L**	181	275	3	1	0.43	2.3	1.6	1.5	28.2
	290	178	144	4	1	1 670 000	2 440 000	1 000	1 300	**HR160 KBE 52X+L**	181	277	3	1	0.44	2.3	1.6	1.5	47.3
	340	160	126	5	1.5	1 610 000	1 920 000	800	1 100	**160 KBE 43+L**	187	314	4	1.5	0.36	2.8	1.9	1.8	60.4
165	290	150	125	4	1	1 400 000	2 130 000	900	1 300	**165 KBE 2901+L**	186	272	3	1	0.33	3.1	2.1	2.0	39.5
170	250	85	65	3	1	535 000	845 000	1 000	1 400	**170 KBE 2501+L**	188	241	2.5	1	0.44	2.3	1.5	1.5	12.3
	260	67	60	3	1	490 000	700 000	1 000	1 300	**170 KBE 30+L**	188	248	2.5	1	0.40	2.5	1.7	1.6	11.8
	260	84	67	3	1	705 000	1 030 000	1 000	1 300	**170 KBE 030+L**	188	249	2.5	1	0.39	2.6	1.7	1.7	14.4
	280	88	78	3	1	775 000	1 040 000	900	1 300	**170 KBE 31+L**	188	266	2.5	1	0.39	2.6	1.7	1.7	19.7
	280	110	88	3	1	1 010 000	1 450 000	900	1 300	**170 KBE 031+L**	188	268	2.5	1	0.39	2.6	1.7	1.7	24.2
	280	150	130	3	1	1 360 000	2 160 000	1 000	1 300	**170 KBE 2802+L**	188	269	2.5	1	0.39	2.6	1.7	1.7	34.6
	310	192	152	5	1.5	1 960 000	2 910 000	900	1 200	**HR170 KBE 52X+L**	197	297	4	1.5	0.44	2.3	1.6	1.5	57.3
180	280	74	66	3	1	560 000	810 000	900	1 300	**180 KBE 30+L**	198	265	2.5	1	0.40	2.5	1.7	1.6	15.4
	280	93	74	3	1	810 000	1 220 000	900	1 200	**180 KBE 030+L**	198	265	2.5	1	0.35	2.9	2.0	1.9	14.4
	300	96	85	4	1.5	890 000	1 210 000	900	1 200	**180 KBE 31+L**	201	284	3	1.5	0.39	2.6	1.7	1.7	24.8
	300	120	96	4	1.5	1 160 000	1 690 000	900	1 200	**180 KBE 031+L**	201	287	3	1.5	0.39	2.6	1.7	1.7	31.1
	320	127	99	5	1.5	1 100 000	1 390 000	800	1 200	**180 KBE 42+L**	207	300	4	1.5	0.44	2.3	1.5	1.5	36.5
	320	192	152	5	1.5	2 020 000	3 050 000	900	1 200	**HR180 KBE 52X+L**	207	308	4	1.5	0.45	2.2	1.5	1.5	59.2
	340	180	140	5	1.5	1 740 000	2 510 000	800	1 100	**180 KBE 3401+L**	207	305	4	1.5	0.43	2.3	1.6	1.5	68.1
190	290	75	67	3	1	605 000	845 000	900	1 200	**190 KBE 30+L**	208	279	2.5	1	0.39	2.6	1.7	1.7	16.2
	290	94	75	3	1	820 000	1 230 000	900	1 200	**190 KBE 030+L**	208	279	2.5	1	0.40	2.5	1.7	1.6	20.1
	320	104	92	4	1.5	985 000	1 380 000	800	1 100	**190 KBE 31+L**	211	301	3	1.5	0.40	2.5	1.7	1.6	30.9
	320	130	104	4	1.5	1 320 000	1 960 000	800	1 100	**190 KBE 031+L**	211	302	3	1.5	0.39	2.6	1.7	1.7	39.0
	340	133	105	5	1.5	1 220 000	1 580 000	800	1 100	**190 KBE 42+L**	217	320	4	1.5	0.40	2.5	1.7	1.6	43.9
	340	204	160	5	1.5	2 340 000	3 550 000	800	1 100	**HR190 KBE 52X+L**	217	327	4	1.5	0.44	2.3	1.6	1.5	70.8
200	310	152	123	3	1	1 600 000	2 740 000	800	1 100	**HR200 KBE 3101+L**	218	301	2.5	1	0.43	2.3	1.6	1.5	40.1
	320	146	110	5	1.5	1 220 000	2 120 000	800	1 100	**200 KBE 3201+L**	227	301	4	1.5	0.52	1.9	1.3	1.3	41.6
	330	180	140	5	1.5	1 710 000	2 730 000	800	1 100	**200 KBE 3301+L**	227	316	4	1.5	0.42	2.4	1.6	1.6	54.4
	340	112	100	4	1.5	1 160 000	1 670 000	800	1 000	**200 KBE 31+L**	221	321	3	1.5	0.40	2.5	1.7	1.6	38.8
	340	140	112	4	1.5	1 550 000	2 250 000	800	1 000	**200 KBE 031+L**	221	324	3	1.5	0.39	2.6	1.7	1.7	47.0
	360	142	110	5	1.5	1 360 000	1 780 000	700	1 000	**200 KBE 42+L**	227	338	4	1.5	0.40	2.5	1.7	1.6	52.6
	360	218	174	5	1.5	2 540 000	3 850 000	800	1 000	**HR200 KBE 52+L**	227	344	4	1.5	0.41	2.5	1.7	1.6	88.3

Remark For other double-row tapered roller bearings not listed above, please contact NSK.

DOUBLE-ROW TAPERED ROLLER BEARINGS

Bore Diameter 206 – 260 mm





Dynamic Equivalent Load

$P = XF_r + YF_a$

$F_a/F_r \leqq e$		$F_a/F_r > e$	
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^{-1})		Bearing Designation	Abutment and Fillet Dimensions (mm)				Constant	Axial Load Factors			Mass (kg)
d	D	B_2	C	r min.	r_1 min.	C_r	C_{0r}	Grease	Oil		d_a min.	D_b min.	r_a max.	r_b max.	e	Y_2	Y_3	Y_0	approx.
206	283	102	83	4	1.5	715 000	1 430 000	900	1 200	**206 KBE 2801+L**	227	275	3	1.5	0.51	2.0	1.3	1.3	18.1
210	355	116	103	4	1.5	1 110 000	1 520 000	700	1 000	**210 KBE 31+L**	231	338	3	1.5	0.46	2.2	1.5	1.4	41.7
220	300	110	88	3	1	900 000	1 710 000	800	1 100	**220 KBE 3001+L**	238	292	2.5	1	0.37	2.7	1.8	1.8	21.2
	340	90	80	4	1.5	855 000	1 280 000	700	1 000	**220 KBE 30+L**	241	324	3	1.5	0.40	2.5	1.7	1.6	27.9
	340	113	90	4	1.5	1 130 000	1 830 000	700	1 000	**220 KBE 030+L**	241	327	3	1.5	0.40	2.5	1.7	1.6	34.7
	370	120	107	5	1.5	1 360 000	1 940 000	700	1 000	**220 KBE 31+L**	247	345	4	1.5	0.39	2.6	1.7	1.7	48.3
	370	150	120	5	1.5	1 800 000	2 760 000	700	1 000	**220 KBE 031+L**	247	349	4	1.5	0.39	2.6	1.7	1.7	60.2
	400	158	122	5	1.5	1 710 000	2 300 000	600	900	**220 KBE 42+L**	247	371	4	1.5	0.40	2.5	1.7	1.6	74.2
240	360	92	82	4	1.5	960 000	1 490 000	700	900	**240 KBE 30+L**	261	344	3	1.5	0.39	2.6	1.7	1.7	30.1
	360	115	92	4	1.5	1 250 000	2 040 000	700	900	**240 KBE 030+L**	261	344	3	1.5	0.35	2.9	2.0	1.9	37.3
	400	128	114	5	1.5	1 450 000	2 190 000	600	900	**240 KBE 31+L**	267	380	4	1.5	0.43	2.3	1.6	1.5	60.0
	400	160	128	5	1.5	1 990 000	3 050 000	600	900	**240 KBE 031+L**	267	378	4	1.5	0.39	2.6	1.7	1.7	73.6
	400	209	168	5	1.5	2 720 000	4 450 000	600	900	**240 KBE 4003+L**	267	384	4	1.5	0.33	3.0	2.0	2.0	96.4
250	380	98	87	4	1	980 000	1 460 000	600	900	**250 KBE 3801+L**	271	365	3	1	0.40	2.5	1.7	1.6	35.5
260	400	104	92	5	1.5	1 100 000	1 670 000	600	800	**260 KBE 30+L**	287	379	4	1.5	0.40	2.5	1.7	1.6	43.4
	400	130	104	5	1.5	1 490 000	2 460 000	600	800	**260 KBE 030+L**	287	382	4	1.5	0.40	2.5	1.7	1.6	54.1
	440	144	128	5	1.5	1 890 000	2 760 000	600	800	**260 KBE 31+L**	287	416	4	1.5	0.39	2.6	1.7	1.7	82.5
	440	172	145	5	1.5	2 290 000	3 500 000	600	800	**260 KBE 4401+L**	287	414	4	1.5	0.38	2.6	1.8	1.7	98.1
	440	180	144	5	1.5	2 600 000	4 150 000	600	800	**260 KBE 031+L**	287	416	4	1.5	0.39	2.6	1.7	1.7	104.0

Remark For other double-row tapered roller bearings not listed above, please contact NSK.



7. SPHERICAL ROLLER BEARINGS

INTRODUCTION ..... C 258

TECHNICAL DATA

Free Space of Spherical Roller Bearings ..... C 260

Measuring Bearing Clearance ..... C 262

BEARING TABLES

Spherical Roller Bearings
Cylindrical Bores, Tapered Bores

Bore Diameter 20 – 1320 mm ..... C 266

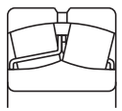
DESIGN, TYPES, AND FEATURES

Various types of high load capacity spherical roller bearings are available. Types EA, C and CD have pressed-steel cages, and type CA has machined-brass cages. EA-type bearings listed here are classified as NSKHPS™ bearings, which offer particularly high load-carrying capacity, high limiting speeds, and superior performance under high-temperature operating conditions up to 200 °C. Machined brass cages are recommended for applications with vibrations or shocks.

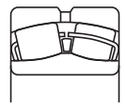
An oil groove and holes are located in the outer ring to supply lubricant, and bearing designations are suffixed with E4.

To use bearings with oil grooves and holes, an oil groove should be located in the housing bore since depth for the groove in the bearing is limited. The dimensions of the oil groove and number of holes present are listed in Tables 1 and 2.

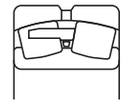
When requiring bearings with a hole for a locking pin to prevent outer ring rotation, please contact NSK.



EA



C and CD

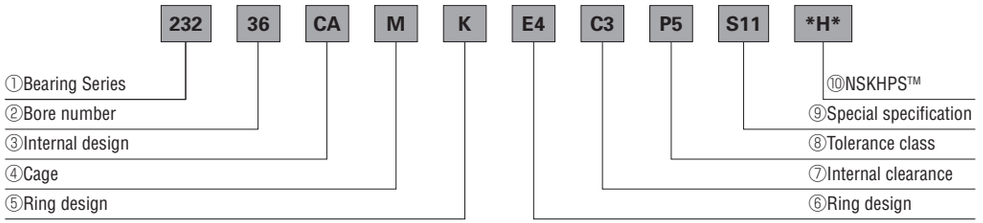


CA

☐ Formulation of Bearing Designations

Spherical Roller Bearings

Example:



①Bearing Series	239, 230, 240, 231, 241, 222, 232, 213, 223: Spherical roller bearings
②Bore number	Bore diameter = Bore number × 5 (mm)
③Internal design	EA, CA: High load capacity
④Cage	M: Machined-brass cage (for CA Design)
	Omitted: Pressed-steel cage (for EA Design)
⑤⑥Ring design	K: Tapered bore of inner ring (taper 1: 12)
	K30: Tapered bore of inner ring (taper 1: 30)
	E4: Lubricating groove on outside surface and holes in outer ring
⑦Internal clearance	Omitted: CN clearance, C3: Clearance greater than CN,
	C4: Clearance greater than C3, C5: Clearance greater than C4
⑧Tolerance class	Omitted: ISO Normal, P6: ISO Class 6, P5: ISO Class 5, P4: ISO Class 4
⑨Special specification	S11: Dimensional stabilizing treatment: working temperature under 200 °C
	(omitted for EA design)
⑩NSKHPS™	*H*: NSKHPS™ designation
	Tolerance Class: ISO Normal

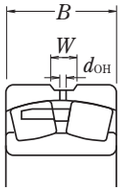


Table 1 Dimensions of Oil Grooves and Holes Units : mm

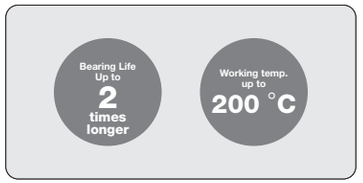
Nominal Width B over	Nominal Width B incl.	Oil Groove Width W	Hole Diameter d_{OH}
18	30	5	2.5
30	40	6	3
40	50	7	4
50	65	8	5
65	80	10	6
80	100	12	8
100	120	15	10
120	160	20	12
160	200	25	15
200	250	30	20
250	315	35	20
315	400	40	25
400	—	40	25

Table 2 Number of Oil Holes

Nominal Outer Ring Dia D (mm) over	Nominal Outer Ring Dia D (mm) incl.	Number of Holes
—	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

NSKHPS™ Spherical Roller Bearings

Features Compared with conventional bearings...



1. Improved reliability
Bearing life is up to twice that of conventional bearings thanks to optimization of the bearing's internal design and improvement of processing technology.
2. High-temperature dimensional stabilizing treatment comes standard
NSK's exclusive heat treatment technology achieves dimensional stability up to 200 °C.

TOLERANCES AND RUNNING ACCURACY

SPHERICAL ROLLER BEARINGS ..... Table 7.2 (Pages A128 to A131)
NSKHPS SPHERICAL ROLLER BEARINGS
Tolerance for Dimensions: ISO Normal
Running Accuracy: ISO Normal

RECOMMENDED FITS

SPHERICAL ROLLER BEARINGS ..... Table 8.3 (Page A164)
Table 8.5 (Page A165)

INTERNAL CLEARANCES

SPHERICAL ROLLER BEARINGS ..... Table 8.16 (Page A172)
NSKHPS SPHERICAL ROLLER BEARINGS
INTERNAL CLEARANCE DESIGNATION : CN, C3, C4

PERMISSIBLE MISALIGNMENT

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

LIMITING SPEEDS (GREASE)

The limiting speeds (grease) listed in the bearing tables should be adjusted depending on bearing load conditions. Furthermore, higher speeds may be attainable by making changes in the lubrication method, cage design, etc. Refer to Page A098 for detailed information.

PRECAUTIONS FOR USE OF SPHERICAL ROLLER BEARINGS

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' as listed in the bearing tables, slippage occurs between the rollers and raceways, which may result in smearing. The higher the weight, 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.

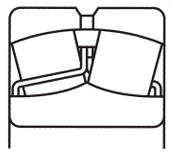
TECHNICAL DATA

Free Space of Spherical Roller Bearings

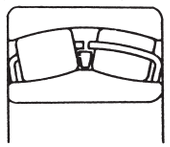
Spherical roller bearings have self-aligning capabilities and the capacity to carry substantially large radial and bi-axial loads. For these reasons, this bearing is used widely in many applications, such as plumber blocks. Application problems include a long span, which causes substantial deflection of the shaft, installation errors, and axial misalignment. These bearings may be exposed to large radial or shock loads.

Grease lubrication is common for spherical roller bearings because it simplifies the seal construction around the housing and makes maintenance and inspection easier. In this case, it is important to select a grease appropriate to the operating conditions and to fill the bearing with the proper amount of grease while considering the housing internal space.

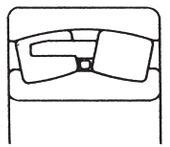
The amount of bearing free space for various spherical roller bearings is shown in Table 1. Under general operating conditions, a user may pack up to 1/3 to 2/3 of the free space of the bearing with grease.



EA type



C, CD type



CA type

Table 1 Free Space of Spherical Roller Bearings (EA, C, CD, and CA)

Units: cm^3

Bearing Bore No.	Bearing Free Space				
	Bearing Series				
	230	231	222	232	223
11	—	—	29	—	78
12	—	—	42	—	96
13	—	—	48	—	113
14	—	—	52	—	139
15	—	—	57	—	170
16	—	—	71	—	206
17	—	—	91	—	234
18	—	—	110	130	283
19	—	—	135	—	327
20	—	—	169	203	410
22	100	150	242	294	560
24	109	228	297	340	700
26	161	240	365	405	955
28	170	292	400	530	1 230
30	209	465	505	680	1 430
32	254	575	680	850	1 710
34	355	610	785	1 090	2 070
36	465	785	810	1 120	2 460
38	565	970	1 160	1 340	2 830
40	715	1 160	1 400	1 640	2 900
44	940	1 500	1 880	2 270	3 750
48	1 030	1 900	2 550	3 550	4 700
52	1 530	2 940	3 300	4 750	5 900
56	1 820	3 150	3 400	4 950	7 250
60	2 200	4 050	4 300	6 200	8 750

Remarks 22211 to 22226 and 22311 to 22324 are EA bearings.
23122 to 23148 and 23218 to 23244 are C bearings.
23022 to 23036 and 22228 to 22236 are CD bearings.
23038 to 23060, 23152 to 23160, 22238 to 22260,
23248 to 23260, and 22326 to 22360 are CA bearings.

Measurement of Clearance in SRBs

The measurement of internal bearing clearance before mounting is critical. Before handling the bearing and measuring the internal bearing clearance, be sure to wear thin rubber gloves.

If bearings are touched with bare hands, the touched part may rust.

When measuring the internal bearing clearance, ensure that the rollers are positioned correctly.

1. Measurement of Bearing Clearance

To measure only internal bearing clearance, set the bearing upright (vertically) on a flat surface while holding the outer ring with one hand. Take care not to incline the inner and outer rings, and stabilize the rollers by turning the inner ring clockwise and counter-clockwise by about one half to one full rotation. Adjust the rollers until a random roller is positioned at the very top of the bearing. Next, use a thickness gauge to measure the internal clearance. Measurement positioning and location may vary slightly depending on the size of the outer ring outside diameter.

1.1 When Bearing Outside Diameter Is Under 200 mm

Insert the thickness gauge between the two rows of rollers and the outer ring at the rollers located at the very top of the bearing. Then, measure the internal clearance Δ_r (see Fig. 1).

1.2 When Bearing Outside Diameter Is Over 200 mm

Insert the thickness gauge between the two rows of rollers and the outer ring at the very top of the bearing and on the sides at two symmetrical points relative to the bearing center. Then, take respective measurements for the bearing internal clearance (see Fig. 2).

Take the individual values measured at the very top of bearing and outer ring as Δ_{rT1} and Δ_{rT2}, and determine the internal clearance at the top of the bearing Δ_{rT} by the following equation:

$$\Delta_{rT} = 1/2\ (\Delta_{rT1} + \Delta_{rT2})$$

Then, take the measurements between the two rows of rollers on the left side as Δ_{rL1} and Δ_{rL2}, and determine the internal clearance on the left side of the bearing Δ_{rL} by the following equation:

$$\Delta_{rL} = 1/2\ (\Delta_{rL1} + \Delta_{rL2})$$

Next, take the measurements between the two rows of rollers on the right side as Δ_{rR1} and Δ_{rR2}, and determine the internal clearance on the right side of the bearing Δ_{rR} by the following equation:

$$\Delta_{rR} = 1/2\ (\Delta_{rR1} + \Delta_{rR2})$$

Finally, determine the internal bearing clearance Δ_r by the following equation:

$$\Delta_r = 1/2\ (\Delta_{rT} + \Delta_{rL} + \Delta_{rR})$$

2. Measuring Bearing Clearance When Mounted on Shaft or Sleeve

In this case, clearance measurements are taken with the outer ring of the bearing hanging down from the rollers. First, while holding the bearing upright, rotate the outer ring clockwise and counter-clockwise by one-half to one full rotation until both rows have a random roller positioned exactly at the bottom. Use a thickness gauge to measure the clearance at the designated measuring points.

The measurement points vary slightly depending on the size of the outer ring outside diameter.

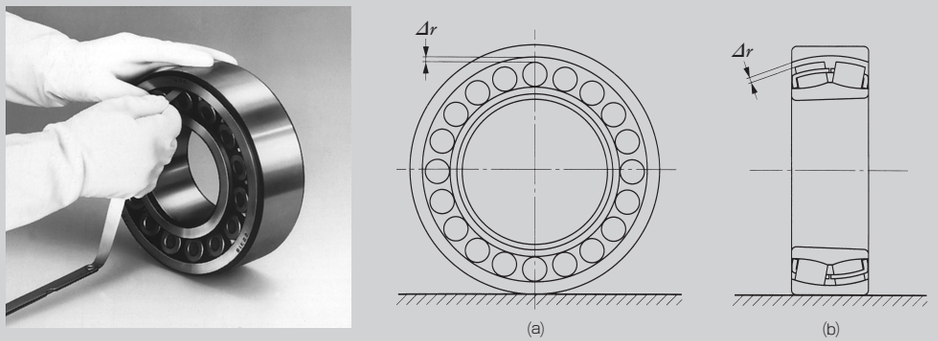


Fig. 1 Clearance Measurement Point (Bearing Outside Diameter: Less Than 200 mm)

2.1 When Bearing Outside Diameter is Under 200 mm

Insert the thickness gauge between the two rows of rollers and outer ring at the very bottom of the bearing, and measure the internal clearance Δ_{rS} (Fig. 3).

2.2 When Bearing Outside Diameter Is Over 200 mm

Insert the thickness gauge between the two rows of rollers and the outer ring at the very bottom of the bearing and on the sides at two symmetrical points relative to the bearing center. Then, take respective measurements for the bearing internal clearance Δ_r (Fig. 3). Because the bearing has two rows, two measurements of bearing internal clearance should be taken as Δ_{rS1} and Δ_{rS2}, and the internal clearance at the very bottom of the bearing Δ_{rS} should be determined by the following equation:

$$\Delta_{rS} = 1/2\ (\Delta_{rS1} + \Delta_{rS2})$$

Then, take the individual values on the left side as Δ_{rL1} and Δ_{rL2}, and determine the internal clearance on the left side of bearing Δ_{rL} by the following equation:

$$\Delta_{rL} = 1/2\ (\Delta_{rL1} + \Delta_{rL2})$$

Next, take the individual values on the right side as Δ_{rR1} and Δ_{rR2}, and determine the internal clearance on the right side of bearing Δ_{rR} by the following equation:

$$\Delta_{rR} = 1/2\ (\Delta_{rR1} + \Delta_{rR2})$$

Finally, determine internal bearing clearance (Δ_r) by the following equation:

$$\Delta_r = 1/2\ (\Delta_{rS} + \Delta_{rL} + \Delta_{rR})$$

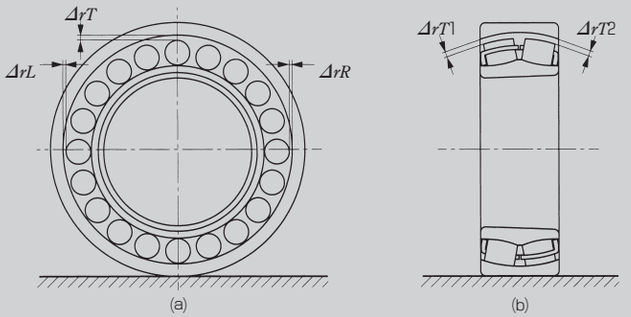


Fig. 2 Clearance Measurement Points (Bearing Outside Diameter: Larger Than 200 mm)

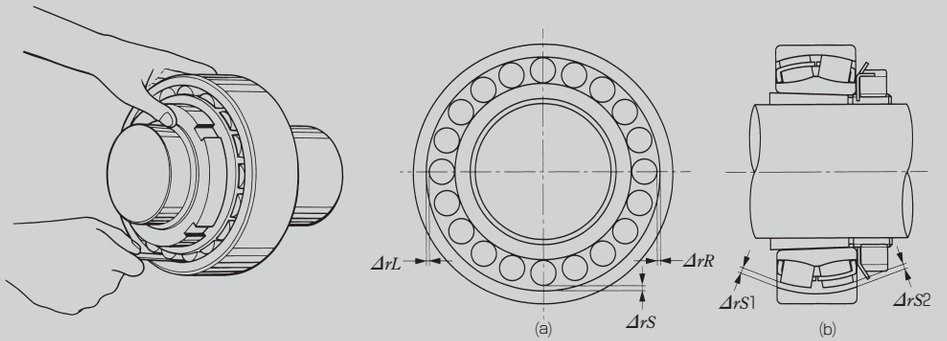


Fig. 3 Clearance Measurement Points

3. Temperature Equilibrium When Taking Measurements

To ensure accurate bearing measurements, the temperature of the measurement instrument and components to be measured must be the same. If the bearing is mounted with an oil heating tank or induction heater, be sure to measure the internal clearance only after a complete cooldown. If a bearing is brought from a warehouse to the measurement area, the temperature of the bearing may still be high; thus, if clearance or dimensions were measured without confirming bearing temperature, the measured value may be wrong.

For a large bearing with an outer ring outside diameter larger than 400 mm, the unpacked bearing should be left on a surface plate for about 24 hours before making a clearance or dimensional measurement. Put the end face of the bearing on a surface plate prior to measurement to ensure both objects have the same temperature.

4. Clearance Adjustment When Mounting a Bearing on a Tapered Shaft or Sleeve

When mounting a bearing with a tapered bore to a tapered shaft or sleeve (adapter or removable sleeve), the inner ring of the bearing will widen and interference will increase when pushing in the bearing, resulting in reduced internal clearance depending on the taper. Be sure to provide proper interference and internal clearance when mounting the bearing. See Table 2 for the clearance reduction amounts when mounting spherical roller bearings with tapered bores.

Each time the bearing is pushed further onto the tapered shaft or sleeve, measure the variation of the internal clearance and repeat the above procedure until the clearance reduction amount specified in Table 2 is attained. This procedure is called “clearance adjustment,” and when the proper reduction amount is attained, the clearance necessary for operation is secured. The clearance reduction amount must be confirmed by a thickness gauge; however, depending on the method of clearance adjustment, the measured value obtained with the thickness gauge may not be correct. Therefore, execute the following corrective procedures:

1. When using heat:
   When the bearing and shaft are both at room temperature, measure the clearance again with a thickness gauge to confirm that the speified value is secured.
2. When using a lockwasher as a turning stopper for the locknut:
   Prior to bending the tooth of the lockwasher into the cutout for the locknut, measure the clearance with the thickness gauge again to confirm that the specified value is secured.
3. When using a hydraulic nut:
   After removal of the hydraulic nut, mount the locknut and measure the clearance again to confirm that the specified value remains constant prior to stopping turning.
4. When using an oil injection pump:
   Drop the pressure of the oil fed from the oil injection pump to zero so that there is no pressure on the bearing or fitted part of the sleeve. Next, measure the clearance with a thickness gauge to confirm that the specified value remains secured.

Radial Internal Clearance and Clearance Reduction Amount for the Bearing to be Mounted

- When radial internal clearance is CN (normal clearance):
  Perform the clearance adjustment by aiming for a middle value between the minimum and maximum clearance reduction amounts.
- When radial internal clearance is C3 or C4:
  Perform the clearance adjustment by aiming for the maximum clearance reduction amount.

Internal Clearance Adjustment of Tapered Bore Bearings

Perform the adjustment by measuring the clearance reduction amount with a thickness gauge.

1. For measurement location and positioning, refer to Section 2 (Page C262) of this catalog.
2. When mounting a bearing on a tapered shaft, perform a clearance adjustment each time the bearing is pushed in by a locknut, end plate, end cap, or hydraulic nut.
3. When using an adapter sleeve, perform a clearance adjustment each time the bearing is pushed in by a locknut or hydraulic nut.
4. When using a removable sleeve, perform an adjustment each time the removable sleeve is pushed in by a locknut or hydraulic nut.

Since the outer ring of the bearing hangs down from the rollers, turn the outer ring clockwise and counterclockwise by onehalf to one full rotation while maintaining the proper bearing position before taking clearance measurements for these operations. Position one randomly chosen roller from each row at the very bottom of the bearing. Then, insert the thickness gauge to measure the internal clearance at the appropriate location(s) based on the size of the outer ring outside diameter. These clearance measurement values should be recorded.

Table 2 Mounting of Spherical Roller Bearings With Tapered Bores

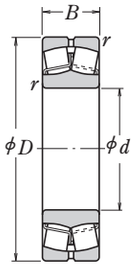
Units : mm

Bore Diameter d (mm) over	incl.	Reduction in Radial Clearance min.	max.	Axial Movement Taper 1 : 12 min.	max.	Taper 1 : 30 min.	max.	Minimum Permissible Residual Clearance CN	C3	C4
30	**40**	0.025	0.030	0.40	0.45	—	—	0.010	0.025	0.035
40	**50**	0.030	0.035	0.45	0.55	—	—	0.015	0.030	0.045
50	**65**	0.030	0.035	0.45	0.55	—	—	0.025	0.035	0.060
65	**80**	0.040	0.045	0.60	0.70	—	—	0.030	0.040	0.075
80	**100**	0.045	0.055	0.70	0.85	1.75	2.15	0.035	0.050	0.085
100	**120**	0.050	0.060	0.75	0.90	1.9	2.25	0.045	0.065	0.110
120	**140**	0.060	0.070	0.90	1.1	2.25	2.75	0.055	0.080	0.130
140	**160**	0.065	0.080	1.0	1.3	2.5	3.25	0.060	0.100	0.150
160	**180**	0.070	0.090	1.1	1.4	2.75	3.5	0.070	0.110	0.170
180	**200**	0.080	0.100	1.3	1.6	3.25	4.0	0.070	0.110	0.190
200	**225**	0.090	0.110	1.4	1.7	3.5	4.25	0.080	0.130	0.210
225	**250**	0.100	0.120	1.6	1.9	4.0	4.75	0.090	0.140	0.230
250	**280**	0.110	0.140	1.7	2.2	4.25	5.5	0.100	0.150	0.250
280	**315**	0.120	0.150	1.9	2.4	4.75	6.0	0.110	0.160	0.280
315	**355**	0.140	0.170	2.2	2.7	5.5	6.75	0.120	0.180	0.300
355	**400**	0.150	0.190	2.4	3.0	6.0	7.5	0.130	0.200	0.330
400	**450**	0.170	0.210	2.7	3.3	6.75	8.25	0.140	0.220	0.360
450	**500**	0.190	0.240	3.0	3.7	7.5	9.25	0.160	0.240	0.390
500	**560**	0.210	0.270	3.4	4.3	8.5	11.0	0.170	0.270	0.410
560	**630**	0.230	0.300	3.7	4.8	9.25	12.0	0.200	0.310	0.460
630	**710**	0.260	0.330	4.2	5.3	10.5	13.0	0.220	0.330	0.520
710	**800**	0.280	0.370	4.5	5.9	11.5	15.0	0.240	0.390	0.590
800	**900**	0.310	0.410	5.0	6.6	12.5	16.5	0.280	0.430	0.660
900	**1000**	0.340	0.460	5.5	7.4	14.0	18.5	0.310	0.470	0.730
1000	**1120**	0.370	0.500	5.9	8.0	15.0	20.0	0.360	0.530	0.800

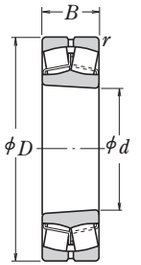
Remarks The values for reduction in radial internal clearance are for bearings with CN clearance.
For bearings with C3 or C4 Clearance, the maximum values listed should be used.

SPHERICAL ROLLER BEARINGS

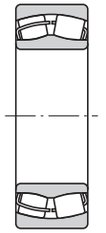
Bore Diameter 20 – 55 mm



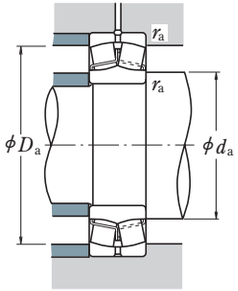
Cylindrical Bore



Tapered Bore



Without an Oil Groove or Holes



Dynamic Equivalent Load

$P = XF_r + YF_a$

$F_a/F_r \leqq e$		$F_a/F_r > e$	
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.

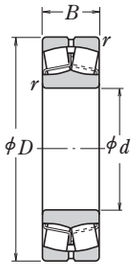
Boundary Dimensions (mm)				Basic Load Ratings (N)		Speeds (min^{-1}) Limiting Speeds				Bearing Desginations		Abutment and Fillet Dimensions (mm)					Constant	Axial Load Factors			Mass (kg)
d	D	B	r min.	C_r	C_{0r}	Thermal Speed Rating (Oil Bath)	Mechanical (Forced Oil Circulation)	Grease	Oil (Oil Bath)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

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

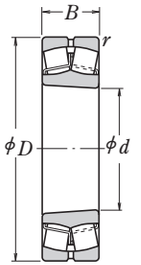
Remarks
1. Bearings denoted by an asterisk (＊) are NSKHPS bearings; they come standard with an oil groove and holes.
2. The recommended fits (shaft tolerances) on Page A164 are different for NSKHPS bearings, with light loads defined as $\leqq 0.05C_r$, normal loads as 0.05 to $0.10C_r$, and heavy loads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

SPHERICAL ROLLER BEARINGS

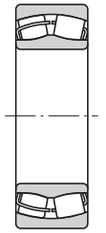
Bore Diameter 60 – 90 mm



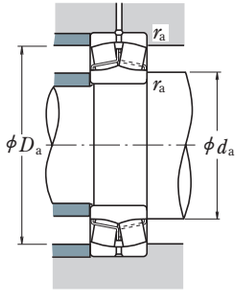
Cylindrical Bore



Tapered Bore



Without an Oil Groove or Holes



Dynamic Equivalent Load

$P = XF_r + YF_a$

$F_a/F_r \leqq e$		$F_a/F_r > e$	
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.

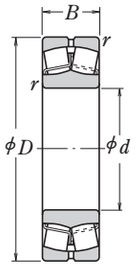
Boundary Dimensions (mm)				Basic Load Ratings (N)		Speeds (min^{-1}) Limiting Speeds				Bearing Desginations		Abutment and Fillet Dimensions (mm)					Constant	Axial Load Factors			Mass (kg)
d	D	B	r min.	C_r	C_{0r}	Thermal Speed Rating (Oil Bath)	Mechanical (Forced Oil Circulation)	Grease	Oil (Oil Bath)	Cylindrical Bore	Tapered Bore[1]	d_a min.	d_a max.	D_a max.	D_a min.	r_a max.	e	Y_2	Y_3	Y_0	approx.
60	95	26	1.1	98 500	141 000	4 800	—	3 600	4 500	**23012CE4**	**23012CKE4**	67	68	88	85	1	0.26	3.9	2.6	2.5	0.68
	110	28	1.5	178 000	174 000	5 300	8 000	4 800	6 000	**＊22212EAE4**	**＊22212EAKE4**	69	72	101	98	1.5	0.23	4.4	3.0	2.9	1.1
	130	31	2.1	238 000	244 000	4 800	6 700	3 800	4 800	**＊21312EAE4**	**＊21312EAKE4**	72	87	118	117	2	0.22	4.5	3.0	3.0	1.98
	130	46	2.1	340 000	340 000	4 000	5 600	3 600	4 500	**＊22312EAE4**	**＊22312EAKE4**	72	79	118	111	2	0.34	3.0	2.0	1.9	2.89
65	120	31	1.5	221 000	230 000	4 800	7 500	4 300	5 300	**＊22213EAE4**	**＊22213EAKE4**	74	80	111	107	1.5	0.24	4.2	2.8	2.7	1.51
	140	33	2.1	264 000	275 000	4 500	6 000	3 600	4 500	**＊21313EAE4**	**＊21313EAKE4**	77	94	128	126	2	0.22	4.6	3.1	3.0	2.45
	140	48	2.1	375 000	380 000	3 800	5 000	3 200	4 000	**＊22313EAE4**	**＊22313EAKE4**	77	84	128	119	2	0.34	3.0	2.0	2.0	3.52
70	125	31	1.5	225 000	232 000	4 500	7 100	4 000	5 300	**＊22214EAE4**	**＊22214EAKE4**	79	84	116	111	1.5	0.23	4.3	2.9	2.8	1.58
	150	35	2.1	310 000	325 000	4 300	5 600	3 200	4 000	**＊21314EAE4**	**＊21314EAKE4**	82	101	138	135	2	0.22	4.6	3.1	3.0	3.0
	150	51	2.1	425 000	435 000	3 600	4 800	3 000	3 800	**＊22314EAE4**	**＊22314EAKE4**	82	91	138	129	2	0.33	3.0	2.0	2.0	4.28
75	130	31	1.5	238 000	244 000	4 300	6 700	4 000	5 000	**＊22215EAE4**	**＊22215EAKE4**	84	87	121	117	1.5	0.22	4.5	3.0	3.0	1.64
	160	37	2.1	310 000	325 000	4 000	5 600	3 200	4 000	**＊21315EAE4**	**＊21315EAKE4**	87	101	148	134	2	0.22	4.6	3.1	3.0	3.64
	160	55	2.1	485 000	505 000	3 400	4 300	2 800	3 600	**＊22315EAE4**	**＊22315EAKE4**	87	97	148	137	2	0.33	3.0	2.0	2.0	5.26
80	140	33	2	264 000	275 000	4 000	6 000	3 600	4 500	**＊22216EAE4**	**＊22216EAKE4**	90	94	130	126	2	0.22	4.6	3.1	3.0	2.01
	170	39	2.1	355 000	375 000	3 800	4 800	3 000	3 800	**＊21316EAE4**	**＊21316EAKE4**	92	109	158	146	2	0.23	4.4	3.0	2.9	4.32
	170	58	2.1	540 000	565 000	3 200	3 800	2 600	3 400	**＊22316EAE4**	**＊22316EAKE4**	92	103	158	145	2	0.33	3.0	2.0	2.0	6.23
85	150	36	2	310 000	325 000	4 000	5 600	3 400	4 300	**＊22217EAE4**	**＊22217EAKE4**	95	101	140	135	2	0.22	4.6	3.1	3.0	2.54
	180	41	3	360 000	395 000	3 800	5 000	3 000	4 000	**＊21317EAE4**	**＊21317EAKE4**	99	108	166	142	2.5	0.24	4.3	2.9	2.8	5.2
	180	60	3	600 000	630 000	3 000	3 400	2 400	3 200	**＊22317EAE4**	**＊22317EAKE4**	99	110	166	155	2.5	0.33	3.1	2.1	2.0	7.23
90	160	40	2	360 000	395 000	3 800	5 000	3 200	4 000	**＊22218EAE4**	**＊22218EAKE4**	100	108	150	142	2	0.24	4.3	2.9	2.8	3.3
	160	52.4	2	340 000	490 000	2 800	—	1 800	2 400	**23218CE4**	**23218CKE4**	100	105	150	138	2	0.32	3.2	2.1	2.1	4.51
	190	43	3	415 000	450 000	3 600	4 500	2 800	3 600	**＊21318EAE4**	**＊21318EAKE4**	104	115	176	152	2.5	0.24	4.3	2.9	2.8	6.1
	190	64	3	665 000	705 000	2 800	3 000	2 400	3 000	**＊22318EAE4**	**＊22318EAKE4**	104	115	176	163	2.5	0.33	3.1	2.1	2.0	8.56

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

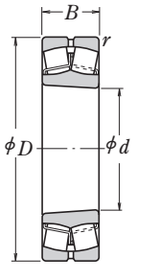
Remarks
1. Bearings denoted by an asterisk (＊) are NSKHPS bearings; they come standard with an oil groove and holes.
2. The recommended fits (shaft tolerances) on Page A164 are different for NSKHPS bearings, with light loads defined as $\leqq 0.05C_r$, normal loads as 0.05 to $0.10C_r$, and heavy loads as $> 0.10C_r$.
3. For the dimensions of adapters and withdrawal sleeves, refer to Pages C349 – C350 and C356.

SPHERICAL ROLLER BEARINGS

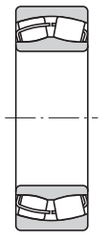
Bore Diameter 95 – 110 mm



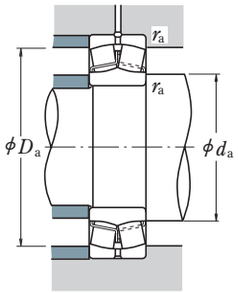
Cylindrical Bore



Tapered Bore



Without an Oil Groove or Holes



Dynamic Equivalent Load

$P = XF_r + YF_a$

$F_a/F_r \leqq e$		$F_a/F_r > e$	
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.

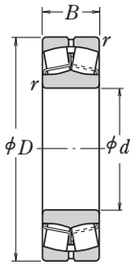
Boundary Dimensions (mm)				Basic Load Ratings (N)		Speeds (min^{-1}) Limiting Speeds				Bearing Desginations		Abutment and Fillet Dimensions (mm)					Constant	Axial Load Factors			Mass (kg)
d	D	B	r min.	C_r	C_{0r}	Thermal Speed Rating (Oil Bath)	Mechanical (Forced Oil Circulation)	Grease	Oil (Oil Bath)	Cylindrical Bore	Tapered Bore[1]	d_a min.	d_a max.	D_a max.	D_a min.	r_a max.	e	Y_2	Y_3	Y_0	approx.
95	170	43	2.1	415 000	450 000	3 800	4 500	3 000	3 800	＊**22219EAE4**	＊**22219EAKE4**	107	115	158	152	2	0.24	4.3	2.9	2.8	4.04
	170	55.6	2.1	370 000	525 000	2 600	—	1 700	2 200	**23219CAME4**	**23219CAMKE4**	107	—	158	146	2	0.32	3.1	2.1	2.0	5.33
	200	45	3	430 000	435 000	3 600	4 800	1 500	2 000	＊**21319CAME4**	＊**21319CAMKE4**	109	—	186	172	2.5	0.22	4.6	3.1	3.0	6.92
	200	45	3	430 000	435 000	3 600	4 800	1 500	2 000	＊**21319CE4**	＊**21319CKE4**	109	127	186	172	2.5	0.22	4.6	3.1	3.0	6.92
	200	67	3	735 000	780 000	2 600	3 000	2 200	2 800	＊**22319EAE4**	＊**22319EAKE4**	109	121	186	172	2.5	0.33	3.1	2.1	2.0	9.91
100	150	37	1.5	212 000	335 000	3 200	—	2 200	2 800	**23020CDE4**	**23020CDKE4**	109	112	141	136	1.5	0.22	4.6	3.1	3.0	2.31
	150	50	1.5	276 000	470 000	2 800	—	1 800	2 400	**24020CE4**	**24020CK30E4**	109	110	141	132	1.5	0.30	3.4	2.3	2.2	3.08
	165	52	2	345 000	530 000	2 800	—	1 700	2 200	**23120CE4**	**23120CKE4**	110	113	155	144	2	0.30	3.4	2.3	2.2	4.38
	165	65	2	345 000	535 000	2 400	—	1 700	2 200	**24120CAME4**	**24120CAMK30E4**	110	—	155	143	2	0.35	2.9	1.9	1.9	5.42
	180	46	2.1	455 000	490 000	3 600	4 300	2 800	3 600	＊**22220EAE4**	＊**22220EAKE4**	112	119	168	160	2	0.24	4.3	2.9	2.8	4.84
	180	60.3	2.1	525 000	605 000	2 800	3 800	1 600	2 200	＊**23220CAME4**	＊**23220CAMKE4**	112	—	168	155	2	0.32	3.2	2.1	2.1	6.6
	180	60.3	2.1	525 000	605 000	2 800	3 800	1 600	2 200	＊**23220CE4**	＊**23220CKE4**	112	118	168	155	2	0.32	3.2	2.1	2.1	6.6
	215	47	3	495 000	485 000	3 400	4 500	1 400	1 900	＊**21320CAME4**	＊**21320CAMKE4**	114	—	201	184	2.5	0.23	4.4	3.0	2.9	8.46
	215	47	3	495 000	485 000	3 400	4 500	1 400	1 900	＊**21320CE4**	＊**21320CKE4**	114	133	201	184	2.5	0.21	4.7	3.2	3.1	8.46
	215	73	3	860 000	930 000	—	2 400	1 800	2 400	＊**22320EAE4**	＊**22320EAKE4**	114	130	201	184	2.5	0.33	2.9	1.9	1.9	12.7
110	170	45	2	293 000	465 000	3 200	—	2 000	2 400	**23022CDE4**	**23022CDKE4**	120	124	160	153	2	0.24	4.2	2.8	2.8	3.76
	170	60	2	380 000	645 000	2 600	—	1 600	2 200	**24022CE4**	**24022CK30E4**	120	121	160	148	2	0.32	3.1	2.1	2.1	4.96
	180	56	2	480 000	630 000	3 200	4 000	1 600	2 000	＊**23122CAME4**	＊**23122CAMKE4**	120	—	170	158	2	0.28	3.5	2.4	2.3	5.7
	180	56	2	480 000	630 000	3 200	4 000	1 600	2 000	＊**23122CE4**	＊**23122CKE4**	120	127	170	158	2	0.28	3.5	2.4	2.3	5.7
	180	69	2	575 000	750 000	2 200	3 400	1 600	2 000	＊**24122CAME4**	＊**24122CAMK30E4**	120	—	170	154	2	0.36	2.8	1.9	1.8	6.84
	180	69	2	575 000	750 000	2 200	3 400	1 600	2 000	＊**24122CE4**	＊**24122CK30E4**	120	123	170	154	2	0.36	2.8	1.9	1.8	6.84
	200	53	2.1	605 000	645 000	3 400	3 400	2 600	3 200	＊**22222EAE4**	＊**22222EAKE4**	122	129	188	178	2	0.25	4.0	2.7	2.6	6.99
	200	69.8	2.1	645 000	760 000	2 600	3 400	1 500	1 900	＊**23222CAME4**	＊**23222CAMKE4**	122	—	188	170	2	0.34	3.0	2.0	1.9	9.54
	200	69.8	2.1	645 000	760 000	2 600	3 400	1 500	1 900	＊**23222CE4**	＊**23222CKE4**	122	130	188	170	2	0.34	3.0	2.0	1.9	9.54
	240	50	3	565 000	545 000	3 000	4 300	1 300	1 700	＊**22322EAE4**	＊**22322EAE4**	124	145	226	206	2.5	0.35	2.9	1.9	1.9	17.6
	240	80	3	1 030 000	1 120 000	—	1 900	1 400	1 900	＊**22322EAE4**	＊**22322EAE4**	124	145	226	206	2.5	0.35	2.9	1.9	1.9	17.6

Note (1) Suffixes K and K30 represent bearings with tapered bores (taper 1:12 or 1:30).

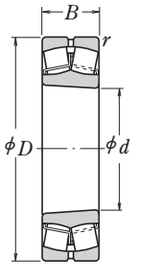
Remarks
1. Bearings denoted by an asterisk (＊) are NSKHPS bearings; they come standard with an oil groove and holes.
2. The recommended fits (shaft tolerances) on Page A164 are different for NSKHPS bearings, with light loads defined as $\leqq 0.05C_r$, normal loads as 0.05 to $0.10C_r$, and heavy loads as $> 0.10C_r$.
3. For the dimensions of adapters and withdrawal sleeves, refer to Pages C351 and C357.

■SPHERICAL ROLLER BEARINGS

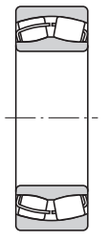
Bore Diameter 120 – 130 mm



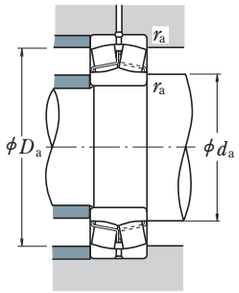
Cylindrical Bore



Tapered Bore



Without an Oil Groove or Holes



Dynamic Equivalent Load

$P = XF_r + YF_a$

$F_a/F_r \leqq e$		$F_a/F_r > e$	
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.

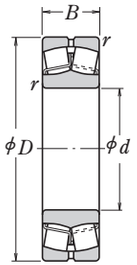
Boundary Dimensions (mm)				Basic Load Ratings (N)		Speeds (min^{-1}) Limiting Speeds				Bearing Desginations		Abutment and Fillet Dimensions (mm)					Constant	Axial Load Factors			Mass (kg)
d	D	B	r min.	C_r	C_{0r}	Thermal Speed Rating (Oil Bath)	Mechanical (Forced Oil Circulation)	Grease	Oil (Oil Bath)	Cylindrical Bore	Tapered Bore[1]	d_a min.	d_a max.	D_a max.	D_a min.	r_a max.	e	Y_2	Y_3	Y_0	approx.
120	180	46	2	395 000	525 000	3 200	4 500	1 800	2 200	**＊23024CAME4**	**＊23024CAMKE4**	130	—	170	163	2	0.22	4.5	3.0	2.9	4.11
	180	46	2	395 000	525 000	3 200	4 500	1 800	2 200	**＊23024CDE4**	**＊23024CDKE4**	130	134	170	163	2	0.22	4.5	3.0	2.9	4.11
	180	60	2	480 000	680 000	2 600	3 600	1 500	2 000	**＊24024CAME4**	**＊24024CAMK30E4**	130	—	170	158	2	0.32	3.2	2.1	2.1	5.33
	180	60	2	495 000	705 000	2 600	3 600	1 500	2 000	**＊24024CE4**	**＊24024CK30E4**	130	131	170	158	2	0.32	3.2	2.1	2.1	5.33
	200	62	2	580 000	720 000	2 800	3 600	1 400	1 800	**＊23124CAME4**	**＊23124CAMKE4**	130	—	190	175	2	0.29	3.5	2.4	2.3	7.85
	200	62	2	580 000	720 000	2 800	3 600	1 400	1 800	**＊23124CE4**	**＊23124CKE4**	130	138	190	175	2	0.29	3.5	2.4	2.3	7.85
	200	80	2	695 000	905 000	2 000	3 000	1 400	1 800	**＊24124CAME4**	**＊24124CAMK30E4**	130	—	190	171	2	0.37	2.7	1.8	1.8	10
	200	80	2	720 000	950 000	2 000	3 000	1 400	1 800	**＊24124CE4**	**＊24124CK30E4**	130	136	190	171	2	0.37	2.7	1.8	1.8	10
	215	58	2.1	685 000	765 000	3 200	3 000	2 400	3 000	**＊22224EAE4**	**＊22224EAKE4**	132	142	203	190	2	0.25	3.9	2.7	2.6	8.8
	215	76	2.1	790 000	970 000	2 200	3 000	1 300	1 700	**＊23224CAME4**	**＊23224CAMKE4**	132	—	203	182	2	0.34	2.9	2.0	1.9	12.1
	215	76	2.1	790 000	970 000	2 200	3 000	1 300	1 700	**＊23224CE4**	**＊23224CKE4**	132	140	203	182	2	0.34	2.9	2.0	1.9	12.1
	260	86	3	1 190 000	1 320 000	—	1 400	1 100	1 400	**＊22324EAE4**	**＊22324EAKE4**	134	157	246	222	2.5	0.35	2.9	1.9	1.9	22.2
130	200	52	2	500 000	655 000	3 000	3 800	1 700	2 000	**＊23026CAME4**	**＊23026CAMKE4**	140	—	190	180	2	0.23	4.3	2.9	2.8	5.98
	200	52	2	500 000	655 000	3 000	3 800	1 700	2 000	**＊23026CDE4**	**＊23026CDKE4**	140	147	190	180	2	0.23	4.3	2.9	2.8	5.98
	200	69	2	620 000	865 000	2 200	3 200	1 400	1 800	**＊24026CAME4**	**＊24026CAMK30E4**	140	—	190	175	2	0.31	3.2	2.2	2.1	7.84
	200	69	2	620 000	865 000	2 200	3 200	1 400	1 800	**＊24026CE4**	**＊24026CK30E4**	140	143	190	175	2	0.31	3.2	2.2	2.1	7.84
	210	64	2	630 000	825 000	2 600	3 400	1 300	1 700	**＊23126CAME4**	**＊23126CAMKE4**	140	—	200	184	2	0.28	3.6	2.4	2.4	8.69
	210	64	2	630 000	825 000	2 600	3 400	1 300	1 700	**＊23126CE4**	**＊23126CKE4**	140	149	200	184	2	0.28	3.6	2.4	2.4	8.69
	210	80	2	735 000	1 010 000	1 800	2 800	1 300	1 700	**＊24126CAME4**	**＊24126CAMK30E4**	140	—	200	180	2	0.37	2.7	1.8	1.8	10.7
	210	80	2	735 000	1 010 000	1 800	2 800	1 300	1 700	**＊24126CE4**	**＊24126CK30E4**	140	146	200	180	2	0.35	2.9	1.9	1.9	10.7
	230	64	3	820 000	940 000	2 800	2 600	2 200	2 600	**＊22226EAE4**	**＊22226EAKE4**	144	152	216	204	2.5	0.26	3.8	2.6	2.5	11
	230	80	3	875 000	1 080 000	2 000	2 800	1 200	1 600	**＊23226CAME4**	**＊23226CAMKE4**	144	—	216	196	2.5	0.34	2.9	2.0	1.9	14.3
	230	80	3	875 000	1 080 000	2 000	2 800	1 200	1 600	**＊23226CE4**	**＊23226CKE4**	144	150	216	196	2.5	0.34	2.9	2.0	1.9	14.3
	280	93	4	1 240 000	1 350 000	1 800	2 600	1 300	1 600	**＊22326CAME4**	**＊22326CAMKE4**	148	—	262	236	3	0.34	2.9	2.0	1.9	28.1
	280	93	4	1 240 000	1 350 000	1 900	2 600	1 300	1 600	**＊22326CE4**	**＊22326CKE4**	148	166	262	236	3	0.34	2.9	2.0	1.9	28.1

Note (1) Suffixes K and K30 represent bearings with tapered bores (taper 1:12 or 1:30).

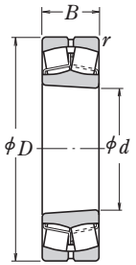
Remarks
1. Bearings denoted by an asterisk (＊) are NSKHPS bearings; they come standard with an oil groove and holes.
2. The recommended fits (shaft tolerances) on Page A164 are different for NSKHPS bearings, with light loads defined as $\leqq 0.05C_r$, normal loads as 0.05 to $0.10C_r$, and heavy loads as $> 0.10C_r$.
3. For the dimensions of adapters and withdrawal sleeves, refer to Pages C351 and C357.

SPHERICAL ROLLER BEARINGS

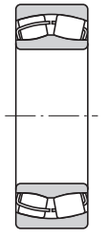
Bore Diameter 140 – 150 mm



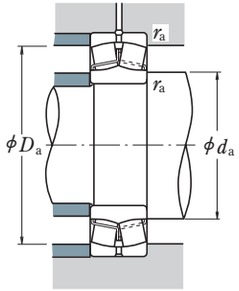
Cylindrical Bore



Tapered Bore



Without an Oil Groove or Holes



Dynamic Equivalent Load

$P = XF_r + YF_a$

$F_a/F_r \leqq e$		$F_a/F_r > e$	
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.

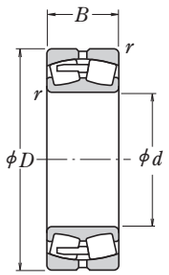
Boundary Dimensions (mm)				Basic Load Ratings (N)		Speeds (min^{-1}) Limiting Speeds				Bearing Desginations		Abutment and Fillet Dimensions (mm)					Constant	Axial Load Factors			Mass (kg)
d	D	B	r min.	C_r	C_{0r}	Thermal Speed Rating (Oil Bath)	Mechanical (Forced Oil Circulation)	Grease	Oil (Oil Bath)	Cylindrical Bore	Tapered Bore[1]	d_a min.	d_a max.	D_a max.	D_a min.	r_a max.	e	Y_2	Y_3	Y_0	approx.
140	210	53	2	525 000	715 000	2 800	3 800	1 600	1 900	＊**23028CAME4**	＊**23028CAMKE4**	150	—	200	190	2	0.22	4.5	3.0	2.9	6.49
	210	53	2	525 000	715 000	2 800	3 800	1 600	1 900	＊**23028CDE4**	＊**23028CDKE4**	150	157	200	190	2	0.22	4.5	3.0	2.9	6.49
	210	69	2	635 000	905 000	2 200	3 000	1 300	1 700	＊**24028CAME4**	＊**24028CAMK30E4**	150	—	200	186	2	0.31	3.4	2.3	2.2	8.37
	210	69	2	655 000	945 000	2 200	3 000	1 300	1 700	＊**24028CE4**	＊**24028CK30E4**	150	154	200	186	2	0.29	3.4	2.3	2.2	8.37
	225	68	2.1	725 000	945 000	2 400	3 200	1 200	1 600	＊**23128CAME4**	＊**23128CAMKE4**	152	—	213	198	2	0.28	3.6	2.4	2.3	10.5
	225	68	2.1	725 000	945 000	2 400	3 200	1 200	1 600	＊**23128CE4**	＊**23128CKE4**	152	158	213	198	2	0.28	3.6	2.4	2.3	10.5
	225	85	2.1	835 000	1 160 000	1 600	2 600	1 200	1 600	＊**24128CAME4**	＊**24128CAMK30E4**	152	—	213	193	2	0.37	2.7	1.8	1.8	13
	225	85	2.1	840 000	1 160 000	1 600	2 600	1 200	1 600	＊**24128CE4**	＊**24128CK30E4**	152	156	213	193	2	0.35	2.9	1.9	1.9	13
	250	68	3	835 000	945 000	2 600	3 200	1 400	1 700	＊**22228CAME4**	＊**22228CAMKE4**	154	—	236	221	2.5	0.26	3.9	2.6	2.5	14.5
	250	68	3	645 000	930 000	2 400	—	1 400	1 700	**22228CDE4**	**22228CDKE4**	154	167	236	219	2.5	0.25	4.0	2.7	2.6	14.5
	250	88	3	1 040 000	1 300 000	1 800	2 600	1 100	1 500	＊**23228CAME4**	＊**23228CAMKE4**	154	—	236	213	2.5	0.35	2.9	1.9	1.9	18.8
	250	88	3	1 040 000	1 300 000	1 800	2 600	1 100	1 500	＊**23228CE4**	＊**23228CKE4**	154	163	236	213	2.5	0.35	2.9	1.9	1.9	18.8
	300	102	4	1 450 000	1 590 000	1 700	2 400	1 200	1 500	＊**22328CAME4**	＊**22328CAMKE4**	158	—	282	253	3	0.35	2.9	1.9	1.9	35.4
	300	102	4	1 450 000	1 590 000	1 700	2 400	1 200	1 500	＊**22328CE4**	＊**22328CKE4**	158	177	282	253	3	0.35	2.9	1.9	1.9	35.4
150	225	56	2.1	590 000	815 000	2 600	3 600	1 400	1 800	＊**23030CAME4**	＊**23030CAMKE4**	162	—	213	203	2	0.22	4.6	3.1	3.0	7.9
	225	56	2.1	590 000	815 000	2 600	3 600	1 400	1 800	＊**23030CDE4**	＊**23030CDKE4**	162	168	213	203	2	0.22	4.6	3.1	3.0	7.9
	225	75	2.1	740 000	1 090 000	1 900	3 000	1 200	1 500	＊**24030CAME4**	＊**24030CAMK30E4**	162	—	213	198	2	0.30	3.4	2.3	2.2	10.5
	225	75	2.1	740 000	1 090 000	1 900	3 000	1 200	1 500	＊**24030CE4**	＊**24030CK30E4**	162	165	213	198	2	0.30	3.4	2.3	2.2	10.5
	250	80	2.1	905 000	1 180 000	2 200	2 800	1 100	1 400	＊**23130CAME4**	＊**23130CAMKE4**	162	—	238	218	2	0.30	3.4	2.3	2.2	15.8
	250	80	2.1	905 000	1 180 000	2 200	2 800	1 100	1 400	＊**23130CE4**	＊**23130CKE4**	162	174	238	218	2	0.30	3.4	2.3	2.2	15.8
	250	100	2.1	1 070 000	1 450 000	1 400	2 400	1 100	1 400	＊**24130CAME4**	＊**24130CAMK30E4**	162	—	238	212	2	0.38	2.6	1.8	1.7	19.8
	250	100	2.1	1 110 000	1 530 000	1 400	2 400	1 100	1 400	＊**24130CE4**	＊**24130CK30E4**	162	169	238	212	2	0.38	2.6	1.8	1.7	19.8
	270	73	3	955 000	1 120 000	2 400	3 000	1 300	1 600	＊**22230CAME4**	＊**22230CAMKE4**	164	—	256	236	2.5	0.26	3.9	2.6	2.5	18.4
	270	73	3	955 000	1 120 000	2 400	3 000	1 300	1 600	＊**22230CDE4**	＊**22230CDKE4**	164	179	256	236	2.5	0.26	3.9	2.6	2.5	18.4
	270	96	3	1 220 000	1 560 000	1 700	2 400	1 100	1 400	＊**23230CAME4**	＊**23230CAMKE4**	164	—	256	230	2.5	0.35	2.9	1.9	1.9	24.2
	270	96	3	1 220 000	1 560 000	1 700	2 400	1 100	1 400	＊**23230CE4**	＊**23230CKE4**	164	176	256	230	2.5	0.35	2.9	1.9	1.9	24.2
	320	108	4	1 530 000	1 690 000	1 600	2 200	1 100	1 400	＊**22330CAME4**	＊**22330CAMKE4**	168	—	302	270	3	0.35	2.9	1.9	1.9	41.5

Note (1) Suffixes K and K30 represent bearings with tapered bores (taper 1:12 or 1:30).

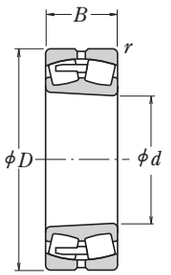
Remarks
1. Bearings denoted by an asterisk (＊) are NSKHPS bearings; they come standard with an oil groove and holes.
2. The recommended fits (shaft tolerances) on Page A164 are different for NSKHPS bearings, with light loads defined as $\leqq 0.05C_r$, normal loads as 0.05 to $0.10C_r$, and heavy loads as $> 0.10C_r$.
3. For the dimensions of adapters and withdrawal sleeves, refer to Pages C352 and C357 – C358.

SPHERICAL ROLLER BEARINGS

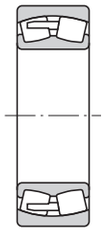
Bore Diameter 160 – 170 mm



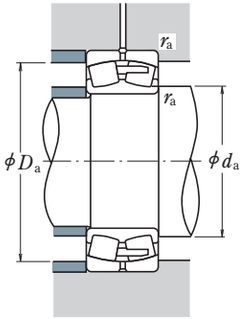
Cylindrical Bore



Tapered Bore



Without an Oil Groove and Holes



Dynamic Equivalent Load

$P = XF_r + YF_a$

$F_a/F_r \leqq e$		$F_a/F_r > e$	
X	Y	X	Y
1	Y_3	0.67	Y_2

Static Equivalent Load

$P_0 = F_r + Y_0F_a$

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

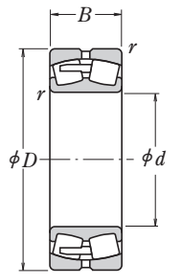
Boundary Dimensions (mm)				Basic Load Ratings (N)		Speeds (min^{-1}) Limiting Speeds				Bearing Desginations		Abutment and Fillet Dimensions (mm)					Constant	Axial Load Factors			Mass (kg)
d	D	B	r min.	C_r	C_{0r}	Thermal Speed Rating (Oil Bath)	Mechanical (Forced Oil Circulation)	Grease	Oil (Oil Bath)	Cylindrical Bore	Tapered Bore[1]	d_a min.	d_a max.	D_a max.	D_a min.	r_a max.	e	Y_2	Y_3	Y_0	approx.
160	220	45	2	450 000	675 000	3 000	3 200	1 400	1 800	＊23932CAME4	＊23932CAMKE4	170	—	210	203	2	0.18	5.6	3.8	3.7	4.97
	240	60	2.1	675 000	955 000	2 400	3 200	1 300	1 700	＊23032CAME4	＊23032CAMKE4	172	—	228	216	2	0.22	4.5	3.0	2.9	9.66
	240	60	2.1	675 000	955 000	2 400	3 200	1 300	1 700	＊23032CDE4	＊23032CDKE4	172	179	228	216	2	0.22	4.5	3.0	2.9	9.66
	240	80	2.1	845 000	1 260 000	1 800	2 800	1 100	1 400	＊24032CAME4	＊24032CAMK30E4	172	—	228	212	2	0.30	3.4	2.3	2.2	12.7
	240	80	2.1	845 000	1 260 000	1 800	2 800	1 100	1 400	＊24032CE4	＊24032CK30E4	172	177	228	212	2	0.30	3.4	2.3	2.2	12.7
	270	86	2.1	1 070 000	1 400 000	2 000	2 600	1 000	1 300	＊23132CAME4	＊23132CAMKE4	172	—	258	234	2	0.30	3.4	2.3	2.2	20.3
	270	86	2.1	1 070 000	1 400 000	2 000	2 600	1 000	1 300	＊23132CE4	＊23132CKE4	172	185	258	234	2	0.30	3.4	2.3	2.2	20.3
	270	109	2.1	1 240 000	1 670 000	1 300	2 200	1 000	1 300	＊24132CAME4	＊24132CAMK30E4	172	—	258	229	2	0.39	2.6	1.7	1.7	25.4
	270	109	2.1	1 300 000	1 760 000	1 300	2 200	1 000	1 300	＊24132CE4	＊24132CK30E4	172	179	258	229	2	0.39	2.6	1.7	1.7	25.4
	290	80	3	1 140 000	1 320 000	2 200	2 800	1 200	1 500	＊22232CAME4	＊22232CAMKE4	174	—	276	255	2.5	0.26	3.8	2.6	2.5	23.1
	290	80	3	1 140 000	1 320 000	2 200	2 800	1 200	1 500	＊22232CDE4	＊22232CDKE4	174	190	276	255	2.5	0.26	3.8	2.6	2.5	23.1
	290	104	3	1 370 000	1 770 000	1 500	2 200	1 000	1 300	＊23232CAME4	＊23232CAMKE4	174	—	276	245	2.5	0.34	2.9	2.0	1.9	30.5
	290	104	3	1 370 000	1 770 000	1 500	2 200	1 000	1 300	＊23232CE4	＊23232CKE4	174	189	276	245	2.5	0.34	2.9	2.0	1.9	30.5
	340	114	4	1 700 000	1 900 000	1 400	2 200	1 100	1 300	＊22332CAME4	＊22332CAMKE4	178	—	322	287	3	0.35	2.9	1.9	1.9	49.3
170	230	45	2	450 000	680 000	3 000	3 600	1 400	1 800	＊23934CAME4	＊23934CAMKE4	180	—	220	213	2	0.17	5.8	3.9	3.8	5.38
	260	67	2.1	795 000	1 090 000	2 200	3 000	1 200	1 600	＊23034CAME4	＊23034CAMKE4	182	—	248	233	2	0.23	4.3	2.9	2.8	13
	260	67	2.1	795 000	1 090 000	2 200	3 000	1 200	1 600	＊23034CDE4	＊23034CDKE4	182	191	248	233	2	0.23	4.3	2.9	2.8	13
	260	90	2.1	1 030 000	1 520 000	1 600	2 400	1 000	1 300	＊24034CAME4	＊24034CAMK30E4	182	—	248	228	2	0.31	3.2	2.2	2.1	17.3
	260	90	2.1	1 030 000	1 520 000	1 600	2 400	1 000	1 300	＊24034CE4	＊24034CK30E4	182	188	248	228	2	0.31	3.2	2.2	2.1	17.3
	280	88	2.1	1 180 000	1 570 000	1 800	2 600	1 000	1 300	＊23134CAME4	＊23134CAMKE4	182	—	268	245	2	0.29	3.5	2.3	2.3	21.8
	280	88	2.1	1 180 000	1 570 000	1 800	2 600	1 000	1 300	＊23134CE4	＊23134CKE4	182	194	268	245	2	0.29	3.5	2.3	2.3	21.8
	280	109	2.1	1 280 000	1 770 000	1 200	2 200	1 000	1 300	＊24134CAME4	＊24134CAMK30E4	182	—	268	239	2	0.38	2.7	1.8	1.7	26.6
	280	109	2.1	1 340 000	1 860 000	1 200	2 200	1 000	1 300	＊24134CE4	＊24134CK30E4	182	190	268	239	2	0.37	2.7	1.8	1.8	26.6
	310	86	4	1 240 000	1 500 000	2 000	2 600	1 100	1 400	＊22234CAME4	＊22234CAMKE4	188	—	292	270	3	0.26	3.8	2.6	2.5	28.8
	310	86	4	1 240 000	1 500 000	2 000	2 600	1 100	1 400	＊22234CDE4	＊22234CDKE4	188	206	292	270	3	0.26	3.8	2.6	2.5	28.8
	310	110	4	1 500 000	1 910 000	1 400	2 200	900	1 200	＊23234CAME4	＊23234CAMKE4	188	—	292	261	3	0.35	2.9	1.9	1.9	36.4
	310	110	4	1 500 000	1 910 000	1 400	2 200	900	1 200	＊23234CE4	＊23234CKE4	188	201	292	261	3	0.34	2.9	2.0	1.9	36.4
	360	120	4	1 970 000	2 110 000	1 300	2 000	1 000	1 200	＊22334CAME4	＊22334CAMKE4	188	—	342	304	3	0.35	2.9	1.9	1.9	57.9

Note (1) Suffixes K and K30 represent bearings with tapered bores (taper 1:12 or 1:30).

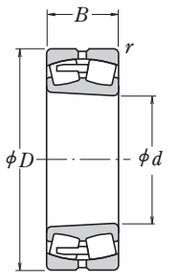
Remarks
1. Bearings denoted by an asterisk (＊) are NSKHPS bearings; they come standard with an oil groove and holes.
2. The recommended fits (shaft tolerances) on Page A164 are different for NSKHPS bearings, with light loads defined as $\leqq 0.05C_r$, normal loads as 0.05 to $0.10C_r$, and heavy loads as $> 0.10C_r$.
3. For the dimensions of adapters and withdrawal sleeves, refer to Pages C352 and C358.

SPHERICAL ROLLER BEARINGS

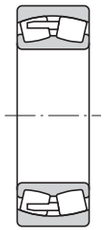
Bore Diameter 180 – 190 mm



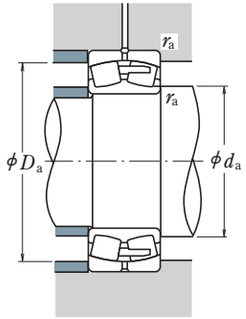
Cylindrical Bore



Tapered Bore



Without an Oil Groove and Holes



Dynamic Equivalent Load

$P = XF_r + YF_a$

$F_a/F_r \leqq e$		$F_a/F_r > e$	
X	Y	X	Y
1	Y_3	0.67	Y_2

Static Equivalent Load

$P_0 = F_r + Y_0F_a$

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

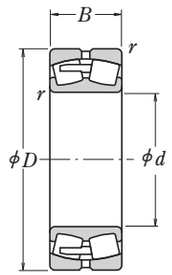
Boundary Dimensions (mm)				Basic Load Ratings (N)		Speeds (min^{-1}) Limiting Speeds				Bearing Desginations		Abutment and Fillet Dimensions (mm)					Constant	Axial Load Factors			Mass (kg)
d	D	B	r min.	C_r	C_{0r}	Thermal Speed Rating (Oil Bath)	Mechanical (Forced Oil Circulation)	Grease	Oil (Oil Bath)	Cylindrical Bore	Tapered Bore[1]	d_a min.	d_a max.	D_a max.	D_a min.	r_a max.	e	Y_2	Y_3	Y_0	approx.
180	250	52	2	590 000	890 000	2 600	3 000	1 200	1 600	＊23936CAME4	＊23936CAMKE4	190	—	240	230	2	0.18	5.5	3.7	3.6	7.64
	280	74	2.1	935 000	1 270 000	2 000	2 800	1 200	1 400	＊23036CAME4	＊23036CAMKE4	192	—	268	249	2	0.24	4.2	2.8	2.8	17.1
	280	74	2.1	935 000	1 270 000	2 000	2 800	1 200	1 400	＊23036CDE4	＊23036CDKE4	192	202	268	249	2	0.24	4.2	2.8	2.8	17.1
	280	100	2.1	1 210 000	1 750 000	1 500	2 200	950	1 200	＊24036CAME4	＊24036CAMK30E4	192	—	268	245	2	0.32	3.1	2.1	2.0	22.7
	280	100	2.1	1 210 000	1 750 000	1 500	2 200	950	1 200	＊24036CE4	＊24036CK30E4	192	200	268	245	2	0.32	3.1	2.1	2.0	22.7
	300	96	3	1 320 000	1 760 000	1 700	2 200	900	1 200	＊23136CAME4	＊23136CAMKE4	194	—	286	260	2.5	0.31	3.3	2.2	2.2	27.5
	300	96	3	1 320 000	1 760 000	1 700	2 200	900	1 200	＊23136CE4	＊23136CKE4	194	206	286	260	2.5	0.30	3.4	2.3	2.2	27.5
	300	118	3	1 490 000	2 040 000	1 100	2 000	900	1 200	＊24136CAME4	＊24136CAMK30E4	194	—	286	255	2.5	0.37	2.7	1.8	1.8	33.1
	300	118	3	1 490 000	2 040 000	1 100	2 000	900	1 200	＊24136CE4	＊24136CK30E4	194	202	286	255	2.5	0.37	2.7	1.8	1.8	33.1
	320	86	4	1 280 000	1 540 000	2 000	2 600	1 100	1 300	＊22236CAME4	＊22236CAMKE4	198	—	302	278	3	0.26	3.9	2.6	2.6	30.2
	320	86	4	1 280 000	1 540 000	2 000	2 600	1 100	1 300	＊22236CDE4	＊22236CDKE4	198	212	302	278	3	0.26	3.9	2.6	2.6	30.2
	320	112	4	1 620 000	2 110 000	1 300	2 000	850	1 100	＊23236CAME4	＊23236CAMKE4	198	—	302	274	3	0.35	2.9	1.9	1.9	38.9
	320	112	4	1 630 000	2 110 000	1 300	2 000	850	1 100	＊23236CE4	＊23236CKE4	198	211	302	274	3	0.33	3.0	2.0	2.0	38.9
	380	126	4	2 170 000	2 340 000	1 200	2 000	950	1 200	＊22336CAME4	＊22336CAMKE4	198	—	362	322	3	0.34	2.9	2.0	1.9	67
190	260	52	2	575 000	875 000	2 600	3 000	1 200	1 500	＊23938CAME4	＊23938CAMKE4	200	—	250	240	2	0.18	5.7	3.8	3.7	8.03
	290	75	2.1	970 000	1 350 000	2 000	2 600	1 100	1 400	＊23038CAME4	＊23038CAMKE4	202	—	278	261	2	0.24	4.2	2.8	2.8	17.6
	290	100	2.1	1 220 000	1 840 000	1 400	2 200	900	1 200	＊24038CAME4	＊24038CAMK30E4	202	—	278	253	2	0.32	3.1	2.1	2.0	24
	290	100	2.1	1 220 000	1 840 000	1 400	2 200	900	1 200	＊24038CE4	＊24038CK30E4	202	210	278	253	2	0.31	3.2	2.2	2.1	24
	320	104	3	1 480 000	2 020 000	1 600	2 200	850	1 100	＊23138CAME4	＊23138CAMKE4	204	—	306	276	2.5	0.31	3.2	2.2	2.1	34.5
	320	104	3	1 480 000	2 020 000	1 600	2 200	850	1 100	＊23138CE4	＊23138CKE4	204	219	306	276	2.5	0.31	3.3	2.2	2.2	34.5
	320	128	3	1 710 000	2 330 000	1 000	1 900	850	1 100	＊24138CAME4	＊24138CAMK30E4	204	—	306	269	2.5	0.40	2.5	1.7	1.6	41.5
	320	128	3	1 710 000	2 330 000	1 000	1 900	850	1 100	＊24138CE4	＊24138CK30E4	204	211	306	269	2.5	0.40	2.5	1.7	1.6	41.5
	340	92	4	1 420 000	1 730 000	1 800	2 400	1 000	1 200	＊22238CAME4	＊22238CAMKE4	208	—	322	296	3	0.26	3.8	2.6	2.5	35.5
	340	120	4	1 800 000	2 350 000	1 200	1 900	800	1 100	＊23238CAME4	＊23238CAMKE4	208	—	322	288	3	0.35	2.8	1.9	1.9	47.6
	340	120	4	1 800 000	2 350 000	1 200	1 900	800	1 100	＊23238CE4	＊23238CKE4	208	222	322	288	3	0.35	2.9	1.9	1.9	47.6
	400	132	5	2 370 000	2 590 000	1 200	1 900	900	1 100	＊22338CAME4	＊22338CAMKE4	212	—	378	338	4	0.34	2.9	2.0	1.9	77.6

Note (1) Suffixes K and K30 represent bearings with tapered bores (taper 1:12 or 1:30).

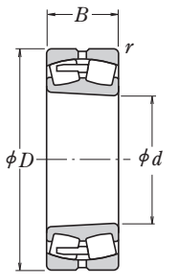
Remarks
1. Bearings denoted by an asterisk (＊) are NSKHPS bearings; they come standard with an oil groove and holes.
2. The recommended fits (shaft tolerances) on Page A164 are different for NSKHPS bearings, with light loads defined as $\leqq 0.05C_r$, normal loads as 0.05 to $0.10C_r$, and heavy loads as $> 0.10C_r$.
3. For the dimensions of adapters and withdrawal sleeves, refer to Pages C352 and C358.

SPHERICAL ROLLER BEARINGS

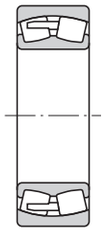
Bore Diameter 200 – 220 mm



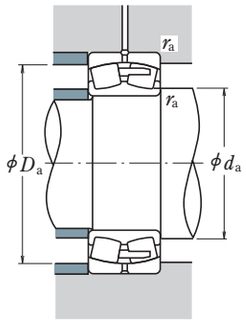
Cylindrical Bore



Tapered Bore



Without an Oil Groove and Holes



Dynamic Equivalent Load

$P = XF_r + YF_a$

$F_a/F_r \leqq e$		$F_a/F_r > e$	
X	Y	X	Y
1	Y_3	0.67	Y_2

Static Equivalent Load

$P_0 = F_r + Y_0F_a$

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

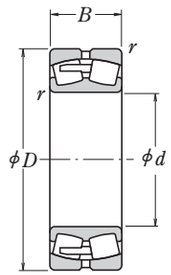
Boundary Dimensions (mm)				Basic Load Ratings (N)		Speeds (min^{-1}) Limiting Speeds				Bearing Desginations		Abutment and Fillet Dimensions (mm)					Constant	Axial Load Factors			Mass (kg)
d	D	B	r min.	C_r	C_{0r}	Thermal Speed Rating (Oil Bath)	Mechanical (Forced Oil Circulation)	Grease	Oil (Oil Bath)	Cylindrical Bore	Tapered Bore[1]	d_a min.	d_a max.	D_a max.	D_a min.	r_a max.	e	Y_2	Y_3	Y_0	approx.
200	280	60	2.1	710 000	1 060 000	2 400	2 600	1 100	1 400	**＊23940CAME4**	**＊23940CAMKE4**	212	—	268	258	2	0.20	5.1	3.4	3.3	11
	310	82	2.1	1 180 000	1 700 000	1 800	2 400	1 000	1 300	**＊23040CAME4**	**＊23040CAMKE4**	212	—	298	279	2	0.25	4.0	2.7	2.6	22.6
	310	109	2.1	1 420 000	2 120 000	1 300	2 000	850	1 100	**＊24040CAME4**	**＊24040CAMK30E4**	212	—	298	271	2	0.33	3.0	2.0	2.0	30.4
	310	109	2.1	1 430 000	2 120 000	1 300	2 000	850	1 100	**＊24040CE4**	**＊24040CK30E4**	212	223	298	271	2	0.32	3.1	2.1	2.0	30.4
	340	112	3	1 700 000	2 330 000	1 500	2 000	800	1 000	**＊23140CAME4**	**＊23140CAMKE4**	214	—	326	293	2.5	0.32	3.2	2.1	2.1	42.7
	340	112	3	1 700 000	2 330 000	1 500	2 000	800	1 000	**＊23140CE4**	**＊23140CKE4**	214	232	326	293	2.5	0.31	3.2	2.2	2.1	42.7
	340	140	3	1 960 000	2 660 000	950	1 800	800	1 000	**＊24140CAME4**	**＊24140CAMK30E4**	214	—	326	290	2.5	0.39	2.5	1.7	1.7	51.3
	340	140	3	1 960 000	2 670 000	950	1 800	800	1 000	**＊24140CE4**	**＊24140CK30E4**	214	226	326	290	2.5	0.39	2.6	1.8	1.7	51.3
	360	98	4	1 620 000	2 010 000	1 700	2 200	950	1 200	**＊22240CAME4**	**＊22240CAMKE4**	218	—	342	315	3	0.26	3.8	2.6	2.5	42.6
	360	128	4	2 070 000	2 750 000	1 100	1 800	750	1 000	**＊23240CAME4**	**＊23240CAMKE4**	218	—	342	307	3	0.35	2.9	1.9	1.9	57.1
	360	128	4	2 070 000	2 750 000	1 100	1 800	750	1 000	**＊23240CE4**	**＊23240CKE4**	218	237	342	307	3	0.34	2.9	2.0	1.9	57.1
	420	138	5	2 500 000	2 990 000	1 100	1 700	850	1 000	**＊22340CAME4**	**＊22340CAMKE4**	222	—	398	352	4	0.34	2.9	2.0	1.9	92.6
220	300	60	2.1	785 000	1 240 000	2 200	2 600	1 000	1 300	**＊23944CAME4**	**＊23944CAMKE4**	232	—	288	278	2	0.18	5.7	3.8	3.7	12.2
	340	90	3	1 360 000	1 980 000	1 600	2 200	950	1 200	**＊23044CAME4**	**＊23044CAMKE4**	234	—	326	302	2.5	0.24	4.1	2.8	2.7	29.7
	340	118	3	1 640 000	2 490 000	1 200	1 900	750	1 000	**＊24044CAME4**	**＊24044CAMK30E4**	234	—	326	296	2.5	0.32	3.2	2.1	2.1	40.5
	340	118	3	1 700 000	2 600 000	1 200	1 900	750	1 000	**＊24044CE4**	**＊24044CK30E4**	234	244	326	296	2.5	0.31	3.2	2.1	2.1	40.5
	370	120	4	1 960 000	2 710 000	1 300	1 800	710	950	**＊23144CAME4**	**＊23144CAMKE4**	238	—	352	320	3	0.31	3.3	2.2	2.2	53
	370	120	4	1 960 000	2 710 000	1 300	1 800	710	950	**＊23144CE4**	**＊23144CKE4**	238	254	352	320	3	0.30	3.3	2.2	2.2	53
	370	150	4	2 250 000	3 200 000	850	1 600	710	950	**＊24144CAME4**	**＊24144CAMK30E4**	238	—	352	313	3	0.39	2.6	1.7	1.7	66.7
	370	150	4	2 250 000	3 200 000	850	1 600	710	950	**＊24144CE4**	**＊24144CK30E4**	238	248	352	313	3	0.39	2.6	1.7	1.7	66.7
	400	108	4	1 960 000	2 430 000	1 500	2 000	850	1 000	**＊22244CAME4**	**＊22244CAMKE4**	238	—	382	348	3	0.27	3.7	2.5	2.4	59
	400	144	4	2 520 000	3 400 000	1 000	1 600	670	900	**＊23244CAME4**	**＊23244CAMKE4**	238	—	382	337	3	0.36	2.8	1.9	1.8	80.4
	400	144	4	2 520 000	3 400 000	1 000	1 600	670	900	**＊23244CE4**	**＊23244CKE4**	238	260	382	337	3	0.35	2.9	1.9	1.9	80.4
	460	145	5	2 940 000	3 400 000	950	1 600	750	950	**＊22344CAME4**	**＊22344CAMKE4**	242	—	438	391	4	0.33	3.0	2.0	2.0	116

Note (1) Suffixes K and K30 represent bearings with tapered bores (taper 1:12 or 1:30).

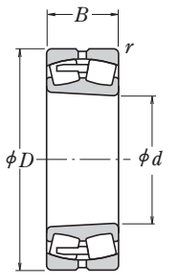
Remarks
1. Bearings denoted by an asterisk (＊) are NSKHPS bearings; they come standard with an oil groove and holes.
2. The recommended fits (shaft tolerances) on Page A164 are different for NSKHPS bearings, with light loads defined as $\leqq 0.05C_r$, normal loads as 0.05 to $0.10C_r$, and heavy loads as $> 0.10C_r$.
3. For the dimensions of adapters and withdrawal sleeves, refer to Pages C353 and C359.

SPHERICAL ROLLER BEARINGS

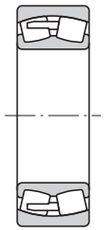
Bore Diameter 240 – 280 mm



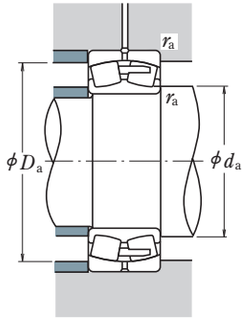
Cylindrical Bore



Tapered Bore



Without an Oil Groove and Holes



Dynamic Equivalent Load

$P = XF_r + YF_a$

$F_a/F_r \leqq e$		$F_a/F_r > e$	
X	Y	X	Y
1	Y_3	0.67	Y_2

Static Equivalent Load

$P_0 = F_r + Y_0F_a$

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

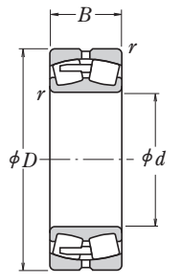
Boundary Dimensions (mm)				Basic Load Ratings (N)		Speeds (min^{-1}) Limiting Speeds				Bearing Desginations		Abutment and Fillet Dimensions (mm)					Constant	Axial Load Factors			Mass (kg)
d	D	B	r min.	C_r	C_{0r}	Thermal Speed Rating (Oil Bath)	Mechanical (Forced Oil Circulation)	Grease	Oil (Oil Bath)	Cylindrical Bore	Tapered Bore[1]	d_a min.	d_a max.	D_a max.	D_a min.	r_a max.	e	Y_2	Y_3	Y_0	approx.
240	320	60	2.1	795 000	1 300 000	1 900	2 600	950	1 200	＊23948CAME4	＊23948CAMKE4	252	—	308	298	2	0.17	6.0	4.0	3.9	13.3
	360	92	3	1 450 000	2 140 000	1 500	2 200	850	1 100	＊23048CAME4	＊23048CAMKE4	254	—	346	324	2.5	0.24	4.2	2.8	2.7	32.6
	360	118	3	1 730 000	2 730 000	1 100	1 800	710	950	＊24048CAME4	＊24048CAMK30E4	254	—	346	317	2.5	0.30	3.4	2.3	2.2	43.4
	360	118	3	1 730 000	2 730 000	1 100	1 800	710	950	＊24048CE4	＊24048CK30E4	254	265	346	317	2.5	0.29	3.4	2.3	2.2	43.4
	400	128	4	2 230 000	3 100 000	1 200	1 700	670	850	＊23148CAME4	＊23148CAMKE4	258	—	382	347	3	0.31	3.3	2.2	2.2	66.9
	400	128	4	2 230 000	3 100 000	1 200	1 700	670	850	＊23148CE4	＊23148CKE4	258	275	382	347	3	0.30	3.3	2.2	2.2	66.9
	400	160	4	2 660 000	3 800 000	750	1 500	670	850	＊24148CAME4	＊24148CAMK30E4	258	—	382	341	3	0.38	2.7	1.8	1.8	79.5
	400	160	4	2 660 000	3 800 000	750	1 500	670	850	＊24148CE4	＊24148CK30E4	258	268	382	341	3	0.38	2.7	1.8	1.8	79.5
	440	120	4	2 340 000	2 890 000	1 400	1 800	750	950	＊22248CAME4	＊22248CAMKE4	258	—	422	383	3	0.27	3.7	2.5	2.4	80.2
	440	160	4	3 050 000	4 050 000	850	1 500	630	800	＊23248CAME4	＊23248CAMKE4	258	—	422	372	3	0.37	2.7	1.8	1.8	106
	500	155	5	3 250 000	3 800 000	850	1 500	670	850	＊22348CAME4	＊22348CAMKE4	262	—	478	423	4	0.32	3.2	2.1	2.1	147
260	360	75	2.1	1 170 000	1 870 000	1 800	2 200	850	1 000	＊23952CAME4	＊23952CAMKE4	272	—	348	333	2	0.19	5.4	3.6	3.5	23
	400	104	4	1 780 000	2 580 000	1 300	1 900	800	950	＊23052CAME4	＊23052CAMKE4	278	—	382	356	3	0.25	4.1	2.7	2.7	46.6
	400	140	4	2 270 000	3 500 000	950	1 600	630	850	＊24052CAME4	＊24052CAMK30E4	278	—	382	348	3	0.32	3.1	2.1	2.1	62.6
	440	144	4	2 700 000	3 750 000	1 100	1 500	600	800	＊23152CAME4	＊23152CAMKE4	278	—	422	380	3	0.32	3.2	2.1	2.1	88.2
	440	180	4	3 200 000	4 700 000	630	1 300	600	800	＊24152CAME4	＊24152CAMK30E4	278	—	422	371	3	0.39	2.6	1.7	1.7	109
	480	130	5	2 720 000	3 400 000	1 200	1 700	670	850	＊22252CAME4	＊22252CAMKE4	282	—	458	418	4	0.27	3.7	2.5	2.5	104
	480	174	5	3 400 000	4 550 000	800	1 400	560	750	＊23252CAME4	＊23252CAMKE4	282	—	458	406	4	0.37	2.7	1.8	1.8	137
	540	165	6	3 900 000	4 600 000	750	1 400	630	800	＊22352CAME4	＊22352CAMKE4	288	—	512	462	5	0.32	3.2	2.1	2.1	180
280	380	75	2.1	1 160 000	1 950 000	1 600	2 000	800	950	＊23956CAME4	＊23956CAMKE4	292	—	368	351	2	0.18	5.7	3.8	3.8	24.5
	420	106	4	1 930 000	2 950 000	1 200	1 800	710	900	＊23056CAME4	＊23056CAMKE4	298	—	402	377	3	0.24	4.2	2.8	2.7	50.5
	420	140	4	2 350 000	3 800 000	850	1 500	600	800	＊24056CAME4	＊24056CAMK30E4	298	—	402	369	3	0.31	3.3	2.2	2.2	66.4
	460	146	5	2 790 000	4 000 000	1 000	1 500	560	750	＊23156CAME4	＊23156CAMKE4	302	—	438	400	4	0.30	3.3	2.2	2.2	94.3
	460	180	5	3 300 000	5 000 000	600	1 300	560	750	＊24156CAME4	＊24156CAMK30E4	302	—	438	392	4	0.37	2.7	1.8	1.8	115
	500	130	5	2 850 000	3 650 000	1 100	1 600	630	800	＊22256CAME4	＊22256CAMKE4	302	—	478	439	4	0.25	4.0	2.7	2.6	110
	500	176	5	3 600 000	4 900 000	750	1 300	530	670	＊23256CAME4	＊23256CAMKE4	302	—	478	425	4	0.35	2.9	1.9	1.9	147
	580	175	6	4 350 000	5 150 000	670	1 300	560	710	＊22356CAME4	＊22356CAMKE4	308	—	552	496	5	0.31	3.2	2.1	2.1	221

Note (1) Suffixes K and K30 represent bearings with tapered bores (taper 1:12 or 1:30).

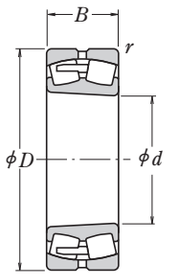
Remarks
1. Bearings denoted by an asterisk (＊) are NSKHPS bearings; they come standard with an oil groove and holes.
2. The recommended fits (shaft tolerances) on Page A164 are different for NSKHPS bearings, with light loads defined as $\leqq 0.05C_r$, normal loads as 0.05 to $0.10C_r$, and heavy loads as $> 0.10C_r$.
3. For the dimensions of adapters and withdrawal sleeves, refer to Pages C353 and C359.

SPHERICAL ROLLER BEARINGS

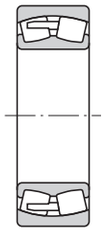
Bore Diameter 300 – 380 mm



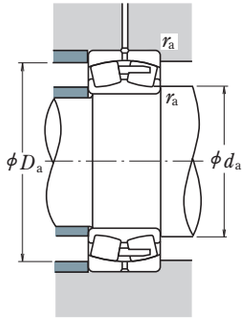
Cylindrical Bore



Tapered Bore



Without an Oil Groove and Holes



Dynamic Equivalent Load

$P = XF_r + YF_a$

$F_a/F_r \leqq e$		$F_a/F_r > e$	
X	Y	X	Y
1	Y_3	0.67	Y_2

Static Equivalent Load

$P_0 = F_r + Y_0F_a$

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

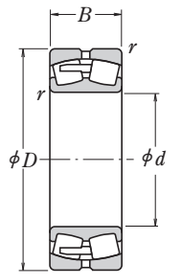
Boundary Dimensions (mm)				Basic Load Ratings (N)		Speeds (min^{-1}) Limiting Speeds				Bearing Desginations		Abutment and Fillet Dimensions (mm)					Constant	Axial Load Factors			Mass (kg)
d	D	B	r min.	C_r	C_{0r}	Thermal Speed Rating (Oil Bath)	Mechanical (Forced Oil Circulation)	Grease	Oil (Oil Bath)	Cylindrical Bore	Tapered Bore[1]	d_a min.	d_a max.	D_a max.	D_a min.	r_a max.	e	Y_2	Y_3	Y_0	approx.
300	420	90	3	1 540 000	2 490 000	1 500	1 800	710	900	＊**23960CAME4**	＊**23960CAMKE4**	314	—	406	386	2.5	0.19	5.2	3.5	3.4	38.2
	460	118	4	2 400 000	3 700 000	1 100	1 600	670	850	＊**23060CAME4**	＊**23060CAMKE4**	318	—	442	413	3	0.24	4.2	2.8	2.7	70.5
	460	160	4	2 890 000	4 600 000	800	1 400	530	710	＊**24060CAME4**	＊**24060CAMK30E4**	318	—	442	400	3	0.32	3.1	2.1	2.0	93.6
	500	160	5	3 350 000	4 800 000	900	1 400	500	670	＊**23160CAME4**	＊**23160CAMKE4**	322	—	478	433	4	0.31	3.3	2.2	2.2	125
	500	200	5	3 900 000	5 800 000	530	1 200	500	670	＊**24160CAME4**	＊**24160CAMK30E4**	322	—	478	423	4	0.38	2.6	1.8	1.7	152
	540	140	5	3 250 000	4 250 000	1 000	1 500	600	750	＊**22260CAME4**	＊**22260CAMKE4**	322	—	518	473	4	0.25	4.0	2.7	2.6	139
	540	192	5	4 250 000	5 900 000	670	1 200	480	630	＊**23260CAME4**	＊**23260CAMKE4**	322	—	518	458	4	0.35	2.9	1.9	1.9	189
320	440	90	3	1 620 000	2 750 000	1 400	1 700	670	850	＊**23964CAME4**	＊**23964CAMKE4**	334	—	426	406	2.5	0.18	5.5	3.7	3.6	40.6
	480	121	4	2 450 000	3 850 000	1 000	1 600	630	800	＊**23064CAME4**	＊**23064CAMKE4**	338	—	462	432	3	0.24	4.2	2.8	2.8	75.6
	480	160	4	3 050 000	5 050 000	710	1 300	500	670	＊**24064CAME4**	＊**24064CAMK30E4**	338	—	462	422	3	0.31	3.3	2.2	2.2	99.7
	540	176	5	3 850 000	5 500 000	800	1 300	480	600	＊**23164CAME4**	＊**23164CAMKE4**	342	—	518	466	4	0.31	3.2	2.1	2.1	162
	540	218	5	4 400 000	6 650 000	500	1 100	480	600	＊**24164CAME4**	＊**24164CAMK30E4**	342	—	518	456	4	0.39	2.6	1.7	1.7	196
	580	150	5	3 750 000	4 850 000	950	1 400	530	670	＊**22264CAME4**	＊**22264CAMKE4**	342	—	558	508	4	0.26	3.9	2.6	2.6	174
	580	208	5	4 850 000	6 900 000	600	1 100	450	600	＊**23264CAME4**	＊**23264CAMKE4**	342	—	558	488	4	0.36	2.8	1.9	1.8	239
340	460	90	3	1 670 000	2 840 000	1 300	1 700	630	800	＊**23968CAME4**	＊**23968CAMKE4**	354	—	446	427	2.5	0.18	5.7	3.8	3.7	42.4
	520	133	5	2 850 000	4 400 000	950	1 500	560	710	＊**23068CAME4**	＊**23068CAMKE4**	362	—	498	465	4	0.24	4.2	2.8	2.8	101
	520	180	5	3 650 000	6 050 000	670	1 200	480	600	＊**24068CAME4**	＊**24068CAMK30E4**	362	—	498	454	4	0.32	3.2	2.1	2.1	135
	580	190	5	4 500 000	6 600 000	710	1 200	430	560	＊**23168CAME4**	＊**23168CAMKE4**	362	—	558	499	4	0.31	3.2	2.1	2.1	206
	580	243	5	5 300 000	7 900 000	450	1 000	430	560	＊**24168CAME4**	＊**24168CAMK30E4**	362	—	558	489	4	0.40	2.5	1.7	1.7	257
	620	224	6	4 400 000	7 800 000	480	—	400	530	**23268CAME4**	**23268CAMKE4**	368	—	592	521	5	0.36	2.8	1.9	1.8	295
360	480	90	3	1 730 000	3 050 000	1 200	1 700	600	750	＊**23972CAME4**	＊**23972CAMKE4**	374	—	466	447	2.5	0.17	6.0	4.1	4.0	44.7
	540	134	5	2 990 000	4 700 000	900	1 400	530	670	＊**23072CAME4**	＊**23072CAMKE4**	382	—	518	485	4	0.24	4.2	2.8	2.8	106
	540	180	5	3 650 000	6 100 000	630	1 200	450	600	＊**24072CAME4**	＊**24072CAMK30E4**	382	—	518	476	4	0.32	3.2	2.1	2.1	139
	600	192	5	4 800 000	7 100 000	670	1 100	400	530	＊**23172CAME4**	＊**23172CAMKE4**	382	—	578	520	4	0.31	3.2	2.2	2.1	217
	600	243	5	5 250 000	8 000 000	430	1 000	400	530	＊**24172CAME4**	＊**24172CAMK30E4**	382	—	578	507	4	0.40	2.5	1.7	1.7	264
	650	232	6	4 800 000	8 550 000	450	—	380	500	**23272CAME4**	**23272CAMKE4**	388	—	622	549	5	0.36	2.8	1.9	1.8	342
380	520	106	4	2 340 000	4 100 000	1 100	1 500	530	670	＊**23976CAME4**	＊**23976CAMKE4**	398	—	502	482	3	0.18	5.5	3.7	3.6	65.4
	560	135	5	3 150 000	5 100 000	850	1 400	530	630	＊**23076CAME4**	＊**23076CAMKE4**	402	—	538	506	4	0.22	4.5	3.0	3.0	113
	560	180	5	3 850 000	6 600 000	600	1 200	430	560	＊**24076CAME4**	＊**24076CAMK30E4**	402	—	538	496	4	0.29	3.4	2.3	2.3	148
	620	194	5	4 000 000	7 600 000	530	—	400	500	**23176CAME4**	**23176CAMKE4**	402	—	598	540	4	0.30	3.3	2.2	2.2	229
	620	243	5	4 350 000	8 450 000	360	—	400	500	**24176CAME4**	**24176CAMK30E4**	402	—	598	529	4	0.38	2.6	1.8	1.7	275
	680	240	6	5 150 000	9 200 000	430	—	360	480	**23276CAME4**	**23276CAMKE4**	408	—	652	578	5	0.35	2.9	1.9	1.9	372

Note (1) Suffixes K and K30 represent bearings with tapered bores (taper 1:12 or 1:30).

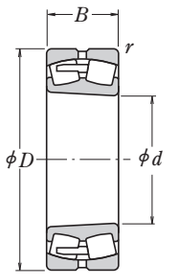
Remarks
1. Bearings denoted by an asterisk (＊) are NSKHPS bearings; they come standard with an oil groove and holes.
2. The recommended fits (shaft tolerances) on Page A164 are different for NSKHPS bearings, with light loads defined as $\leqq 0.05C_r$, normal loads as 0.05 to $0.10C_r$, and heavy loads as $> 0.10C_r$.
3. For the dimensions of adapters and withdrawal sleeves, refer to Pages C354 and C360.

SPHERICAL ROLLER BEARINGS

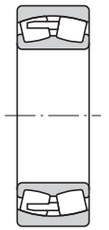
Bore Diameter 400 – 460 mm



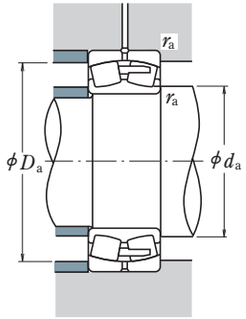
Cylindrical Bore



Tapered Bore



Without an Oil Groove and Holes



Dynamic Equivalent Load

$P = XF_r + YF_a$

$F_a/F_r \leqq e$		$F_a/F_r > e$	
X	Y	X	Y
1	Y_3	0.67	Y_2

Static Equivalent Load

$P_0 = F_r + Y_0F_a$

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

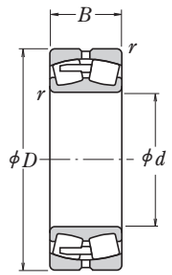
Boundary Dimensions (mm)				Basic Load Ratings (N)		Speeds(min⁻¹) Limiting Speeds				Bearing Desginations		Abutment and Fillet Dimensions (mm)					Constant	Axial Load Factors			Mass (kg)
d	D	B	r min.	C_r	C_{0r}	Thermal Speed Rating (Oil Bath)	Mechanical (Forced Oil Circulation)	Grease	Oil (Oil Bath)	Cylindrical Bore	Tapered Bore(1)	d_a min.	d_a max.	D_a max.	D_a min.	r_a max.	e	Y_2	Y_3	Y_0	approx.
400	540	106	4	2 370 000	4 250 000	1 000	1 400	530	630	＊**23980CAME4**	＊**23980CAMKE4**	418	—	522	501	3	0.18	5.7	3.9	3.8	69.1
	600	148	5	3 700 000	5 900 000	800	1 300	480	600	＊**23080CAME4**	＊**23080CAMKE4**	422	—	578	540	4	0.23	4.4	3.0	2.9	146
	600	200	5	4 500 000	7 600 000	560	1 100	400	500	＊**24080CAME4**	＊**24080CAMK30E4**	422	—	578	527	4	0.31	3.3	2.2	2.2	193
	650	200	6	4 150 000	7 900 000	500	—	380	480	**23180CAME4**	**23180CAMKE4**	428	—	622	569	5	0.29	3.4	2.3	2.3	257
	650	250	6	4 950 000	10 100 000	320	—	380	480	**24180CAME4**	**24180CAMK30E4**	428	—	622	551	5	0.37	2.7	1.8	1.8	316
	720	256	6	5 800 000	10 400 000	380	—	340	450	**23280CAME4**	**23280CAMKE4**	428	—	692	610	5	0.36	2.8	1.9	1.9	449
420	560	106	4	2 340 000	4 250 000	1 000	1 400	500	600	＊**23984CAME4**	＊**23984CAMKE4**	438	—	542	521	3	0.17	6.0	4.0	3.9	71.6
	620	150	5	2 910 000	5 850 000	670	—	450	560	**23084CAME4**	**23084CAMKE4**	442	—	598	562	4	0.23	4.3	2.9	2.8	151
	620	200	5	3 750 000	8 100 000	480	—	380	480	**24084CAME4**	**24084CAMK30E4**	442	—	598	549	4	0.31	3.2	2.2	2.1	199
	700	224	6	5 000 000	9 400 000	480	—	340	450	**23184CAME4**	**23184CAMKE4**	448	—	672	607	5	0.31	3.3	2.2	2.2	341
	700	280	6	6 000 000	12 000 000	280	—	340	450	**24184CAME4**	**24184CAMK30E4**	448	—	672	598	5	0.38	2.6	1.8	1.7	421
	760	272	7.5	6 450 000	11 700 000	360	—	320	430	**23284CAME4**	**23284CAMKE4**	456	—	724	644	6	0.35	2.9	1.9	1.9	534
440	600	118	4	2 190 000	4 800 000	630	—	450	560	**23988CAME4**	**23988CAMKE4**	458	—	582	555	3	0.18	5.7	3.9	3.8	96.3
	650	157	6	3 150 000	6 350 000	630	—	430	530	**23088CAME4**	**23088CAMKE4**	468	—	622	587	5	0.23	4.3	2.9	2.8	173
	650	212	6	4 150 000	9 100 000	450	—	360	450	**24088CAME4**	**24088CAMK30E4**	468	—	622	576	5	0.31	3.2	2.1	2.1	237
	720	226	6	5 300 000	10 300 000	430	—	320	430	**23188CAME4**	**23188CAMKE4**	468	—	692	627	5	0.3	3.3	2.2	2.2	360
	720	280	6	6 000 000	12 100 000	280	—	320	430	**24188CAME4**	**24188CAMK30E4**	468	—	692	617	5	0.37	2.7	1.8	1.8	433
	790	280	7.5	6 900 000	12 800 000	340	—	300	400	**23288CAME4**	**23288CAMKE4**	476	—	754	669	6	0.35	2.9	1.9	1.9	594
460	620	118	4	2 220 000	4 950 000	600	—	430	530	**23992CAME4**	**23992CAMKE4**	478	—	602	575	3	0.17	5.9	4.0	3.9	100
	680	163	6	3 450 000	7 100 000	600	—	400	500	**23092CAME4**	**23092CAMKE4**	488	—	652	615	5	0.22	4.6	3.1	3.0	201
	680	218	6	4 500 000	9 950 000	430	—	340	430	**24092CAME4**	**24092CAMK30E4**	488	—	652	604	5	0.29	3.4	2.3	2.3	266
	760	240	7.5	5 700 000	10 900 000	430	—	300	400	**23192CAME4**	**23192CAMKE4**	496	—	724	661	6	0.31	3.3	2.2	2.2	423
	760	300	7.5	6 300 000	12 400 000	280	—	300	400	**24192CAME4**	**24192CAMK30E4**	496	—	724	646	6	0.39	2.6	1.7	1.7	512
	830	296	7.5	7 350 000	13 700 000	320	—	280	380	**23292CAME4**	**23292CAMKE4**	496	—	794	702	6	0.37	2.8	1.9	1.8	691

Note (1) Suffixes K and K30 represent bearings with tapered bores (taper 1:12 or 1:30).

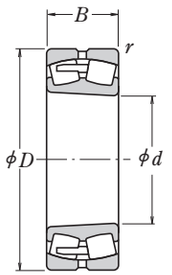
Remarks
1. Bearings denoted by an asterisk (＊) are NSKHPS bearings; they come standard with an oil groove and holes.
2. The recommended fits (shaft tolerances) on Page A164 are different for NSKHPS bearings, with light loads defined as $\leqq 0.05C_r$, normal loads as 0.05 to $0.10C_r$, and heavy loads as $> 0.10C_r$.
3. For the dimensions of adapters and withdrawal sleeves, refer to Pages C354 – C355 and C360 – C361.

SPHERICAL ROLLER BEARINGS

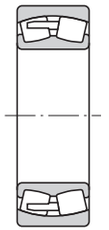
Bore Diameter 480 – 560 mm



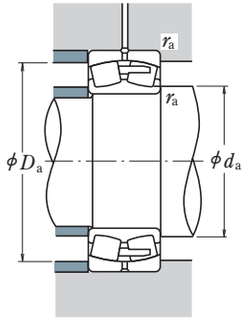
Cylindrical Bore



Tapered Bore



Without an Oil Groove and Holes



Dynamic Equivalent Load

$P = XF_r + YF_a$

$F_a/F_r \leqq e$		$F_a/F_r > e$	
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.

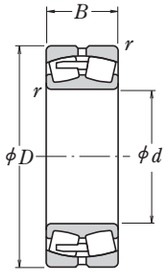
Boundary Dimensions (mm)				Basic Load Ratings (N)		Speeds (min^{-1}) Limiting Speeds				Bearing Desginations		Abutment and Fillet Dimensions (mm)					Constant	Axial Load Factors			Mass (kg)
d	D	B	r min.	C_r	C_{0r}	Thermal Speed Rating (Oil Bath)	Mechanical (Forced Oil Circulation)	Grease	Oil (Oil Bath)	Cylindrical Bore	Tapered Bore(1)	d_a min.	d_a max.	D_a max.	D_a min.	r_a max.	e	Y_2	Y_3	Y_0	approx.
480	650	128	5	2 580 000	5 850 000	560	—	400	500	**23996CAME4**	**23996CAMKE4**	502	—	628	602	4	0.18	5.7	3.8	3.7	121
	700	165	6	3 800 000	7 950 000	560	—	400	480	**23096CAME4**	**23096CAMKE4**	508	—	672	633	5	0.22	4.6	3.1	3.0	211
	700	218	6	4 600 000	10 200 000	400	—	320	430	**24096CAME4**	**24096CAMK30E4**	508	—	672	625	5	0.30	3.4	2.3	2.2	270
	790	248	7.5	6 050 000	11 700 000	400	—	300	380	**23196CAME4**	**23196CAMKE4**	516	—	754	688	6	0.31	3.3	2.2	2.2	475
	790	308	7.5	7 150 000	14 600 000	240	—	300	380	**24196CAME4**	**24196CAMK30E4**	516	—	754	670	6	0.39	2.6	1.7	1.7	567
	870	310	7.5	7 850 000	14 400 000	300	—	260	360	**23296CAME4**	**23296CAMKE4**	516	—	834	733	6	0.37	2.8	1.9	1.8	795
500	670	128	5	2 460 000	5 550 000	560	—	400	500	**239/500CAME4**	**239/500CAMKE4**	522	—	648	622	4	0.17	6.0	4.0	3.9	124
	720	167	6	3 750 000	8 100 000	530	—	380	480	**230/500CAME4**	**230/500CAMKE4**	528	—	692	655	5	0.21	4.8	3.2	3.1	220
	720	218	6	4 450 000	9 900 000	400	—	300	400	**240/500CAME4**	**240/500CAMK30E4**	528	—	692	643	5	0.30	3.4	2.3	2.2	276
	830	264	7.5	6 850 000	13 400 000	360	—	280	360	**231/500CAME4**	**231/500CAMKE4**	536	—	794	720	6	0.31	3.2	2.2	2.1	567
	830	325	7.5	8 000 000	16 000 000	220	—	280	360	**241/500CAME4**	**241/500CAMK30E4**	536	—	794	703	6	0.39	2.6	1.7	1.7	666
	920	336	7.5	9 000 000	16 600 000	280	—	260	320	**232/500CAME4**	**232/500CAMKE4**	536	—	884	773	6	0.38	2.7	1.8	1.8	969
530	710	136	5	2 930 000	6 800 000	500	—	360	450	**239/530CAME4**	**239/530CAMKE4**	552	—	688	659	4	0.17	6.0	4.0	3.9	149
	780	185	6	4 400 000	9 200 000	500	—	340	430	**230/530CAME4**	**230/530CAMKE4**	558	—	752	706	5	0.22	4.6	3.1	3.0	298
	780	250	6	5 400 000	11 800 000	360	—	280	360	**240/530CAME4**	**240/530CAMK30E4**	558	—	752	690	5	0.31	3.3	2.2	2.2	390
	870	272	7.5	7 150 000	14 100 000	340	—	260	340	**231/530CAME4**	**231/530CAMKE4**	566	—	834	758	6	0.30	3.3	2.2	2.2	628
	870	335	7.5	8 500 000	17 500 000	200	—	260	340	**241/530CAME4**	**241/530CAMK30E4**	566	—	834	740	6	0.38	2.6	1.8	1.7	773
	980	355	9.5	10 100 000	18 800 000	260	—	240	300	**232/530CAME4**	**232/530CAMKE4**	574	—	936	824	8	0.38	2.7	1.8	1.7	1 170
560	750	140	5	3 100 000	7 250 000	480	—	340	430	**239/560CAME4**	**239/560CAMKE4**	582	—	728	697	4	0.16	6.1	4.1	4.0	172
	820	195	6	5 000 000	10 700 000	450	—	320	400	**230/560CAME4**	**230/560CAMKE4**	588	—	792	742	5	0.22	4.5	3.0	2.9	344
	820	258	6	5 950 000	13 300 000	340	—	260	340	**240/560CAME4**	**240/560CAMK30E4**	588	—	792	729	5	0.30	3.3	2.2	2.2	440
	920	280	7.5	7 850 000	15 500 000	320	—	240	320	**231/560CAME4**	**231/560CAMKE4**	596	—	884	804	6	0.30	3.4	2.3	2.2	727
	920	355	7.5	9 400 000	19 600 000	190	—	240	320	**241/560CAME4**	**241/560CAMK30E4**	596	—	884	782	6	0.39	2.6	1.8	1.7	886
	1 030	365	9.5	10 900 000	20 500 000	240	—	220	280	**232/560CAME4**	**232/560CAMKE4**	604	—	986	870	8	0.36	2.8	1.9	1.8	1 320

Note (1) Suffixes K and K30 represent bearings with tapered bores (taper 1:12 or 1:30).

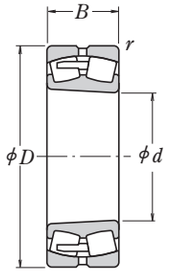
Remark For the dimensions of adapters and withdrawal sleeves, refer to Pages C355 and C361.

SPHERICAL ROLLER BEARINGS

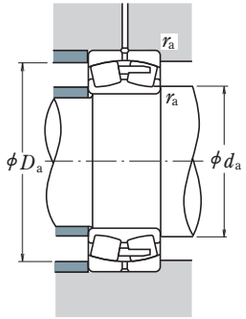
Bore Diameter 600 – 750 mm



Cylindrical Bore



Tapered Bore



Dynamic Equivalent Load

$P = XF_r + YF_a$

$F_a/F_r \leqq e$		$F_a/F_r > e$	
X	Y	X	Y
1	Y_3	0.67	Y_2

Static Equivalent Load

$P_0 = F_r + Y_0 F_a$

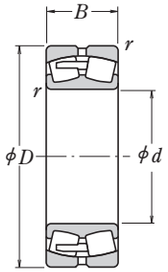
The values of e, Y_2, Y_3, and Y_0 are given in the table below.

Boundary Dimensions (mm)				Basic Load Ratings (N)		Speeds (min^{-1}) Limiting Speeds				Bearing Desginations		Abutment and Fillet Dimensions (mm)					Constant	Axial Load Factors			Mass (kg)
d	D	B	r min.	C_r	C_{0r}	Thermal Speed Rating (Oil Bath)	Mechanical (Forced Oil Circulation)	Grease	Oil (Oil Bath)	Cylindrical Bore	Tapered Bore(1)	d_a min.	d_a max.	D_a max.	D_a min.	r_a max.	e	Y_2	Y_3	Y_0	approx.
600	800	150	5	3 450 000	8 100 000	450	—	320	400	**239/600CAME4**	**239/600CAMKE4**	622	—	778	745	4	0.17	5.9	3.9	3.9	205
	870	200	6	5 450 000	12 200 000	400	—	300	360	**230/600CAME4**	**230/600CAMKE4**	628	—	842	794	5	0.21	4.8	3.3	3.2	389
	870	272	6	6 600 000	15 100 000	300	—	240	320	**240/600CAME4**	**240/600CAMK30E4**	628	—	842	772	5	0.30	3.3	2.2	2.2	529
	980	300	7.5	8 750 000	17 500 000	280	—	220	280	231/600CAME4	231/600CAMKE4	636	—	944	856	6	0.30	3.4	2.3	2.2	898
	980	375	7.5	10 400 000	21 900 000	170	—	220	280	**241/600CAME4**	**241/600CAMK30E4**	636	—	944	836	6	0.39	2.6	1.8	1.7	1 050
	1 090	388	9.5	12 700 000	24 900 000	200	—	200	260	**232/600CAME4**	**232/600CAMKE4**	644	—	1 046	923	8	0.36	2.8	1.9	1.8	1 590
630	850	165	6	4 000 000	9 350 000	400	—	300	360	**239/630CAME4**	**239/630CAMKE4**	658	—	822	786	5	0.18	5.6	3.8	3.7	259
	920	212	7.5	5 900 000	12 700 000	400	—	280	340	**230/630CAME4**	**230/630CAMKE4**	666	—	884	835	6	0.22	4.7	3.1	3.1	468
	920	290	7.5	7 550 000	17 700 000	280	—	220	300	**240/630CAME4**	**240/630CAMK30E4**	666	—	884	815	6	0.30	3.3	2.2	2.2	637
	1 030	315	7.5	9 600 000	19 400 000	260	—	200	260	231/630CAME4	231/630CAMKE4	666	—	994	900	6	0.30	3.4	2.3	2.2	1 040
	1 030	400	7.5	11 300 000	23 900 000	160	—	200	260	**241/630CAME4**	**241/630CAMK30E4**	666	—	994	876	6	0.38	2.7	1.8	1.7	1 250
	1 150	412	12	13 400 000	25 600 000	200	—	180	240	**232/630CAME4**	**232/630CAMKE4**	684	—	1 096	970	10	0.37	2.8	1.9	1.8	1 850
670	900	170	6	4 350 000	10 300 000	380	—	260	340	**239/670CAME4**	**239/670CAMKE4**	698	—	872	836	5	0.17	5.8	3.9	3.8	300
	980	230	7.5	6 850 000	15 000 000	360	—	240	320	**230/670CAME4**	**230/670CAMKE4**	706	—	944	891	6	0.22	4.7	3.1	3.1	571
	980	308	7.5	8 450 000	19 500 000	260	—	200	260	**240/670CAME4**	**240/670CAMK30E4**	706	—	944	868	6	0.30	3.3	2.2	2.2	773
	1 090	336	7.5	10 600 000	21 600 000	240	—	190	240	**231/670CAME4**	**231/670CAMKE4**	706	—	1 054	952	6	0.30	3.3	2.2	2.2	1 230
	1 090	412	7.5	12 400 000	26 500 000	150	—	190	240	**241/670CAME4**	**241/670CAMK30E4**	706	—	1 054	934	6	0.37	2.7	1.8	1.8	1 440
	1 220	438	12	14 900 000	28 700 000	180	—	170	220	**232/670CAME4**	**232/670CAMKE4**	724	—	1 166	1 024	10	0.37	2.7	1.8	1.8	2 210
710	950	180	6	4 800 000	11 700 000	360	—	240	300	**239/710CAME4**	**239/710CAMKE4**	738	—	922	883	5	0.17	5.8	3.9	3.8	352
	1 030	236	7.5	7 100 000	15 800 000	340	—	240	280	**230/710CAME4**	**230/710CAMKE4**	746	—	994	936	6	0.22	4.6	3.1	3.0	647
	1 030	315	7.5	8 850 000	20 700 000	240	—	190	240	**240/710CAME4**	**240/710CAMK30E4**	746	—	994	916	6	0.29	3.4	2.3	2.2	861
	1 150	438	9.5	13 900 000	30 500 000	130	—	170	220	**241/710CAME4**	**241/710CAMK30E4**	754	—	1 106	981	8	0.38	2.6	1.8	1.7	1 730
	1 280	450	12	15 700 000	30 500 000	170	—	160	200	**232/710CAME4**	**232/710CAMKE4**	764	—	1 226	1 080	10	0.36	2.8	1.9	1.8	2 470
750	1 000	185	6	5 250 000	12 800 000	320	—	220	280	**239/750CAME4**	**239/750CAMKE4**	778	—	972	931	5	0.17	6.0	4.1	4.0	398
	1 090	250	7.5	7 750 000	17 200 000	320	—	220	260	**230/750CAME4**	**230/750CAMKE4**	786	—	1 054	990	6	0.22	4.6	3.1	3.0	768
	1 090	335	7.5	10 100 000	24 000 000	220	—	180	220	**240/750CAME4**	**240/750CAMK30E4**	786	—	1 054	969	6	0.29	3.4	2.3	2.2	1 030
	1 360	475	15	17 700 000	35 500 000	150	—	140	190	**232/750CAME4**	**232/750CAMKE4**	814	—	1 296	1 148	12	0.36	2.8	1.9	1.8	2 980

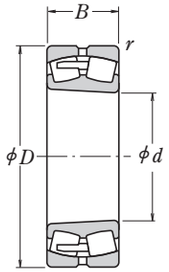
Note (1) Suffixes K and K30 represent bearings with tapered bores (taper 1:12 or 1:30).

SPHERICAL ROLLER BEARINGS

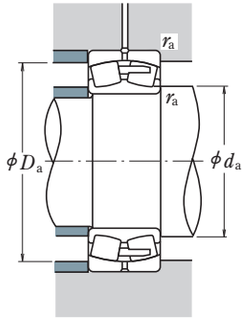
Bore Diameter 800 – 1320 mm



Cylindrical Bore



Tapered Bore



Dynamic Equivalent Load

$P = XF_r + YF_a$

$F_a/F_r \leqq e$		$F_a/F_r > e$	
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)		Speeds (min^{-1}) Limiting Speeds				Bearing Desginations		Abutment and Fillet Dimensions (mm)					Constant	Axial Load Factors			Mass (kg)
d	D	B	r min.	C_r	C_{0r}	Thermal Speed Rating (Oil Bath)	Mechanical (Forced Oil Circulation)	Grease	Oil (Oil Bath)	Cylindrical Bore	Tapered Bore(1)	d_a min.	d_a max.	D_a max.	D_a min.	r_a max.	e	Y_2	Y_3	Y_0	approx.
800	1 060	195	6	5 600 000	13 700 000	300	—	220	260	**239/800CAME4**	**239/800CAMKE4**	828	—	1 032	987	5	0.17	6.0	4.0	3.9	462
	1 150	258	7.5	8 350 000	19 100 000	300	—	200	240	**230/800CAME4**	**230/800CAMKE4**	836	—	1 114	1 045	6	0.21	4.7	3.2	3.1	870
	1 150	345	7.5	10 900 000	26 300 000	200	—	160	200	**240/800CAME4**	**240/800CAMK30E4**	836	—	1 114	1 029	6	0.27	3.7	2.5	2.5	1 130
	1 280	375	9.5	13 800 000	29 200 000	190	—	150	190	231/800CAME4	231/800CAMKE4	844	—	1 236	1 127	8	0.28	3.6	2.4	2.3	1 870
850	1 120	200	6	6 100 000	15 200 000	280	—	190	240	**239/850CAME4**	**239/850CAMKE4**	878	—	1 092	1 046	5	0.16	6.2	4.2	4.1	523
	1 220	272	7.5	9 300 000	21 400 000	280	—	180	220	**230/850CAME4**	**230/850CAMKE4**	886	—	1 184	1 109	6	0.21	4.8	3.2	3.1	1 020
	1 220	365	7.5	11 600 000	28 300 000	190	—	150	190	**240/850CAME4**	**240/850CAMK30E4**	886	—	1 184	1 093	6	0.28	3.6	2.4	2.4	1 350
900	1 180	206	6	6 600 000	16 700 000	260	—	180	220	**239/900CAME4**	**239/900CAMKE4**	928	—	1 152	1 103	5	0.16	6.4	4.3	4.2	591
	1 280	280	7.5	9 850 000	22 800 000	260	—	160	200	230/900CAME4	230/900CAMKE4	936	—	1 244	1 169	6	0.20	4.9	3.3	3.2	1 160
	1 280	375	7.5	12 800 000	31 500 000	170	—	140	180	**240/900CAME4**	**240/900CAMK30E4**	936	—	1 244	1 147	6	0.28	3.6	2.4	2.4	1 520
950	1 250	224	7.5	7 600 000	19 900 000	240	—	160	200	**239/950CAME4**	**239/950CAMKE4**	986	—	1 214	1 169	6	0.16	6.3	4.2	4.1	732
	1 360	300	7.5	11 300 000	26 500 000	240	—	150	190	**230/950CAME4**	**230/950CAMKE4**	986	—	1 324	1 241	6	0.21	4.8	3.2	3.2	1 400
	1 360	412	7.5	14 500 000	36 500 000	160	—	120	160	**240/950CAME4**	**240/950CAMK30E4**	986	—	1 324	1 219	6	0.28	3.6	2.4	2.3	1 880
1 000	1 320	236	7.5	8 200 000	21 700 000	220	—	150	190	239/1000CAME4	239/1000CAMKE4	1 036	—	1 284	1 229	6	0.16	6.4	4.3	4.2	881
	1 420	308	7.5	11 900 000	28 100 000	220	—	140	170	230/1000CAME4	230/1000CAMKE4	1 036	—	1 384	1 298	6	0.20	4.9	3.3	3.2	1 560
	1 420	412	7.5	15 300 000	38 500 000	150	—	110	150	**240/1000CAME4**	**240/1000CAMK30E4**	1 036	—	1 384	1 275	6	0.27	3.7	2.5	2.4	2 010
1 060	1 400	250	7.5	9 300 000	24 400 000	200	—	130	170	**239/1060CAME4**	**239/1060CAMKE4**	1 096	—	1 364	1 302	6	0.16	6.1	4.1	4.0	1 030
	1 500	325	9.5	13 000 000	31 500 000	200	—	120	160	**230/1060CAME4**	**230/1060CAMKE4**	1 104	—	1 456	1 368	8	0.21	4.9	3.3	3.2	1 790
	1 500	438	9.5	16 800 000	43 000 000	140	—	100	130	240/1060CAME4	240/1060CAMK30E4	1 104	—	1 456	1 346	8	0.28	3.6	2.4	2.4	2 410
1 120	1 580	345	9.5	15 400 000	38 000 000	180	—	110	140	230/1120CAME4	230/1120CAMKE4	1 164	—	1 536	1 444	8	0.20	5.0	3.4	3.3	2 120
	1 580	462	9.5	18 700 000	49 500 000	120	—	95	120	**240/1120CAME4**	**240/1120CAMK30E4**	1 164	—	1 536	1 421	8	0.27	3.7	2.5	2.5	2 790
1 180	1 660	475	9.5	20 200 000	52 500 000	120	—	85	110	240/1180CAME4	240/1180CAMK30E4	1 224	—	1 616	1 494	8	0.27	3.7	2.5	2.4	3 180
1 250	1 750	500	9.5	21 000 000	59 500 000	110	—	75	100	**240/1250CAME4**	**240/1250CAMK30E4**	1 294	—	1 706	1 579	8	0.25	4.0	2.7	2.6	3 700
1 320	1 850	530	12	22 600 000	63 500 000	100	—	67	85	**240/1320CAME4**	**240/1320CAMK30E4**	1 374	—	1 796	1 656	10	0.26	3.9	2.6	2.6	4 400

Note (1) Suffixes K and K30 represent bearings with tapered bores (taper 1:12 or 1:30).