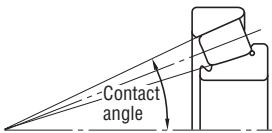


DESIGN, TYPES, AND FEATURES

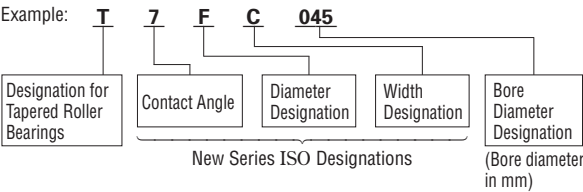


Tapered roller bearings are designed so the apices of the cones formed by the raceways of the inner and outer rings and the inner ring rollers all coincide at one point on the axis of the bearing. When a radial load is imposed, a component axial force occurs; therefore, it is necessary to use two bearings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

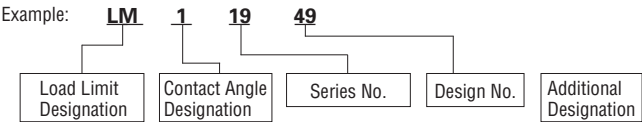
For Metric Series medium-angle or steep-angle tapered roller bearings, the respective contact angle designation C or D is added after the bore number. For normal-angle tapered roller bearings, no contact angle designation is used. Medium-angle tapered roller bearings are primarily used for the pinion 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 preceded by ▲ in the bearing tables)

Table 2 Tolerances for Inner Rings (CLASS K)

Units : μm

Nominal Bore Diameter d (mm)		Δd_{mp}		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)		ΔD_{mp}		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 ΔT_{1s}		Deviation of Actual Effective Width of Outer Ring ΔT_{2s}		Deviation of Actual Bearing Width ΔT_s	
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

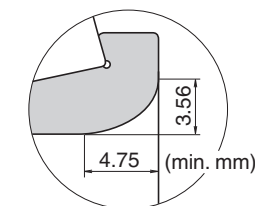
Units : μm

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

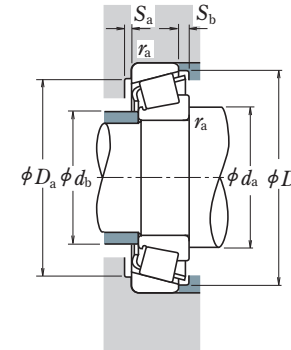
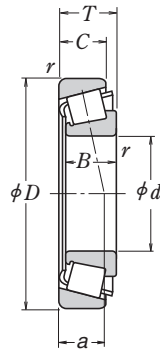
The tolerances for outside diameter and those for radial runout of the inner rings and outer rings conform to Table 7.4.2 (Pages A136 and A137).

(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:



Bore Diameter 30 – 35 mm



Dynamic Equivalent Load

$$P = XF_r + YF_a$$

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

Static Equivalent Load

$$P_0 = 0.5F_r + Y_0F_a$$

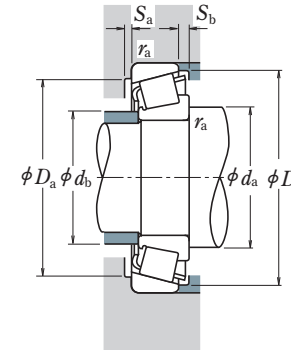
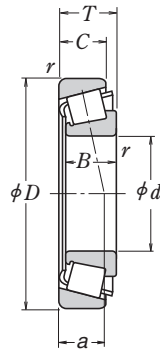
When $F_r > 0.5F_r + Y_0F_a$, use $P_0 = F_r$

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 approx.	Abutment and Fillet Dimensions (mm)								Eff. Load Center (mm) <i>a</i>	Constant <i>e</i>	Axial Load Factors		Mass (kg) approx.	
<i>d</i>	<i>D</i>	<i>T</i>	<i>B</i>	<i>C</i>	Inner <i>r</i> min.	Ring: Outer <i>r</i> min.	<i>C_r</i>	<i>C_{0r}</i>	Grease	Oil			<i>d_a</i> min.	<i>d_b</i> max.	<i>D_a</i> max.	<i>D_b</i> min.	<i>S_a</i> min.	<i>S_b</i> min.	Inner Outer <i>r_a</i> max.	<i>Y₁</i>			<i>Y₀</i>			
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.

Bore Diameter 40 – 50 mm



Dynamic Equivalent Load

$$P = XF_r + YF_a$$

$F_a/F_r \leq e$		$F_a/F_r > e$	
X	Y	X	Y
1	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 $P_0 = F_r$

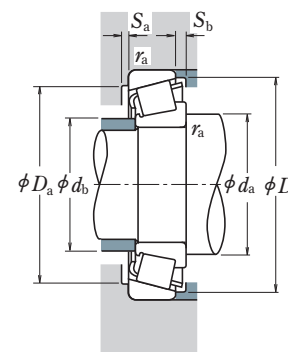
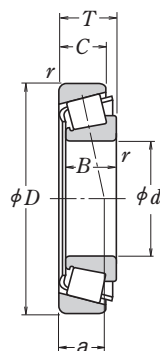
The values of e , Y_1 , and Y_0 are given in the table below.

Boundary Dimensions (mm)							Basic Load Ratings (N)		Limiting Speeds (min ⁻¹)		Bearing Designation	ISO355 Dimension Series approx.	Abutment and Fillet Dimensions (mm)						Ring: Inner Outer <i>r</i> _a min. max.	Eff. Load Center (mm) <i>a</i>	Constant <i>e</i>	Axial Load Factors		Mass (kg) approx.			
<i>d</i>	<i>D</i>	<i>T</i>	<i>B</i>	<i>C</i>	Inner <i>r</i> min.	Outer	<i>C</i> _r	<i>C</i> _{0r}	Grease	Oil			<i>d</i> _a min.	<i>d</i> _b max.	<i>D</i> _a max.	<i>D</i> _b min.	<i>S</i> _a min.	<i>S</i> _b min.				<i>Y</i> ₁	<i>Y</i> ₀				
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

$$P = XF_r + YF_a$$

$F_a/F_r \leq e$		$F_a/F_r > e$	
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 approx.	Abutment and Fillet Dimensions (mm)								Eff. Load Center (mm) <i>a</i>	Constant <i>e</i>	Axial Load Factors		Mass (kg) approx.	
<i>d</i>	<i>D</i>	<i>T</i>	<i>B</i>	<i>C</i>	Ring: Inner <i>r</i> min.	Outer	<i>C_r</i>	<i>C_{0r}</i>	Grease	Oil			<i>d_a</i> min.	<i>d_b</i> max.	<i>D_a</i> max.	<i>D_b</i> min.	<i>S_a</i> min.	<i>S_b</i> min.	Ring: Inner <i>r_a</i> max.	Outer						
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

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