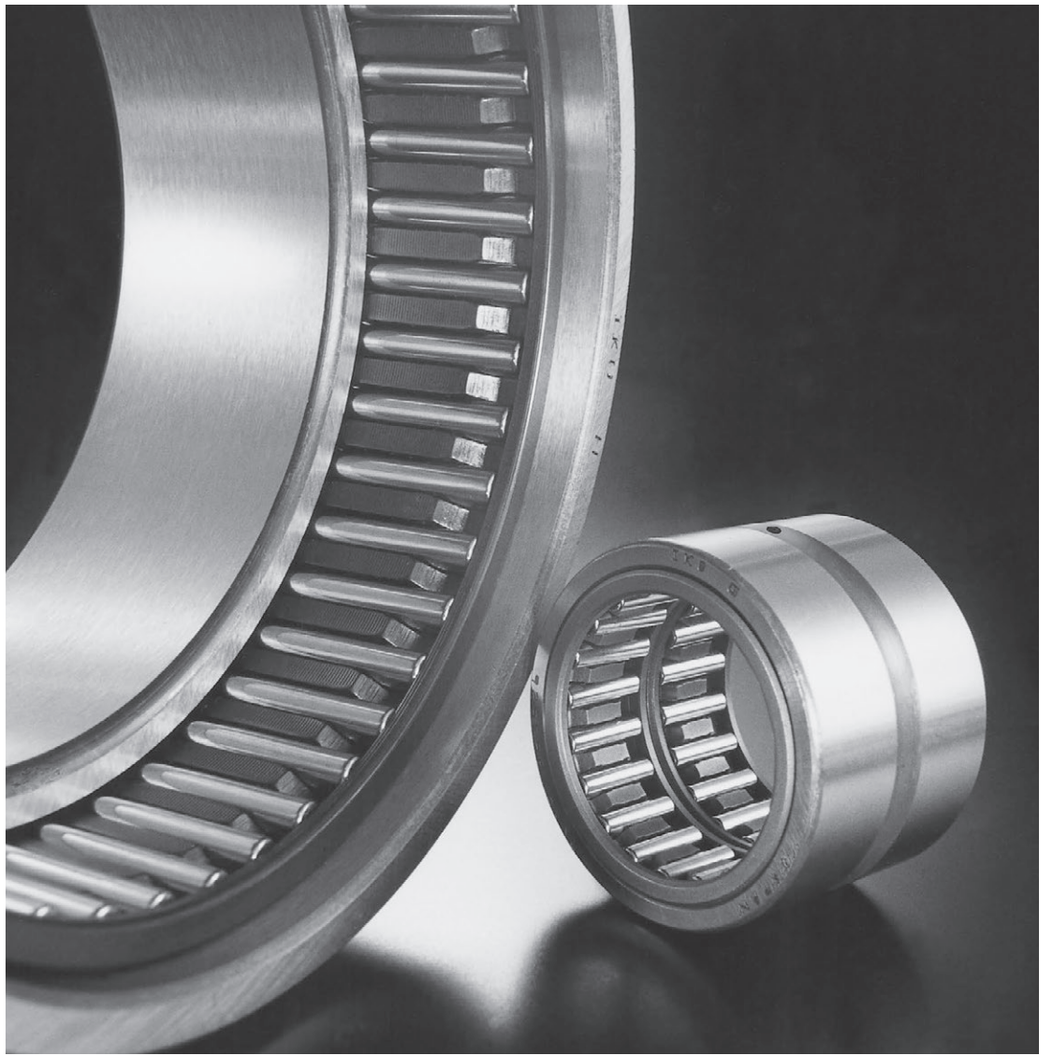
NEEDLE ROLLER BEARINGS WITH SEPARABLE CAGE

●Needle Roller Bearings with Separable Cage - Without Inner Ring
●Needle Roller Bearings with Separable Cage - With Inner Ring

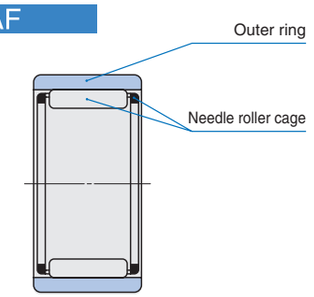


Structure and Features

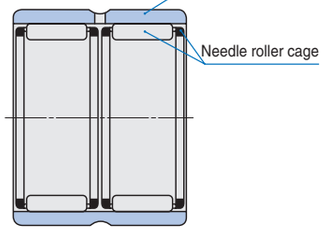
In IKO Needle Roller Bearings with Separable Cage, the inner ring, outer ring and IKO Needle Roller Cage are combined, and they can be separated easily. This type has a simple structure with high accuracy. In addition, the radial clearance can be freely chosen by selecting and combining these component parts. As Needle Roller Cages are used, these bearings have excellent rotational performance.
These bearings are most suitable for mass-production high accuracy products such as machine tools, textile machinery, and printing machines.

Structures of Needle Roller Bearings with Separable Cage

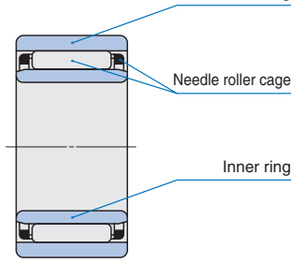
RNAF



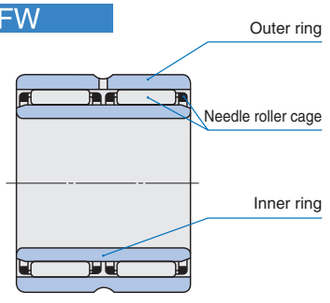
RNAFW



NAF



NAFW



Types

Needle Roller Bearings with Separable Cage are available in the types shown in Table 1.

Table 1 Type of bearing

Type	Single-row		Double-row	
	Without inner ring	With inner ring	Without inner ring	With inner ring
Model code	RNAF	NAF	RNAFW	NAFW

Needle Roller Bearings with Separable Cage - Without Inner Ring

The single-row as well as the double-row types are available with the same sectional height, and either of them can be selected according to load conditions. As shown in the section, "Design of shaft and housing" on page A44, any desired radial internal clearance can be selected by combining a shaft which is heat-treated and finished by grinding.

Needle Roller Bearings with Separable Cage - With Inner Ring

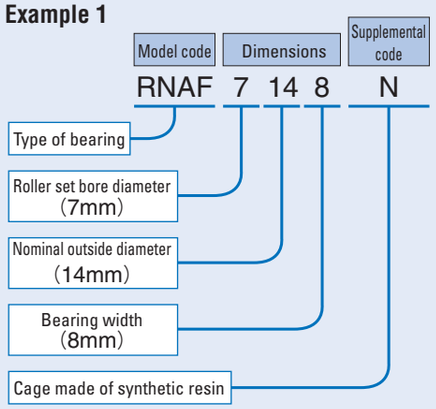
These bearings are made to the CN clearance shown in Table 19 on page A37. When especially high accuracy is required, it is possible to supply semi-finished inner rings which have a finishing allowance on their outside diameter so that they can be ground after being press-fitted to shafts.

Identification Number

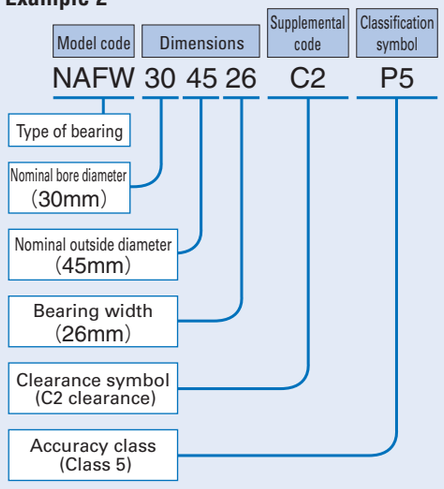
The identification number of Needle Roller Bearings with Separable Cage consists of a model code, dimensions, any supplemental codes and a classification symbol. The arrangement examples are as follows.

Examples of identification number

Example 1



Example 2



Accuracy

Needle Roller Bearings with Separable Cage are manufactured to the accuracy based on JIS (See page A31.). Tolerances for the smallest single roller set bore diameter of bearings without inner ring are based on Table 14 on page A33.

Clearance

Radial internal clearances of Needle Roller Bearings with Separable Cage are made to the CN clearance shown in Table 18 on page A37.

Fit

Recommended fits for Needle Roller Bearings with Separable Cage are shown in Tables 21 to 23 on pages A41 and A42.

Lubrication

Needle Roller Bearings with Separable Cage are not provided with prepacked grease. Perform proper lubrication for use. Using them without lubrication will increase the wear of the rolling contact surfaces and shorten their lives.

Oil Hole

The double-row type outer rings have both an oil hole and an oil groove, but the single-row type outer rings do not. When outer rings with an oil hole are required, attach "-OH" before the clearance symbol in the identification number, and when outer rings with both an oil hole and an oil groove are required, attach "-OG" to the same position.
Example: NAF 203517 - OH C2 P6
When outer rings with multiple oil holes or inner rings with oil hole(s) are required, please contact IKO.

Operating temperature range

For synthetic resin cages, "N" is added at the end of the identification number. The operating temperature range for Needle Roller Bearings with Separable Cage is -20 ～ +120˚C. However, the maximum allowable temperature for synthetic resin cages is +110˚C, and when they are continuously operated, it is +100˚C.

Mounting

Mounting examples of Needle Roller Bearings with Separable Cage are shown in Fig.1.
When mounting Needle Roller Bearings with Separable Cage, it is necessary to locate the needle cage axially. The needle cage is guided by shoulders of the shaft and housing or by side plates, and their guide surfaces must be heat-treated and finished by grinding at right angles to the shaft central axis.
Dimensions related to mounting are shown in the table of dimensions.

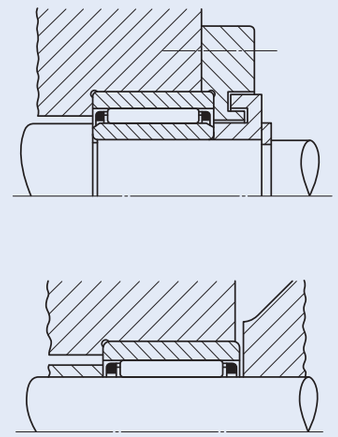


Fig.1 Mounting examples

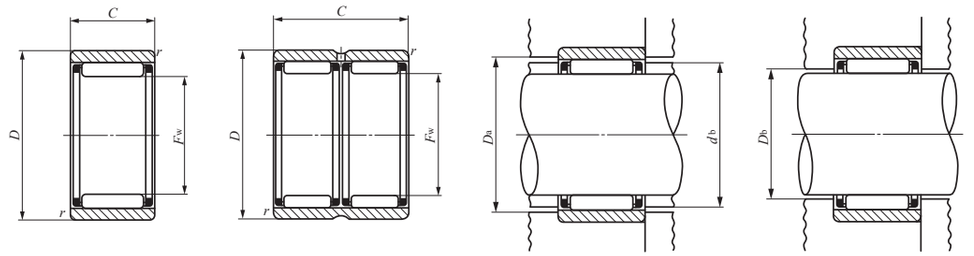
1N=0.102kgf=0.2248lbs.
1mm=0.03937inch

NEEDLE ROLLER BEARINGS WITH SEPARABLE CAGE

Without Inner Ring







RNAF RNAFW

Shaft dia. 5 — 18mm

Shaft dia. mm	Identification number	Mass (Ref.) g	Boundary dimensions mm F_w	D	C	$r_{s\,min}$ (1)	Standard mounting dimensions mm d_b	D_a Max.	D_b	Basic dynamic load rating C N	Basic static load rating C_0 N	Allowable rotational speed(2) min^{-1}
5	RNAF 5108N	2.8	5	10	8	0.2	6.7	8.4	5.4	2 420	1 950	85 000
6	RNAF 6138N	5.5	6	13	8	0.3	8.4	11	6.4	2 700	2 320	75 000
7	RNAF 7148N	6.1	7	14	8	0.3	9.4	12	7.4	2 960	2 690	65 000
8	RNAF 81510	8.2	8	15	10	0.3	10.4	13	8.4	3 630	3 600	60 000
	RNAFW 81620	20.5	8	16	20	0.3	10.8	14	8.4	6 220	7 200	60 000
10	RNAF 101710	9.6	10	17	10	0.3	12.4	15	10.4	4 160	4 550	50 000
	RNAF 102012	18.7	10	20	12	0.3	13.5	18	10.4	5 940	6 000	50 000
12	RNAF 122212	19.5	12	22	12	0.3	15.5	20	12.4	9 030	8 460	40 000
14	RNAF 142213	18.7	14	22	13	0.3	17.6	20	14.6	7 860	9 410	35 000
	RNAFW 142220	28.5	14	22	20	0.3	17.6	20	14.6	10 800	14 200	35 000
	RNAF 142612	29	14	26	12	0.3	19.4	24	14.6	9 790	9 680	35 000
15	RNAF 152313	19.7	15	23	13	0.3	18.6	21	15.6	8 250	10 200	35 000
	RNAFW 152320	30.5	15	23	20	0.3	18.6	21	15.6	11 400	15 400	35 000
16	RNAF 162413	21	16	24	13	0.3	19.6	22	16.6	8 620	11 000	30 000
	RNAFW 162420	32	16	24	20	0.3	19.6	22	16.6	11 900	16 700	30 000
	RNAF 162812	31.5	16	28	12	0.3	21.4	26	16.6	10 500	10 900	30 000
17	RNAF 172513	22	17	25	13	0.3	20.6	23	17.6	8 980	11 800	30 000
	RNAFW 172520	33.5	17	25	20	0.3	20.6	23	17.6	12 400	17 900	30 000
18	RNAF 182613	23	18	26	13	0.3	21.6	24	18.6	9 330	12 700	30 000
	RNAFW 182620	35	18	26	20	0.3	21.6	24	18.6	12 900	19 100	30 000
	RNAF 183012	34.5	18	30	12	0.3	23.4	28	18.6	11 800	13 100	30 000
	RNAFW 183024	69.5	18	30	24	0.3	23.4	28	18.6	20 200	26 200	30 000

Notes(1) Minimum allowable value of chamfer dimension r
(2) Allowable rotational speed applies to oil lubrication. For grease lubrication, a maximum of 50% of this value is allowable.

Remarks1. The character "N" at the end of the identification number indicates that a synthetic resin cage is incorporated.
2. RNAF has no oil hole. RNAFW is provided with an oil groove and an oil hole on the outer ring.
3. No grease is prepacked. Perform proper lubrication.

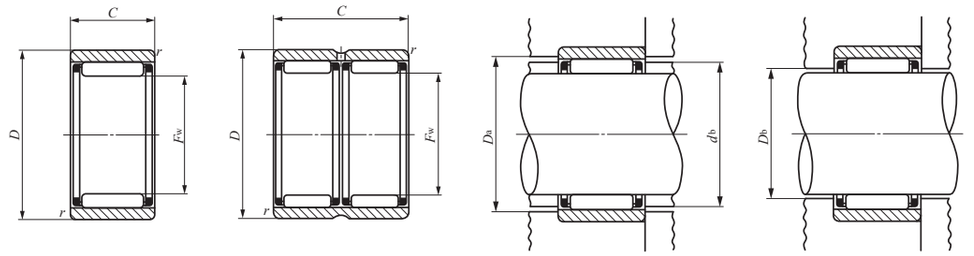
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1mm=0.03937inch

NEEDLE ROLLER BEARINGS WITH SEPARABLE CAGE

Without Inner Ring







RNAF RNAFW

Shaft dia. 20 — 40mm

Shaft dia. mm	Identification number	Mass (Ref.) g	Boundary dimensions mm F_w	D	C	$r_{s\,min}$ (1)	Standard mounting dimensions mm d_b	D_a Max.	D_b	Basic dynamic load rating C N	Basic static load rating C_0 N	Allowable rotational speed(2) min^{-1}
20	RNAF 202813	25	20	28	13	0.3	23.6	26	20.6	9 590	13 500	25 000
	RNAFW 202826	49.5	20	28	26	0.3	23.6	26	20.6	16 400	27 100	25 000
	RNAF 203212	37.5	20	32	12	0.3	25.4	30	20.6	12 400	14 300	25 000
	RNAFW 203224	75	20	32	24	0.3	25.4	30	20.6	21 200	28 600	25 000
22	RNAF 223013	27	22	30	13	0.3	25.6	28	22.6	10 200	15 200	25 000
	RNAFW 223026	53.5	22	30	26	0.3	25.6	28	22.6	17 500	30 300	25 000
	RNAF 223516	58.5	22	35	16	0.3	27.8	33	22.6	17 600	20 900	25 000
	RNAFW 223532	117	22	35	32	0.3	27.8	33	22.6	30 200	41 800	25 000
25	RNAF 253517	51	25	35	17	0.3	29.5	33	25.6	17 300	26 600	20 000
	RNAFW 253526	78	25	35	26	0.3	29.5	33	25.6	22 400	37 200	20 000
	RNAF 253716	57	25	37	16	0.3	30.4	35	25.6	19 400	24 500	20 000
	RNAFW 253732	114	25	37	32	0.3	30.4	35	25.6	33 200	49 000	20 000
28	RNAF 284016	62.5	28	40	16	0.3	33.4	38	28.6	20 100	26 500	18 000
	RNAFW 284032	125	28	40	32	0.3	33.4	38	28.6	34 400	53 000	18 000
30	RNAF 304017	59	30	40	17	0.3	34.5	38	30.6	18 700	31 100	17 000
	RNAFW 304026	90.5	30	40	26	0.3	34.5	38	30.6	24 200	43 400	17 000
	RNAF 304216	66	30	42	16	0.3	35.4	40	30.6	20 800	28 400	17 000
	RNAFW 304232	132	30	42	32	0.3	35.4	40	30.6	35 700	56 800	17 000
35	RNAF 354517	67.5	35	45	17	0.3	39.5	43	35.6	20 500	36 900	14 000
	RNAFW 354526	103	35	45	26	0.3	39.5	43	35.6	26 600	51 500	14 000
	RNAF 354716	75.5	35	47	16	0.3	40.4	45	35.6	23 100	33 900	14 000
	RNAFW 354732	151	35	47	32	0.3	40.4	45	35.6	39 500	67 800	14 000
40	RNAF 405017	76	40	50	17	0.3	43.5	48	40.8	22 200	42 700	12 000
	RNAFW 405034	152	40	50	34	0.3	43.5	48	40.8	38 000	85 400	12 000
	RNAF 405520	140	40	55	20	0.3	45.2	53	40.8	31 400	48 000	12 000
	RNAFW 405540	280	40	55	40	0.3	45.2	53	40.8	53 900	96 000	12 000

Notes(1) Minimum allowable value of chamfer dimension r
(2) Allowable rotational speed applies to oil lubrication. For grease lubrication, a maximum of 50% of this value is allowable.
Remarks1. RNAF has no oil hole. RNAFW is provided with an oil groove and an oil hole on the outer ring.
2. No grease is prepacked. Perform proper lubrication.

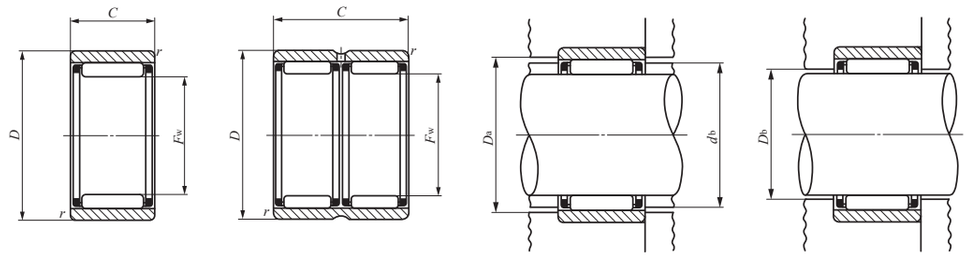
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1mm=0.03937inch

NEEDLE ROLLER BEARINGS WITH SEPARABLE CAGE

Without Inner Ring







RNAF RNAFW

Shaft dia. 45 — 100mm

Shaft dia. mm	Identification number	Mass (Ref.) g	Boundary dimensions mm F_w	D	C	$r_{s\,min}$ (1)	Standard mounting dimensions mm d_b	D_a Max.	D_b	Basic dynamic load rating C N	Basic static load rating C_0 N	Allowable rotational speed(2) min^{-1}
45	RNAF 455517	83.5	45	55	17	0.3	48.5	53	45.8	23 300	47 100	11 000
	RNAFW 455534	167	45	55	34	0.3	48.5	53	45.8	39 900	94 200	11 000
	RNAF 456220	184	45	62	20	0.3	50.9	60	45.8	33 200	53 300	11 000
	RNAFW 456240	370	45	62	40	0.3	50.9	60	45.8	56 900	107 000	11 000
50	RNAF 506220	138	50	62	20	0.3	54.2	60	50.8	27 100	59 300	10 000
	RNAFW 506240	275	50	62	40	0.3	54.2	60	50.8	46 400	119 000	10 000
	RNAF 506520	170	50	65	20	0.3	55.2	63	50.8	35 900	61 100	10 000
	RNAFW 506540	340	50	65	40	0.6	55.2	61	50.8	61 500	122 000	10 000
55	RNAF 556820	167	55	68	20	0.3	59.5	66	55.8	28 600	66 000	9 000
	RNAFW 556840	335	55	68	40	0.3	59.5	66	55.8	49 000	132 000	9 000
	RNAF 557220	220	55	72	20	1	60.9	67	55.8	37 400	66 400	9 000
	RNAFW 557240	440	55	72	40	1	60.9	67	55.8	64 100	133 000	9 000
60	RNAF 607820	255	60	78	20	1	66.3	73	60.8	38 900	71 700	8 500
	RNAFW 607840	510	60	78	40	1	66.3	73	60.8	66 700	143 000	8 500
65	RNAF 658530	470	65	85	30	1.5	72	77	66	59 300	127 000	7 500
	RNAFW 658560	945	65	85	60	1.5	72	77	66	102 000	255 000	7 500
70	RNAF 709030	500	70	90	30	1.5	77	82	71	61 200	136 000	7 000
	RNAFW 709060	1 000	70	90	60	1.5	77	82	71	105 000	272 000	7 000
75	RNAF 759530	530	75	95	30	1.5	82	87	76	63 100	144 000	6 500
	RNAFW 759560	1 060	75	95	60	1.5	82	87	76	108 000	289 000	6 500
80	RNAF 8010030	560	80	100	30	1.5	87	92	81	65 000	153 000	6 000
	RNAFW 8010060	1 120	80	100	60	1.5	87	92	81	111 000	306 000	6 000
85	RNAF 8510530	590	85	105	30	1.5	92	97	86	66 600	161 000	6 000
90	RNAF 9011030	625	90	110	30	1.5	97	102	91	69 600	174 000	5 500
95	RNAF 9511530	655	95	115	30	1.5	102	107	96	70 900	182 000	5 500
100	RNAF 10012030	685	100	120	30	1.5	107	112	101	72 500	191 000	4 500

Notes(1) Minimum allowable value of chamfer dimension r

(2) Allowable rotational speed applies to oil lubrication. For grease lubrication, a maximum of 50% of this value is allowable.

Remarks1. RNAF has no oil hole. RNAFW is provided with an oil groove and an oil hole on the outer ring.

2. No grease is prepacked. Perform proper lubrication.

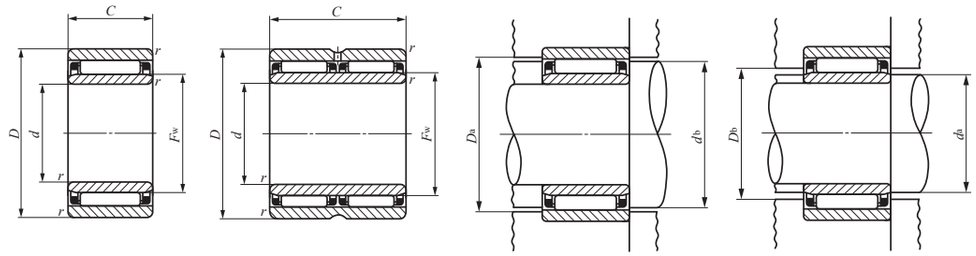
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1mm=0.03937inch

NEEDLE ROLLER BEARINGS WITH SEPARABLE CAGE

With Inner Ring







NAF NAFW

Shaft dia. 6 — 25mm

Shaft dia. mm	Identification number	Mass (Ref.) g	Boundary dimensions mm d	D	C	$r_{s\,min}$ (1)	F_w	Standard mounting dimensions mm d_b	D_a Max.	d_a Min.	d_a Max.	D_b	Basic dynamic load rating C N	Basic static load rating C_0 N	Allowable rotational speed(2) min^{-1}	Assembled inner ring
6	NAF 61710	13.5	6	17	10	0.3	10	12.4	15	8	9.7	10.4	4 160	4 550	50 000	LRT 61010
7	NAF 72012	22.5	7	20	12	0.3	10	13.5	18	9	9.7	10.4	5 940	6 000	50 000	LRT 71012-1
9	NAF 92212	24	9	22	12	0.3	12	15.5	20	11	11.5	12.4	9 030	8 460	40 000	LRT 91212
10	NAF 102213	26	10	22	13	0.3	14	17.6	20	12	13	14.6	7 860	9 410	35 000	LRT 101413
	NAFW 102220	40	10	22	20	0.3	14	17.6	20	12	13	14.6	10 800	14 200	35 000	LRT 101420
	NAF 102612	36	10	26	12	0.3	14	19.4	24	12	13	14.6	9 790	9 680	35 000	LRT 101412
12	NAF 122413	29.5	12	24	13	0.3	16	19.6	22	14	15	16.6	8 620	11 000	30 000	LRT 121613
	NAFW 122420	45.5	12	24	20	0.3	16	19.6	22	14	15	16.6	11 900	16 700	30 000	LRT 121620
	NAF 122812	40	12	28	12	0.3	16	21.4	26	14	15	16.6	10 500	10 900	30 000	LRT 121612
15	NAF 152813	38.5	15	28	13	0.3	20	23.6	26	17	19	20.6	9 590	13 500	25 000	LRT 152013
	NAFW 152826	77.5	15	28	26	0.3	20	23.6	26	17	19	20.6	16 400	27 100	25 000	LRT 152026
	NAF 153212	50.5	15	32	12	0.3	20	25.4	30	17	19	20.6	12 400	14 300	25 000	LRT 152012
17	NAF 173013	42.5	17	30	13	0.3	22	25.6	28	19	21	22.6	10 200	15 200	25 000	LRT 172213
	NAFW 173026	84.5	17	30	26	0.3	22	25.6	28	19	21	22.6	17 500	30 300	25 000	LRT 172226
	NAF 173516	77.5	17	35	16	0.3	22	27.8	33	19	21	22.6	17 600	20 900	25 000	LRT 172216
	NAFW 173532	155	17	35	32	0.3	22	27.8	33	19	21	22.6	30 200	41 800	25 000	LRT 172232
20	NAF 203517	74	20	35	17	0.3	25	29.5	33	22	24	25.6	17 300	26 600	20 000	LRT 202517
	NAFW 203526	114	20	35	26	0.3	25	29.5	33	22	24	25.6	22 400	37 200	20 000	LRT 202526
	NAF 203716	79	20	37	16	0.3	25	30.4	35	22	24	25.6	19 400	24 500	20 000	LRT 202516
	NAFW 203732	158	20	37	32	0.3	25	30.4	35	22	24	25.6	33 200	49 000	20 000	LRT 202532
25	NAF 254017	87.5	25	40	17	0.3	30	34.5	38	27	29	30.6	18 700	31 100	17 000	LRT 253017
	NAFW 254026	135	25	40	26	0.3	30	34.5	38	27	29	30.6	24 200	43 400	17 000	LRT 253026
	NAF 254216	94	25	42	16	0.3	30	35.4	40	27	29	30.6	20 800	28 400	17 000	LRT 253016
	NAFW 254232	186	25	42	32	0.3	30	35.4	40	27	29	30.6	35 700	56 800	17 000	LRT 253032

Notes(1) Minimum allowable value of chamfer dimension r
(2) Allowable rotational speed applies to oil lubrication. For grease lubrication, a maximum of 50% of this value is allowable.
Remarks1. NAF has no oil hole. NAFW is provided with an oil groove and an oil hole on the outer ring.
2. No grease is prepacked. Perform proper lubrication.

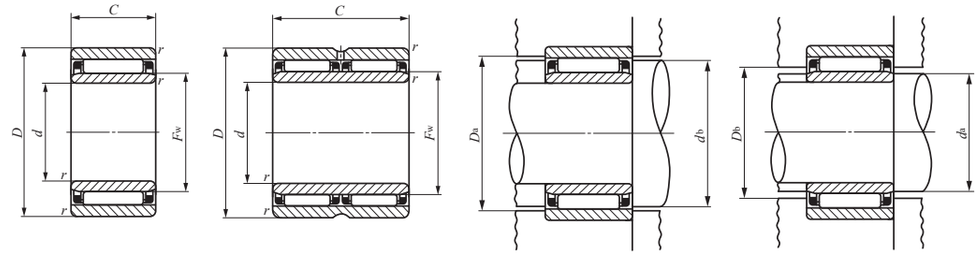
1N=0.102kgf=0.2248lbs.
1mm=0.03937inch

NEEDLE ROLLER BEARINGS WITH SEPARABLE CAGE

With Inner Ring







NAF NAFW

Shaft dia. 30 — 65mm

Shaft dia. mm	Identification number	Mass (Ref.) g	Boundary dimensions mm d	D	C	$r_{s\,min}$ (1)	F_w	Standard mounting dimensions mm d_b	D_a Max.	d_a Min.	d_a Max.	D_b	Basic dynamic load rating C N	Basic static load rating C_0 N	Allowable rotational speed(2) min⁻¹	Assembled inner ring
30	NAF 304517	101	30	45	17	0.3	35	39.5	43	32	34	35.6	20 500	36 900	14 000	LRT 303517
	NAFW 304526	155	30	45	26	0.3	35	39.5	43	32	34	35.6	26 600	51 500	14 000	LRT 303526
	NAF 304716	107	30	47	16	0.3	35	40.4	45	32	34	35.6	23 100	33 900	14 000	LRT 303516
	NAFW 304732	215	30	47	32	0.3	35	40.4	45	32	34	35.6	39 500	67 800	14 000	LRT 303532
35	NAF 355017	115	35	50	17	0.3	40	43.5	48	37	39	40.8	22 200	42 700	12 000	LRT 354017
	NAFW 355034	230	35	50	34	0.3	40	43.5	48	37	39	40.8	38 000	85 400	12 000	LRT 354034
	NAF 355520	186	35	55	20	0.3	40	45.2	53	37	39	40.8	31 400	48 000	12 000	LRT 354020
	NAFW 355540	375	35	55	40	0.3	40	45.2	53	37	39	40.8	53 900	96 000	12 000	LRT 354040
40	NAF 405517	128	40	55	17	0.3	45	48.5	53	42	44	45.8	23 300	47 100	11 000	LRT 404517
	NAFW 405534	255	40	55	34	0.3	45	48.5	53	42	44	45.8	39 900	94 200	11 000	LRT 404534
	NAF 406220	235	40	62	20	0.3	45	50.9	60	42	44	45.8	33 200	53 300	11 000	LRT 404520
	NAFW 406240	475	40	62	40	0.3	45	50.9	60	42	44	45.8	56 900	107 000	11 000	LRT 404540
45	NAF 456220	196	45	62	20	0.3	50	54.2	60	47	49	50.8	27 100	59 300	10 000	LRT 455020
	NAFW 456240	390	45	62	40	0.3	50	54.2	60	47	49	50.8	46 400	119 000	10 000	LRT 455040
	NAF 457220	340	45	72	20	1	55	60.9	67	50	54	55.8	37 400	66 400	9 000	LRT 455520
	NAFW 457240	685	45	72	40	1	55	60.9	67	50	54	55.8	64 100	133 000	9 000	LRT 455540
50	NAF 506820	230	50	68	20	0.3	55	59.5	66	52	54	55.8	28 600	66 000	9 000	LRT 505520
	NAFW 506840	465	50	68	40	0.3	55	59.5	66	52	54	55.8	49 000	132 000	9 000	LRT 505540
	NAF 507820	390	50	78	20	1	60	66.3	73	55	59	60.8	38 900	71 700	8 500	LRT 506020
	NAFW 507840	775	50	78	40	1	60	66.3	73	55	59	60.8	66 700	143 000	8 500	LRT 506040
55	NAF 558530	690	55	85	30	1.5	65	72	77	63	63.5	66	59 300	127 000	7 500	LRT 556530
	NAFW 558560	1 380	55	85	60	1.5	65	72	77	63	63.5	66	102 000	255 000	7 500	LRT 556560
60	NAF 609030	740	60	90	30	1.5	70	77	82	68	68.5	71	61 200	136 000	7 000	LRT 607030
	NAFW 609060	1 480	60	90	60	1.5	70	77	82	68	68.5	71	105 000	272 000	7 000	LRT 607060
65	NAF 659530	790	65	95	30	1.5	75	82	87	73	73.5	76	63 100	144 000	6 500	LRT 657530
	NAFW 659560	1 580	65	95	60	1.5	75	82	87	73	73.5	76	108 000	289 000	6 500	LRT 657560

Notes(1) Minimum allowable value of chamfer dimension *r*
(2) Allowable rotational speed applies to oil lubrication. For grease lubrication, a maximum of 50% of this value is allowable.
Remarks1. NAF has no oil hole. NAFW is provided with an oil groove and an oil hole on the outer ring.
2. No grease is prepacked. Perform proper lubrication.

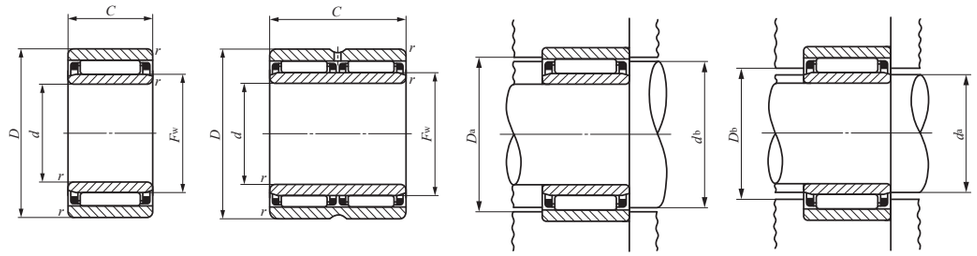
1N=0.102kgf=0.2248lbs.
1mm=0.03937inch

NEEDLE ROLLER BEARINGS WITH SEPARABLE CAGE

With Inner Ring







NAF NAFW

Shaft dia. 70 — 90mm

Shaft dia. mm	Identification number	Mass (Ref.) g	Boundary dimensions mm d	D	C	$r_{s\,min}$ (1)	F_w	Standard mounting dimensions mm d_b	D_a Max.	d_a Min.	d_a Max.	D_b	Basic dynamic load rating C N	Basic static load rating C_0 N	Allowable rotational speed(2) min⁻¹	Assembled inner ring
70	**NAF 7010030**	835	70	100	30	1.5	80	87	92	78	78.5	81	65 000	153 000	6 000	**LRT 708030-1**
	NAFW 7010060	1 680	70	100	60	1.5	80	87	92	78	78.5	81	111 000	306 000	6 000	**LRT 708060**
75	**NAF 7510530**	885	75	105	30	1.5	85	92	97	83	83.5	86	66 600	161 000	6 000	**LRT 758530-1**
80	**NAF 8011030**	935	80	110	30	1.5	90	97	102	88	88.5	91	69 600	174 000	5 500	**LRT 809030-1**
85	**NAF 8511530**	985	85	115	30	1.5	95	102	107	93	93.5	96	70 900	182 000	5 500	**LRT 859530**
90	**NAF 9012030**	1 040	90	120	30	1.5	100	107	112	98	98.5	101	72 500	191 000	4 500	**LRT 9010030**

Notes(1) Minimum allowable value of chamfer dimension *r*
(2) Allowable rotational speed applies to oil lubrication. For grease lubrication, a maximum of 50% of this value is allowable.
Remarks1. NAF has no oil hole. NAFW is provided with an oil groove and an oil hole on the outer ring.
2. No grease is prepacked. Perform proper lubrication.

1N=0.102kgf=0.2248lbs.
1mm=0.03937inch