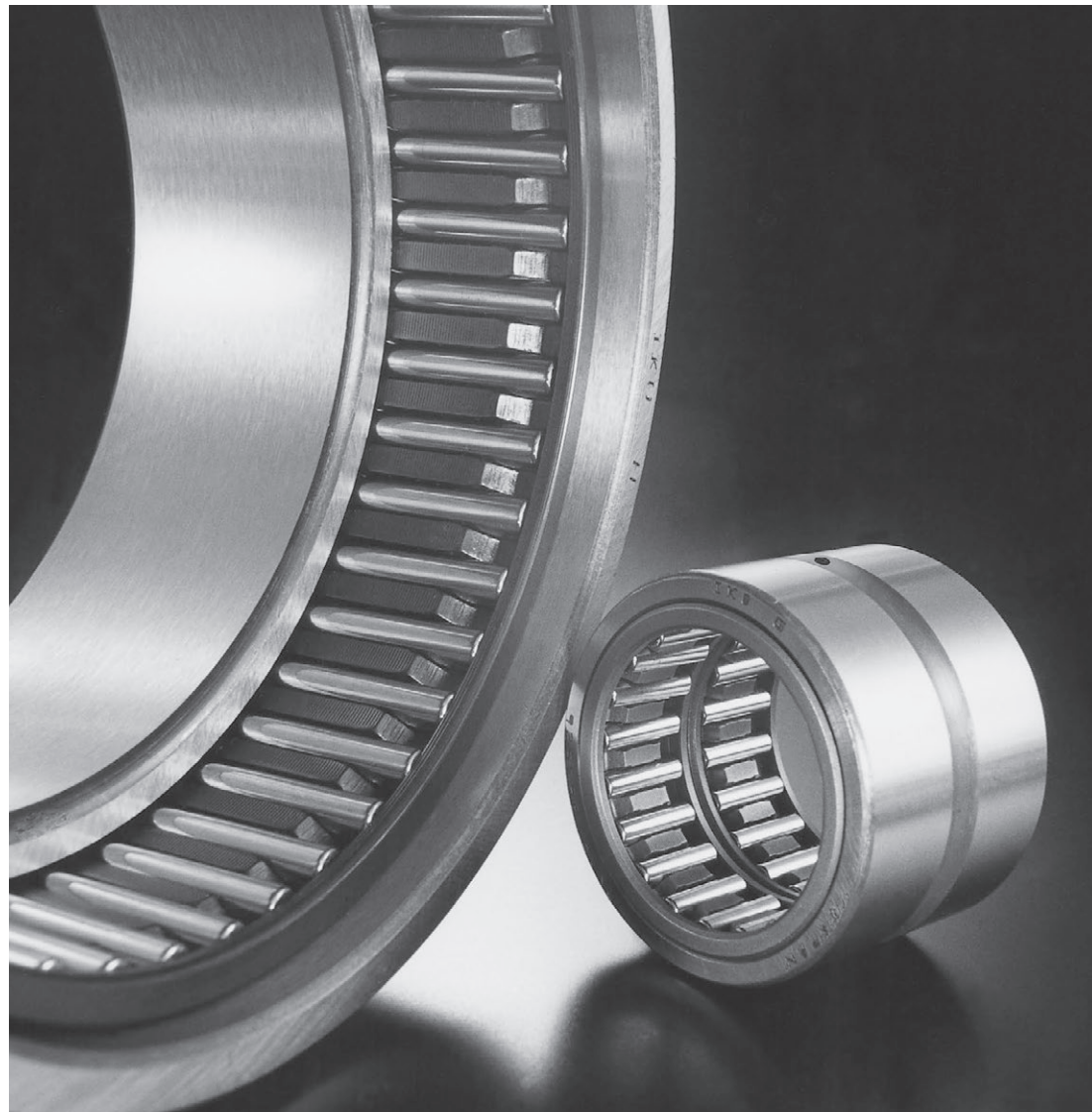


# NEEDLE ROLLER BEARINGS WITH SEPARABLE CAGE

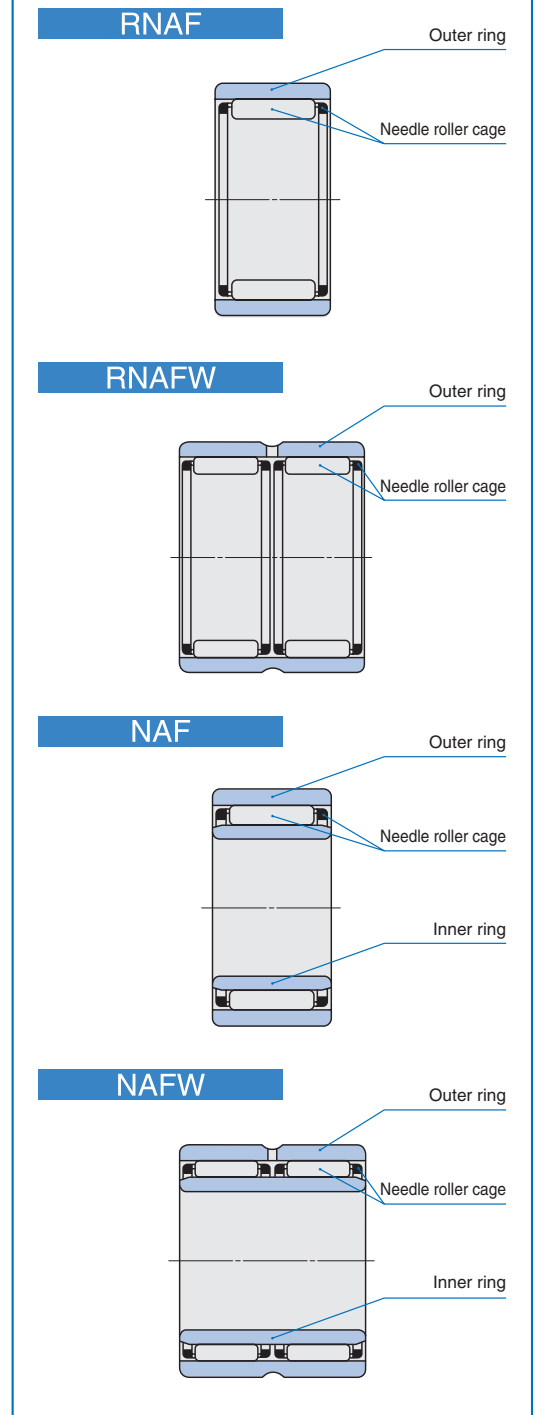
- Needle Roller Bearings with Separable Cage - Without Inner Ring
- Needle Roller Bearings with Separable Cage - With Inner Ring



## 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



## 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

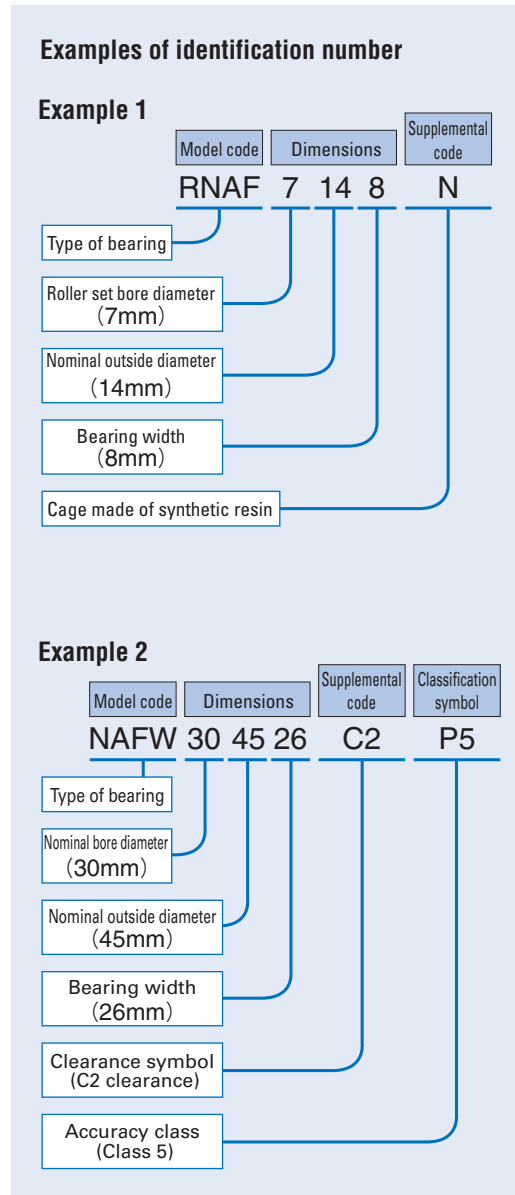
The single-row as well as the double-row types are available with the same sectional height, and either of them can be selected according to load conditions. As shown in the section, "Design of shaft and housing" on page A44, any desired radial internal clearance can be selected by combining a shaft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



## 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.

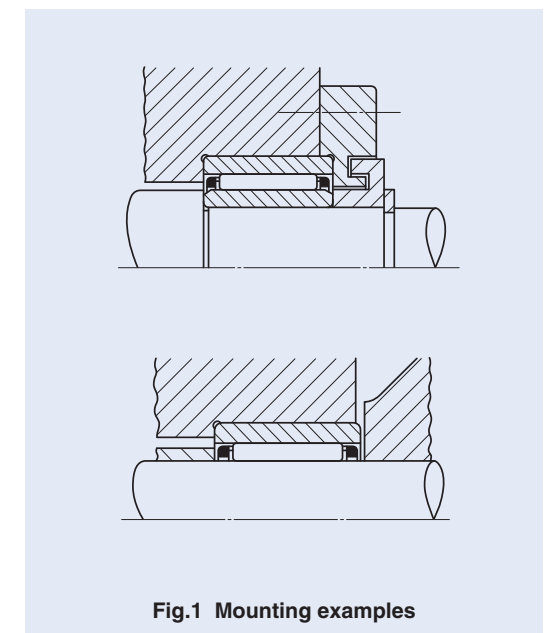


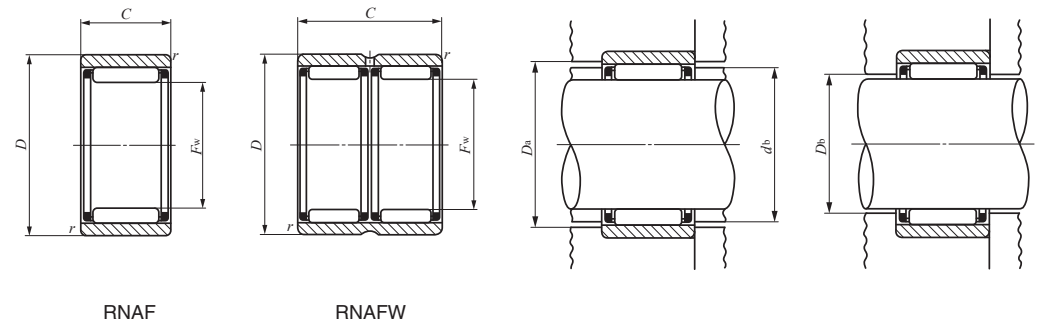
Fig.1 Mounting examples





**NEEDLE ROLLER BEARINGS WITH SEPARABLE CAGE**

Without Inner Ring



Shaft dia. 45 – 100mm

Shaft dia. mm	Identification number	Mass (Ref.) g	Boundary dimensions mm				Standard mounting dimensions mm			Basic dynamic load rating C N	Basic static load rating C <sub>0</sub> N
			F <sub>w</sub>	D	C	r <sub>s min</sub> <sup>(1)</sup>	d <sub>b</sub>	D <sub>a</sub> Max.	D <sub>b</sub>		
45	<b>RNAF 455517</b>	83.5	45	55	17	0.3	48.5	53	45.8	23 300	47 100
	<b>RNAFW 455534</b>	167	45	55	34	0.3	48.5	53	45.8	39 900	94 200
	<b>RNAF 456220</b>	184	45	62	20	0.3	50.9	60	45.8	33 200	53 300
	<b>RNAFW 456240</b>	370	45	62	40	0.3	50.9	60	45.8	56 900	107 000
50	<b>RNAF 506220</b>	138	50	62	20	0.3	54.2	60	50.8	27 100	59 300
	<b>RNAFW 506240</b>	275	50	62	40	0.3	54.2	60	50.8	46 400	119 000
	<b>RNAF 506520</b>	170	50	65	20	0.3	55.2	63	50.8	35 900	61 100
	<b>RNAFW 506540</b>	340	50	65	40	0.6	55.2	61	50.8	61 500	122 000
55	<b>RNAF 556820</b>	167	55	68	20	0.3	59.5	66	55.8	28 600	66 000
	<b>RNAFW 556840</b>	335	55	68	40	0.3	59.5	66	55.8	49 000	132 000
	<b>RNAF 557220</b>	220	55	72	20	1	60.9	67	55.8	37 400	66 400
	<b>RNAFW 557240</b>	440	55	72	40	1	60.9	67	55.8	64 100	133 000
60	<b>RNAF 607820</b>	255	60	78	20	1	66.3	73	60.8	38 900	71 700
	<b>RNAFW 607840</b>	510	60	78	40	1	66.3	73	60.8	66 700	143 000
65	<b>RNAF 658530</b>	470	65	85	30	1.5	72	77	66	59 300	127 000
	<b>RNAFW 658560</b>	945	65	85	60	1.5	72	77	66	102 000	255 000
70	<b>RNAF 709030</b>	500	70	90	30	1.5	77	82	71	61 200	136 000
	<b>RNAFW 709060</b>	1 000	70	90	60	1.5	77	82	71	105 000	272 000
75	<b>RNAF 759530</b>	530	75	95	30	1.5	82	87	76	63 100	144 000
	<b>RNAFW 759560</b>	1 060	75	95	60	1.5	82	87	76	108 000	289 000
80	<b>RNAF 8010030</b>	560	80	100	30	1.5	87	92	81	65 000	153 000
	<b>RNAFW 8010060</b>	1 120	80	100	60	1.5	87	92	81	111 000	306 000
85	<b>RNAF 8510530</b>	590	85	105	30	1.5	92	97	86	66 600	161 000
90	<b>RNAF 9011030</b>	625	90	110	30	1.5	97	102	91	69 600	174 000
95	<b>RNAF 9511530</b>	655	95	115	30	1.5	102	107	96	70 900	182 000
100	<b>RNAF 10012030</b>	685	100	120	30	1.5	107	112	101	72 500	191 000

Notes<sup>(1)</sup> Minimum allowable value of chamfer dimension *r*  
<sup>(2)</sup> 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.

Allowable rotational speed <sup>(2)</sup> min <sup>-1</sup>
11 000
11 000
11 000
11 000
10 000
10 000
10 000
10 000
9 000
9 000
9 000
9 000
8 500
8 500
7 500
7 500
7 000
7 000
6 500
6 500
6 000
6 000
6 000
5 500
5 500
4 500



**NEEDLE ROLLER BEARINGS WITH SEPARABLE CAGE**

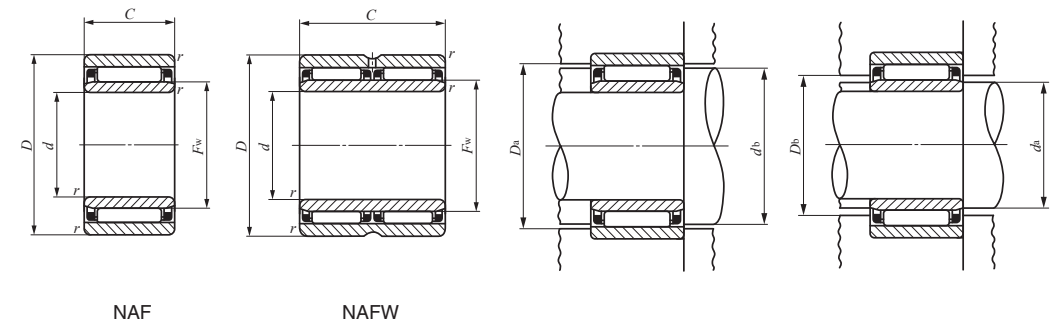
With Inner Ring



Shaft dia. 6 – 25mm

Shaft dia. mm	Identification number	Mass (Ref.) g	Boundary dimensions mm					Standard mounting dimensions mm				
			<i>d</i>	<i>D</i>	<i>C</i>	<i>r<sub>s min</sub></i> <sup>(1)</sup>	<i>F<sub>w</sub></i>	<i>d<sub>b</sub></i>	<i>D<sub>a</sub></i> Max.	<i>d<sub>a</sub></i> Min. Max.	<i>D<sub>b</sub></i>	
6	<b>NAF 61710</b>	13.5	6	17	10	0.3	10	12.4	15	8	9.7	10.4
7	<b>NAF 72012</b>	22.5	7	20	12	0.3	10	13.5	18	9	9.7	10.4
9	<b>NAF 92212</b>	24	9	22	12	0.3	12	15.5	20	11	11.5	12.4
10	<b>NAF 102213</b>	26	10	22	13	0.3	14	17.6	20	12	13	14.6
	<b>NAFW 102220</b>	40	10	22	20	0.3	14	17.6	20	12	13	14.6
	<b>NAF 102612</b>	36	10	26	12	0.3	14	19.4	24	12	13	14.6
12	<b>NAF 122413</b>	29.5	12	24	13	0.3	16	19.6	22	14	15	16.6
	<b>NAFW 122420</b>	45.5	12	24	20	0.3	16	19.6	22	14	15	16.6
	<b>NAF 122812</b>	40	12	28	12	0.3	16	21.4	26	14	15	16.6
15	<b>NAF 152813</b>	38.5	15	28	13	0.3	20	23.6	26	17	19	20.6
	<b>NAFW 152826</b>	77.5	15	28	26	0.3	20	23.6	26	17	19	20.6
	<b>NAF 153212</b>	50.5	15	32	12	0.3	20	25.4	30	17	19	20.6
17	<b>NAF 173013</b>	42.5	17	30	13	0.3	22	25.6	28	19	21	22.6
	<b>NAFW 173026</b>	84.5	17	30	26	0.3	22	25.6	28	19	21	22.6
	<b>NAF 173516</b>	77.5	17	35	16	0.3	22	27.8	33	19	21	22.6
	<b>NAFW 173532</b>	155	17	35	32	0.3	22	27.8	33	19	21	22.6
20	<b>NAF 203517</b>	74	20	35	17	0.3	25	29.5	33	22	24	25.6
	<b>NAFW 203526</b>	114	20	35	26	0.3	25	29.5	33	22	24	25.6
	<b>NAF 203716</b>	79	20	37	16	0.3	25	30.4	35	22	24	25.6
	<b>NAFW 203732</b>	158	20	37	32	0.3	25	30.4	35	22	24	25.6
25	<b>NAF 254017</b>	87.5	25	40	17	0.3	30	34.5	38	27	29	30.6
	<b>NAFW 254026</b>	135	25	40	26	0.3	30	34.5	38	27	29	30.6
	<b>NAF 254216</b>	94	25	42	16	0.3	30	35.4	40	27	29	30.6
	<b>NAFW 254232</b>	186	25	42	32	0.3	30	35.4	40	27	29	30.6

Notes<sup>(1)</sup> Minimum allowable value of chamfer dimension *r*  
<sup>(2)</sup> 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.



Basic dynamic load rating <i>C</i> N	Basic static load rating <i>C<sub>0</sub></i> N	Allowable rotational speed <sup>(2)</sup> min <sup>-1</sup>	Assembled inner ring
4 160	4 550	50 000	<b>LRT 61010</b>
5 940	6 000	50 000	<b>LRT 71012-1</b>
9 030	8 460	40 000	<b>LRT 91212</b>
7 860	9 410	35 000	<b>LRT 101413</b>
10 800	14 200	35 000	<b>LRT 101420</b>
9 790	9 680	35 000	<b>LRT 101412</b>
8 620	11 000	30 000	<b>LRT 121613</b>
11 900	16 700	30 000	<b>LRT 121620</b>
10 500	10 900	30 000	<b>LRT 121612</b>
9 590	13 500	25 000	<b>LRT 152013</b>
16 400	27 100	25 000	<b>LRT 152026</b>
12 400	14 300	25 000	<b>LRT 152012</b>
10 200	15 200	25 000	<b>LRT 172213</b>
17 500	30 300	25 000	<b>LRT 172226</b>
17 600	20 900	25 000	<b>LRT 172216</b>
30 200	41 800	25 000	<b>LRT 172232</b>
17 300	26 600	20 000	<b>LRT 202517</b>
22 400	37 200	20 000	<b>LRT 202526</b>
19 400	24 500	20 000	<b>LRT 202516</b>
33 200	49 000	20 000	<b>LRT 202532</b>
18 700	31 100	17 000	<b>LRT 253017</b>
24 200	43 400	17 000	<b>LRT 253026</b>
20 800	28 400	17 000	<b>LRT 253016</b>
35 700	56 800	17 000	<b>LRT 253032</b>

**NEEDLE ROLLER BEARINGS WITH SEPARABLE CAGE**

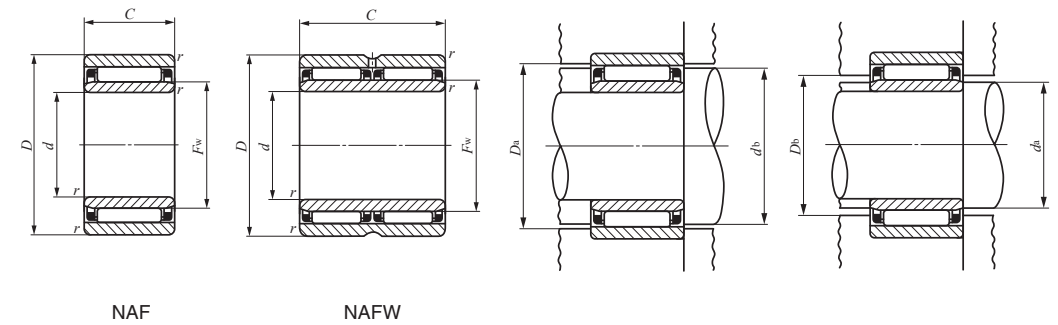
With Inner Ring



Shaft dia. 30 – 65mm

Shaft dia. mm	Identification number	Mass (Ref.) g	Boundary dimensions mm					Standard mounting dimensions mm				
			<i>d</i>	<i>D</i>	<i>C</i>	<i>r<sub>s min</sub></i> <sup>(1)</sup>	<i>F<sub>w</sub></i>	<i>d<sub>b</sub></i>	<i>D<sub>a</sub></i> Max.	<i>d<sub>a</sub></i> Min. Max.	<i>D<sub>b</sub></i>	
30	NAF 304517	101	30	45	17	0.3	35	39.5	43	32	34	35.6
	NAFW 304526	155	30	45	26	0.3	35	39.5	43	32	34	35.6
	NAF 304716	107	30	47	16	0.3	35	40.4	45	32	34	35.6
	NAFW 304732	215	30	47	32	0.3	35	40.4	45	32	34	35.6
35	NAF 355017	115	35	50	17	0.3	40	43.5	48	37	39	40.8
	NAFW 355034	230	35	50	34	0.3	40	43.5	48	37	39	40.8
	NAF 355520	186	35	55	20	0.3	40	45.2	53	37	39	40.8
	NAFW 355540	375	35	55	40	0.3	40	45.2	53	37	39	40.8
40	NAF 405517	128	40	55	17	0.3	45	48.5	53	42	44	45.8
	NAFW 405534	255	40	55	34	0.3	45	48.5	53	42	44	45.8
	NAF 406220	235	40	62	20	0.3	45	50.9	60	42	44	45.8
	NAFW 406240	475	40	62	40	0.3	45	50.9	60	42	44	45.8
45	NAF 456220	196	45	62	20	0.3	50	54.2	60	47	49	50.8
	NAFW 456240	390	45	62	40	0.3	50	54.2	60	47	49	50.8
	NAF 457220	340	45	72	20	1	55	60.9	67	50	54	55.8
	NAFW 457240	685	45	72	40	1	55	60.9	67	50	54	55.8
50	NAF 506820	230	50	68	20	0.3	55	59.5	66	52	54	55.8
	NAFW 506840	465	50	68	40	0.3	55	59.5	66	52	54	55.8
	NAF 507820	390	50	78	20	1	60	66.3	73	55	59	60.8
	NAFW 507840	775	50	78	40	1	60	66.3	73	55	59	60.8
55	NAF 558530	690	55	85	30	1.5	65	72	77	63	63.5	66
	NAFW 558560	1 380	55	85	60	1.5	65	72	77	63	63.5	66
60	NAF 609030	740	60	90	30	1.5	70	77	82	68	68.5	71
	NAFW 609060	1 480	60	90	60	1.5	70	77	82	68	68.5	71
65	NAF 659530	790	65	95	30	1.5	75	82	87	73	73.5	76
	NAFW 659560	1 580	65	95	60	1.5	75	82	87	73	73.5	76

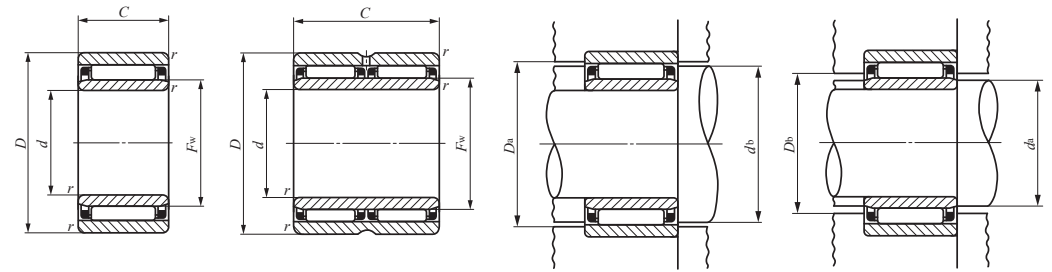
Notes<sup>(1)</sup> Minimum allowable value of chamfer dimension *r*  
<sup>(2)</sup> Allowable rotational speed applies to oil lubrication. For grease lubrication, a maximum of 50% of this value is allowable.  
 Remarks1. NAF has no oil hole. NAFW is provided with an oil groove and an oil hole on the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



Basic dynamic load rating <i>C</i> N	Basic static load rating <i>C<sub>0</sub></i> N	Allowable rotational speed <sup>(2)</sup> min <sup>-1</sup>	Assembled inner ring
20 500	36 900	14 000	LRT 303517
26 600	51 500	14 000	LRT 303526
23 100	33 900	14 000	LRT 303516
39 500	67 800	14 000	LRT 303532
22 200	42 700	12 000	LRT 354017
38 000	85 400	12 000	LRT 354034
31 400	48 000	12 000	LRT 354020
53 900	96 000	12 000	LRT 354040
23 300	47 100	11 000	LRT 404517
39 900	94 200	11 000	LRT 404534
33 200	53 300	11 000	LRT 404520
56 900	107 000	11 000	LRT 404540
27 100	59 300	10 000	LRT 455020
46 400	119 000	10 000	LRT 455040
37 400	66 400	9 000	LRT 455520
64 100	133 000	9 000	LRT 455540
28 600	66 000	9 000	LRT 505520
49 000	132 000	9 000	LRT 505540
38 900	71 700	8 500	LRT 506020
66 700	143 000	8 500	LRT 506040
59 300	127 000	7 500	LRT 556530
102 000	255 000	7 500	LRT 556560
61 200	136 000	7 000	LRT 607030
105 000	272 000	7 000	LRT 607060
63 100	144 000	6 500	LRT 657530
108 000	289 000	6 500	LRT 657560

**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					Standard mounting dimensions mm				
			<i>d</i>	<i>D</i>	<i>C</i>	<i>r</i> <sub>s min</sub> <sup>(1)</sup>	<i>F</i> <sub>w</sub>	<i>d</i> <sub>b</sub>	<i>D</i> <sub>a</sub> Max.	<i>d</i> <sub>a</sub> Min. Max.	<i>D</i> <sub>b</sub>	
70	<b>NAF 7010030</b>	835	70	100	30	1.5	80	87	92	78	78.5	81
	<b>NAFW 7010060</b>	1 680	70	100	60	1.5	80	87	92	78	78.5	81
75	<b>NAF 7510530</b>	885	75	105	30	1.5	85	92	97	83	83.5	86
80	<b>NAF 8011030</b>	935	80	110	30	1.5	90	97	102	88	88.5	91
85	<b>NAF 8511530</b>	985	85	115	30	1.5	95	102	107	93	93.5	96
90	<b>NAF 9012030</b>	1 040	90	120	30	1.5	100	107	112	98	98.5	101

Notes<sup>(1)</sup> Minimum allowable value of chamfer dimension *r*  
<sup>(2)</sup> 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.

Basic dynamic load rating <i>C</i> N	Basic static load rating <i>C</i> <sub>0</sub> N	Allowable rotational speed <sup>(2)</sup> min <sup>-1</sup>	Assembled inner ring
65 000	153 000	6 000	<b>LRT 708030-1</b>
111 000	306 000	6 000	<b>LRT 708060</b>
66 600	161 000	6 000	<b>LRT 758530-1</b>
69 600	174 000	5 500	<b>LRT 809030-1</b>
70 900	182 000	5 500	<b>LRT 859530</b>
72 500	191 000	4 500	<b>LRT 9010030</b>