

## Heavy Duty Needle Roller Bearings (Machined Needle Roller Bearings, Solid Needle Roller Bearings)



**OVERVIEW:** Heavy-duty Needle roller bearings consist of a machined and ground channel-shaped outer ring with a component of needle rollers retained and guided by a cage. The high-strength cage retains and guides the rollers. An optional groove and hole in the outer ring facilitate relubrication. These bearings can be used with or without a machined or ground inner ring, depending on the suitability of the shaft as a raceway surface.

**APPLICATIONS:** Gear pumps, sheaves, automotives transmissions and two-cycle engines.

Description:

MR	Inch Heavy Duty Needle Bearing without Inner Ring
TJ	Inch Heavy Duty Needle Bearing without Inner Ring, Two Rollers Each Window
BRI	Inch Heavy Duty Needle Bearing with Inner Ring
HJ..RS/2RS	Inch Heavy Duty Needle Bearing with Inner Ring, with One/Two Seals
NK, NKS, RNA	Metric Heavy Duty Needle Bearing without Inner Ring
NKI, NKIS, NA	Metric Heavy Duty Needle Bearing with Inner Ring
RNAO	Metric Heavy Duty Needle Bearing without Inner Ring and Ribs
NAO	Metric Heavy Duty Needle Bearing with Inner Ring and without Ribs
RNAV	Metric Full Complement Heavy Duty Needle Bearing without Inner Ring
NAV	Metric Full Complement Heavy Duty Needle Bearing with Inner Ring
RNA49..RS/2RS	Metric Heavy Duty Needle Bearing without Inner Ring, with One/Two Seals
NA49..RS/2RS	Metric Heavy Duty Needle Bearing with Inner Ring and One/Two Seals

Internal Radial Clearance of Metric Heavy Duty Needle Roller Bearings with Inner Ring:

Inside Diameter (mm)		CN(μm)	
>	≤	Min.	Max.
1	24	20	45
24	30	20	45
30	40	25	50
40	50	30	60
50	65	40	70
65	80	40	75
80	100	50	85
100	120	50	90
120	140	60	105
140	160	70	120
160	180	75	125
180	200	90	145
200	225	105	165
225	250	110	175
250	280	125	195
280	315	130	205
315	355	145	225
355	400	190	280

## Heavy Duty Needle Roller Bearings (Machined Needle Roller Bearings, Solid Needle Roller Bearings)

Metric Series Caged Needle  
Roller Complement Bore  
Diameter for Bearings without  
Inner Rings(NK, NKS, RNA):

Fw (mm)		Deviation (um)		Width(um)	
>	≤	Min.	Max.	Max.	Min.
3	6	10	18	0	-120
6	10	13	22	0	-120
10	18	16	27	0	-120
18	30	20	33	0	-120
30	50	25	41	0	-120
50	80	30	49	0	-150
80	120	36	58	0	-200
120	180	43	68	0	-250
180	250	50	79	0	-300
250	315	56	88	0	-350
315	400	62	98	0	-400

Roller Complement Bore Tolerance(MR, TJ, DTJ, HJ..RS, HJ..2RS Series):

Fw (mm)		Deviation (mm)	
>	≤	Min.	Max.
12.7	15.875	0.02	0.043
15.875	28.575	0.023	0.046
28.575	41.275	0.025	0.048
41.275	47.625	0.025	0.05
47.625	69.85	0.028	0.053
69.85	76.2	0.028	0.058
76.2	101.6	0.03	0.06
101.6	114.3	0.03	0.066
114.3	152.4	0.033	0.069
152.4	165.12	0.033	0.074
165.1	195.85	0.036	0.077
195.85	234.95	0.036	0.082

Outside Diameter and Width Tolerance (MR, TJ, DTJ, HJ..RS, HJ..2RS Series):

D (mm)		Deviation (mm)		Width (mm)	
>	≤	Min.	Max.	Min.	Max.
19.05	50.8	-0.013	0	-0.127	0
50.8	82.55	-0.015	0	-0.127	0
82.55	120.65	-0.02	0	-0.127	0
120.65	184.15	-0.025	0	-0.127	0
184.15	260.35	-0.03	0	-0.127	0
260.35	317.5	-0.036	0	-0.127	0

Inside Diameter Tolerance of Metric Machined Needle Roller Bearings with Inner Ring:

d(mm)		I.D.Tolerance(um)		Width Tolerance(um)	
>	≤	Max	Min	Max	Min
2.5	10	0	-8	0	-120
10	18	0	-8	0	-120
18	30	0	-10	0	-120
30	50	0	-12	0	-120
50	80	0	-15	0	-150
80	120	0	-20	0	-200
120	180	0	-25	0	-250
180	250	0	-30	0	-300
250	315	0	-35	0	-350
315	400	0	-40	0	-400
400	500	0	-45	0	-450

Heavy Duty Needle Roller Bearings (Machined Needle Roller Bearings, Solid Needle Roller Bearings)

Outside Diameter Tolerance of Metric Solid Needle Roller Bearings with Inner Ring:

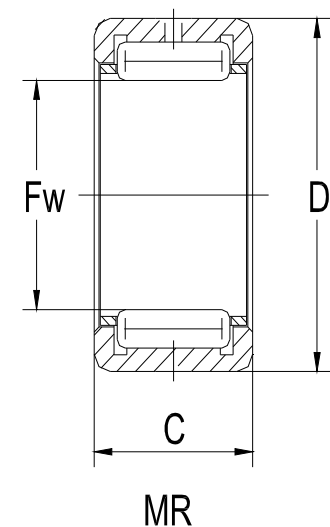
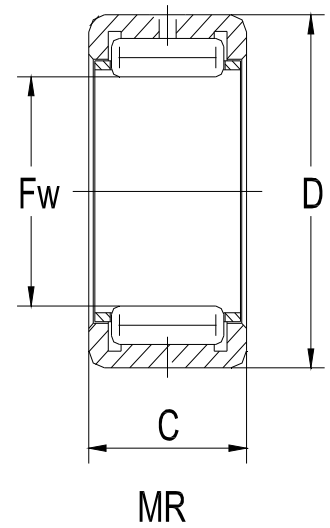
D(mm)		O.D.Tolerance(um)		Width Tolerance(um)	
>	≤	Max	Min	Max	Min
6	18	0	-8	0	-120
18	30	0	-9	0	-120
30	50	0	-11	0	-120
50	80	0	-13	0	-150
80	120	0	-15	0	-200
120	150	0	-18	0	-250
150	180	0	-25	0	-250
180	250	0	-30	0	-300
250	315	0	-35	0	-350
315	400	0	-40	0	-400
400	500	0	-45	0	-450

Internal Radial Clearance of Inch Heavy Duty Needle Roller Bearings with Inner Ring:

Inside Diameter (mm)		CN(μm)	
>	≤	Min.	Max.
1	18.034	33	66
18.034	25.908	41	76
25.908	30.226	46	82
30.226	35.052	48	86
35.052	41.91	50	89
41.91	50.038	50	92
50.038	70.104	56	99
70.104	80.01	56	104
80.01	100.076	63	117
100.076	102.108	68	127

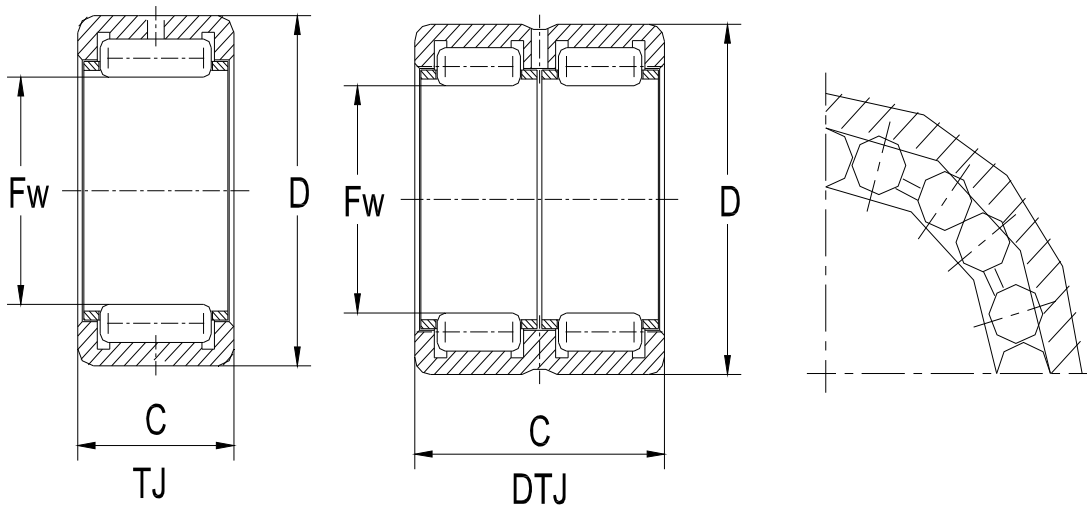
Heavy Duty Needle Roller Bearings (Machined Needle Roller Bearings, Solid Needle Roller Bearings)

Part Number	Dimension (Inch)			Load Rating(LBS)	
	Fw	D	C	Co	Cor
MR10N	0.625	1.1250	0.75	4320	4300
MR10	0.625	1.1250	1.00	5930	6500
MR12N	0.750	1.2500	0.75	4990	5400
MR12	0.750	1.2500	1.00	6830	8100
MR14N	0.875	1.3750	0.75	5280	6000
MR14	0.875	1.3750	1.00	7240	9000
MR16N	1.000	1.5000	0.75	5840	7100
MR16	1.000	1.5000	1.00	8000	10600
MR18N	1.125	1.6250	1.00	8720	12200
MR18	1.125	1.6250	1.25	10900	16300
MR20N	1.250	1.7500	1.00	9020	13100
MR20	1.250	1.7500	1.25	11300	17500
MR22N	1.375	1.8750	1.00	9640	14700
MR22	1.375	1.8750	1.25	12100	19700
MR24N	1.500	2.0625	1.00	10300	15500
MR24	1.500	2.0625	1.25	13000	20800
MR26N	1.625	2.1875	1.00	10600	16400
MR26	1.625	2.1875	1.25	13300	22100
MR28N	1.750	2.3125	1.00	11200	18100
MR28	1.750	2.3125	1.25	14100	24400
MR30N	1.875	2.4375	1.00	11400	19000
MR30	1.875	2.4375	1.25	14400	25600
MR32N	2.000	2.5625	1.00	12000	20700
MR32	2.000	2.5625	1.25	15200	27900
MR36N	2.250	3.0000	1.50	22400	39100
MR36	2.250	3.0000	1.75	26000	47400
MR40N	2.500	3.2500	1.50	23400	42900
MR40	2.500	3.2500	1.75	27200	52100
MR44N	2.750	3.5000	1.50	24500	46700
MR44	2.750	3.5000	1.75	28400	56700
MR48N	3.000	3.7500	1.50	26100	52300
MR48	3.000	3.7500	1.75	30300	63400
MR52	3.250	4.2500	1.75	29900	64400
MR56N	3.500	4.5000	1.75	31300	71600
MR56	3.500	4.5000	2.00	35900	83500
MR60	3.750	4.7500	2.00	36500	87100
MR64	4.000	5.0000	2.00	38000	93800
MR68	4.250	5.2500	2.00	39500	101000
MR72	4.500	6.0000	2.25	60300	130000
MR80	5.000	6.5000	2.25	64600	148000
MR88N	5.500	7.0000	2.50	70200	169800
MR88	5.500	7.0000	3.00	85700	222000
MR96N	6.000	7.5000	2.50	71000	177000
MR96	6.000	7.5000	3.00	86600	228000
MR104N	6.500	8.0000	2.50	71700	183000
MR104	6.500	8.0000	3.00	87500	237000
MR116	7.250	9.1250	3.00	95200	234000
MR124	7.750	9.6250	3.00	99100	252000
MR132	8.250	10.1250	3.00	103000	270000
MR140	8.750	10.6250	3.00	104000	280000
MR148	9.250	11.1250	3.00	108000	292000



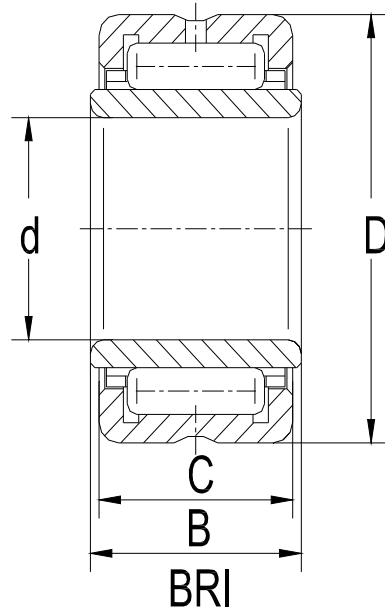
Remark: Other design like SJ, HJ, NCS and BR are also workable.

Heavy Duty Needle Roller Bearings (Machined Needle Roller Bearings, Solid Needle Roller Bearings)

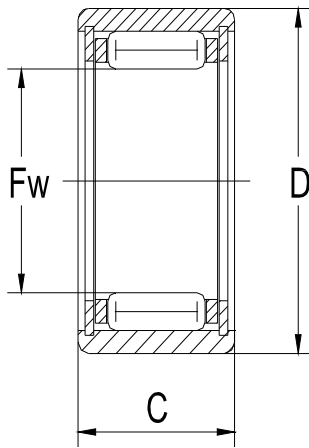


Part Number	Dimension (Inch)			Load Rating(LBS)		Limiting Speed(RPM)
	Fw	D	C	C	Co	
TJ75317	0.8750	1.5000	1.063	7,300	10,800	13,000
TJ7194	1.0000	1.5000	1.000	8,000	13,700	11,800
TJ74765	1.0625	1.6875	1.000	9,500	13,900	11,000
TJ7214	1.1250	1.6250	1.000	8,500	15,500	10,500
TJ7215	1.1250	1.6250	1.250	10,600	20,400	10,500
TJ7235	1.2500	1.7500	1.250	11,300	22,700	9,400
TJ75117	1.3750	2.0625	1.000	10,100	17,900	8,500
TJ75129	1.5000	2.2500	1.000	11,300	18,900	7,800
TJ75318	1.5000	2.3750	1.250	15,000	24,400	7,800
DTJ75319	1.5000	2.3750	2.500	25,800	48,900	7,100
TJ7314	1.7500	2.3125	1.000	11,500	23,900	6,700
TJ7315	1.7500	2.3125	1.250	14,300	31,800	6,700
TJ7354	2.0000	2.5625	1.000	12,500	27,700	5,900
TJ7355	2.0000	2.5625	1.250	15,600	36,800	5,900
TJ8446	2.5000	3.2500	1.500	19,000	46,600	4,700
TJ8447	2.5000	3.2500	1.750	22,200	56,900	4,700
TJ8476	2.7500	3.5000	1.500	19,500	49,800	4,300
TJ8477	2.7500	3.5000	1.750	22,800	60,900	4,300
TJ8516	3.0000	3.7500	1.500	20,900	56,000	3,900
TJ8517	3.0000	3.7500	1.750	24,400	68,500	3,900
DTJ75168	3.2500	4.2500	4.000	54,500	164,500	3,300
TJ75310	3.3125	4.0000	1.500	20,900	64,400	3,500
TJ75309	3.3125	4.0000	1.650	22,900	72,600	3,500
TJ9608	3.5000	4.5000	2.000	32,800	87,900	3,300
TJ75177	3.8125	4.3750	1.500	18,400	76,000	3,100
TJ75311	4.0000	4.8125	2.125	34,100	116,000	3,000
TJ75176	4.0625	4.6250	1.500	18,900	81,000	2,900
TJ75312	4.5000	5.3125	2.080	36,200	127,000	2,600
TJ6769	4.5000	6.0000	2.250	49,600	119,000	2,600
TJ6770	4.5000	6.0000	2.500	55,400	137,000	2,600
DTJ75169	4.5000	6.0000	4.500	85,800	236,000	2,300
TJ74986	5.0000	6.0000	2.000	39,000	135,000	2,400
TJ6849	5.0000	6.5000	2.250	54,000	137,000	2,400
TJ6918	5.5000	7.0000	2.500	62,000	169,000	2,100
TJ6919	5.5000	7.0000	3.000	74,200	213,000	2,100
DTJ75170	5.5000	7.0000	6.000	127,000	425,000	1,900
TJ6926	6.0000	7.5000	3.000	79,300	239,000	2,000
TJ6935	6.5000	8.0000	2.500	67,500	200,000	1,800
DTJ75166	8.0000	10.1250	7.750	260,000	830,000	1,350

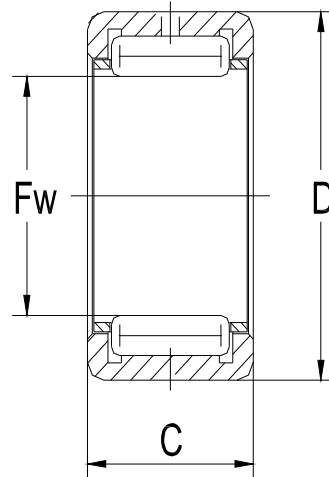
Heavy Duty Needle Roller Bearings (Machined Needle Roller Bearings, Solid Needle Roller Bearings)



Part Number	Dimensions(mm)				Load Rating(N)		Limiting Speed(RPM)	Weight(g)
	d	D	C	B	Co	Cor		
BRI61812	9.525	28.575	19.05	19.3	18900	19700	25000	67.5
BRI82012	12.7	31.75	19.05	19.3	21700	24400	20000	79.5
BRI82016	12.7	31.75	25.4	25.65	27600	33100	20000	106
BRI102212	15.875	34.925	19.05	19.3	23000	27100	18000	91
BRI102216	15.875	34.925	25.4	25.65	29100	36800	18000	122
BRI122412	19.05	38.1	19.05	19.3	25300	31900	16000	102
BRI122416	19.05	38.1	25.4	25.65	32100	43300	16000	136
BRI142616	22.225	41.275	25.4	25.65	34900	49900	14000	152
BRI142620	22.225	41.275	31.75	32	43200	65600	14000	190
BRI162816	25.4	44.45	25.4	25.65	36000	53500	13000	166
BRI162820	25.4	44.45	31.75	32	44600	70300	13000	210
BRI183016	28.575	47.625	25.4	25.65	38500	60000	11000	182
BRI183020	28.575	47.625	31.75	32	47700	78900	11000	225
BRI203316	31.75	52.388	25.4	25.65	43700	66900	11000	220
BRI203320	31.75	52.388	31.75	32	54200	88200	11000	275
BRI223516	34.925	55.562	25.4	25.65	44800	70900	9500	235
BRI223520	34.925	55.562	31.75	32	55600	93400	9500	295
BRI243716	38.1	58.738	25.4	25.65	47500	78200	9000	250
BRI243720	38.1	58.738	31.75	32	58900	103000	9000	315
BRI243820	38.1	60.325	31.75	32	58900	103000	9000	350
BRI243920	38.1	61.912	31.75	32	60100	108000	8500	380
BRI264116	41.275	65.088	25.4	25.65	51000	89400	8000	325
BRI264120	41.275	65.088	31.75	32	63200	118000	8000	410
BRI284824	44.45	76.2	38.1	38.35	90300	158000	7000	735
BRI284828	44.45	76.2	44.45	44.7	105000	191000	7000	855
BRI325224	50.8	82.55	38.1	38.35	94600	174000	6500	810
BRI325228	50.8	82.55	44.45	44.7	110000	210000	6500	945
BRI365624	57.15	88.9	38.1	38.35	98700	189000	5500	885
BRI365628	57.15	88.9	44.45	44.7	114000	228000	5500	1040
BRI406024	63.5	95.25	38.1	38.35	105000	211000	5500	965
BRI406028	63.5	95.25	44.45	44.7	122000	255000	5500	1130
BRI446828	69.85	107.95	44.45	44.7	141000	259000	5000	1520
BRI446832	69.85	107.95	50.8	51.05	154000	290000	5000	1740
BRI487232	76.2	114.3	50.8	51.05	162000	316000	4500	1860
BRI527632	82.55	120.65	50.8	51.05	169000	342000	4000	1980
BRI568032	88.9	127	50.8	51.05	176000	368000	4000	2120



NK(FW≤10)



NK(Fw≥12 mm)

Part Number	Dimensions (mm)			Load Rating(N)		Limiting Speed(RPM)	Weight(g)
	Fw	D	C	Co	Cor		
NK5/10TV	5	10	10	2650	1920	39000	3.1
NK5/12TV	5	10	12	3400	2650	39000	3.7
NK6/10TV	6	12	10	2950	2280	36500	4.7
NK6/12TV	6	12	12	3800	3150	36500	5.7
NK7/10TV	7	14	10	3250	2650	34500	6.9
NK7/12TV	7	14	12	4150	3600	34500	8.2
NK8/12TV	8	15	12	4450	4100	32500	8.7
NK8/16TV	8	15	16	5800	5800	32500	12
NK9/12TV	9	16	12	5100	5000	31000	10.3
NK9/16TV	9	16	16	6600	7100	31000	12.8
NK10/12TV	10	17	12	5300	5500	29500	10.1
NK10/16TV	10	17	16	7000	7800	29500	13.3
NK12/12	12	19	12	7200	7100	26500	12.1
NK12/16	12	19	16	10100	11000	26500	15.9
NK14/16	14	22	16	11400	11500	24600	20.7
NK14/20	14	22	20	14500	15600	24600	25.5
NK15/16	15	23	16	12100	12700	23900	21.8
NK15/20	15	23	20	15400	17200	23900	26.6
NK16/16	16	24	16	12800	13900	23200	22.4
NK16/20	16	24	20	16300	18800	23200	28.4
NK17/16	17	25	16	13500	15000	22600	23.7
NK17/20	17	25	20	17100	20400	22600	29.8
NK18/16	18	26	16	14100	16200	22100	24.9
NK18/20	18	26	20	17900	22000	22100	31.4
NK19/16	19	27	16	14700	17400	21600	26.1
NK19/20	19	27	20	18700	23600	21600	32.2
NK20/16	20	28	16	14600	17500	21100	27
NK20/20	20	28	20	18600	23800	21100	33.9
NK21/16	21	29	16	15200	18700	20600	28.1
NK21/20	21	29	20	19300	25500	20600	35.2
NK22/16	22	30	16	15800	19900	20000	30
NK22/20	22	30	20	20000	27000	20000	37
NK24/16	24	32	16	16900	22300	18500	31.9
NK24/20	24	32	20	21400	30500	18500	40
NK25/16	25	33	16	16800	22400	17800	32.6

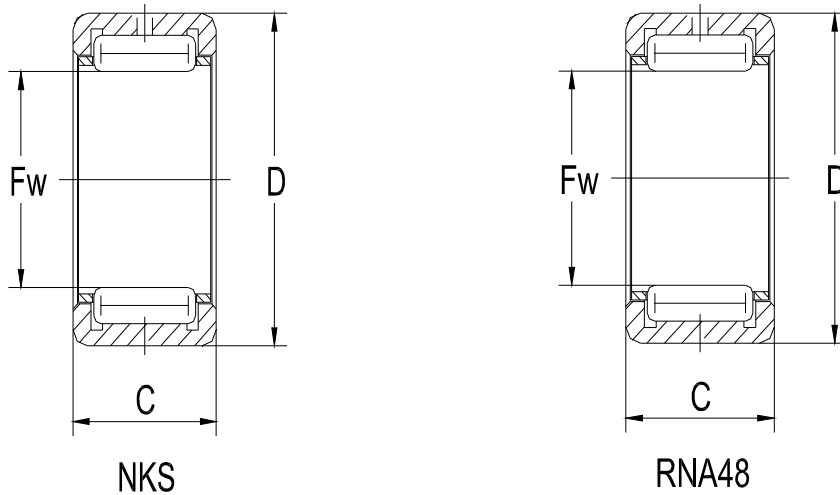
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NK25/20	25	33	20	21300	30500	17800	42
NK26/16	26	34	16	17300	23600	17200	34
NK26/20	26	34	20	22000	32000	17200	42
NK28/20	28	37	20	24800	34000	15800	52.2
NK28/30	28	37	30	37000	57000	15800	82
NK29/20TV	29	38	20	27500	39000	15300	50
NK29/30	29	38	30	37000	57000	15300	84.3
NK30/20TV	30	40	20	28000	41000	14800	61
NK30/30TV	30	40	30	42000	69000	14800	92.4
NK32/20TV	32	42	20	29500	44500	14000	64
NK32/30	32	42	30	39000	63000	14000	102
NK35/20 TV	35	45	20	31000	48500	12900	69.4
NK35/30 TV	35	45	30	46000	81000	12300	106
NK37/20	37	47	20	28000	43500	12300	77
NK37/30	37	47	30	42000	73000	12300	113
NK38/20	38	48	20	29000	45000	12000	79.4
NK38/30	38	48	30	43000	76000	12000	116
NK40/20 TV	40	50	20	33500	56000	11400	78
NK40/30	40	50	30	44000	79000	11400	125
NK42/20	42	52	20	30000	49000	10900	85.8
NK42/30	42	52	30	44500	82000	10900	130
NK43/20	43	53	20	30500	51000	10700	86
NK42/30	43	53	30	45500	85000	10700	133
NK45/20	45	55	20	35000	62000	10200	85.3
NK45/30	45	55	30	52000	103000	9800	132
NK47/20	47	57	20	32500	56000	9800	94.5
NK47/30	47	57	30	48500	94000	9800	142
NK50/25	50	62	25	48500	87000	9200	153.7
NK50/35	50	62	35	67000	132000	8800	215.4
NK55/25	55	68	25	45500	82000	8400	188.2
NK55/35	55	68	35	60000	118000	8400	263.7
NK60/25	60	72	25	53000	80000	7400	181.3
NK60/35	60	72	35	63000	130000	7700	254
NK65/25	65	78	25	50000	98000	7200	218.8
NK65/35	65	78	35	66000	142000	7200	306.5
NK68/25	68	82	25	49500	89000	6800	245
NK68/35	68	82	35	70000	139000	6800	343.3
NK70/25	70	85	25	50000	92000	6600	277.2
NK70/35	70	85	35	71000	144000	6600	388.5
NK73/25	73	90	25	60000	100000	6300	319.4
NK73/35	73	90	35	85000	156000	6300	448.4
NK75/25	75	92	25	61000	104000	6100	327.5
NK75/35	75	92	35	87000	162000	6100	459.8
NK80/25	80	95	25	63000	119000	5800	301
NK80/35	80	95	35	89000	184000	5800	425
NK85/25	85	105	25	78000	123000	5400	425
NK85/35	85	105	35	111000	193000	5400	600
NK90/25	90	110	25	81000	132000	5100	450
NK90/35	90	110	35	116000	208000	5100	630
NK95/26	95	115	26	83000	137000	4850	490
NK95/36	95	115	36	121000	223000	4850	680
NK100/26	100	120	26	86000	146000	4600	515
NK100/36	100	120	36	125000	237000	4600	715
NK105/26	105	125	26	89000	155000	4400	540
NK105/36	105	125	36	129000	250000	4400	715
NK110/30	110	130	30	111000	210000	4200	650
NK110/40	110	130	40	143000	290000	4200	830

Remark: Other design like TAF, NB, RLM and NQ are also workable.



Heavy Duty Needle Roller Bearings (Machined Needle Roller Bearings, Solid Needle Roller Bearings)

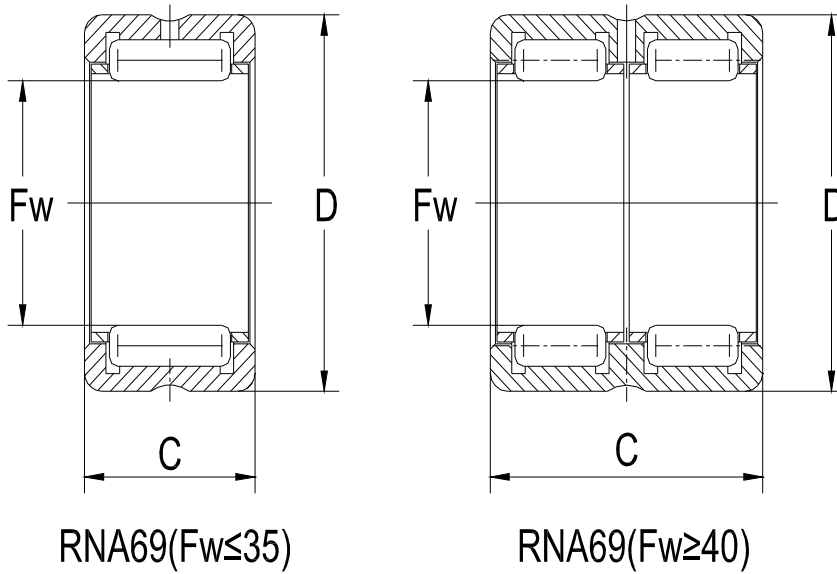


Part Number	Dimensions (mm)			Load Rating(N)		Limiting Speed(RPM)	Weight(g)
	Fw	D	C	Co	Cor		
NKS20	20	32	20	26000	25000	18800	48.7
NKS22	22	35	20	27500	28000	17200	61.5
NKS24	24	37	20	29500	31000	16100	65.5
NKS25	25	38	20	31000	33500	15600	68.1
NKS28	28	42	20	32500	36500	14000	83.6
NKS30	30	45	22	36500	40000	13100	104
NKS32	32	47	22	38000	43500	12400	110
NKS35	35	50	22	39500	47000	11500	118
NKS37	37	52	22	41500	50000	11000	123
NKS40	40	55	22	42500	54000	10300	129
NKS43	43	58	22	44000	57000	9700	139
NKS45	45	60	22	45500	60000	9300	145
NKS50	50	65	22	48000	67000	8500	157
NKS55	55	72	22	51000	74000	7700	221
NKS60	60	80	28	71000	98000	7000	335
NKS65	65	85	28	75000	108000	6500	356
NKS70	70	90	28	77000	113000	6100	380
NKS75	75	95	28	81000	123000	5800	402

Remark: Other design like TR and NQS are also workable.

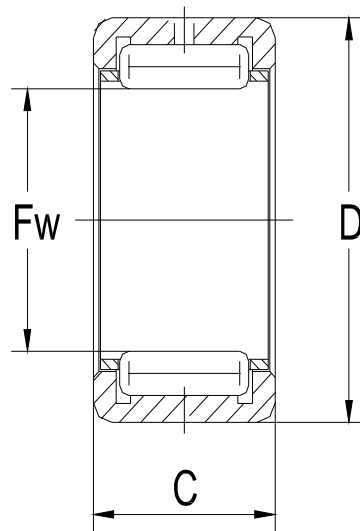
Part Number	Dimensions (mm)			Load Rating(N)		Limiting Speed(RPM)	Weight(g)
	Fw	D	C	Co	Cor		
RNA4822	120	140	30	106000	216000	3750	670
RNA4824	130	150	30	112000	239000	3500	730
RNA4826	145	165	35	134000	310000	3150	990
RNA4828	155	175	35	136000	325000	2950	1050
RNA4830	165	190	40	172000	400000	2750	1600
RNA4832	175	200	40	181000	435000	2600	1700
RNA4834	185	215	45	209000	510000	2450	2540
RNA4836	195	225	45	219000	550000	2330	2680
RNA4838	210	240	50	255000	690000	2180	3210
RNA4840	220	250	50	260000	720000	2090	3350
RNA4844	240	270	50	275000	790000	1920	3620
RNA4848	265	300	60	400000	1080000	1730	5400
RNA4852	285	320	60	415000	1160000	1620	5800
RNA4856	305	350	69	510000	1300000	1500	9300
RNA4860	330	380	80	700000	1770000	1380	12700
RNA4864	350	400	80	710000	1850000	1310	13400
RNA4868	370	420	80	730000	1940000	1240	1400
RNA4872	390	440	80	740000	2020000	1180	14800
RNA4876	415	480	100	1130000	2900000	1090	26000

Heavy Duty Needle Roller Bearings (Machined Needle Roller Bearings, Solid Needle Roller Bearings)



Part Number	Dimensions (mm)			Load Rating(N)		Limiting Speed(RPM)	Weight(g)
	Fw	D	C	Co	Cor		
RNA6901	16	24	22	18100	21600	23200	31
RNA6902	20	28	23	19500	25500	20400	39.7
RNA6903	22	30	23	21100	29000	18800	42.4
RNA6904	25	37	30	40500	51000	15800	100
RNA69/22	28	39	30	42000	55000	14600	98
RNA6905	30	42	30	44000	59000	13600	112
RNA69/28	32	45	30	45500	63000	12700	135
RNA6906	35	47	30	49000	71000	12000	126
RNA69/32	40	52	36	53000	82000	10700	162
RNA6907	42	55	36	54000	86000	10100	193
RNA6908	48	62	40	74000	116000	8900	256
RNA6909	52	68	40	79000	127000	8200	338
RNA6910	58	72	40	82000	139000	7500	310
RNA6911	63	80	45	102000	176000	6900	470
RNA6912	68	85	45	106000	191000	6400	488
RNA6913	72	90	45	108000	198000	6000	580
RNA6914	80	100	54	145000	265000	5400	857
RNA6915	85	105	54	147000	275000	5200	935
RNA6916	90	110	54	153000	300000	4900	987
RNA6917	100	120	63	188000	400000	4450	1200
RNA6918	105	125	63	195000	425000	4250	1330
RNA6919	110	130	63	197000	440000	4100	1460

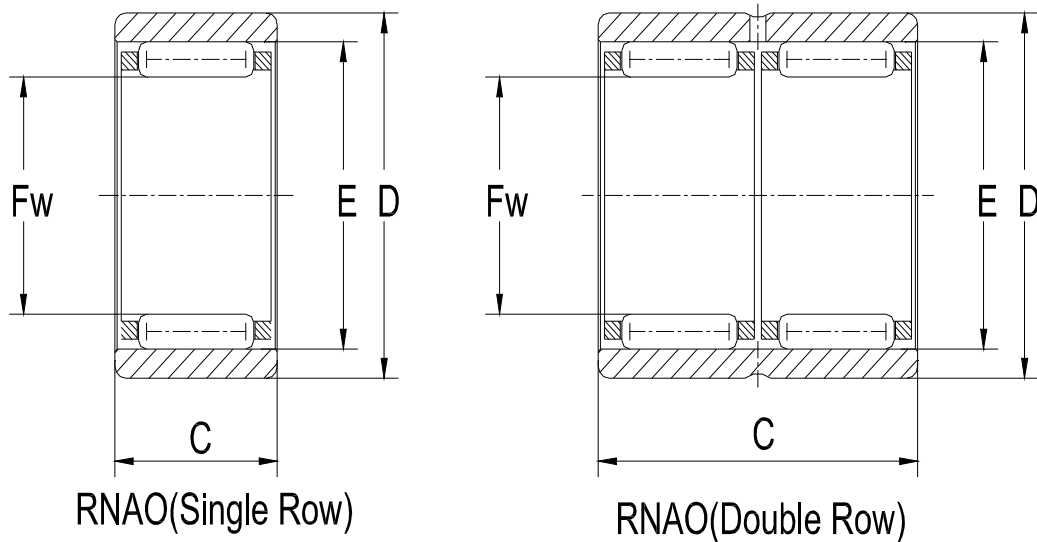
Heavy Duty Needle Roller Bearings (Machined Needle Roller Bearings, Solid Needle Roller Bearings)



RNA49

Part Number	Dimensions (mm)			Load Rating(N)		Limiting Speed(RPM)	Weight(g)
	Fw	D	C	Co	Cor		
RNA4900	14	22	13	9600	9200	23600	16.5
RNA4901	16	24	13	10600	10900	23200	17.4
RNA4902	20	28	13	12000	13600	20400	21.7
RNA4903	22	30	13	12400	14600	18800	22.2
RNA4904	25	37	17	23700	25500	15800	52.3
RNA49/22	28	39	17	26000	29500	14600	50.2
RNA4905	30	42	17	26500	31500	13600	61
RNA49/28	32	45	17	27500	33500	12700	73.2
RNA4906	35	47	17	28500	35500	12000	69.4
RNA49/32	40	52	20	34500	47500	10700	89.1
RNA4907	42	55	20	35500	50000	10100	107
RNA4908	48	62	22	48500	67000	8900	140
RNA4909	52	68	22	51000	73000	8200	182
RNA4910	58	72	22	53000	80000	7500	163
RNA4911	63	80	25	65000	100000	6900	255
RNA4912	68	85	25	68000	108000	6400	275
RNA4913	72	90	25	69000	112000	6000	312
RNA4914	80	100	30	95000	156000	5400	460
RNA4915	85	105	30	97000	162000	5200	489
RNA4916	90	110	30	101000	174000	4900	516
RNA4917	100	120	35	125000	237000	4450	657
RNA4918	105	125	35	129000	250000	4250	745
RNA4919	110	130	35	131000	260000	4100	719
RNA4920	115	140	40	144000	270000	4000	1150
RNA4922	125	150	40	149000	290000	3700	1240
RNA4924	135	165	45	205000	390000	3400	1860
RNA4926	150	180	50	229000	470000	3100	2210
RNA4928	160	190	50	237000	500000	2900	2350

Heavy Duty Needle Roller Bearings (Machined Needle Roller Bearings, Solid Needle Roller Bearings)

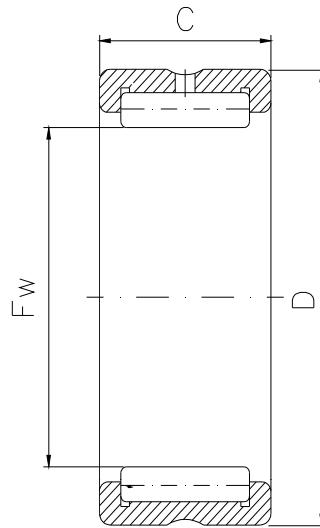


Part Number	Dimension(mm)				Load Rating(N)		Limiting Speed(RPM)	Weight(g)
	Fw	D	C	E	Co	Cor		
RNAO5X10X8TN	5	10	8	8	2650	1920	39000	3
RNAO6X13X8TN	6	13	8	9	2950	2280	36500	6
RNAO7X14X8TN	7	14	8	10	3250	2650	34500	6
RNAO8X15X10TN	8	15	10	11	4450	4100	32500	8
RNAO10X17X10TN	10	17	10	13	5300	5500	29500	10
RNAO12X22X12TN	12	22	12	18	11300	9900	26000	19
RNAO15X23X13	15	23	13	19	9700	10900	22900	20
RNAO16X24X13	16	24	13	20	10100	11800	23600	21
RNAO16X28X12	16	28	12	22	13000	12500	22900	32
RNAO17X25X13	17	25	13	21	11700	14600	22900	22
RNAO18X30X24ZW	18	30	24	24	24800	30000	21800	69
RNAO20X28X13	20	28	13	24	11100	14300	21300	25
RNAO20X28X26ZW	20	28	26	24	19000	28500	21300	50
RNAO20X32X12	20	32	12	26	15100	16200	20900	38
RNAO22X30X13	22	30	13	26	11800	15900	20400	27
RNAO22X35X16	22	35	16	29	22600	25500	19200	59
RNAO25X35X17	25	35	17	29	16800	26000	18100	53
RNAO25X35X26ZW	25	35	26	29	21900	37000	18100	76
RNAO25X37X16	25	37	16	32	23800	28000	17200	60
RNAO30X40X17	30	40	17	35	22100	34000	15100	60
RNAO30X42X16	30	42	16	37	26000	33500	14600	59
RNAO30X42X32ZW	30	42	32	37	45000	67000	14600	137
RNAO35X45X13	35	45	13	40	18300	28000	13100	53
RNAO35X45X17	35	45	17	40	23500	38500	13100	69
RNAO35X45X26ZW	35	45	26	40	31500	56000	13100	91
RNAO35X47X16	35	47	16	42	27500	37500	12700	78
RNAO35X47X18	35	47	16	42	31000	43000	12700	89
RNAO35X47X32ZW	35	47	32	42	47500	75000	12700	156
RNAO40X50X17	40	50	17	45	24200	41500	11500	74
RNAO40X50X34ZW	40	50	34	45	41500	83000	11500	152
RNAO40X55X20	40	55	20	47	37000	57000	11300	145
RNAO40X55X40ZW	40	55	40	48	70000	118000	11100	275
RNAO45X55X17	45	55	17	50	25500	46000	10300	83
RNAO45X62X40ZW	45	62	40	53	76000	135000	10000	377
RNAO50X62X20	50	62	20	55	30000	60000	9300	140
RNAO50X65X20	50	65	20	58	40500	62000	9100	168

## Heavy Duty Needle Roller Bearings (Machined Needle Roller Bearings, Solid Needle Roller Bearings)

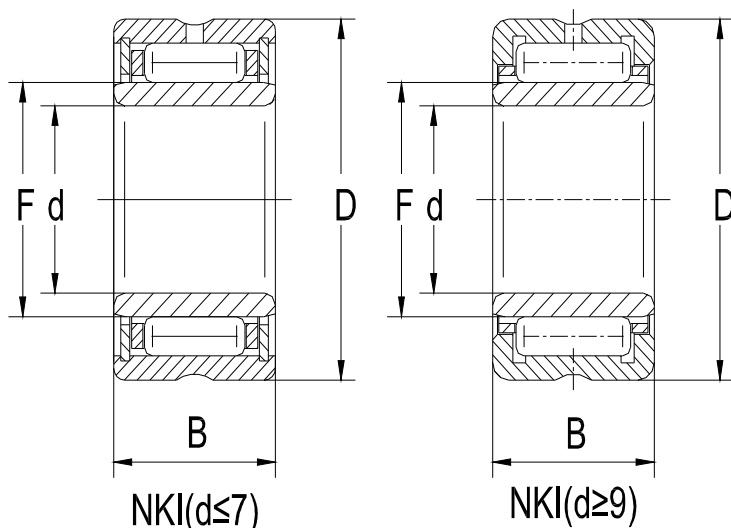
RNAO50X65X40ZW	50	65	40	58	69000	124000	9100	355
RNAO55X68X20	55	68	20	60	32000	66000	8500	166
RNAO60X78X20	60	78	20	68	49500	85000	7700	255
RNAO60X78X40ZW	60	78	40	68	85000	171000	7700	435
RNAO65X85X30	65	85	30	73	64000	123000	7100	464
RNAO70X90X30	70	90	30	78	68000	135000	6600	499
RNAO80X100X30	80	100	30	88	80000	176000	5800	580
RNAO90X105X26	90	105	26	98	69000	150000	5200	373
RNAO90X110X30	90	110	30	98	76000	172000	5200	610
RNAO100X120X30	100	120	30	108	80000	188000	4700	694

**Remark: Other design like RNAF and RNAFW are also workable.**



Part Number	Dimensions (mm)			Load Rating(N)		Limiting Speed(RPM)	Weight(Kg)
	Fw	D	C	Co	Cor		
RNAV4002	21.87	32	17	10800	29800	4500	0.045
RNAV4003	24.3	35	18	17900	37900	4300	0.062
RNAV4004	28.7	42	22	28150	60900	3900	0.114
RNAV4005	33.5	47	22	33800	70800	3700	0.129
RNAV4006	40.1	55	25	49900	96500	3500	0.193
RNAV4007	45.9	62	27	47600	122800	3100	0.259
RNAV4008	51.6	68	28	49900	137900	2700	0.304
RNAV4009	57.4	75	30	52500	153500	2600	0.39
RNAV4010	62.1	80	30	55700	166000	2500	0.426
RNAV4011	69.8	90	35	68500	225800	2300	0.645
RNAV4012	74.6	95	35	75400	239000	2100	0.677
RNAV4013	80.3	100	35	79500	256900	1900	0.692
RNAV4014	88	110	40	98800	354900	1700	0.95
RNAV4015	92.7	115	40	101800	372900	1600	1
RNAV4016	100.3	125	45	102900	373500	1500	1.4
RNAV4017	104.8	130	45	103800	374800	1400	1.54

Heavy Duty Needle Roller Bearings (Machined Needle Roller Bearings, Solid Needle Roller Bearings)

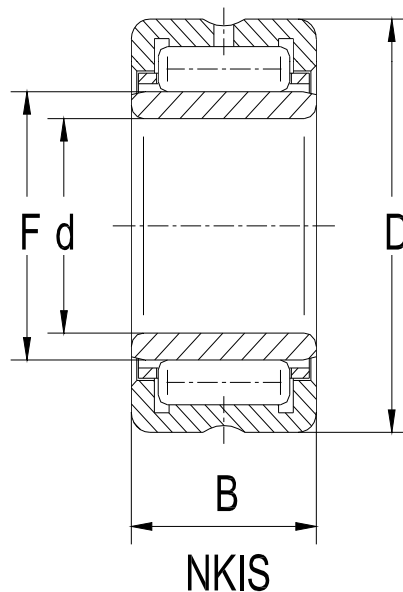


Part Number	Dimension(mm)				Load Rating(N)		Limiting Speed(RPM)	Weight(g)
	d	F	D	B	Co	Cor		
NKI5/12TV	5	8	15	12	4450	4100	32500	11.5
NKI5/16TV	5	8	15	16	5800	5800	32500	15.3
NKI6/12TV	6	9	16	12	5100	5000	31000	13.5
NKI6/16TV	6	9	16	16	6600	7100	31000	17.4
NKI7/12TV	7	10	17	12	5300	5500	29500	13.7
NKI7/16TV	7	10	17	16	7000	7800	29500	18.2
NKI9/12	9	12	19	12	7200	7100	26500	16.6
NKI9/16	9	12	19	16	10100	11000	26500	21.9
NKI10/16	10	14	22	16	11400	11500	24600	29.4
NKI10/20	10	14	22	20	14500	15600	24600	37.1
NKI12/16	12	16	24	16	12800	13900	23200	33.3
NKI12/20	12	16	24	20	16300	18800	23200	41.9
NKI15/16	15	19	27	16	14700	17400	21600	38.8
NKI15/20	15	19	27	20	18700	23600	21600	48.7
NKI17/16	17	21	29	16	15200	18700	20600	42.4
NKI17/20	17	21	29	20	19300	25500	20600	53.4
NKI20/16	20	24	32	16	16900	22300	18500	49
NKI20/20	20	24	32	20	21400	30500	18500	61
NKI22/16	22	26	34	16	17300	23600	17200	52
NKI22/20	22	26	34	20	22000	32000	17200	65.4
NKI25/20	25	29	38	20	27500	39000	15300	75.8
NKI25/30	25	29	38	30	37000	57000	15300	124
NKI28/20	28	32	42	20	29500	44500	14000	92.4
NKI28/30	28	32	42	30	39000	63000	14000	146
NKI30/20	30	35	45	20	31000	48500	12900	108
NKI30/30	30	35	45	30	46000	81000	12900	165
NKI32/20	32	37	47	20	28000	43500	12300	118
NKI32/30	32	37	47	30	42000	73000	12300	180
NKI35/20	35	40	50	20	33500	56000	11400	122
NKI35/30	35	40	50	30	44000	79000	11400	193
NKI38/20	38	43	53	20	30500	51000	10700	136
NKI38/30	38	43	53	30	45500	85000	10700	207
NKI40/20	40	45	55	20	35000	62000	10200	136
NKI40/30	40	45	55	30	52000	10300	10200	216
NKI42/20	42	47	57	20	32500	56000	9800	148
NKI42/30	42	47	57	30	48500	94000	9800	222
NKI45/25	45	50	62	25	48500	87000	9200	217
NKI45/35	45	50	62	35	67000	132000	9200	308

Heavy Duty Needle Roller Bearings (Machined Needle Roller Bearings, Solid Needle Roller Bearings)

NKI50/25	50	55	68	25	45500	82000	8400	270
NKI50/35	50	55	68	35	60000	118000	8400	379
NKI55/25	55	60	72	25	53000	103000	7700	255
NKI55/35	55	60	72	35	63000	130000	7700	379
NKI60/25	60	68	82	25	49500	89000	6800	394
NKI60/35	60	68	82	35	70000	139000	6800	553
NKI65/25	65	73	90	25	60000	100000	6300	467
NKI65/35	65	73	90	35	85000	156000	6300	659
NKI70/25	70	80	95	25	63000	119000	5800	521
NKI70/35	70	80	95	35	89000	184000	5800	737
NKI75/25	75	85	105	25	78000	123000	5400	641
NKI75/35	75	85	105	35	111000	193000	5400	908
NKI80/25	80	90	110	25	81000	132000	5100	677
NKI80/35	80	90	110	35	116000	208000	5100	959
NKI85/26	85	95	115	26	83000	137000	4850	734
NKI85/36	85	95	115	36	121000	223000	4850	1040
NKI90/26	90	100	120	26	86000	146000	4600	778
NKI90/36	90	100	120	36	125000	237000	4600	1090
NKI95/26	95	105	125	26	89000	155000	4400	816
NKI95/36	95	105	125	36	129000	250000	4400	1145
NKI100/30	100	110	130	30	111000	210000	4200	990
NKI100/40	100	110	130	40	143000	290000	4200	1330

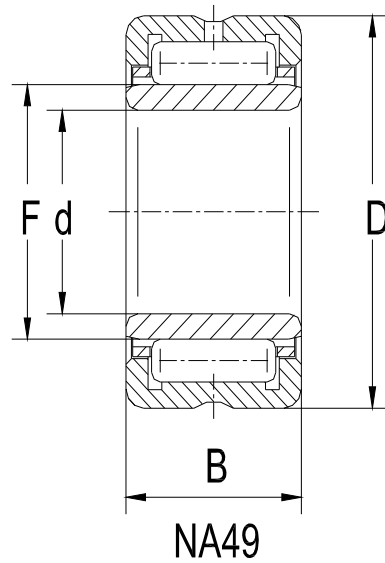
Remark: Other design like NKJ, TAFI, LM and NBI are also workable.



Part Number	Dimension(mm)				Load Rating(N)		Limiting Speed(RPM)	Weight(g)
	d	F	D	B	Co	Cor		
NKIS15	15	22	35	20	27500	28000	19600	92
NKIS17	17	24	37	20	29500	31000	18100	98
NKIS20	20	28	42	20	32500	36500	15800	129
NKIS25	25	32	47	22	38000	43500	13600	162
NKIS30	30	37	52	22	41500	50000	12000	184
NKIS35	35	43	58	22	44000	57000	10500	220
NKIS40	40	50	65	22	48000	67000	9300	281
NKIS45	45	55	72	22	51000	74000	8400	336
NKIS50	50	60	80	28	71000	98000	7500	518
NKIS55	55	65	85	28	75000	108000	7000	558
NKIS60	60	70	90	28	77000	113000	6500	560
NKIS65	65	75	95	28	81000	123000	6100	641

Remark: Other design like NQIS and NKJS are also workable.

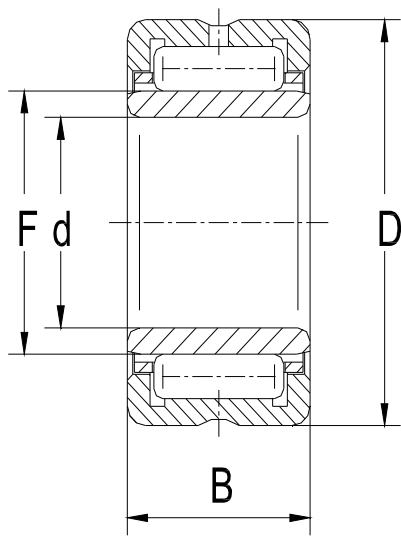
Heavy Duty Needle Roller Bearings (Machined Needle Roller Bearings, Solid Needle Roller Bearings)



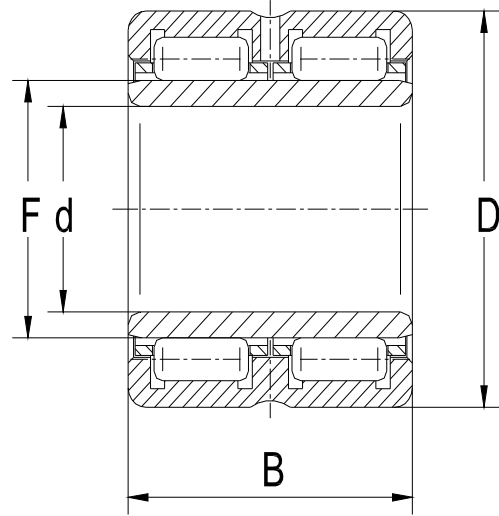
Part Number	Dimension(mm)				Load Rating(N)		Limiting Speed(RPM)	Weight(g)
	d	F	D	B	Co	Cor		
NA4900	10	14	22	13	9600	9200	25000	23
NA4901	12	16	24	13	10600	10900	23600	26
NA4902	15	20	28	13	12000	13600	21600	34
NA4903	17	22	30	13	12400	14600	20600	37
NA4904	20	25	37	17	23700	25500	17200	75.2
NA49/22	22	28	39	17	26000	29500	16100	80
NA4905	25	30	42	17	26500	31500	14600	88
NA49/28	28	32	45	17	27500	33500	13400	97.7
NA4906	30	35	47	17	28500	35500	12700	101
NA49/32	32	40	52	20	34500	47500	11700	158
NA4907	35	42	55	20	35500	50000	10900	170
NA4908	40	48	62	22	48500	67000	9600	230
NA4909	45	52	68	22	51000	73000	8700	271
NA4910	50	58	72	22	53000	80000	8000	274
NA4911	55	63	80	25	65000	100000	7300	393
NA4912	60	68	85	25	68000	108000	6800	426
NA4913	65	72	90	25	69000	112000	6300	456
NA4914	70	80	100	30	95000	156000	5800	728
NA4915	75	85	105	30	97000	162000	5400	775
NA4916	80	90	110	30	101000	174000	5200	878
NA4917	85	100	120	35	125000	237000	4800	1250
NA4918	90	105	125	35	129000	250000	4550	1312
NA4919	95	110	130	35	131000	260000	4350	1371
NA4920	100	115	140	40	144000	270000	4100	1900
NA4922	110	125	150	40	149000	290000	3750	2070
NA4924	120	135	165	45	205000	390000	3450	2860
NA4926	130	150	180	50	229000	470000	3150	3900
NA4928	140	160	190	50	237000	500000	2950	4150



Heavy Duty Needle Roller Bearings (Machined Needle Roller Bearings, Solid Needle Roller Bearings)



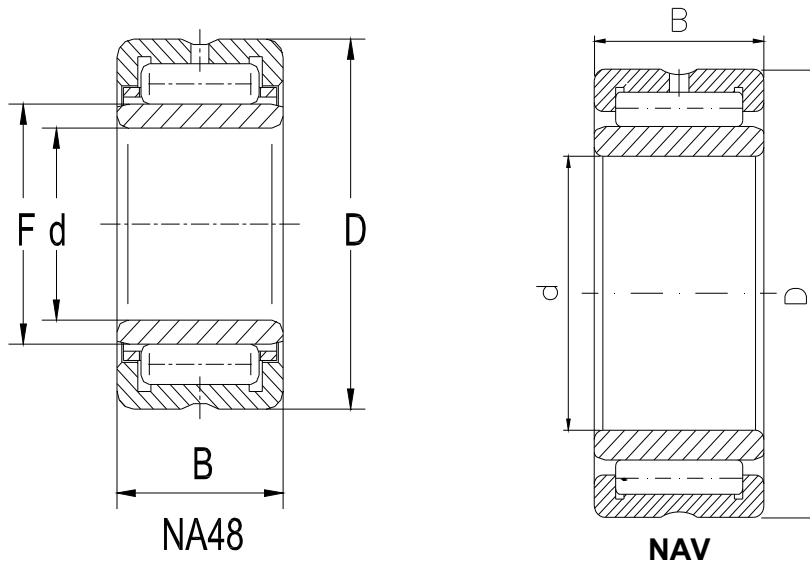
NA69(d≤30)



NA69(d≥32)

Part Number	Dimension(mm)				Load Rating(N)		Limiting Speed(RPM)	Weight(g)
	d	F	D	B	Co	Cor		
NA6901	12	16	24	22	18100	21600	23600	46
NA6902	15	20	28	23	19500	25500	21600	63.6
NA6903	17	22	30	23	21100	29000	20600	72
NA6904	20	25	37	30	40500	51000	17200	141
NA69/22	22	28	39	30	42000	55000	16100	150
NA6905	25	30	42	30	44000	59000	14600	161
NA69/28	28	32	45	30	45500	63000	13400	182
NA6906	30	35	47	30	49000	71000	12700	192
NA69/32	32	40	52	36	53000	82000	11700	288
NA6907	35	42	55	36	54000	86000	10900	310
NA6908	40	48	62	40	74000	116000	9600	430
NA6909	45	52	68	40	79000	127000	8700	495
NA6910	50	58	72	40	82000	139000	8000	515
NA6911	55	63	80	45	102000	176000	7300	780
NA6912	60	68	85	45	106000	191000	6800	808
NA6913	65	72	90	45	108000	198000	6300	833
NA6914	70	80	100	54	145000	265000	5800	1340
NA6915	75	85	105	54	147000	275000	5400	1450
NA6916	80	90	110	54	153000	300000	5200	1522
NA6917	85	100	120	63	188000	400000	4800	2200
NA6918	90	105	125	63	195000	425000	4550	2310
NA6919	95	110	130	63	197000	440000	4350	2500

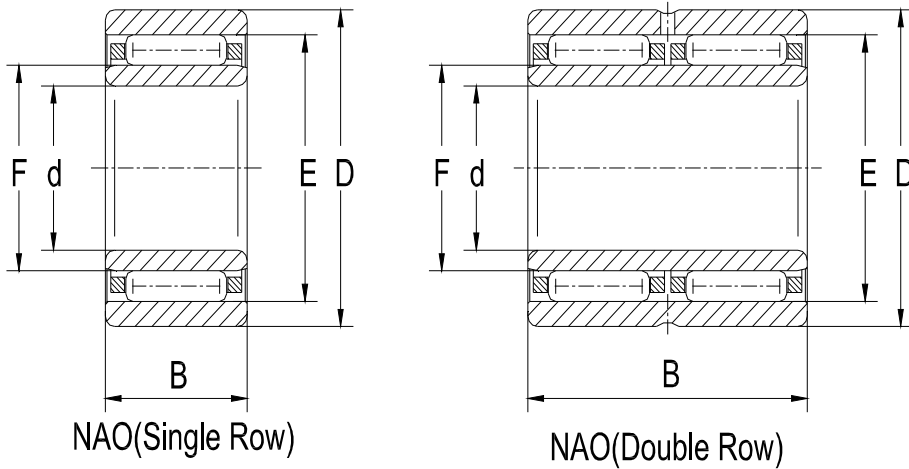
Heavy Duty Needle Roller Bearings (Machined Needle Roller Bearings, Solid Needle Roller Bearings)



Part Number	Dimension(mm)				Load Rating(N)		Limiting Speed(RPM)	Weight(g)
	d	F	D	B	Co	Cor		
NA4822	110	120	140	30	106000	216000	3900	1080
NA4824	120	130	150	30	112000	239000	3650	1170
NA4826	130	145	165	35	134000	310000	3300	1810
NA4828	140	155	175	35	136000	325000	3100	1920
NA4830	150	165	190	40	172000	400000	2900	2720
NA4832	160	175	200	40	181000	435000	2700	2890
NA4834	170	185	215	45	209000	510000	2550	3960
NA4836	180	195	225	45	219000	550000	2420	4200
NA4838	190	210	240	50	255000	690000	2280	5610
NA4840	200	220	250	50	260000	720000	2150	5840
NA4844	220	240	270	50	275000	790000	1980	6380
NA4848	240	265	300	60	400000	1080000	1780	10000
NA4852	260	285	320	60	415000	1160000	1660	10600
NA4856	280	305	350	69	510000	1300000	1540	15300
NA4860	300	330	380	80	700000	1770000	1420	21800
NA4864	320	350	400	80	710000	1850000	1340	23000
NA4868	340	370	420	80	730000	1940000	1270	24200
NA4872	360	390	440	80	740000	2020000	1210	25600
NA4876	380	415	480	100	1130000	2900000	1130	42600

Part Number	Dimensions(mm)			Load Rating(N)		Limiting Speed(RPM)	Weight(g)
	d	D	B	Cr	Cor		
NAV4002	15	32	17	10800	29800	4500	0.076
NAV4003	17	35	18	12000	17000	3400	0.098
NAV4004	20	42	22	14500	29600	3000	0.175
NAV4005	25	47	22	23000	34600	2600	0.021
NAV4006	30	55	25	25800	46900	2000	0.311
NAV4007	35	62	27	33000	59900	1800	0.418
NAV4008	40	68	28	35900	67000	1700	0.498
NAV4009	45	75	30	41000	74000	1500	0.637
NAV4010	50	80	30	42800	88900	1400	0.702
NAV4011	55	90	35	39000	226000	3600	1.03
NAV4012	60	95	35	50700	116000	1100	1.125
NAV4013	65	100	35	59800	126000	1000	1.2
NAV4014	70	110	40	72400	115000	950	1.7
NAV4015	75	115	40	72800	180000	900	1.81
NAV4016	80	125	45	76000	195000	850	2.47
NAV4017	85	130	45	78000	210000	800	2.58

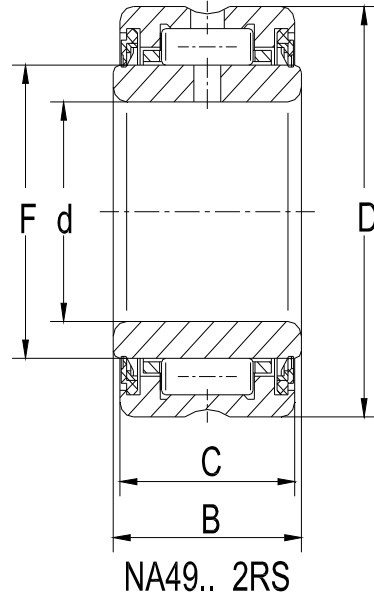
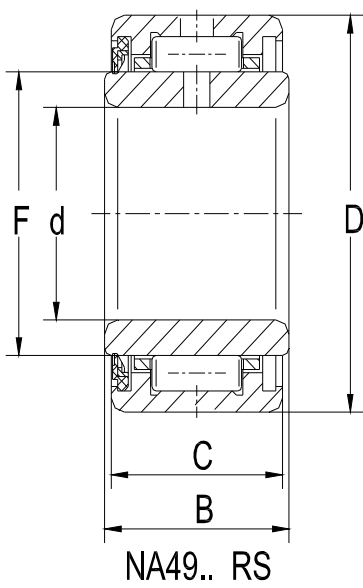
Heavy Duty Needle Roller Bearings (Machined Needle Roller Bearings, Solid Needle Roller Bearings)



Part Number	Dimension(mm)					Load Rating(N)		Weight(g)
	d	D	B	F	E	Co	Cor	
NAO6X17X10TV	6	17	10	10	13	5300	5500	14
NAO9X22X12TV	9	22	12	12	18	11300	9900	23.5
NAO12X24X13	12	24	13	16	20	10100	11800	30
NAO12X28X12	12	28	12	16	22	13000	12500	40
NAO15X28X13	15	28	13	20	24	11100	14300	29
NAO15X32X12	15	32	12	20	26	15100	16200	50
NAO17X30X13	17	30	13	22	26	11800	15900	42
NAO17X35X16	17	35	16	22	29	22600	25500	78
NAO20X35X17	20	35	17	25	29	16800	26000	76
NAO20X37X16	20	37	16	25	32	23800	28000	82
NAO25X40X17	25	40	17	30	35	22100	34000	88
NAO25X42X16	25	42	16	30	37	26000	33500	86
NAO25X42X32ZW	25	42	32	30	37	45000	67000	190
NAO30X45X17	30	45	17	35	40	23500	38500	102
NAO30X45X26ZW	30	45	26	35	40	31500	56000	157
NAO30X47X16	30	47	16	35	42	27500	37500	109
NAO30X47X18	30	47	18	35	42	31000	43000	119
NAO35X50X17	35	50	17	40	45	24200	41500	113
NAO35X55X20	35	55	20	40	47	37000	57000	190
NAO40X55X17	40	55	17	45	50	25500	46000	127
NAO50X68X20	50	68	20	55	60	32000	66000	230
NAO70X100X30	70	100	30	80	88	80000	176000	850
NAO80X110X30	80	110	30	90	98	76000	172000	920
NAO90X120X30	90	120	30	100	108	80000	188000	1044

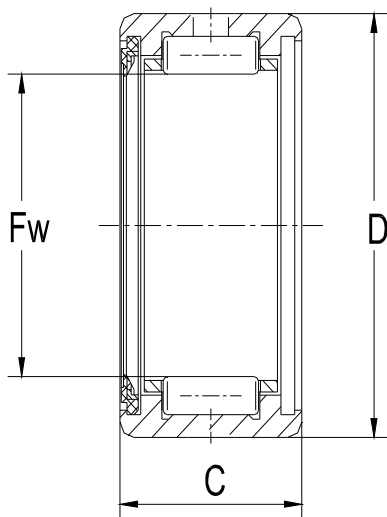
Remark: Other design like NAF and NAFW are also workable.

Heavy Duty Needle Roller Bearings (Machined Needle Roller Bearings, Solid Needle Roller Bearings)



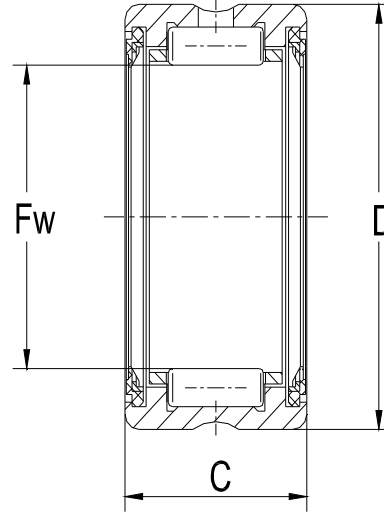
Part Number		Dimension(mm)				
One Seal	Double Seals	d	F	D	C	B
NA4900RS	NA4900.2RS	10	14	22	13	14
NA4901RS	NA4901.2RS	12	16	24	13	14
NA4902RS	NA4902.2RS	15	20	28	13	14
NA4903RS	NA4903.2RS	17	22	30	13	14
NA4904RS	NA4904.2RS	20	25	37	17	18
NA4905RS	NA4905.2RS	25	30	42	17	18
NA4906RS	NA4906.2RS	30	35	47	17	18
NA4907RS	NA4907.2RS	35	42	55	20	21
NA4908RS	NA4908.2RS	40	48	62	22	23
NA4909RS	NA4909.2RS	45	52	68	22	23
NA4910RS	NA4910.2RS	50	58	72	22	23
Part Number		Load Rating(N)		Limiting Speed(RPM)	Weight(g)	
One Seal	Double Seals	Co	Cor			
NA4900RS	NA4900.2RS	7700	6900	13000	24.5	
NA4901RS	NA4901.2RS	8600	8300	12000	27.5	
NA4902RS	NA4902.2RS	9700	10300	10000	37	
NA4903RS	NA4903.2RS	10000	11000	9000	40	
NA4904RS	NA4904.2RS	19500	19900	7500	80	
NA4905RS	NA4905.2RS	21800	24200	6500	89.5	
NA4906RS	NA4906.2RS	23900	28500	5500	104	
NA4907RS	NA4907.2RS	29500	39500	4800	175	
NA4908RS	NA4908.2RS	41000	53000	4200	252	
NA4909RS	NA4909.2RS	43000	59000	3900	290	
NA4910RS	NA4910.2RS	45000	64000	3500	295	

Heavy Duty Needle Roller Bearings (Machined Needle Roller Bearings, Solid Needle Roller Bearings)



RNA49.. RS

**HJ..RS**



RNA49.. 2RS

**HJ..2RS**

Part Number		Dimension(mm)			Load Rating(N)		Limiting Speed(RP)	Weight(g)
One Seal	Double Seals	Fw	D	C	Co	Cor		
RNA4900RS	RNA4900.2R	14	22	13	7700	6900	13000	16
RNA4901RS	RNA4901.2R	16	24	13	8600	8300	12000	18
RNA4902RS	RNA4902.2R	20	28	13	9700	10300	10000	21.5
RNA4903RS	RNA4903.2R	22	30	13	10000	11000	9000	23
RNA4904RS	RNA4904.2R	25	37	17	19500	19900	7500	56
RNA4905RS	RNA4905.2R	30	42	17	21800	24200	6500	60
RNA4906RS	RNA4906.2R	35	47	17	23900	28500	5500	69
RNA4907RS	RNA4907.2R	42	55	20	29500	39500	4800	107
RNA4908RS	RNA4908.2R	48	62	22	41000	53000	4200	154
RNA4909RS	RNA4909.2R	52	68	22	43000	59000	3900	157
RNA4910RS	RNA4910.2R	58	72	22	45000	64000	3500	160

Part Number		Dimension (mm)			Load Rating(LBS)		Limiting Speed(RP)	Weight(Kg)
One Seal	Two Seals	Fw	D	C	C	Co		
HJ101816RS	HJ101816.2RS	15.8750	28.575	25.40	19.30	20.70	12000	0.07
HJ122016RS	HJ122016.2RS	19.0500	31.750	25.40	20.70	23.30	10000	0.08
HJ142216RS	HJ142216.2RS	22.2250	34.925	25.40	23.00	27.90	8700	0.09
HJ162416RS	HJ162416.2RS	25.4000	38.100	25.40	25.30	32.50	7600	0.1
HJ182620RS	HJ182620.2RS	28.5750	41.275	31.75	36.30	53.80	6800	0.13
HJ202820RS	HJ202820.2RS	31.7500	44.450	31.75	37.40	57.40	6100	0.15
HJ223020RS	HJ223020.2RS	34.9250	47.625	31.75	39.80	64.10	5600	0.16
HJ243320RS	HJ243320.2RS	38.1000	52.388	31.75	47.60	72.50	5100	0.2
HJ263520RS	HJ263520.2RS	41.2750	55.563	31.75	48.50	76.50	2400	0.21
HJ283720RS	HJ283720.2RS	44.4500	58.738	31.75	49.80	81.00	4400	0.22
HJ324120RS	HJ324120.2RS	50.8000	65.088	31.75	53.80	93.00	3800	0.25
HJ364828RS	HJ364828.2RS	57.1500	76.200	44.45	89.90	164.10	1700	0.53
HJ405228RS	HJ405228.2RS	63.5000	82.550	44.45	97.00	187.30	3100	0.59
HJ445628RS	HJ445628.2RS	69.8500	88.900	44.45	101.00	203.30	1400	0.64
HJ486028RS	HJ486028.2RS	76.2000	95.250	44.45	107.20	226.40	2500	0.68

Remark: Other design like MR..S, MR..SS, SJ..S, SJ..SS, BR..U, BR..UU and HJ..RS, HU..2RS are also workable.