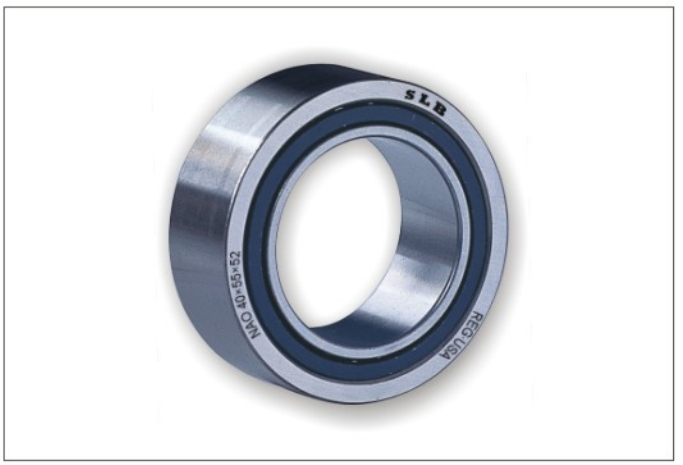
Machined-ring needle roller bearings, Separable



TECHNICAL SUPPLEMENT T098

PRODUCT INFORMATION P100 - 109

1. Bearing materials

The available **SLB** Machined Ring Needle Roller Bearings, Separable, include the series RNAO (without inner ring) and series NAO (with inner ring). The cage used for **SLB** Machined Ring Needle Roller Bearings, Separable, is usually a machined ring type. However, cages of molded polyamide reinforced with glass fiber or carbon fiber (suffix TV) may be used. The TV cage features a maximum allowable operating temperature of 120°C and maximum allowable continuous operating temperature of 100°C.

2. Interpreting bearing numbers

The bearing numbers of **SLB** Machined Ring Needle Roller Bearings, Separable, comprise a series number (RNAO, NAO), dimension code (inscribed enveloping circle diameter or bore diameter X outside diameter X width), and suffix (Fig. 1~3).

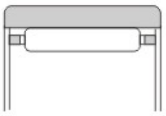


Fig. 1 Series RNAO

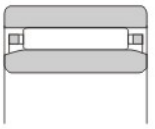


Fig. 2 Series NAO

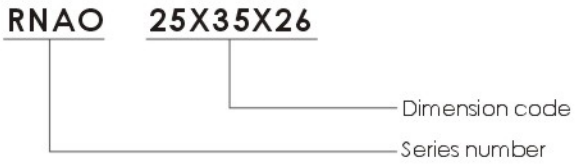
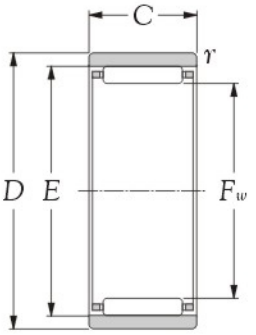


Fig. 3

MACHINED-RING NEEDLE ROLLER BEARINGS.
SEPARABLE

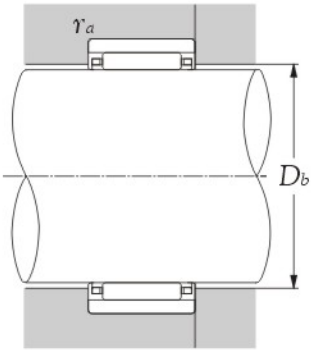


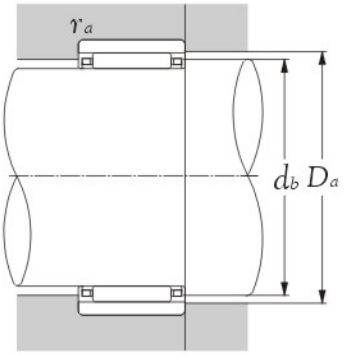
Inner bore F_w	Bearing number	Boundary dimensions				Basic load ratings (Radial)			
		D	C	$r_s\ min^{1)}$	E	dynamic C	static Co	dynamic C	static Co
mm		mm				N		kgf	
5 $^{+0.018}_{+0.010}$	RNAO 5x10x8	10	8.0	0.15	8	2640	2190	269	224
6 $^{+0.018}_{+0.010}$	RNAO 6x13x8	13	8.0	0.30	9	2660	2280	272	233
7 $^{+0.022}_{+0.013}$	RNAO 7x14x8	14	8.0	0.30	10	2670	2350	272	239
8 $^{+0.022}_{+0.013}$	RNAO 8x15x10	15	10.0	0.30	11	4000	4100	410	420
10 $^{+0.022}_{+0.013}$	RNAO 10x17x10	17	10.0	0.30	13	4550	5100	460	520
10 $^{+0.022}_{+0.013}$	RNAO 10x20x12	20	12.0	0.30	16	7100	5950	720	610
12 $^{+0.027}_{+0.016}$	RNAO 12x19x13.5	19	13.5	0.30	15	6000	7700	615	785
12 $^{+0.027}_{+0.016}$	RNAO 12x22x12	22	12.0	0.30	18	8650	8000	880	815
14 $^{+0.027}_{+0.016}$	RNAO 14x22x13	22	13.0	0.30	18	8300	10100	845	1030
14 $^{+0.027}_{+0.016}$	RNAO 14x26x12	26	12.0	0.30	20	9350	9150	955	930
15 $^{+0.027}_{+0.016}$	RNAO 15x23x13	23	13.0	0.30	19	8250	10200	840	1040
16 $^{+0.027}_{+0.016}$	RNAO 16x24x13	24	13.0	0.30	20	9050	11800	925	1200
16 $^{+0.027}_{+0.016}$	RNAO 16x28x12	28	12.0	0.30	22	11700	12500	1190	1280
17 $^{+0.027}_{+0.016}$	RNAO 17x25x13	25	13.0	0.30	21	9400	12600	960	1280
18 $^{+0.027}_{+0.016}$	RNAO 18x26x13	26	13.0	0.30	22	8900	11900	910	1210
18 $^{+0.027}_{+0.016}$	RNAO 18x30x12	30	12.0	0.30	24	12300	13800	1250	1410
20 $^{+0.033}_{+0.020}$	RNAO 20x28x13	28	13.0	0.30	24	10000	14300	1020	1460
20 $^{+0.033}_{+0.020}$	RNAO 20x32 x12	32	12.0	0.30	26	12900	15100	1320	1540
22 $^{+0.033}_{+0.020}$	RNAO 22x30x13	30	13.0	0.30	26	10200	15200	1040	1550
22 $^{+0.033}_{+0.020}$	RNAO 22x35x16	35	16.0	0.30	29	18700	22700	1910	2310
25 $^{+0.033}_{+0.020}$	RNAO 25x35x17	35	17.0	0.30	29	14200	24000	1450	2450
25 $^{+0.033}_{+0.020}$	RNAO 25x37x16	37	16.0	0.30	32	19500	24700	1990	2520
26 $^{+0.033}_{+0.020}$	RNAO 26x39x13	39	13.0	0.30	30	11800	19200	1200	1960
28 $^{+0.033}_{+0.020}$	RNAO 28x40x16	40	16.0	0.30	35	21200	28400	2160	2900

Notes: 1) These values are the allowable minimum dimensions of the chamfer dimension r.

Technical supplement

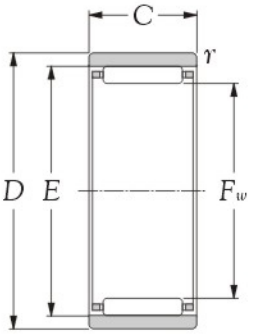
Cages		*Precision*	*Grease*
Steel-	√		
Polymid-	X	Normal (ISO)	Nil
Brass -	X		





Max runout speed grease	Max runout speed oil	Abutment dimensions D_b min	Abutment dimensions D_a max	Abutment dimensions d_b min	Abutment dimensions r_a max	Weight
r/min						kg.
27000	40000	7.7	8.8	5.3	0.15	0.003
25000	37000	8.7	11.0	6.3	0.30	0.006
23000	34000	9.7	12.0	7.3	0.30	0.006
21000	32000	10.7	13.0	8.3	0.30	0.008
19000	28000	12.7	15.0	10.3	0.30	0.010
19000	28000	15.7	18.0	10.3	0.30	0.018
17000	26000	14.7	17.0	12.3	0.30	0.015
17000	26000	17.6	20.0	12.3	0.30	0.019
16000	24000	17.6	20.0	14.4	0.30	0.018
16000	24000	19.6	24.0	14.4	0.30	0.029
15000	23000	18.6	21.0	15.4	0.30	0.020
15000	23000	19.6	22.0	16.4	0.30	0.021
15000	23000	21.6	26.0	16.4	0.30	0.032
15000	22000	20.6	23.0	17.4	0.30	0.022
14000	21000	21.6	24.0	18.4	0.30	0.022
14000	21000	23.6	28.0	18.4	0.30	0.035
13000	20000	23.6	26.0	20.4	0.30	0.025
13000	20000	25.6	30.0	20.4	0.30	0.038
12000	18000	25.6	28.0	22.4	0.30	0.027
12000	18000	28.4	33.0	22.4	0.30	0.059
11000	16000	28.4	33.0	25.6	0.30	0.053
11000	16000	31.4	35.0	25.6	0.30	0.060
10000	15000	29.4	37.0	26.6	0.30	0.060
9500	14000	34.4	38.0	28.6	0.30	0.061

MACHINED-RING NEEDLE ROLLER BEARINGS.
SEPARABLE

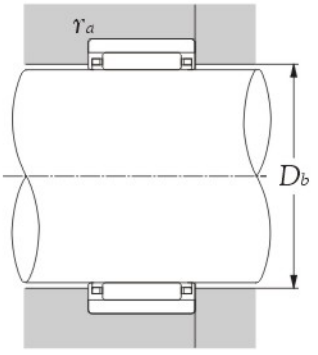


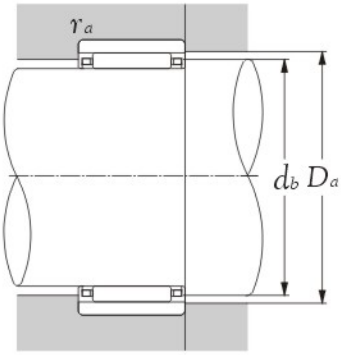
Inner bore F_w	Bearing number	Boundary dimensions				Basic load ratings (Radial)			
		D	C	$r_{s\,min}$ 1)	E	dynamic C	static Co	dynamic C	static Co
mm		mm				N		kgf	
30 $^{+0.033}_{+0.020}$	RNAO 30x40x17	40	17	0.3	35	19400	32500	1970	3350
30 $^{+0.033}_{+0.020}$	RNAO 30x42x16	42	16	0.3	37	21900	30500	2230	3100
32 $^{+0.041}_{+0.025}$	RNAO 32x42x13	42	13	0.3	37	14500	23000	1480	2350
35 $^{+0.041}_{+0.025}$	RNAO 35x45x13	45	13	0.3	40	15200	25100	1550	2560
35 $^{+0.041}_{+0.025}$	RNAO 35x45x17	45	17	0.3	40	20000	36000	2040	3650
35 $^{+0.041}_{+0.025}$	RNAO 35x47x16	47	16	0.3	42	24100	36000	2450	3650
35 $^{+0.041}_{+0.025}$	RNAO 35x47x18	47	18	0.3	42	24700	37000	2510	3750
37 $^{+0.041}_{+0.025}$	RNAO 37x47x13	47	13	0.3	42	15900	27100	1620	2770
37 $^{+0.041}_{+0.025}$	RNAO 37x52x18	52	18	0.3	44	26300	41000	2680	4150
40 $^{+0.041}_{+0.025}$	RNAO 40x50x17	50	17	0.3	45	21800	41500	2220	4250
40 $^{+0.041}_{+0.025}$	RNAO 40x55x20	55	20	0.3	47	31000	51500	3150	5250
45 $^{+0.041}_{+0.025}$	RNAO 45x55x17	55	17	0.3	50	22300	44500	2280	4550
45 $^{+0.041}_{+0.025}$	RNAO 45x62x20	62	20	0.3	53	36000	59000	3650	6000
50 $^{+0.041}_{+0.025}$	RNAO 50x62x20	62	20	0.3	55	27900	62000	2850	6300
50 $^{+0.041}_{+0.025}$	RNAO 50x65x20	65	20	0.3	58	38500	67500	3950	6850
55 $^{+0.049}_{+0.060}$	RNAO 55x68x20	68	20	0.6	60	28800	66500	2940	6750
55 $^{+0.049}_{+0.030}$	RNAO 55x68x25	68	25	0.6	63	50500	97500	5150	9950
55 $^{+0.049}_{+0.030}$	RNAO 55x72x20	72	20	0.6	63	39000	70000	3950	7100
60 $^{+0.049}_{+0.030}$	RNAO 60x78x20	78	20	1.0	68	40000	75000	4100	7650
65 $^{+0.049}_{+0.030}$	RNAO 65x85x30	85	30	1.0	73	61000	132000	6200	13400
70 $^{+0.049}_{+0.030}$	RNAO 70x90x30	90	30	1.0	78	65500	149000	6700	15200
75 $^{+0.049}_{+0.030}$	RNAO 75x95x30	95	30	1.0	83	67500	157000	6850	16100
80 $^{+0.049}_{+0.030}$	RNAO 80x95x30	95	30	1.0	86	57000	159000	5800	16200
80 $^{+0.049}_{+0.030}$	RNAO 80x100x30	100	30	1.0	88	69000	166000	7050	17000

Notes: 1) These values are the allowable minimum dimensions of the chamfer dimension r.

Technical supplement

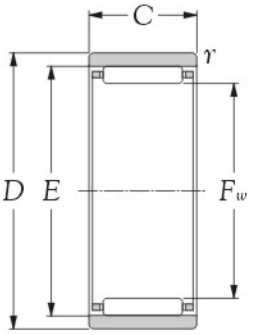
Cages		Precision	Grease
Steel-	√		
Polymid-	X	Normal (ISO)	Nil
Brass -	X		





Max runout speed grease	Max runout speed oil	Abutment dimensions D_b min	Abutment dimensions D_a max	Abutment dimensions d_b min	Abutment dimensions r_a max	Weight
r/min						kg.
9000	13000	34.4	38	30.6	0.3	0.060
9000	13000	36.4	40	30.6	0.3	0.069
8500	13000	36.4	40	32.6	0.3	0.049
7500	11000	39.4	43	35.6	0.3	0.053
7500	11000	39.4	43	35.6	0.3	0.069
7500	11000	41.4	45	35.6	0.3	0.078
7500	11000	41.4	45	35.6	0.3	0.089
7000	11000	41.4	45	37.6	0.3	0.056
7000	11000	43.4	50	37.6	0.3	0.125
6500	10000	44.4	48	40.6	0.3	0.074
6500	10000	46.2	53	40.6	0.3	0.145
6000	9000	49.2	53	45.6	0.3	0.083
6000	9000	52.2	60	45.6	0.3	0.175
5500	8000	54.2	60	50.6	0.3	0.140
5500	8000	57.2	63	50.6	0.3	0.168
4800	7500	59.4	64	55.8	0.6	0.166
4800	7500	62.4	64	55.8	0.6	0.200
4800	7500	62.4	68	55.8	0.6	0.216
4400	6500	67.2	73	60.8	1.0	0.255
4100	6000	72.2	80	66.0	1.0	0.464
3800	5500	77.2	85	71.0	1.0	0.199
3600	5500	82.2	90	76.0	1.0	0.520
3300	5000	85.2	90	81.0	1.0	0.405
3300	5000	87.2	95	81.0	1.0	0.580

MACHINED-RING NEEDLE ROLLER BEARINGS.
SEPARABLE

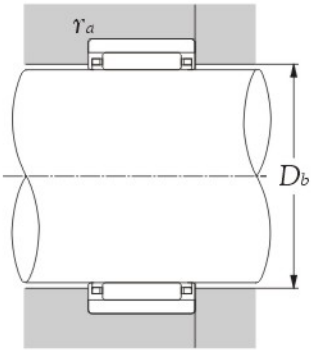


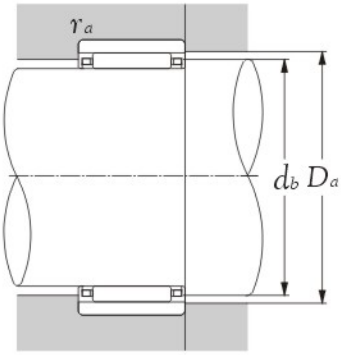
Inner bore F_w	Bearing number	Boundary dimensions				Basic load ratings (Radial)			
		D	C	$r_{s\,min}$[1]	E	dynamic C	static Co	dynamic C	static Co
mm		mm				N		kgf	
85 $^{+0.058}_{+0.036}$	RNAO 85x105x25	105	25	1	93	61500	146000	6250	14900
85 $^{+0.058}_{+0.036}$	RNAO 85x105x30	105	30	1	93	71000	175000	7200	17900
90 $^{+0.058}_{+0.036}$	RNAO 90x105x26	105	26	1	98	64000	157000	6550	16000
90 $^{+0.058}_{+0.036}$	RNAO 90x110x30	110	30	1	98	72500	184000	7400	18800
95 $^{+0.058}_{+0.036}$	RNAO 95x115x30	115	30	1	103	74000	193000	7550	19600
100 $^{+0.058}_{+0.035}$	RNAO 100x120x30	120	30	1	108	76000	201000	7700	20500

Notes: 1) These values are the allowable minimum dimensions of the chamfer dimension r.

Technical supplement

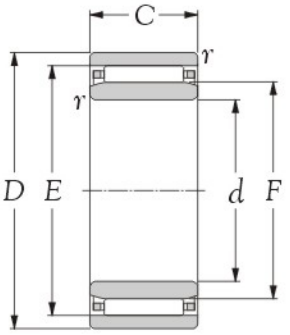
Cages		*Precision*	*Grease*
Steel -	√		
Polymid -	X	Normal (ISO)	Nil
Brass -	X		





Max runout speed grease	Max runout speed oil	Abutment dimensions D_b min	Abutment dimensions D_a max	Abutment dimensions d_b min	Abutment dimensions r_a max	Weight
r/min						kg.
3100	4700	92.2	100	86	1	0.459
3100	4700	92.2	100	86	1	0.585
3000	4400	97.2	100	91	1	0.373
3000	4400	97.2	105	91	1	0.610
2800	4200	102.2	110	96	1	0.640
2700	4000	107.2	115	101	1	0.694

MACHINED-RING NEEDLE ROLLER BEARINGS, SEPARABLE

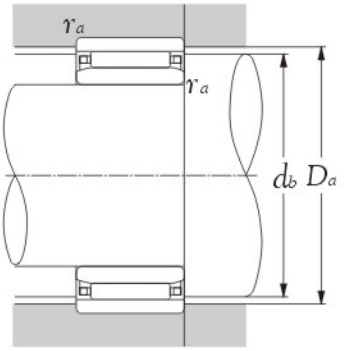


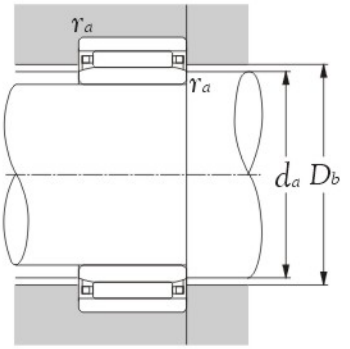
Inner bore d	Bearing number	Boundary dimensions					Basic load ratings (Radial)			
		D	C	r s min 1)	F	E	dynamic C	static Co	dynamic C	static Co
mm		mm					N		kgf	
6	NAO 6x17x10	17	10	0.3	10	13	4550	5100	460	520
7	NAO 7x20x12	20	12	0.3	10	16	7100	5950	720	610
9	NAO 9x22x12	22	12	0.3	12	18	8650	8000	880	815
10	NAO 10x22x13	22	13	0.3	14	18	8300	10100	845	1030
10	NAO 10x26x12	26	12	0.3	14	20	9350	9150	955	930
12	NAO 12x24x13	24	13	0.3	16	20	9050	11800	925	1200
12	NAO 12x28x12	28	12	0.3	16	22	11700	12500	1190	1280
15	NAO 15x28x13	28	13	0.3	20	24	10000	14300	1020	1460
15	NAO 15x32x12	32	12	0.3	20	26	12900	15100	1320	1540
17	NAO 17x30x13	30	13	0.3	22	26	10200	15200	1040	1550
17	NAO 17x35x16	35	16	0.3	22	29	18700	22700	1910	2310
20	NAO 20x35x17	35	17	0.3	25	29	14200	24000	1450	2450
20	NAO 20x37x16	37	16	0.3	25	32	19500	24700	1990	2520
25	NAO 25x40x17	40	17	0.3	30	35	19400	32500	1970	3350
25	NAO 25x42x16	42	16	0.3	30	37	21900	30500	2230	3100
29	NAO 29x42x13	42	13	0.3	32	37	14500	23000	1480	2350
30	NAO 30x45x13	45	13	0.3	35	40	15200	25100	1550	2560
30	NAO 30x45x17	45	17	0.3	35	40	20000	36000	2040	3650
30	NAO 30x47x16	47	16	0.3	35	42	24100	36000	2450	3650
30	NAO 30x47x18	47	18	0.3	35	42	24700	37000	2510	3750
30	NAO 30x52x18	52	18	0.3	37	44	26300	41000	2680	4150
33	NAO 33x47x13	47	13	0.3	37	42	15900	27100	1620	2770
35	NAO 35x50x17	50	17	0.3	40	45	21800	41500	2220	4250
35	NAO 35x55x20	55	20	0.3	40	47	31000	51500	3150	5250

Notes: 1) These values are the allowable minimum dimensions of the chamfer dimension r.

Technical supplement

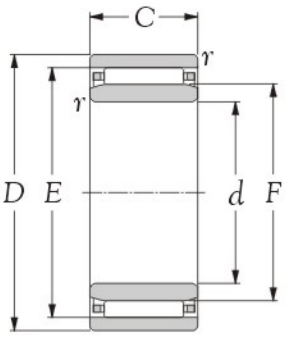
Cages		Precision	Grease
Steel-	√		
Polymid-	X	Normal (ISO)	Nil
Brass -	X		





Max runout speed grease	Max runout speed oil	Abutment dimensions d_a min	d_b	D_a max	D_b	r_a max	Weight
r/min							kg.
19000	28000	8	12.7	15	10.3	0.3	0.014
19000	28000	9	15.7	18	10.3	0.3	0.022
17000	26000	11	17.6	20	12.3	0.3	0.024
16000	24000	12	17.6	20	14.4	0.3	0.026
16000	24000	12	19.6	24	14.4	0.3	0.036
15000	23000	14	19.6	22	16.4	0.3	0.030
15000	23000	14	21.6	26	16.4	0.3	0.040
13000	20000	17	23.6	26	20.4	0.3	0.029
13000	20000	17	25.6	30	20.4	0.3	0.050
12000	18000	19	25.6	28	22.4	0.3	0.042
12000	18000	19	28.4	33	22.4	0.3	0.078
11000	16000	22	28.4	33	25.6	0.3	0.076
11000	16000	22	31.4	35	25.6	0.3	0.082
9000	13000	27	34.4	38	30.6	0.3	0.088
9000	13000	27	36.4	40	30.6	0.3	0.086
8500	13000	31	36.4	40	32.6	0.3	0.062
7500	11000	32	39.4	43	35.6	0.3	0.077
7500	11000	32	39.4	43	35.6	0.3	0.102
7500	11000	32	41.4	45	35.6	0.3	0.109
7500	11000	32	41.4	45	35.6	0.3	0.119
7000	11000	32	43.4	50	37.6	0.3	0.177
7000	11000	35	41.4	45	37.6	0.3	0.085
6500	10000	37	44.4	48	40.6	0.3	0.113
6500	10000	37	46.2	53	40.6	0.3	0.190

MACHINED-RING NEEDLE ROLLER BEARINGS, SEPARABLE

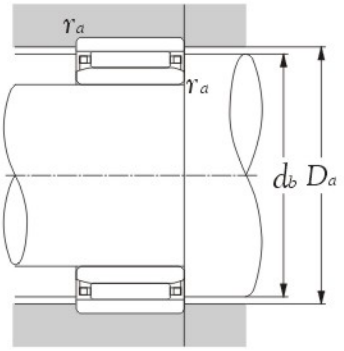


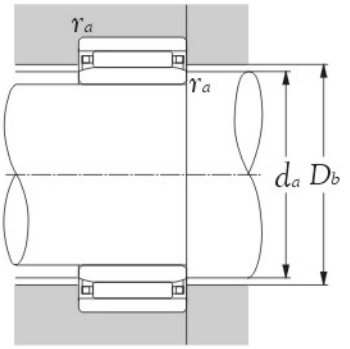
Inner bore d	Bearing number	Boundary dimensions					Basic load ratings (Radial)			
		D	C	r s min 1)	F	E	dynamic C	static Co	dynamic C	static Co
mm		mm					N		kgf	
40	NAO 40x55x17	55	17	0.3	45	50	22300	44500	2280	4550
40	NAO 40x62x20	62	20	0.3	45	53	36000	59000	3650	6000
40	NAO 40x65x20	65	20	0.3	50	58	38500	67500	3950	6850
45	NAO 45x62x20	62	20	0.3	50	55	27900	62000	2850	6300
45	NAO 45x72x20	72	20	0.6	55	63	39000	70000	3950	7100
50	NAO 50x68x20	68	20	0.6	55	60	28800	66500	2940	6750
50	NAO 50x78x20	78	20	1.0	60	68	40000	75000	4100	7650
55	NAO 55x85x30	85	30	1.0	65	73	61000	132000	6200	13400
60	NAO 60x90x30	90	30	1.0	70	78	65500	149000	6700	15200
65	NAO 65x95x30	95	30	1.0	75	83	67500	157000	6850	16100
70	NAO 70x95x30	95	30	1.0	80	86	57000	159000	5800	16200
70	NAO 70x100x30	100	30	1.0	80	88	69000	166000	7050	17000
75	NAO 75x105x25	105	25	1.0	85	93	61500	146000	6250	14900
75	NAO 75x105x30	105	30	1.0	85	93	71000	175000	7200	17900
80	NAO 80x110x30	110	30	1.0	90	98	72500	184000	7400	18800
85	NAO 85x115x30	115	30	1.0	95	103	74000	193000	7550	19600
90	NAO 90x120x30	120	30	1.0	100	108	76000	201000	7700	20500

Notes: 1) These values are the allowable minimum dimensions of the chamfer dimension r.

Technical supplement

Cages		Precision	Grease
Steel-	√		
Polymid-	X	Normal (ISO)	Nil
Brass -	X		





Max runout speed		Abutment dimensions					Weight
grease	oil	d_a min	d_b	D_a max	D_b	r_a max	
r/min							kg.
6000	9000	42	49.2	53	45.6	0.3	0.127
6000	9000	42	52.2	60	45.6	0.3	0.230
5500	9000	42	57.2	63	50.6	0.3	0.279
5500	8000	47	54.2	60	50.6	0.3	0.192
4800	7500	49	62.4	68	55.8	0.6	0.335
4800	7500	54	59.4	64	55.8	0.6	0.230
4400	6500	55	67.2	73	60.8	1.0	0.410
4100	6000	60	72.2	80	66.0	1.0	0.680
3800	5500	65	77.2	85	71.0	1.0	0.720
3600	5500	70	82.2	90	76.0	1.0	0.770
3300	5000	75	85.2	90	81.0	1.0	0.675
3300	5000	75	87.2	95	81.0	1.0	0.850
3100	4700	80	92.2	100	86.0	1.0	0.700
3100	4700	80	92.2	100	86.0	1.0	0.880
3000	4400	85	97.2	105	91.0	1.0	0.920
2800	4200	90	102.2	110	96.0	1.0	0.960
2700	4000	95	107.2	115	101.0	1.0	1.040