

# High Performance Cylindrical Roller Bearings

## New standard EW Series with pressed cages and EM Series with machined brass cages

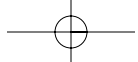
NSK's high performance cylindrical roller bearings have higher load ratings and a reduced noise level due to their high-strength cages. EW and EM therefore improve performance for a wide range of applications.



***EW SERIES***  
*Pressed Cages*

***EM SERIES***  
*Machined Brass Cages*

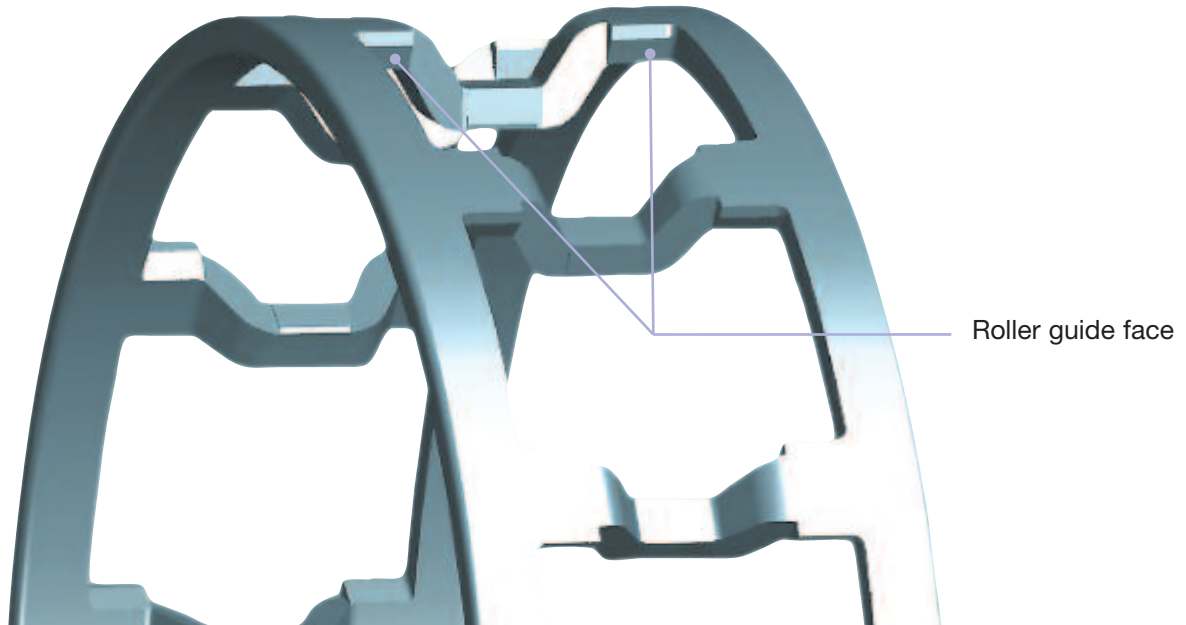




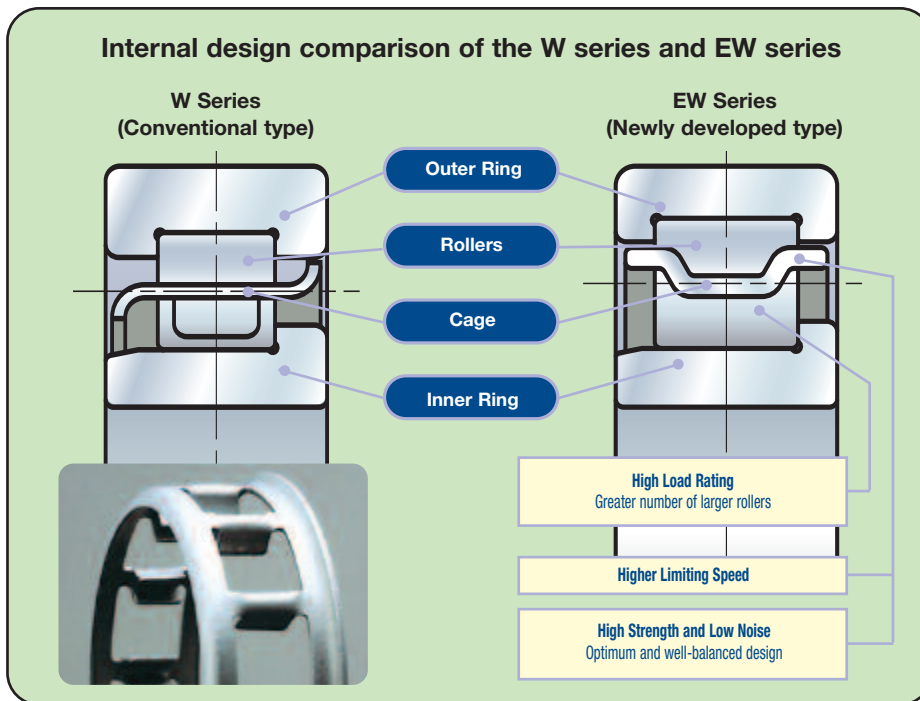
# EW SERIES

Pressed Cages

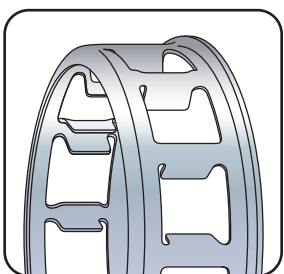
## Cylindrical Roller Bearing - A newly developed standard bearing



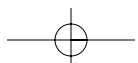
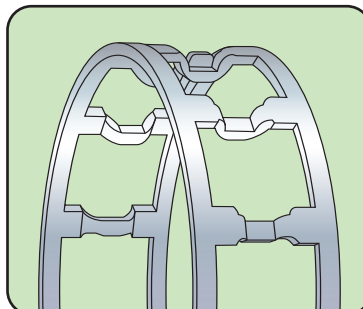
### Design concept of our newly developed standard bearing—the EW series

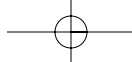


W Series



EW Series

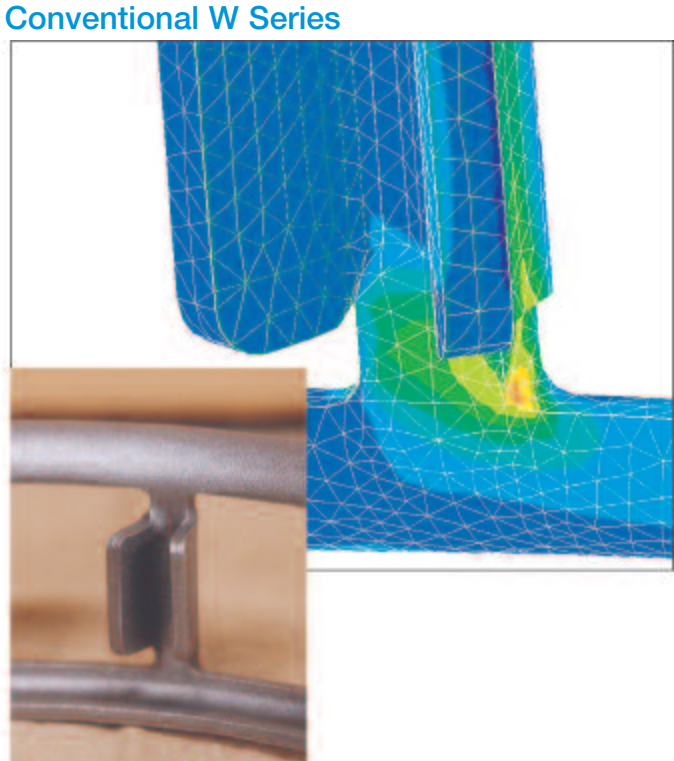
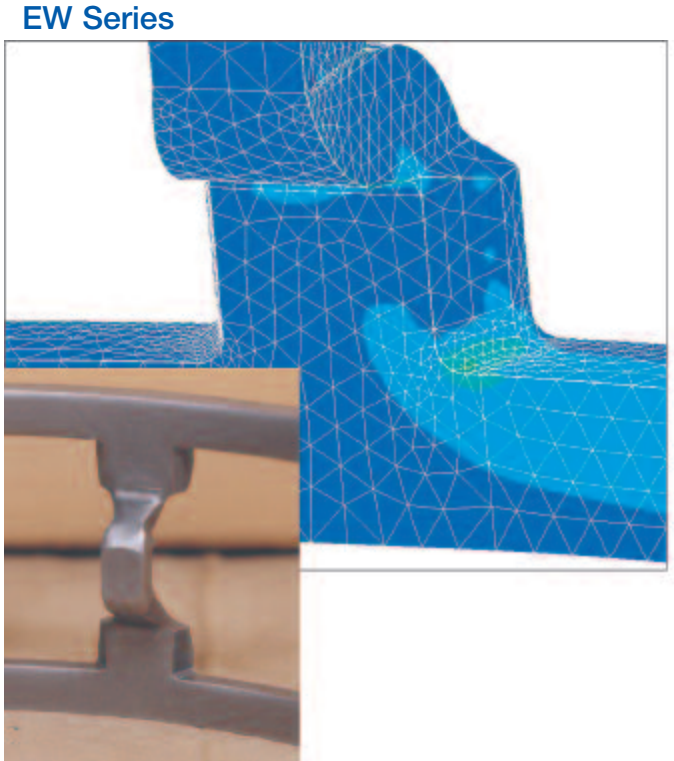




# EW SERIES

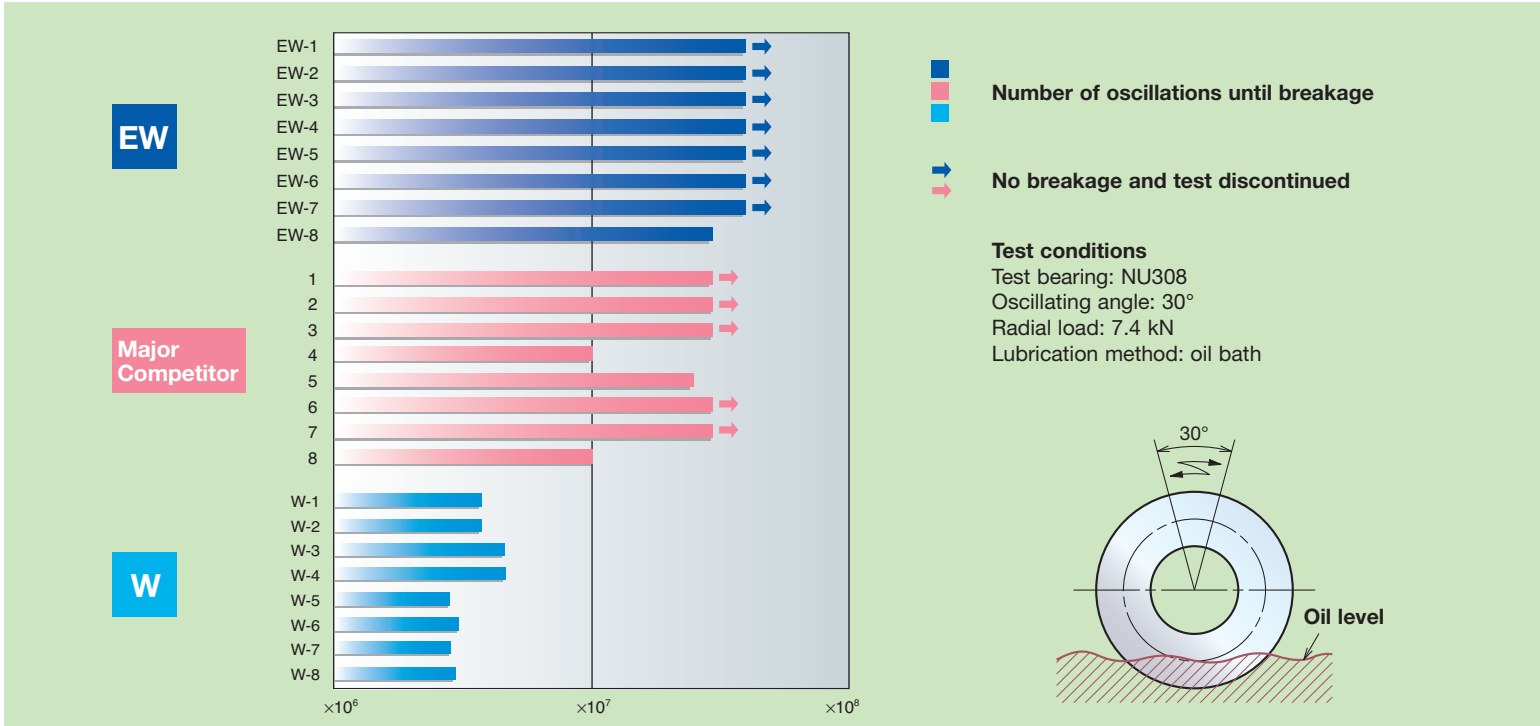
Pressed Cages

## Results of FEM analysis

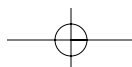


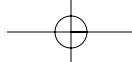
Tests confirm that the stress levels of NSK's EW series cages are 40% lower than that of cages in conventional W series.

## Cage strength test results



NSK's EW series showed greater cage strength performance than that of our major competitor.

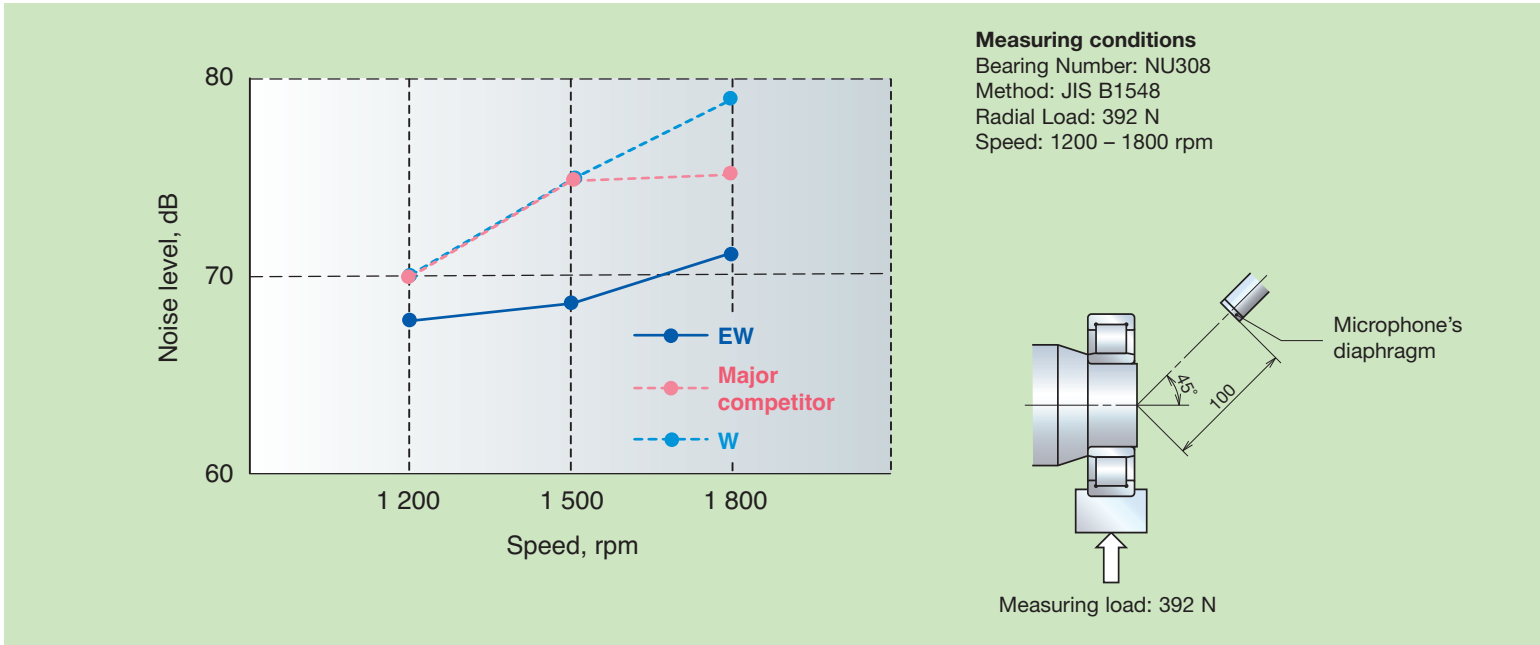




# EW SERIES

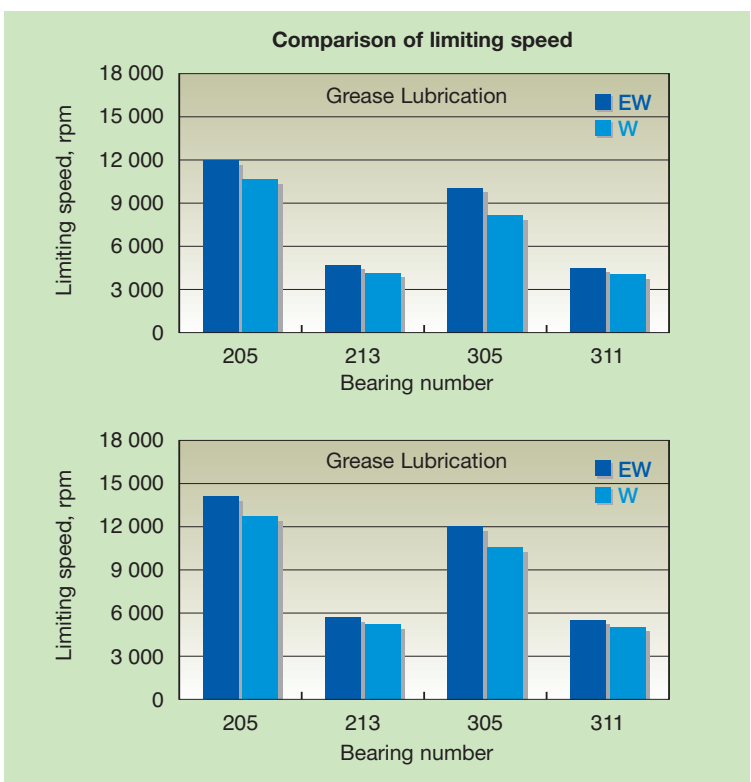
Pressed Cages

## Noise measurement test results



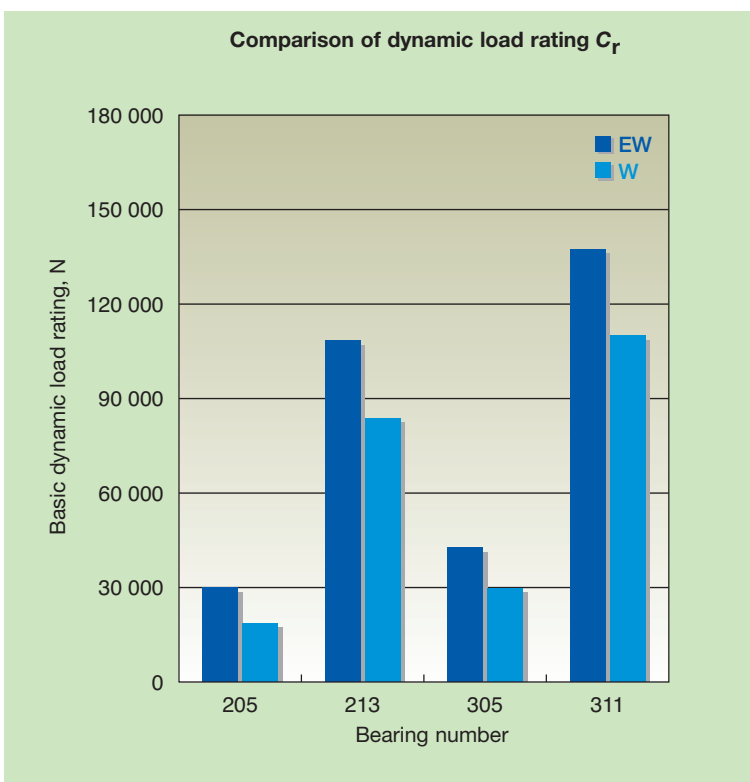
The EW series is 3 to 7 dB quieter than that of our major competitor.

## Higher Limiting Speed

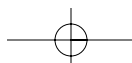


The limiting speed of the EW series is 10-25% higher than that of conventional W series.

## Higher Load Rating



The load rating of the EW series is 10-60% higher than that of conventional W series.



# EM SERIES

Machined brass cages

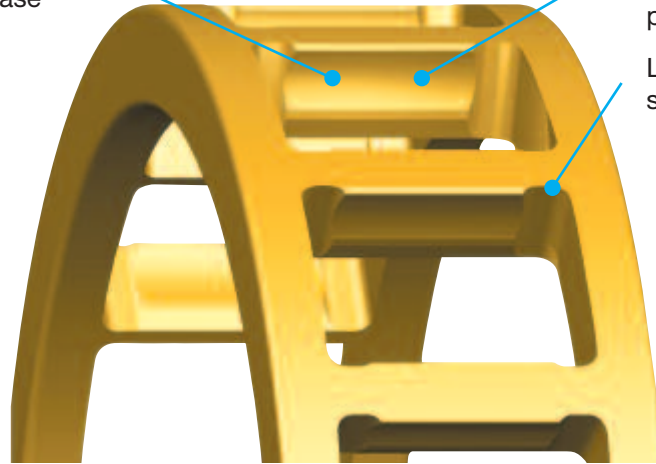
## Cylindrical Roller Bearing - A newly developed standard bearing

### Advantages of a roller-guided cage

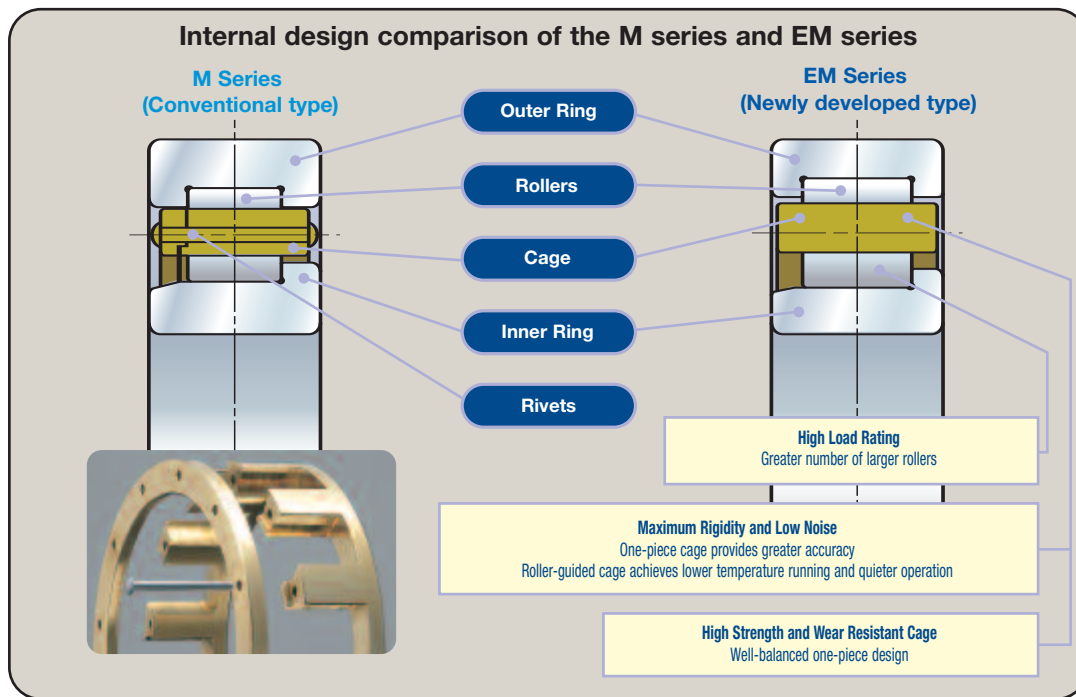
- Trouble-free packing of grease
- Quieter operation
- Improved oil flow

Greater accuracy of the roller guidance achieved through special pocket profiling

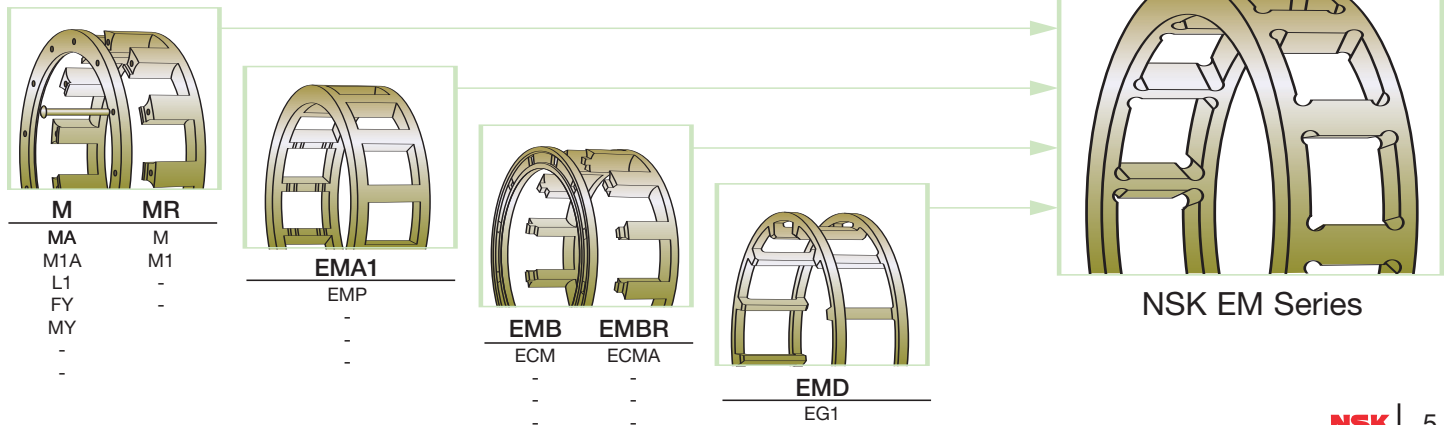
Large pocket corner radii relieve stress concentrations on the cage



## Design concept of our newly developed standard bearing—the EM series



## From current designs to EM concept



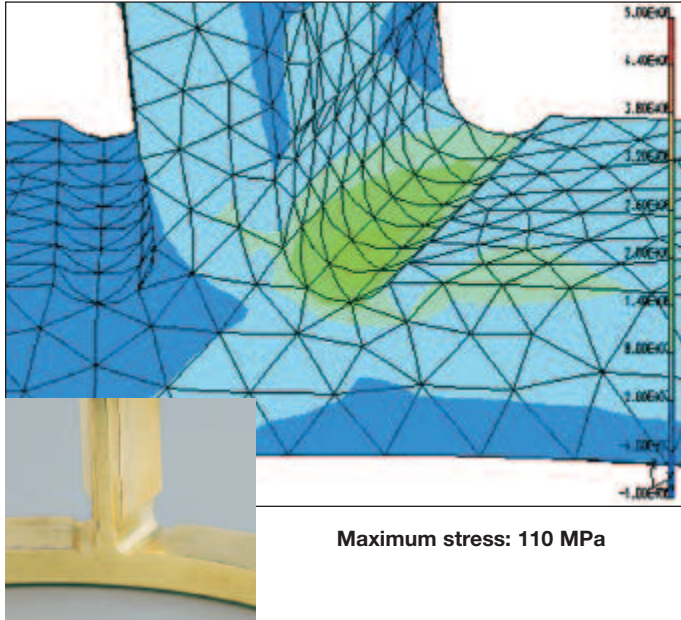
# EM SERIES

Machined brass cages

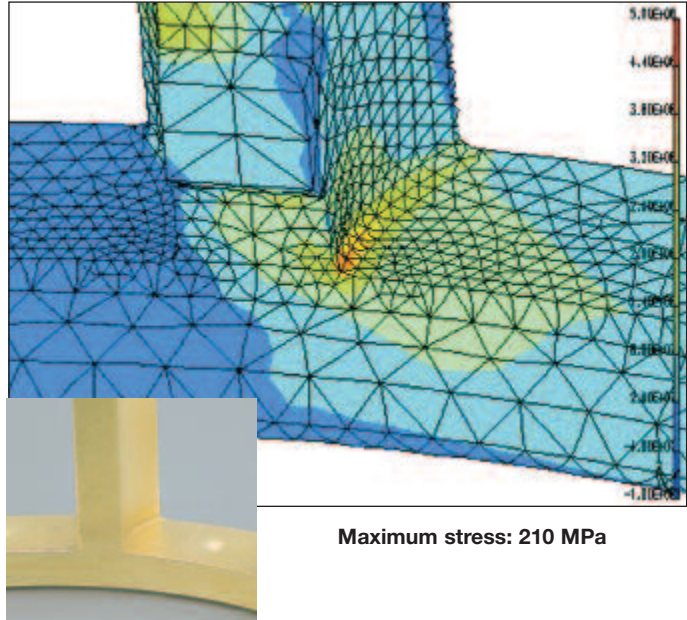


## Results of FEM analysis

EM Series

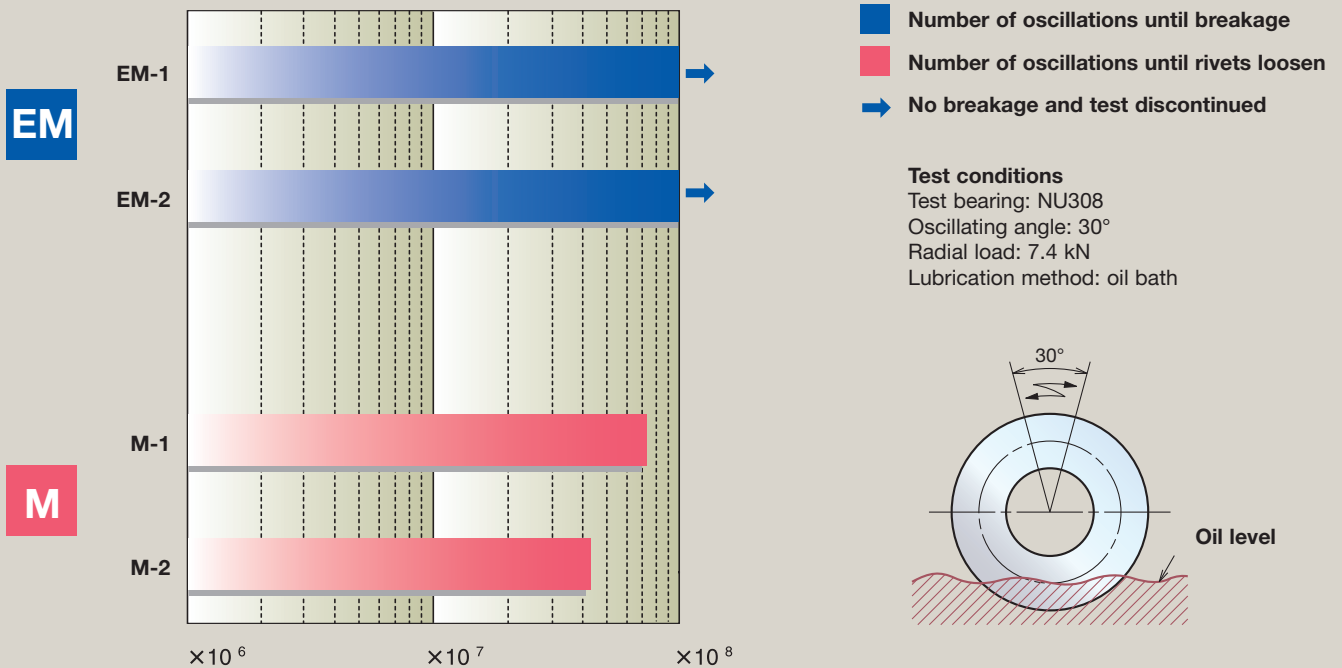


Major competitor's M Series



Tests confirm that the stress levels of NSK's EM series cages are 50% lower than that of major competitor's M series.

## Results of cage strength test



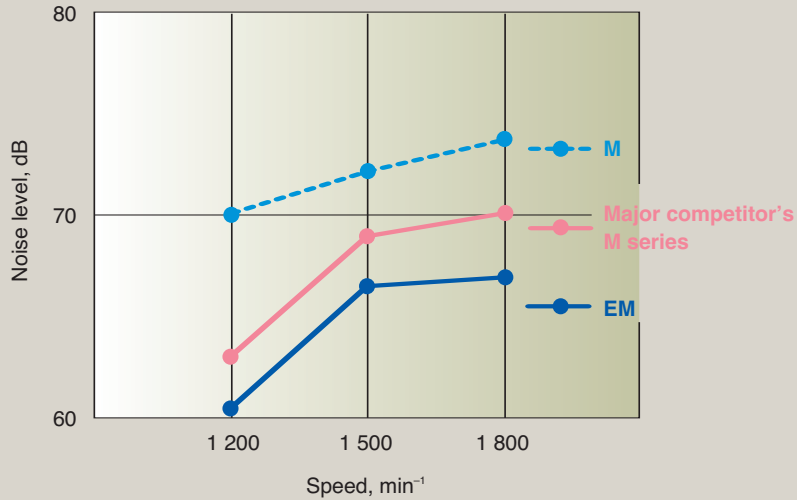
Test results show that NSK's EM series has greater cage strength performance than that of conventional M-type cages.

# EM SERIES

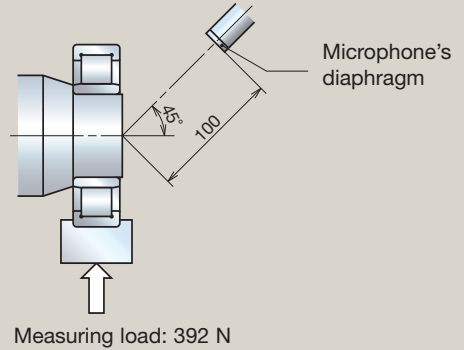
Machined brass cages



## Noise measurement test results

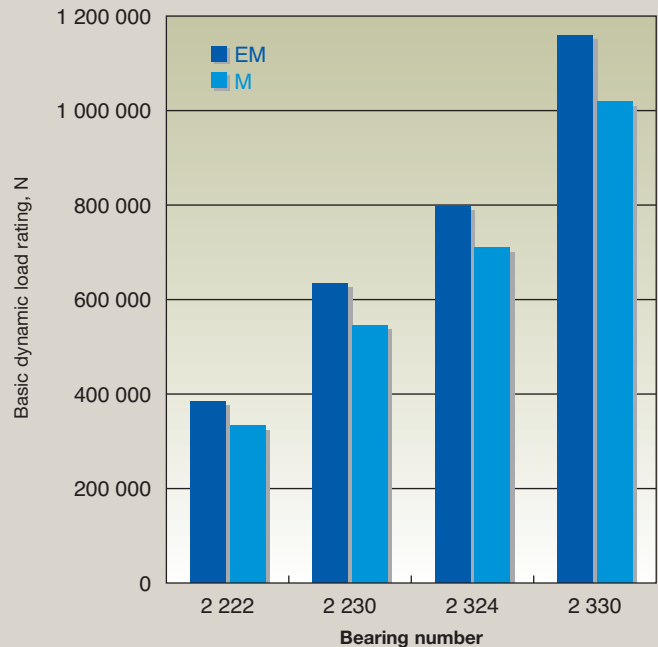
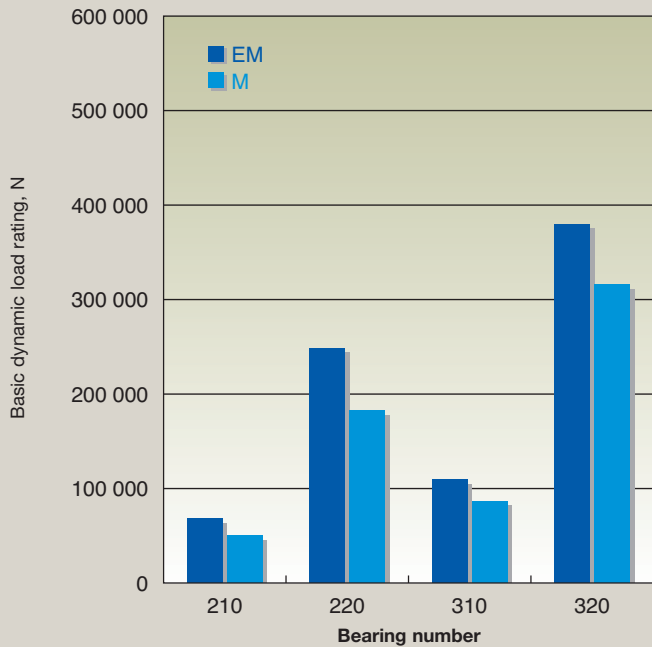


**Measuring conditions**  
 Bearing number: NU308  
 Method: JIS B1548  
 Radial load: 392 N  
 Speed: 1 200 to 1 800 min<sup>-1</sup>

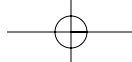


The EM series exhibited noise levels 5 dB lower than competitive two-piece cage designs.

## Higher Load Rating

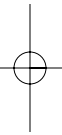
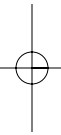
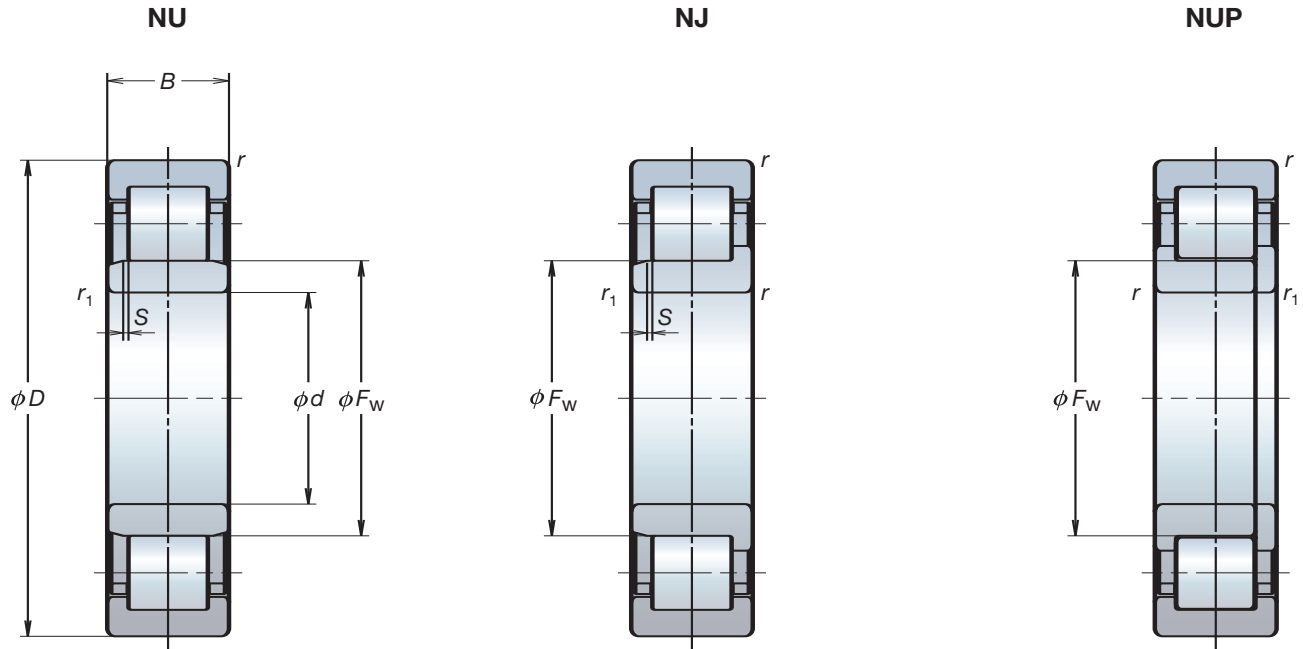


The EM series benefits from a 30% higher load-carrying capacity than the conventional M series.

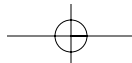


# EW SERIES

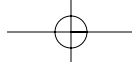
Pressed Cages



Boundary Dimensions (mm)						Basic Load Ratings				Limiting Speeds rpm	
$d$	$D$	$B$	$r$ <i>min.</i>	$r_1$ <i>min.</i>	$F_w$	[N]		[kgf]		Grease	Oil
						$C_r$	$C_{or}$	$C_r$	$C_{or}$		
25	52	15	1	0.6	31.5	29 300	27 700	2 990	2 830	12 000	14 000
	62	17	1.1	1.1	34	41 500	37 500	4 250	3 800	10 000	12 000
30	62	16	1	0.6	37.5	39 000	37 500	4 000	3 800	9 500	12 000
	72	19	1.1	1.1	40.5	53 000	50 000	5 400	5 100	8 500	10 000
35	72	17	1.1	0.6	44	50 500	50 000	5 150	5 100	8 500	10 000
	80	21	1.5	1.1	46.2	66 500	65 500	6 800	6 650	7 500	9 500
40	80	18	1.1	1.1	49.5	55 500	55 500	5 700	5 650	7 500	9 000
	90	23	1.5	1.5	52	83 000	81 500	8 500	8 300	6 700	8 000
45	85	19	1.1	1.1	54.5	63 000	66 500	6 450	6 800	6 700	8 000
	100	25	1.5	1.5	58.5	97 500	98 500	9 950	10 000	6 000	7 500
50	90	20	1.1	1.1	59.5	69 000	76 500	7 050	7 800	6 300	7 500
	110	27	2	2	65	110 000	113 000	11 200	11 500	5 000	6 000
55	100	21	1.5	1.1	66	86 500	98 500	8 800	10 100	5 600	7 100
	120	29	2	2	70.5	137 000	143 000	14 000	14 600	4 500	5 600
60	110	22	1.5	1.5	72	97 500	107 000	9 950	10 900	5 300	6 300
	120	23	1.5	1.5	78.5	108 000	119 000	11 000	12 100	4 800	5 600

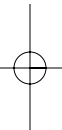
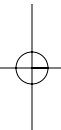
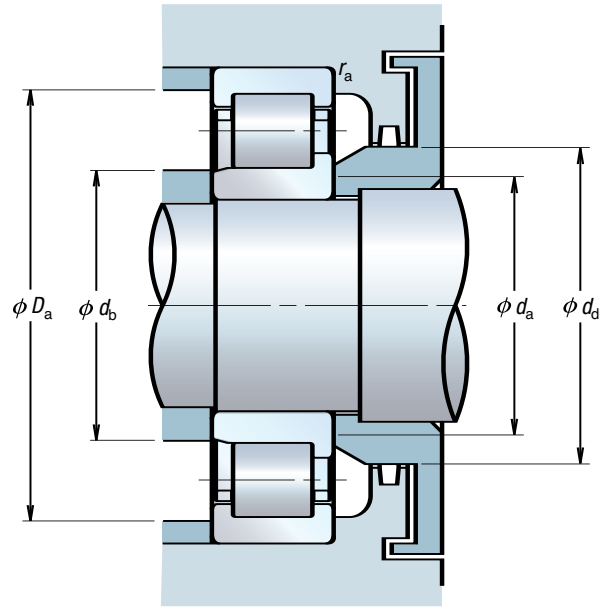
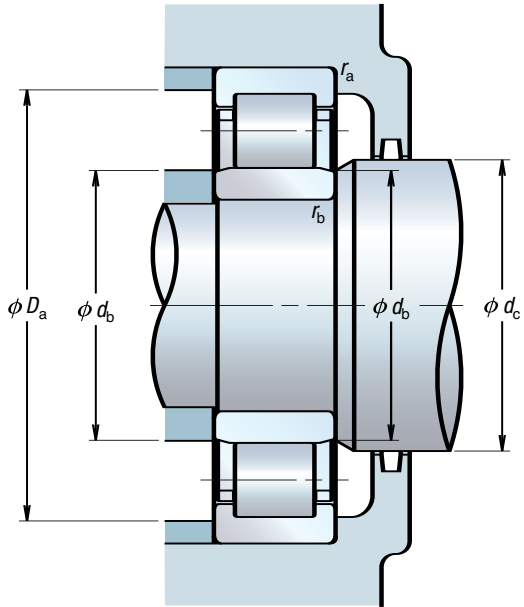






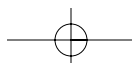
# EW SERIES

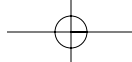
Pressed Cages



Bearing numbers			Abutment and Fillet Dimensions (mm)								Permissible Axial Movement S (mm)
NU	NJ	NUP	$d_a$ <i>min.</i>	$d_b$ <i>min.</i>	$d_b$ <i>max.</i>	$d_c$ <i>min.</i>	$d_d$ <i>min.</i>	$D_a$ <i>max.</i>	$r_a$ <i>max.</i>	$r_b$ <i>max.</i>	
NU205EW	NJ	NUP	30	29	30	34	37	47	1	0.6	1.2
NU305EW	NJ	NUP	31.5	31.5	32	37	40	55.5	1	1	1.2
NU206EW	NJ	NUP	35	34	36	40	44	57	1	0.6	1.2
NU306EW	NJ	NUP	36.5	36.5	39	44	48	65.5	1	1	1.2
NU207EW	NJ	NUP	41.5	39	42	46	50	65.5	1	0.6	1.2
NU307EW	NJ	NUP	43	41.5	44	48	53	72	1.5	1	1.2
NU208EW	NJ	NUP	46.5	46.5	48	52	56	73.5	1	1	1.2
NU308EW	NJ	NUP	48	48	50	55	60	82	1.5	1.5	1.2
NU209EW	NJ	NUP	51.5	51.5	52	57	61	78.5	1	1	1.2
NU309EW	NJ	NUP	53	53	56	60	66	92	1.5	1.5	1.4
NU210EW	NJ	NUP	56.5	56.5	57	62	67	83.5	1	1	1.7
NU310EW	NJ	NUP	59	59	63	67	73	101	2	2	1.4
NU211EW	NJ	NUP	63	61.5	64	68	73	92	1.5	1	1.2
NU311EW	NJ	NUP	64	64	68	72	80	111	2	2	1.4
NU212EW	NJ	NUP	68	68	70	75	80	102	1.5	1.5	1.2
NU213EW	NJ	NUP	73	73	76	81	87	112	1.5	1.5	1.4

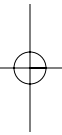
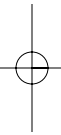
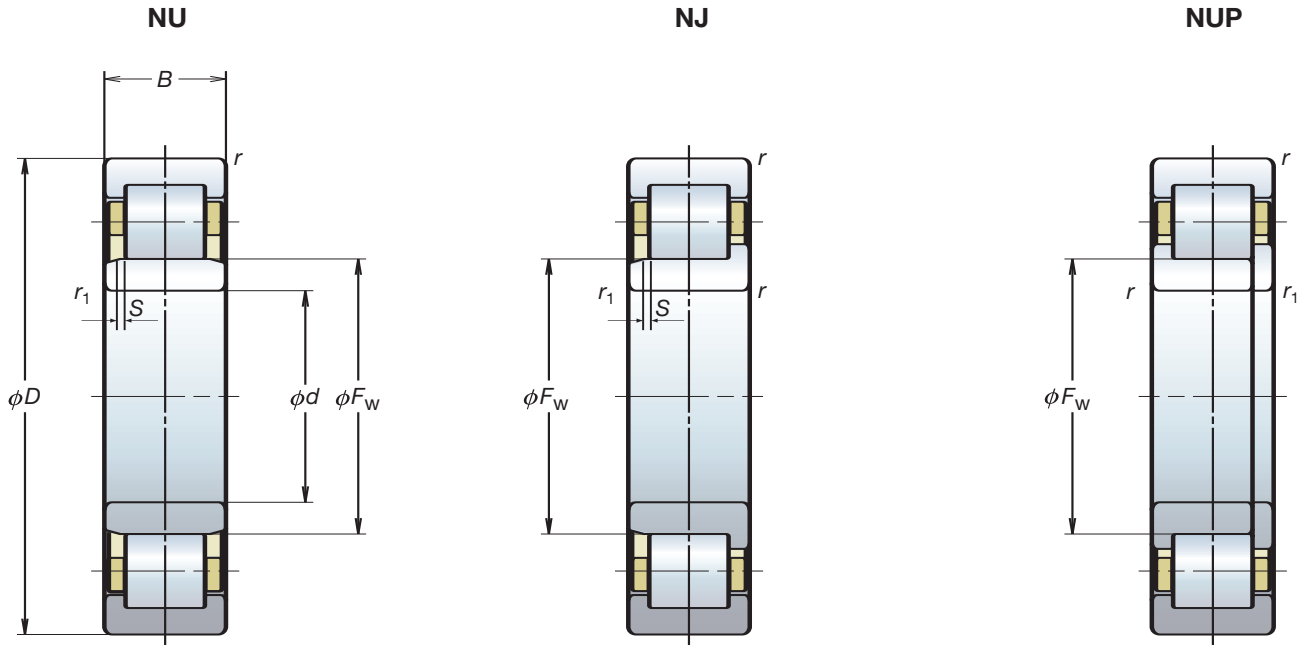
For more information contact NSK.





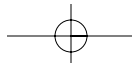
# EM SERIES

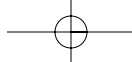
Machined brass cages



Boundary Dimensions (mm)						Basic Load Ratings [N]		Limiting Speeds rpm	
<i>d</i>	<i>D</i>	<i>B</i>	<i>r</i> <i>min.</i>	<i>r</i> <sub>1</sub> <i>min.</i>	<i>F<sub>w</sub></i>	<i>C<sub>r</sub></i>	<i>C<sub>or</sub></i>	Grease	Oil
25	52	15	1	0.6	31.5	29 300	27 700	13 000	16 000
	62	17	1.1	1.1	34	41 500	37 500	10 000	13 000
30	62	16	1	0.6	37.5	39 000	37 500	11 000	13 000
	72	19	1.1	1.1	40.5	53 000	50 000	8 500	11 000
35	72	17	1.1	0.6	44	50 500	50 000	9 500	11 000
	80	21	1.5	1.1	46.2	66 500	65 500	8 000	9 500
40	80	18	1.1	1.1	49.5	55 500	55 500	8 500	10 000
	90	23	1.5	1.5	52	83 000	81 500	6 700	8 500
45	85	19	1.1	1.1	54.5	63 000	66 500	7 500	9 000
	100	25	1.5	1.5	58.5	97 500	98 500	6 300	7 500
50	90	20	1.1	1.1	59.5	69 000	76 500	7 100	8 500
	110	27	2	2	65	110 000	113 000	5 600	6 700
55	100	21	1.5	1.1	66	86 500	98 500	6 300	7 500
	120	29	2	2	70.5	137 000	143 000	5 000	6 300
60	110	22	1.5	1.5	72	97 500	107 000	6 000	7 100
	130	31	2.1	2.1	77	150 000	157 000	4 800	5 600
65	120	23	1.5	1.5	78.5	108 000	119 000	5 300	6 300
	140	33	2.1	2.1	82.5	181 000	191 000	4 300	5 300
70	125	24	1.5	1.5	83.5	119 000	137 000	5 000	6 300
	150	35	2.1	2.1	89	205 000	222 000	4 000	5 000
75	130	25	1.5	1.5	88.5	130 000	156 000	4 800	6 000
	160	37	2.1	2.1	95	240 000	263 000	3 800	4 800
80	140	26	2	2	95.3	139 000	167 000	4 500	5 300
	170	39	2.1	2.1	101	256 000	282 000	3 600	4 300
85	150	28	2	2	100.5	167 000	199 000	4 300	5 000
	180	41	3	3	108	291 000	330 000	3 400	4 000

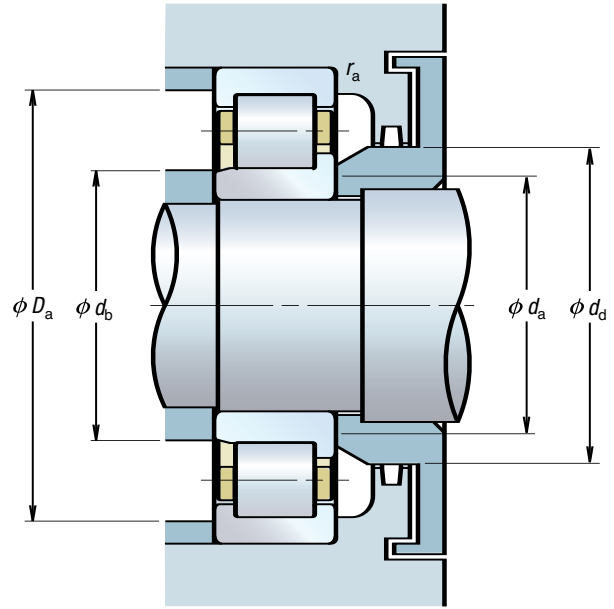
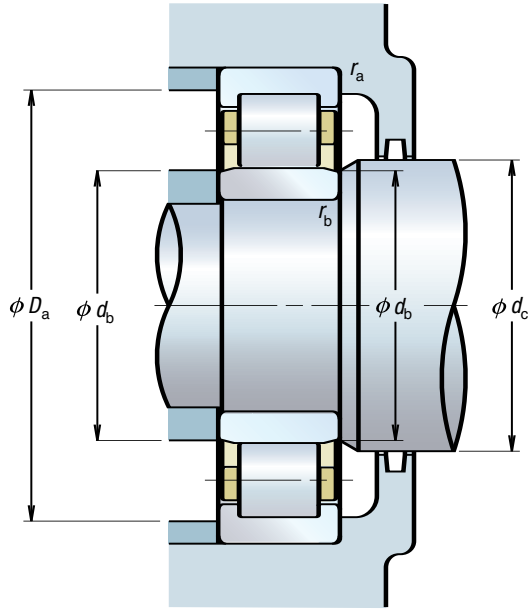
The following are also available: 1. N and NF type bearings. 2. Cages with an outside diameter of less than 650 mm.





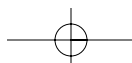
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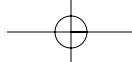
Machined brass cages



Bearing numbers			Abutment and Fillet Dimensions (mm)								Permissible Axial Movement S (mm)	Mass (kg) approx
NU	NJ	NUP	$d_a$ min.	$d_b$ min.	$d_b$ max.	$d_c$ min.	$d_d$ min.	$D_a$ max.	$r_a$ max.	$r_b$ max.		
NU205EM	NJ	NUP	30	29	30	34	37	47	1	0.6	1.2	0.155
NU305EM	NJ	NUP	31.5	31.5	32	37	40	55.5	1	1	1.2	0.279
NU206EM	NJ	NUP	35	34	36	40	44	57	1	0.6	1.2	0.236
NU306EM	NJ	NUP	36.5	36.5	39	44	48	65.5	1	1	1.2	0.410
NU207EM	NJ	NUP	41.5	39	42	46	50	65.5	1	0.6	1.2	0.341
NU307EM	NJ	NUP	43	41.5	44	48	53	72	1.5	1	1.2	0.547
NU208EM	NJ	NUP	46.5	46.5	48	52	56	73.5	1	1	1.2	0.430
NU308EM	NJ	NUP	48	48	50	55	60	82	1.5	1.5	1.2	0.751
NU209EM	NJ	NUP	51.5	51.5	52	57	61	78.5	1	1	1.2	0.492
NU309EM	NJ	NUP	53	53	56	60	66	92	1.5	1.5	1.4	1.01
NU210EM	NJ	NUP	56.5	56.5	57	62	67	83.5	1	1	1.7	0.564
NU310EM	NJ	NUP	59	59	63	67	73	101	2	2	1.4	1.32
NU211EM	NJ	NUP	63	61.5	64	68	73	92	1.5	1	1.2	0.736
NU311EM	NJ	NUP	64	64	68	72	80	111	2	2	1.4	1.67
NU212EM	NJ	NUP	68	68	70	75	80	102	1.5	1.5	1.2	0.930
NU312EM	NJ	NUP	71	71	75	79	86	119	2	2	1.5	2.06
NU213EM	NJ	NUP	73	73	76	81	87	112	1.5	1.5	1.4	1.17
NU313EM	NJ	NUP	76	76	80	85	93	129	2	2	1.5	2.56
NU214EM	NJ	NUP	78	78	81	86	92	117	1.5	1.5	1.4	1.29
NU314EM	NJ	NUP	81	81	86	92	100	139	2	2	1.5	3.09
NU215EM	NJ	NUP	83	83	86	90	96	122	1.5	1.5	1.4	1.44
NU315EM	NJ	NUP	86	86	92	97	106	149	2	2	1.4	3.73
NU216EM	NJ	NUP	89	89	92	97	104	131	2	2	1.4	1.7
NU316EM	NJ	NUP	91	91	98	105	114	159	2	2	1.5	4.45
NU217EM	NJ	NUP	94	94	98	104	110	141	2	2	1.3	2.11
NU317EM	NJ	NUP	98	98	105	110	119	167	2.5	2.5	2	5.26

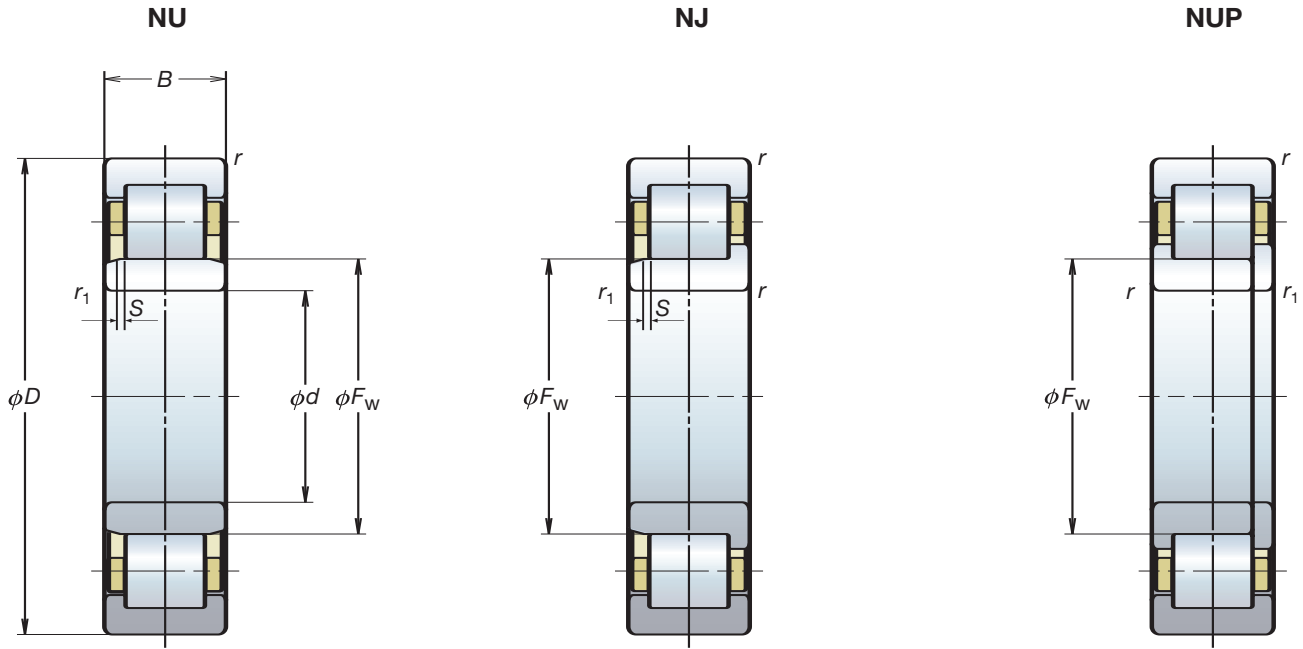
For more information contact NSK.





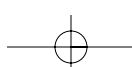
# EM SERIES

Machined brass cages



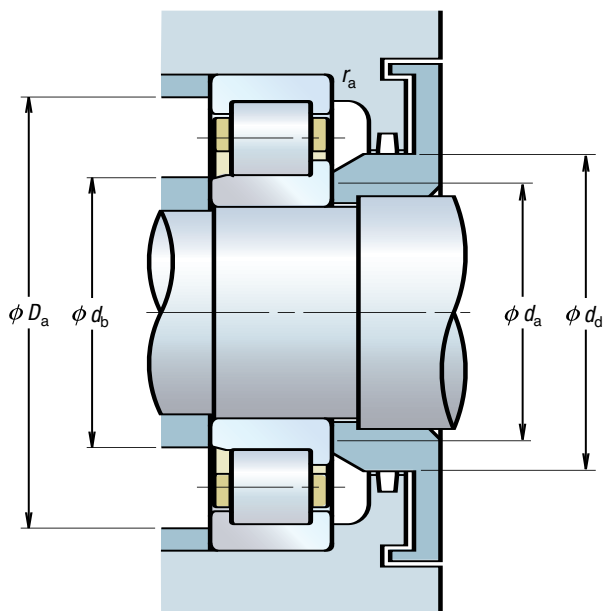
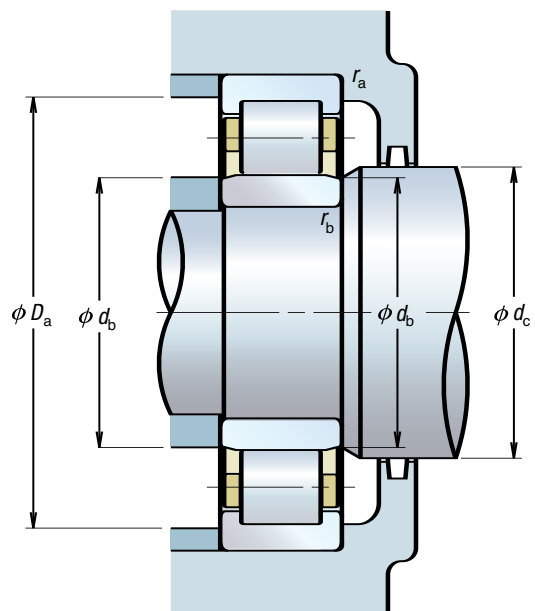
Boundary Dimensions (mm)						Basic Load Ratings [N]		Limiting Speeds rpm	
$d$	$D$	$B$	$r$ <i>min.</i>	$r_1$ <i>min.</i>	$F_w$	$C_r$	$C_{or}$	Grease	Oil
90	160	30	2	2	107	182 000	217 000	4 000	4 800
	190	43	3	3	113.5	315 000	355 000	3 200	3 800
95	170	32	2.1	2.1	112.5	220 000	265 000	3 800	4 500
	200	45	3	3	121.5	335 000	385 000	3 000	3 600
100	180	34	2.1	2.1	119	249 000	305 000	3 600	4 300
	215	47	3	3	127.5	380 000	425 000	2 800	3 400
105	190	36	2.1	2.1	125	262 000	310 000	3 400	4 000
	225	49	3	3	133	425 000	480 000	2 600	3 200
110	200	38	2.1	2.1	132.5	293 000	365 000	3 200	3 800
	200	53	2.1	2.1	132.5	385 000	515 000	2 800	3 400
	240	50	3	3	143	450 000	525 000	2 600	3 000
120	215	40	2.1	2.1	143.5	335 000	420 000	3 000	3 400
	215	58	2.1	2.1	143.5	450 000	620 000	2 600	3 200
	260	55	3	3	154	530 000	610 000	2 200	2 800
	260	86	3	3	154	795 000	1 030 000	2 000	2 600
130	230	40	3	3	153.5	365 000	455 000	2 600	3 200
	230	64	3	3	153.5	530 000	735 000	2 400	3 000
	280	58	4	4	167	615 000	735 000	2 200	2 600
	280	93	4	4	167	920 000	1 230 000	1 900	2 400
140	250	42	3	3	169	395 000	515 000	2 400	3 000
	250	68	3	3	169	550 000	790 000	2 200	2 800
	300	62	4	4	180	665 000	795 000	2 000	2 400
	300	102	4	4	180	1 020 000	1 380 000	1 700	2 200
150	270	45	3	3	182	450 000	595 000	2 200	2 800
	270	73	3	3	182	635 000	930 000	2 000	2 600
	320	65	4	4	193	760 000	920 000	1 800	2 200
	320	108	4	4	193	1 160 000	1 600 000	1 600	2 000

The following are also available: 1. N and NF type bearings. 2. Cages with an outside diameter of less than 650 mm.



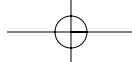
# EM SERIES

Machined brass cages



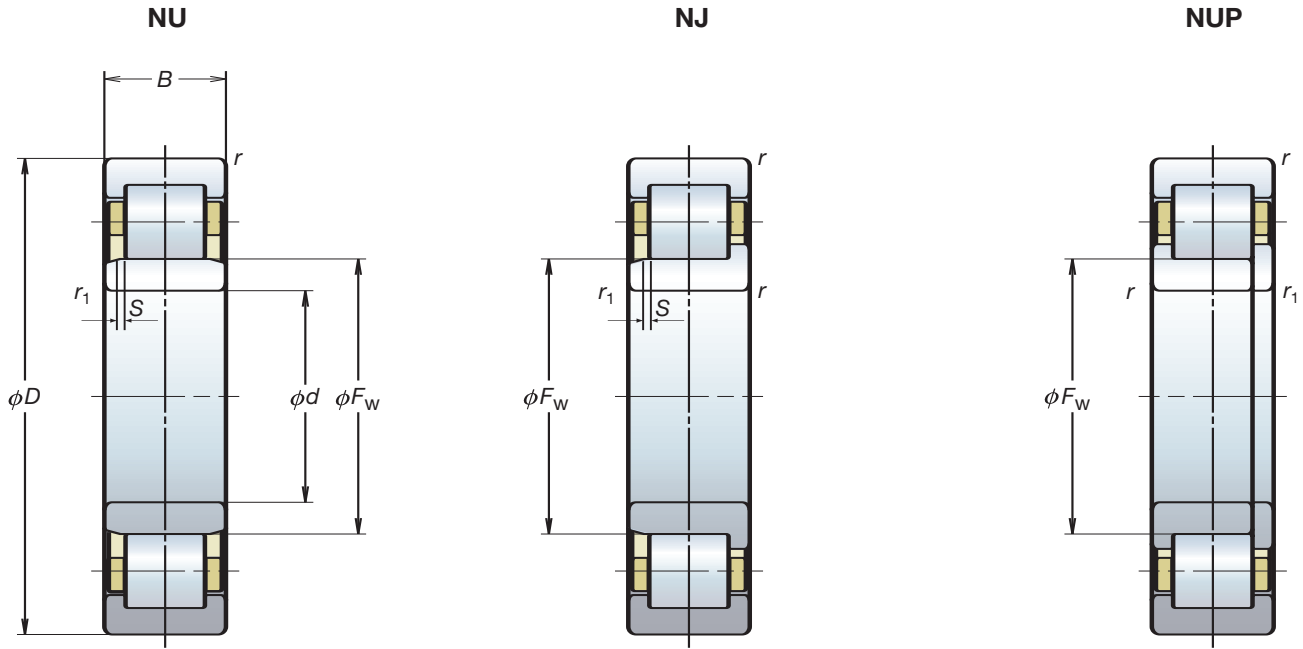
Bearing numbers			Abutment and Fillet Dimensions (mm)								Permissible Axial Movement S (mm)	Mass (kg) approx
NU	NJ	NUP	$d_a$ min.	$d_b$ min.	$d_b$ max.	$d_c$ min.	$d_d$ min.	$D_a$ max.	$r_a$ max.	$r_b$ max.		
NU218EM	NJ	NUP	99	99	104	109	116	151	2	2	1.4	2.6
NU318EM	NJ	NUP	103	103	111	117	127	177	2.5	2.5	1.5	6.1
NU219EM	NJ	NUP	106	106	110	116	123	159	2	2	1.4	3.17
NU319EM	NJ	NUP	108	108	118	124	134	187	2.5	2.5	1.5	7.13
NU220EM	NJ	NUP	111	111	116	122	130	169	2	2	1.4	3.81
NU320EM	NJ	NUP	113	113	124	132	143	202	2.5	2.5	1.8	8.63
NU221EM	NJ	NUP	116	116	121	129	137	179	2	2	1.4	4.58
NU321EM	NJ	NUP	118	118	131	137	149	212	2.5	2.5	1.8	9.84
NU222EM	NJ	NUP	121	121	129	135	144	189	2	2	1.4	5.37
NU2222EM	NJ	NUP	121	121	129	135	144	189	2	2	1.4	7.65
NU322EM	NJ	NUP	123	123	139	145	158	227	2.5	2.5	3.8	11.8
NU224EM	NJ	NUP	131	131	140	146	156	204	2	2	1.5	6.43
NU2224EM	NJ	NUP	131	131	140	146	156	204	2	2	2	9.51
NU324EM	NJ	NUP	133	133	150	156	171	247	2.5	2.5	1.8	15
NU2324EM	NJ	NUP	133	133	150	156	171	247	2.5	2.5	2.8	25
NU226EM	NJ	NUP	143	143	150	158	168	217	2.5	2.5	1.5	8.03
NU2226EM	NJ	NUP	143	143	150	158	168	217	2.5	2.5	3	9.44
NU326EM	NJ	NUP	146	146	163	169	184	264	3	3	2.3	18.7
NU2326EM	NJ	NUP	146	146	163	169	184	264	3	3	2.3	30
NU228EM	NJ	NUP	153	153	165	171	182	237	2.5	2.5	1.5	9.38
NU2228EM	NJ	NUP	153	153	165	171	182	237	2.5	2.5	2.5	15.2
NU328EM	NJ	NUP	156	156	176	182	198	284	3	3	3.3	22.8
NU2328EM	NJ	NUP	156	156	176	182	198	284	3	3	2.8	37.7
NU230EM	NJ	NUP	163	163	177	184	196	257	2.5	2.5	1.5	11.9
NU2230EM	NJ	NUP	163	163	177	184	196	257	2.5	2.5	3	19.3
NU330EM	NJ	NUP	166	166	188	195	213	304	3	3	3.2	27.1
NU2330EM	NJ	NUP	166	166	188	195	213	304	3	3	2.2	45.1

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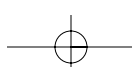
# EM SERIES

Machined brass cages



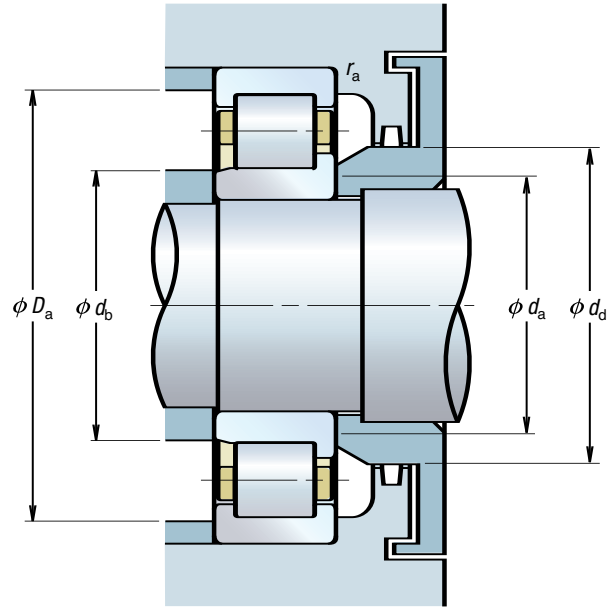
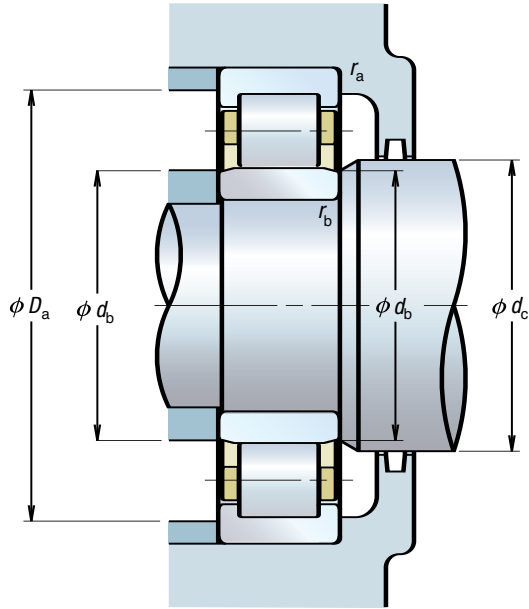
Boundary Dimensions (mm)						Basic Load Ratings [N]		Limiting Speeds rpm	
$d$	$D$	$B$	$r$ <i>min.</i>	$r_1$ <i>min.</i>	$F_w$	$C_r$	$C_{or}$	Grease	Oil
160	290	48	3	3	195	500 000	665 000	2 200	2 600
	290	80	3	3	193	810 000	1 190 000	1 900	2 400
	340	68	4	4	204	860 000	1 050 000	1 700	2 000
	340	114	4	4	204	1 310 000	1 820 000	1 500	1 900
170	310	52	4	4	207	605 000	800 000	2 000	2 400
	310	86	4	4	205	925 000	1 330 000	1 800	2 200
	360	72	4	4	218	930 000	1 150 000	1 600	2 000
	360	120	4	4	216	1 490 000	2 070 000	1 400	1 800
180	320	52	4	4	217	625 000	850 000	1 900	2 200
	320	86	4	4	215	1 010 000	1 510 000	1 700	2 000
	380	75	4	4	231	985 000	1 230 000	1 500	1 800
	380	126	4	4	227	1 560 000	2 220 000	1 300	1 700
190	340	55	4	4	230	695 000	955 000	1 800	2 200
	340	92	4	4	228	1 100 000	1 670 000	1 600	2 000
	400	78	5	5	245	1 060 000	1 340 000	1 400	1 700
	400	132	5	5	240	1 770 000	2 520 000	1 300	1 600
200	360	58	4	4	243	765 000	1 060 000	1 700	2 000
	360	98	4	4	241	1 220 000	1 870 000	1 500	1 800
	420	80	5	5	258	1 140 000	1 450 000	1 300	1 600
	420	138	5	5	253	1 910 000	2 760 000	1 200	1 500

The following are also available: 1. N and NF type bearings. 2. Cages with an outside diameter of less than 650 mm.



# EM SERIES

Machined brass cages



Bearing numbers			Abutment and Fillet Dimensions (mm)								Permissible Axial Movement S (mm)	Mass (kg) approx
NU	NJ	NUP	$d_a$ min.	$d_b$ min.	$d_b$ max.	$d_c$ min.	$d_d$ min.	$D_a$ max.	$r_a$ max.	$r_b$ max.		
NU232EM	NJ	NUP	173	173	190	197	210	277	2.5	2.5	1.8	14.7
NU2232EM	NJ	NUP	173	173	188	197	210	277	2.5	2.5	3.3	24.5
NU332EM	NJ	NUP	176	176	199	211	228	324	3	3	3.2	32.1
NU2332EM	NJ	NUP	176	176	199	211	228	324	3	3	2.7	53.9
NU234EM	NJ	NUP	186	186	202	211	223	294	3	3	3.8	18.3
NU2234EM	NJ	NUP	186	186	200	211	223	294	3	3	2.8	29.9
NU334EM	NJ	NUP	186	186	213	223	241	344	3	3	1.7	37.9
NU2334EM	NJ	NUP	186	186	210	223	241	344	3	3	6.2	63.4
NU236EM	NJ	NUP	196	196	212	221	233	304	3	3	2.2	19
NU2236EM	NJ	NUP	196	196	210	221	233	304	3	3	2.7	31.4
NU336EM	NJ	NUP	196	196	226	235	255	364	3	3	2.2	44
NU2336EM	NJ	NUP	196	196	222	235	255	364	3	3	6.2	74.6
NU238EM	NJ	NUP	206	206	225	234	247	324	3	3	1.7	23
NU2238EM	NJ	NUP	206	206	223	234	247	324	3	3	1.7	38.3
NU338EM	NJ	NUP	210	210	240	248	268	380	4	4	1.7	50.6
NU2338EM	NJ	NUP	210	210	235	248	268	380	4	4	6.2	86.2
NU240EM	NJ	NUP	216	216	238	247	261	344	3	3	2.2	27.4
NU2240EM	NJ	NUP	216	216	235	247	261	344	3	3	2.2	46.1
NU340EM	NJ	NUP	220	220	252	263	283	400	4	4	1.2	57.1
NU2340EM	NJ	NUP	220	220	247	263	283	400	4	4	7.7	99.3

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