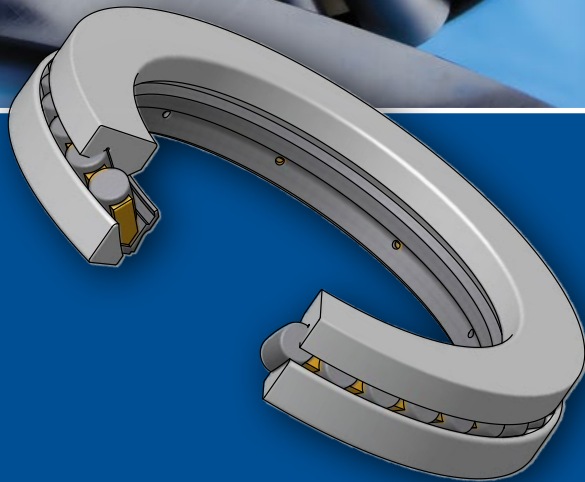




SPHERICAL ROLLER THRUST BEARINGS



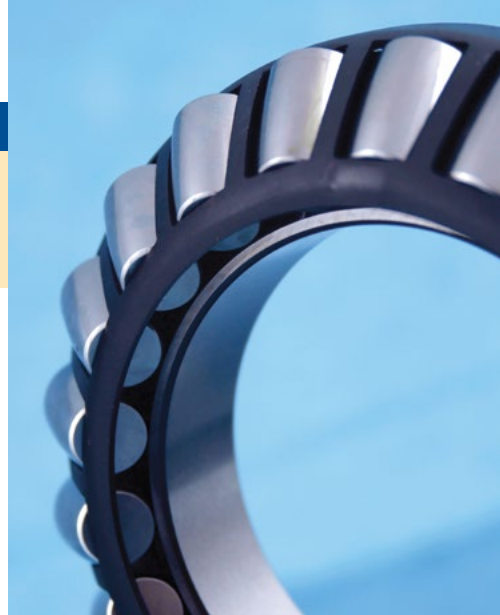
SPHERICAL ROLLER THRUST BEARINGS

Spherical roller thrust bearings are able to carry high axial load. Because of their construction with spherical raceways and transmission of load at a certain angle they can carry radial load as well. They are dismountable which allows simpler installation of individual rings into the arrangement.

Design of the individual parts of the spherical roller thrust bearings allows in operation certain mutual misalignment of the rings against each other. In this way the spherical roller thrust bearings are able to eliminate certain deflection of the connecting parts.

Spherical roller thrust bearings have a great number of asymmetrical spherical rollers with a good conformity to the raceway and therefore they are able to carry high axial load.

Spherical roller thrust bearings can be applied in arrangements with high demands for load forces transfer, e.g. shaping machines, cranes, ship's shaft, mining machines, etc.



DESIGN SPECIFICATION

MAIN DIMENSIONS

The main dimensions of double row spherical roller bearings specified in the dimension tables are in accordance with the international standards ISO 104.

DESIGN

Spherical roller thrust bearings are commonly manufactured with brass cage guided by a sleeve held in the shaft washer bore. Designation of these bearings is „MC” Another manufactured design is spherical roller thrust bearing with pressed window-type steel cage. Their designation is „EJ”.

TOLERANCES

Spherical roller thrust bearings are commonly produced in the basic P0 tolerance class. Production of bearings with higher tolerance class should be discussed in advance with the manufacturer. The limit values of deviations in tolerances are in accordance with the international standards, while their values are given in table part of this catalogue (table 17a, 17b and 17c).

INFLUENCE OF THE OPERATING TEMPERATURE

The supplied range of axial spherical roller bearings is standardly designed for use in environments with temperatures up to 120°C. We recommend consulting the supplier when using bearings for a temperature range other than -20°C + 120°C.

MISALIGNMENT

Because of their design spherical roller thrust bearings allow mutual misalignment, i.e. at common operating conditions ($P_a \leq 0,1.C_a$) they are able to accommodate the misalignment of the shaft and housing without affecting their correct function. Permitted misalignment is stated in the table:

Permitted Misalignment	Bearing Type
2°	292XX
2°30'	293XX
3°	294XX

EQUIVALENT DYNAMIC LOAD

In dependence on the influence of the bearing arrangements run-outs and its elimination by the mutual movement of the rings and if $F_r \leq 0,55.F_a$ then:

$$P_a = F_a + 1,2.F_r \quad \text{- when run-outs in the bearing arrangement affect the load distribution in the bearing}$$

$$P_a = 0,88.(F_a + 1,2.F_r) \quad \text{- when run-outs in the bearing arrangement do not affect the load distribution in the bearing}$$

where

- P_{ea} - equivalent dynamic load of the bearing (N)
- F_a - radial load of the bearing (N)
- F_r - axial load of the bearing (N)

If $F_r \geq 0,55.F_a$, the ZVL SLOVAKIA engineering department should be contacted.

EQUIVALENT STATIC LOAD

Axial load is, if $F_r \leq 0,55.F_a$:

$$P_{oa} = F_a + 2,7.F_r$$

where

P_{oa} - equivalent static load of the bearing (N)

F_a - radial load of the bearing (N)

F_r - axial load of the bearing (N)

If $F_r \geq 0,55.F_a$, the ZVL SLOVAKIA engineering department should be contacted.

MINIMUM AXIAL LOADING

During the operation of axial bearing a risk of roller bodies sliding between the raceways of rings is registered due to the presence of centrifugal forces and friction of lubrication and so that the possibility of damage for roller bodies or raceways, respectively. Therefore, a minimal loading must act on the bearing. Its size can be derived from following formula:

$$F_{amin} = 0,00125.C_o$$

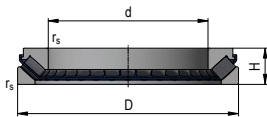
where:

F_{amin} - minimal loading (kN)

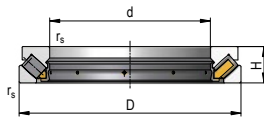
C_o - static load capacity (kN)



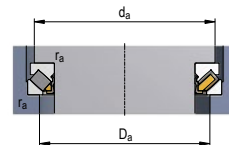
SPHERICAL ROLLER THRUST BEARINGS








EJ

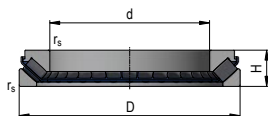


MC

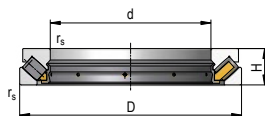


Dimensions mm				Basic Load Rating kN		Limiting Speed for Lubrication min ⁻¹	Bearing Designation	Weight kg	Abutment and Fillet Dimensions mm		
d	D	H	r _s min	 C	 Co				d _a min	D _a max	r _a max
60	130	42	1,5	370,50	945,53	2400	29412EJ	2,500	90	107	1,5
65	140	45	2	432,25	1 114,63	2200	29413EJ	3,140	100	117	2
65	140	45	2	415,41	1 147,60	2200	29413MA	3,23	100	118	2
70	150	48	2	494,00	1 238,69	2000	29414EJ	3,820	105	125	2
75	160	51	2	570,00	1 449,43	2000	29415EJ	4,550	115	133	2
80	170	54	2,1	636,50	1 651,10	1900	29416EJ	5,390	120	141	2
85	180	58	2,1	698,25	1 787,57	1800	29417EJ	6,430	130	151	2
90	190	60	2,1	815,00	2 000,00	1700	29418EJ	7,460	135	158	2
90	190	60	2,1	617,72	1 764,70	1900	29418MC	8,100	135	158	2
100	170	42	1,5	441,75	1 366,47	2000	29320EJ	3,500	130	147	1,5
100	210	67	3	746,75	1 995,00	1500	29420MC	10,300	150	175	2,5
110	190	48	2	579,50	1 766,30	1600	29322EJ	5,150	145	164	2
110	190	48	2	496,753	1 555,87	1600	29322MC	5,4	145	165	2
110	230	73	3	1 007,00	2 862,52	1400	29422MC	13,700	165	193	2,5
120	210	54	2,1	765,00	2 120,00	1400	29324EJ	7,200	160	181	2
120	210	54	2,1	596,766	1 851,58	1400	29324MC	7,35	160	181	2
120	250	78	4	1 181,32	3 361,06	1300	29424MC	17,000	180	209	3
130	225	58	2,1	779,00	2 335,56	1400	29326MC	8,950	175	194	2
130	270	85	4	1 292,00	3 715,56	1200	29426MC	22,500	195	227	3
140	240	60	2,1	855,00	2 660,40	1300	29328MC	11,000	185	208	2
140	280	85	4	1 425,00	4 185,04	1200	29428MC	22,100	205	236	3
150	250	60	2,1	883,50	2 745,61	1200	29330MC	11,100	195	219	2
150	300	90	4	1 615,00	4 735,43	1100	29430MC	29,200	220	254	3
160	270	67	3	1 026,00	3 372,77	1200	29332MC	14,900	210	235	2,5
160	320	95	5	1 814,50	5 518,95	1000	29432MC	31,800	235	270	4
170	280	67	3	1 045,00	3 519,30	1100	29334MC	15,400	220	245	2,5
170	340	103	5	2 128,00	6 262,99	950	29434MC	42,200	250	286	4
180	300	73	3	1 235,00	3 843,66	1100	29336MC	19,100	235	262	2,5
180	360	109	5	2 280,00	6 857,54	900	29436MC	49,600	265	304	4
190	320	78	4	1 425,00	5 022,34	950	29338MC	24,200	250	280	3
190	380	115	5	2 410,83	7 645,29	850	29438MC	57,800	280	321	4
200	280	48	2,1	649,41	2 700,19	1150	29240MC	8,760	235	253	2
200	340	85	4	1 527,21	5 345,41	900	29340MC	30,000	265	297	3
200	400	122	5	2 850,00	7 885,00	800	29440MC	71,000	295	337	4
220	300	48	2,1	680,00	2 900,00	1300	29244MC	9,640	255	271	2
220	360	85	4	1 611,99	6 009,27	900	29344MC	33,500	285	316	3
220	420	122	6	3 150,00	9 400,00	750	29444MC	74,000	315	358	5
240	340	60	2,1	874,38	3 689,85	890	29248MC	16,700	290	308	2
240	380	85	4	1 637,39	6 301,10	800	29348MC	35,500	305	336	3
240	440	122	6	3 160,00	9 500,00	750	29448MC	79,000	335	378	5
260	360	60	2,1	934,59	4 185,87	890	29252MC	16,900	310	326	2
260	420	95	5	2 300,00	8 000,00	750	29352MC	48,300	335	370	4

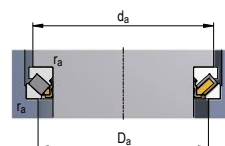
SPHERICAL ROLLER THRUST BEARINGS



EJ



MC



Dimensions mm				Basic Load Rating kN		Limiting Speed for Lubrication min ⁻¹	Bearing Designation	Weight kg	Abutment and Fillet Dimensions mm		
d	D	H	r _s min	C	C ₀				d ₂ min	D ₂ max	r _a max
260	480	132	6	3 705,00	11 547,30	670	29452MC	100,000	365	412	5
280	380	60	2,1	1 105,00	4 920,00	840	29256MC	19,500	325	347	2
280	440	95	5	2 400,00	8 300,00	710	29356MC	53,000	355	390	4
280	520	145	6	3 340,98	11 644,51	660	29456MC	137,000	395	446	5
300	420	73	3	1 373,68	6 200,42	750	29260MC	30,500	360	380	2,5
300	480	109	5	2 660,00	10 568,61	700	29360MC	75,000	385	423	4
300	540	145	6	4 100,00	15 800,00	620	29460MC	140,000	415	465	5
320	440	73	3	1 405,00	7 198,00	710	29264MC	32,900	380	400	2,5
320	500	109	5	2 707,50	10 697,00	680	29364MC	79,000	405	442	4
320	580	155	7,5	4 400,00	16 800,00	560	29464MC	175,000	450	500	6
340	540	122	5	2 920,00	11 320,00	620	29368MC	106,000	440	479	4
340	620	170	7,5	5 189,51	19 950,00	500	29468MC	218,000	475	530	6
360	500	85	4	1 692,77	7 742,53	630	29272MC	51,800	430	453	3
360	560	122	4	3 106,00	11 600,00	600	29372MC	110,000	460	500	3
380	520	85	4	1 732,00	7 930,00	600	29276MC	52,800	450	473	3
380	600	132	6	3 280,00	15 200,00	600	29376MC	130,000	495	535	5
380	670	175	7,5	5 834,77	21 850,00	470	29476MC	248,000	525	580	6
400	540	85	4	1 897,77	9 294,86	600	29280MC	55,300	470	493	3
400	620	132	6	3 846,57	16 360,79	600	29380MC	150,000	510	550	5
400	710	185	7,5	6 300,00	26 000,00	450	29480MC	306,000	550	615	6
420	650	140	6	3 960,00	17 900,00	550	29384MC	175,000	535	580	5
420	730	185	7,5	6 500,00	27 000,00	430	29484MC	323,000	575	635	6
440	680	145	6	4 589,58	19 535,59	500	29388MC	190,000	520	545	4
440	780	206	9,5	7 400,00	30 000,00	400	29488MC	407,000	605	675	8
480	850	224	9,5	9 200,00	37 000,00	340	29496MC	518,000	660	735	8
500	870	224	9,5	9 560,64	38 000,00	330	294500MC	560,000	685	755	8