BUREAU OF INDIAN STANDARDS
DRAFT FOR COMMENTS ONLY

Doc No.: PGD 13 (25210) P-Draft
April 2024

प्रारंभिक मसौदा

स्व - संरेखित रोलर बियरिंग्स

भाग 2 — दो पंक्ति विशिष्टता

Preliminary Draft

Self - Aligning Roller Bearings

Part 2 — Double Row Specification

ICS 21.100.20

Bearings Sectional Committee, PGD 13	Last date for Comment: 09-July-2024

NATIONAL FOREWORD

This Indian Standard (First Revision) was adopted by the Bureau of Indian Standards, after the draft was finalized by the Bearings Sectional Committee and had been approved by the Production and General Engineering Division Council.

This standard was first published in 1972. This revision has been taken up to incorporate feedback gained through experience and other developments taken at international level in this field.

In this revision, the following changes have been made:

a) Clauses on terminology, material specification, and hardness have been added.
b) Clauses on dimensions, tolerances and designation have been modified.
c) Figure 1 has been added; and
d) Table 1 and Table 2 have been added.

In the formulation of this standard, considerable assistance has been derived from DIN 635-1 Rolling bearings, Radial spherical roller bearings - Part 1: Single row with cylindrical or tapered bore (barrel roller bearings) and DIN 635-2 Rolling bearings, Radial spherical roller bearings - Part 2: Double row, with cylindrical or tapered bore, issued by the Deutsches Institut Für Normung (DIN).

For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated expressing the result of a test or analysis, shall be rounded off in accordance with IS 2 : 2022 ‘Rules for rounding off numerical values (*second revision*).’ The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

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Indian Standard

SELF ALIGNING ROLLER BEARINGS — SPECIFICATION

(*First Revision*)

1 SCOPE

This standard specifies requirements for self - Aligning roller bearings and their components including through hardened, induction hardened and cased hardened bearings.

This standard does not cover requirements of airframe bearings and instrument precision bearings.

2 REFERENCES

The standards given below contain provisions which, through reference in this text, constitute provisions of this standard. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreements based on this standard are encouraged to investigate the possibility of applying the most recent editions of the standard indicated below:

IS	*Title*
513 (Part 1) : 2016	Cold Reduced Carbon Steel Sheet and Strip Part 1 Cold Forming and Drawing Purpose (*Sixth Revision*)
2399 : 2019	Rolling bearings — Vocabulary (*second revision*)
3073 : 1967	Assessment of surface roughness
3823 : 2014	Rolling bearings — Static load ratings (*third revision*)
3824 : 2014	Rolling bearings — Dynamic load ratings and rating life (*third revision*)
4397 : 1999	Cold-rolled carbon steel strips for ball and roller bearing cages/retainers
4398 : 1994	Carbon-chromium steel for the manufacture of balls, rollers and bearing races (second revision)
4905 : 2015	Random sampling and randomization procedures (*first revision*)
5692 : 2019	Rolling bearings — Radial bearings — Geometrical product specifications (GPS) and tolerance values (*second revision*)
5935 (Part 1) : 2019	Rolling bearings — Internal clearance: Part 1 Radial internal clearance for radial bearings (*second revision*)
17111 : 2019	Heat-treated steels, alloy steels and free-cutting steels — Ball and roller bearing steels

3 TERMS AND DEFINITIONS

For the purpose of this standard, the terms and definitions given in IS 2399 and the following shall apply.

3.1 Supplier

The party supplying the bearings.

3.2 Purchaser

The party purchasing the bearings. This term shall also apply to person or persons expressly authorized by the purchaser to act on his behalf for inspection of the material.

4 DIMENSION AND DESIGNATIONS

4.1 Double Row Radial Spherical Roller Bearings

The designs shown are for illustrative purposes only; however, the dimensions of double row, radial spherical roller bearings shall be as specified.

Details of the inner design are not standardized. Boundary dimensions and designation of double row, radial spherical roller bearings shall be as per Table 1 and Fig 1.

Table 1 Dimension and Designation
(*Clause* 4.1)

All Dimensions are in millimetres

d	D	B	r_{1s}, r_{2s} min	Designation [1)]		
				Cylindrical	1:12 tapered	1:30 tapered
20	52	15	1,1	21304	—	—
25	52	18	1	22205	—	—
	62	17	1,1	21305	—	—
30	62	20	1	22206	—	—
	72	19	1,1	21306	—	—
35	72	23	1,1	22207	—	—
	80	21	1,5	21307	—	—
	80	23	1,1	22208 E	22208 EK	—
40	90	23	1,5	21308 E	21308 EK	—
	90	33	1,5	22308 E	22308 EK	—
	85	23	1,1	22209 E	22209 EK	—
45	100	25	1,5	21309 E	21309 EK	—
	100	36	1,5	22309 E	22309 EK	—
	90	23	1,1	22210 E	22210 EK	—
50	110	27	2	21310 E	21310 EK	—
	110	40	2	22310 E	22310 EK	—
	100	25	1,5	22211 E	22211 EK	—
55	120	29	2	21311 E	21311 EK	—
	120	43	2	22311 E	22311 EK	—
	110	28	1,5	22212 E	22212 EK	—
60	130	31	2,1	21312 E	21312 EK	—
	130	46	2,1	22312 E	22312 EK	—
	120	31	1,5	22213 E	22213 EK	—
65	140	33	2,1	21313 E	21313 EK	—
	140	48	2,1	22313 E	22313 EK	—
	125	31	1,5	22214 E	22214 EK	—
70	150	35	2,1	21314 E	21314 EK	—
	150	51	2,1	22314 E	22314 EK	—
	130	31	1,5	22215 E	22215 EK	—

75	160	37	2,1	21315 E	21315 EK	—
	160	55	2,1	22315 E	22315 EK	—
	140	33	2	22216 E	22216 EK	—
80	170	39	2,1	21316 E	21316 EK	—
	170	58	2,1	22316 E	22316 EK	—
	150	36	2	22217 E	22217 EK	—
85	180	41	3	21317 E	21317 EK	—
	180	60	3	22317 E	22317 EK	—
	160	40	2	22218 E	22218 EK	—
90	160	52,4	2	23218 E	23218 K	—
	190	43	3	21318 E	21318 EK	—
	190	64	3	22318 E	22318 EK	—
95	170	43	2,1	22219 E	22219 EK	—
	200	45	3	21319 E	21319 EK	—
	200	67	3	22319 E	22319 EK	—
100	180	46	2,1	22220 E	22220 EK	—
	180	60,3	2,1	23220 E	23220 EK	—
	215	47	3	21320 E	21320 EK	—
	215	73	3	22320 E	22320 EK	—
105	225	49	3	21321	21321 K	—
110	170	45	2	23022	—	—
	170	60	2	24022	—	24022 K30
	180	56	2	23122	23122 K	—
	180	69	2	24122	—	24122 K30
	200	53	2,1	22222 E	22222 K	—
	200	69,8	2,1	23222	23222 K	—
	240H	50	3	21322	21322 K	—
	240	80	3	22322 E	22322 K	—
120	180	46	2	23024	23024 K	—
	180	60	2	24024	—	24024 K30
	200	62	2	23124	23124 K	—
	200	80	2	24124	—	24124 K30
	215	58	2,1	22224 E	22224 EK	—
	215	76	2,1	23224	23224 K	—
	260	86	3	22324	22324 K	—
130	200	52	2	23026	23026 K	—
	200	69	2	24026	—	24026 K30
	210	64	2	23126	23126 K	—
	210	80	2	24126	—	24126 K30
	230	64	3	22226	22226	—
	230	80	3	23226	23226 K	—
	280	93	4	22326	22326 K	—
140	210	53	2	23028	23028 K	—
	210	69	2	24028	—	24028 K30
	225	68	2,1	23128	23128 K	—

	225	85	2,1	24128	—	24128 K30
	250	68	3	22228	22228 K	—
	250	88	3	23228	23228 K	—
	300	102	4	22328	22328 K	—
150	225	56	2,1	23030	23030 K	—
	225	75	2,1	24030	—	24030 K30
	250	80	2,1	23130	23130 K	—
	250	100	2,1	24130	—	24130 K30
	270	73	3	22230	22230 K	—
	270	96	3	23230	23230 K	—
	320	108	4	22330	22330 K	—
160	240	60	2,1	23032	23032 K	—
	240	80	2,1	24032	—	24032 K30
	270	86	2,1	23132	23132 K	—
	270	109	2,1	24132	—	24132 K30
	290	80	3	22232	22232 K	—
	290	104	3	23232	23232 K	—
	340	114	4	22332	22332 K	—
170	260	67	2,1	23034	23034 K	—
	260	90	2,1	24034	—	24034 K30
	280	88	2,1	23134	23134 K	—
	280	109	2,1	24134	—	24134 K30
	310	86	4	22234	22234 K	—
	310	110	4	23234	23234 K	—
	360	120	4	22334	22334 K	—
180	250	52	2	23936	23936 K	—
	280	74	2,1	23036	23036 K	—
	280	100	2,1	24036	—	24036 K30
	300	96	3	23136	23136 K	—
	300	118	3	24136	—	24136 K30
	320	86	4	22236	22236 K	—
	320	112	4	23236	23236 K	—
	380	126	4	22336	22336 K	—
190	260	52	2	23938	23938 K	—
	290	75	2,1	23038	23038 K	—
	290	100	2,1	24038	—	24038 K30
	320	104	3	23138	23138 K	—
	320	128	3	24138	—	24138 K30
	340	92	4	22238	22238 K	—
	340	120	4	23238	23238 K	—
	400	132	5	22338	22338 K	—
200	280	60	2,1	23940	23940 K	—
	310	82	2,1	23040	23040 K	—
	310	109	2,1	24040	—	24040 K30
	340	112	3	23140	23140 K	—
	340	140	3	24140	—	24140 K30
	360	98	4	22240	22240 K	—

	360	128	4	23240	23240 K	—
	420	138	5	22340	22340 K	—
220	300	60	2,1	23944	23944 K	—
	340	90	3	23044	23044 K	—
	340	118	3	24044	—	24044 K30
	370	120	4	23144	23144 K	
	370	150	4	24144	—	24144 K30
	400	108	4	22244	22244 K	—
	400	144	4	23244	23244 K	—
	460	145	5	22344	22344 K	—
240	320	60	2,1	23948	23948 K	—
	360	92	3	23048	23048 K	—
	360	118	3	24048	—	24048 K30
	400	128	4	23148	23148 K	—
	400	160	4	24148	—	24148 K30
	440	120	4	22248	22248 K	—
	440	160	4	23248	23248 K	—
	500	155	5	22348	22348 K	—
260	360	75	2,1	23952	23952K	—
	400	104	4	23052	23052 K	—
	400	140	4	24052	—	24052 K30
	440	144	4	23152	23152 K	—
	440	180	4	24152	—	24152 K30
	480	130	5	22252	22252 K	—
	480	174	5	23252	23252 K	—
	540	165	6	22352	22352 K	—
280	380	75	2,1	23956	23956 K	—
	420	106	4	23056	23056 K	—
	420	140	4	24056	—	24056 K30
	460	146	5	23156	23156 K	—
	460	180	5	24156	—	24156 K30
	500	130	5	22256	22256 K	—
	500	176	5	23256	23256 K	—
	580	175	6	22356	22356 K	—
300	380	60	2,1	23860	23860 K	—
	420	90	3	23960	23960 K	—
	460	118	4	23060	23060 K	—
	460	160	4	24060	—	24060 K30
	500	160	5	23160	23160 K	—
	500	200	5	24160	—	24160 K30
	540	140	5	22260	22260 K	—
	540	192	5	23260	23260 K	—
320	440	90	3	23964	23964 K	—
	480	121	4	23064	23064 K	—
	480	160	4	24064	—	24064 K30
	540	176	5	23164	23164 K	
	540	218	5	24164	—	24164 K30
	580	150	5	22264	22264 K	—
	580	208	5	23264	23264 K	—

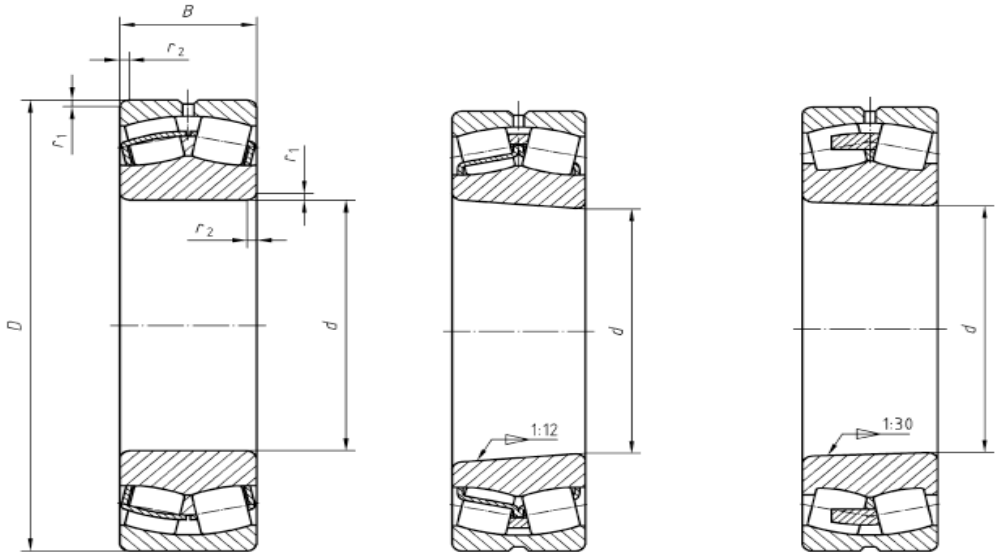
340	460	90	3	23968	23968 K	—
	520	133	5	23068	23068 K	—
	520	180	5	24068	—	24068 K30
	580	190	5	23168	23168 K	—
	580	243	5	24168	—	24168 K30
	620	224	6	23268	23268 K	—
360	480	90	3	23972	23972 K	—
	540	134	5	23072	23072 K	—
	540	180	5	24072	—	24072 K30
	600	192	5	23172	23172 K	—
	600	243	5	24172	—	24172 K30
	650	170	6	22272	22272 K	—
	650	232	6	23272	23272 K	—
380	520	106	4	23976	23976 K	—
	560	135	5	23076	23076 K	—
	560	180	5	24076	—	24076 K30
	620	194	5	23176	23176 K	—
	620	243	5	24176	—	24176 K30
	680	240	6	23276	23276 K	—
400	540	106	4	23980	23980 K	—
	600	148	5	23080	23080 K	—
	600	200	5	24080	—	24080 K30
	650	200	6	23180	23180 K	—
	650	250	6	24180	—	24180 K30
	720	256	6	23280	23280 K	—
	820	243	7,5	22380	22380 K	—
420	560	106	4	23984	23984 K	—
	620	150	5	23084	23084 K	—
	620	200	5	24084	—	24084 K30
	700	224	6	23184	23184 K	—
	700	280	6	24184	—	24184 K30
	760	272	7,5	23284	23284 K	—
440	600	118	4	23988	23988 K	—
	650	157	6	23088	23088 K	—
	650	212	6	24088	—	24088 K30
	720	226	6	23188	23188 K	—
	720	280	6	24188	—	24188 K30
	790	280	7,5	23288	23288 K	—
460	580	118	3	24892	—	24892 K30
	620	118	4	23992	23992 K	—
	680	163	6	23092	23092 K	—
	680	218	6	24092	—	24092 K30
	760	240	7,5	23192	23192 K	—
	760	300	7,5	24192	—	24192 K30

	830	296	7,5	23292	23292 K	—
480	600	090	3	23896	23896 K	—
	650	128	5	23996	23996 K	—
	700	165	6	23096	23096 K	—
	700	218	6	24096	—	24096 K30
	790	248	7,5	23196	23196 K	—
	790	308	7,5	24196	—	24196 K30
	870	310	7,5	23296	23296 K	—
500	620	90	3	238/500	238/500 K	—
	670	128	5	239/500	239/500 K	—
	720	167	6	230/500	230/500 K	—
	720	218	6	240/500	—	240/500 K30
	830	264	7,5	231/500	231/500 K	—
	830	325	7,5	241/500	—	241/500 K30
	920	336	7,5	232/500	232/500 K	—
530	650	118	3	248/530	—	248/530 K30
	710	136	5	239/530	239/530 K	—
	780	185	6	230/530	230/530 K	—
	780	250	6	240/530	—	240/530 K30
	870	272	7,5	231/530	231/530 K	—
	870	335	7,5	241/530	—	241/530 K30
	980	355	9,5	232/530	232/530 K	—
560	750	140	5	239/560	239/560 K	—
	820	195	6	230/560	230/560 K	—
	820	258	6	240/560	—	240/560 K30
	920	280	7,5	231/560	231/560 K	—
	920	355	7,5	241/560	—	241/560 K30
	1 030	365	9,5	232/560	232/560 K	—
600	800	150	5	239/600	239/600 K	—
	870	200	6	230/600	230/600 K	—
	870	272	6	240/600	—	240/600 K30
	980	300	7,5	231/600	231/600 K	—
	980	375	7,5	241/600	—	241/600 K30
	1 090	388	9,5	232/600	232/600 K	—
630	780	112	4	238/630	238/630 K	—
	850	165	6	239/630	239/630 K	—
	920	212	7,5	230/630	230/630 K	—
	920	290	7,5	240/630	—	240/630 K30
	1 030	315	7,5	231/630	231/630 K	—
	1 030	400	7,5	241/630	—	241/630 K30
670	820	112	4	238/670	238/670 K	—
	820	150	4	248/670	—	—

	900	170	6	239/670	239/670 K	—
	980	230	7,5	230/670	230/670 K	—
	980	308	7,5	240/670	—	240/670 K30
	1 090	336	7,5	231/670	231/670 K	—
	1 090	412	7,5	241/670	—	241/670 K30
	1 220	438	12	232/670	232/670 K	—
710	870	118	4	238/710	—	—
	950	180	6	239/710	239/710 K	—
	950	243	6	249/710	—	249/710 K30
	1 030	236	7,5	230/710	230/710 K	—
	1 030	315	7,5	240/710	—	240/710 K30
	1 150	345	9,5	231/710	231/710 K	—
	1 150	438	9,5	241/710	—	241/710 K30
	1 280	450	12	232/710	232/710 K	—
750	920	128	5	238/750	238/750 K	—
	1 000	185	6	239/750	239/750 K	—
	1 000	250	6	249/750	—	249/750 K30
	1 090	250	7,5	230/750	230/750 K	—
	1 090	335	7,5	240/750	—	240/750 K30
	1 220	365	9,5	231/750	231/750 K	—
	1 220	475	9,5	241/750	—	241/750 K30
	1 360	475	15	232/750	232/750 K	—
800	980	180	5	248/800	—	248/800 K30
	1 060	195	6	239/800	239/800 K	—
	1 060	258	6	249/800	—	249/800 K30
	1 150	258	7,5	230/800	230/800 K	—
	1 150	345	7,5	240/800	—	240/800 K30
	1 280	375	9,5	231/800	231/800 K	—
	1 280	475	9,5	241/800	—	241/800 K30
850	1 030	136	5	238/850	238/850 K	—
	1 120	200	6	239/850	239/850 K	—
	1 120	272	6	249/850	—	249/850 K30
	1 220	272	7,5	230/850	230/850 K	—
	1 220	365	7,5	240/850	—	240/850 K30
	1 360	400	12	231/850	231/850 K	—
	1 360	500	12	241/850	—	241/850 K30
900	1 090	190	5	248/900	—	248/900 K30
	1 180	206	6	239/900	239/900 K	—
	1 280	280	7,5	230/900	230/900 K	—
	1 280	375	7,5	240/900	—	240/900 K30
	1 420	515	12	241/900	—	241/900 K30
950	1 250	224	7,5	239/950	239/950 K	—
	1 250	300	7,5	249/950	—	249/950 K30
	1 360	300	7,5	230/950	230/950 K	—

	1 360	412	7,5	240/950	—	240/950 K30
	1 500	545	12	241/950	—	241/950 K30
1 000	1 220	165	6	238/1 000	238/1 000 K	—
	1 320	315	7,5	249/1 000	—	249/1 000 K30
	1 420	308	7,5	230/1 000	230/1 000 K	—
	1 420	412	7,5	240/1 000	—	240/1 000 K30
	1 580	462	12	231/1 000	231/1 000 K	—
	1 580	580	12	241/1 000	—	241/1 000 K30
1 060	1 280	165	6	238/1 060	238/1 060 K	—
	1 280	218	6	248/1 060	—	248/1 060 K30
	1 400	250	7,5	239/1060	239/1060 K	—
	1 400	335	7,5	249/1 060	—	249/1 060 K30
	1 500	325	9,5	230/1 060	230/1 060 K	—
	1 500	438	9,5	240/1 060	—	240/1 060 K30
1 120	1 360	243	6	248/1 120	—	248/1 120 K30
	1 460	335	7,5	249/1 120	—	249/1 120 K30
	1 580	462	9,5	240/1 120	—	240/1 120 K30
1 180	1 420	180	6	238/1 180	238/1 180 K	—
	1 420	243	6	248/1 180	—	248/1 180 K30
	1 540	272	7,5	239/1 180	239/1 180 K	—
	1 540	355	7,5	249/1 180	—	249/1 180 K30
1 250	1 750	375	9,5	230/1 250	230/1 250 K	—
1 320	1 600	280	6	248/1 320	—	248/1 320 K30
	1 720	400	7,5	249/1 320	—	249/1 320 K30
1 500	1 820	315	7,5	248/1 500	—	248/1 500 K30
1 800	2 180	375	9,5	248/1 800	—	248/1 800 K30

1) Designation given is informative and may vary for different manufacturers.



Bearing with cylindrical bore Bearing with 1:12 tapered bore Bearing with 1:30 tapered bore

B Bearing width
D Bearing outside diameter
d Bearing bore diameter

r1s, r2s Smallest permissible chamfer dimension

FIG. 1 DOUBLE ROW RADIAL SPHERICAL ROLLER BEARING DESIGN

5 TOLERANCES AND GEOMETRICAL CHARACTERISTICS

Tolerances and geometrical characteristics of the boundary dimensions shall be as specified in IS 5692 and shall be tabulated based on precision class of bearing from tolerance class '2' to tolerance class 'Normal'.

6 MATERIAL OF RACES AND ROLLERS

6.1 Radial Spherical Roller Bearing has to fulfil the requirements for fatigue strength, wear resistance, hardness, toughness and structural stability. The material used for the races and rolling elements is generally a low alloy, through hardening chromium steel of high purity. For bearings subjected to considerable shock loads and reversed bending stresses, case hardening steel is also used as per agreement between the supplier and the manufacturer.

6.2 Material of races and rollers shall be as specified in IS 17111, IS 4398 as applicable.

7 CAGE

7.1 Rolling bearing press steel cages are widely used for Radial Spherical Roller bearing. Material of Steel cages shall be as specified in IS 4397 or IS 513 (Part 1).

7.2 In some of case Radial Spherical Roller bearing cages are also made with brass and polyamide. Material for such cages may be as agreed between supplier and the manufacturer.

8 RADIAL INTERNAL CLEARANCE

8.1 Radial internal clearance is arithmetical mean of the radial distances through which one of the rings may be displaced relative to the other, from one eccentric extreme position to the diametrically opposite extreme position, in different angular directions and without being subjected to any external load.

8.2 Radial Internal clearance shall be as specified in IS 5935 (Part 1).

9 SURFACE FINISH

9.1 The outer surface, bore and the sides of rolling bearings shall have the maximum values of surface roughness as given in Table 2 when measured in accordance with IS 3073.

9.2 The surface finish of the functional surfaces shall be as per agreement between the purchaser and the supplier.

10 HARDNESS

10.1 The hardness of the inner rings, outer rings and rolling elements shall be minimum 58 HRC.

10.2 For special heat treatment, hardness requirement may be as agreed between the supplier and the purchaser.

10.3 There shall be no impression of the test cone on the load bearing surface.

Table 2 Dimension and Designation
(*Clause* 9.1)

All Dimensions are in millimetres

Nominal Diameter (mm)		**Permissible Mean Surface Roughness (R) (µm)**		
above	up to	Bore	Outside Surface	Sides
18	50	0.6	-	0.6
50	62	0.7	0.25	0.6
62	80	0.7	0.4	0.6
80	120	0.8	0.4	0.6
120	250	0.8	0.6	0.6
250	400	1	0.6	0.6
400	500	1	0.8	0.6
500	800	1.2	0.8	0.6
800	1000	1.2	1.2	0.6
1000	2000	1.4	1.2	0.6
2000	2500	-	1.2	0.6

11 LOAD RATING

11.1 Basic Dynamic Radial Load Rating

11.1.1 The basic dynamic load rating 'C' is that load of constant magnitude and direction which a sufficiently large number of apparently identical bearings can endure for a basic rating life of one million revolutions.

11.1.2 IS 3824 shall be followed for arriving at basic dynamic radial load rating for Radial Spherical Roller Bearing.

11.1.3 This standard is not applicable to designs where the rolling elements operate directly on a shaft or housing surface, bearing rings which are integral to housing, for example, planet gear which also acts as bearing raceway unless that surface is equivalent in all respects to the bearing rings quality.

12.2 Basic Static Radial Load Rating

12.2.1 Permanent deformations appear in rolling elements and raceways of rolling bearings under static loads of moderate magnitude and increase gradually with increasing load. Basic static radial load rating is the radial load which corresponds to a calculated contact stress at the center of the most heavily loaded rolling element/raceway contact of 4000 MPa for all radial roller bearing types. For these contact stresses, under static load, a total permanent deformation of rolling element and raceway occurs which is approximately 0.0001 times of the rolling element diameter.

12.2.2 IS 3823 shall be followed for arriving at basic static radial load rating for Radial Spherical Roller Bearing.

13 WORKMANSHIP AND DELIVERY REQUIREMENT

13.1 Visual Inspection

The surfaces of the bore, outside diameter, sides, and load carrying areas shall be smooth and shall not show any damaged areas.

13.2 Product noise

The running noise of the rolling bearings shall be as agreed to between the supplier and the purchaser.

13.3 Interchangeability

Complete rolling bearings with the same bearing Designation 1)s, same boundary dimensions shall be interchangeable with regards to fitting and the functioning.

13.4 Temperatures

The rolling bearing parts during service shall withstand at least 100 °C.

13.4.1 Rolling bearings for service temperatures over 100 °C shall be specially heat treated by manufacturer. The supply of these rolling bearings shall be in accordance with agreement between the purchaser and the supplier.

13.5 Protection Against Corrosion

The type of protection against corrosion shall be decided by the manufacturer depending on the packing material used. Under proper storage conditions, the anti-corrosive treatment shall be effective for at least 12 months in order to ensure a satisfactory functioning of the rolling bearings, unless otherwise required by the purchaser.

13.5.1 For proper storage conditions, the purchaser may consult the manufacturer.

14 PACKING

Rolling bearings treated as in 13.5 shall be packed individually and several pieces may be packed together in suitable containers depending on the size. The packing shall be such as to protect the contents from external influences.

15 MARKING

15.1 Packed containers may be marked with the following:

a) Manufacturer’s name or trademark.
b) Designation of the bearing.
c) Coded or direct indication of month and year of manufacture; and
d) Quantity.

15.2 BIS Certification Marking

The product(s) conforming to the requirements of this standard may be certified as per the conformity assessment schemes under the provisions of the *Bureau of Indian Standards Act*, 2016 and the Rules and Regulations framed thereunder, and the products may be marked with the standard mark.

16 SAMPLING AND CRITERIA FOR ACCEPTANCE

Shall be as given in Annex A.

ANNEX A

(*Clause* 16)

SAMPLING AND CRITERIA FOR ACCEPTANCE

A-1 SCALE OF SAMPLING

A-1.1 Lot

In any consignment all rolling bearings of the same designation and manufactured under similar conditions of production shall be grouped together to constitute a lot.

A-1.2 Rolling bearings from each lot shall be examined to ascertain its conformity to the requirements of the relevant specification.

A-1.3 Unless otherwise agreed to between the supplier and the purchaser the number of ball bearings to be selected at random shall be in accordance with col 1 and col 2 of Table 3. To ensure randomness, selection methods given in IS 4905 shall be followed.

A-1.4 Number of Tests and Criteria for Conformity

A-1.4.1 The rolling bearings selected according to A-1.3 shall be inspected for dimensions and tolerances, workmanship, surface finish and protection against corrosion. Any bearing failing to meet requirements for any one or more of the above characteristics shall be declared as defective.

A-1.4.1.1 The lot shall be considered conforming to the requirements of the above characteristics, if the number of rolling bearings found defective according to A-1.3 is less than or equal to the corresponding acceptance number given under col 3 of Table 3.

Table 3 Scale of Sampling and Criteria for Conformity

(*Clause* A-1.3, A-1.4.1.1 and A-1.4.2)

Lot Size (1)	**Sampling Size** (2)	**Acceptance Number** (3)	**Sub-Sample Size** (4)
Up to 50	5	0	3
51 to 160	8	0	5
161 to 300	13	0	5
301 to 500	20	0	8
501 to 1 000	32	1	13
1 001 and above	60	1	13

A-1.4.2 If the lot is found satisfactory according to A-1.4.1.1, a number of rolling bearings corresponding to sub-sample size given under col 4 of Table 3 shall be selected and subjected to hardness test.

A-1.4.2.1 The lot shall be considered satisfactory to the requirements of the specification if none of the rolling bearings fails to meet the requirement for hardness.

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