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**Rolling bearings — Mounting dimensions
and fits**

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Foreword

This translation has been made based on the original Japanese Industrial Standard revised by the Minister of Economy, Trade and Industry, through deliberations at the Japanese Industrial Standards Committee as the result of proposal for revision of The Japan Bearing Industry Association (JBIA) with the draft being attached, based on the provision of Article 12 Clause 1 of the Industrial Standardization Law applicable to the case of revision by the provision of Article 14.

Consequently, **JIS B 1566:1989** is replaced with this Standard.

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Rolling bearings — Mounting dimensions and fits

1 Scope

This Japanese Industrial Standard specifies the general references of mounting dimensions¹⁾ and fits for rolling bearings (hereafter referred to as "bearings").

NOTE 1 For reference, the mounting dimensions of radial bearings with adapter and radial cylindrical roller bearings of high load capacity type are given in Annex A, and the numerical values relating to tolerance classes of shaft and housing used regularly, and fits are given in Annex B.

NOTE 2 It is preferable to consult the manufacturer about the mounting dimensions and fits of bearings not specified herein.

NOTE 3 It is preferable to determine the geometrical tolerances for the deviation from circular form of mounting part, etc. in consideration of the service conditions.

Note¹⁾ The mounting dimensions of bearings mean the dimensions relating to the mounting of bearings at the bearing seating of shaft and the bearing seating of housing, and the adjacent parts.

2 Normative references

The following standards contain provisions which, through reference in this text, constitute provisions of this Standard. The most recent editions of the standards (including amendments) shall be applied.

JIS B 0104 *Rolling bearings — Vocabulary*

JIS B 0124 *Rolling bearings — Symbols for quantities*

JIS B 0401-1 *ISO system of limits and fits — Part 1 : Bases of tolerances, deviations and fits*

JIS B 0401-2 *ISO system of limits and fits — Part 2 : Tables of standard tolerance grades and limit deviations for holes and shafts*

JIS B 1514-1 *Rolling bearings — Tolerances of bearings — Part 1 : Radial bearings*

JIS B 1514-2 *Rolling bearings — Tolerances of bearings — Part 2 : Thrust bearings*

3 Terms and definitions

For the purpose of this Standard, the terms and definitions given in JIS B 0104 and JIS B 0401-1, and the following apply.

3.1 rotating inner ring load

load of which the line of action is rotating in relation to the inner ring of bearing

3.2 stationary inner ring load

load of which the line of action does not rotate in relation to the inner ring of bearing

3.3 stationary outer ring load

load of which the line of action does not rotate in relation to the outer ring of bearing

3.4 rotating outer ring load

load of which the line of action is rotating in relation to the outer ring of bearing

3.5 indeterminate direction load

load of which the direction cannot be determined

NOTE : This is a load of which the direction is considered to be rotating or oscillating in relation to both bearing rings.

3.6 centric axial load

axial load of which the line of action coincides with the bearing axis

3.7 combined load

load that consists of a combination of the radial load, and the axial load, and works on a bearing

4 Symbols for quantities

For the purpose of this Standard, the symbols for quantities given in **JIS B 0124**, and the following apply.

D	: nominal bearing outside diameter
D_a	: diameter of shoulder of housing
D_b, D_c	: dimension of inside diameter of outer ring stopper, etc. or dimension of inside diameter of shoulder of housing
d	: nominal bearing inside diameter
d_a	: diameter of shoulder of shaft
d_b, d_c, d_d	: dimension of outside diameter of inner ring stopper, etc. or dimension of outside diameter of shaft
E_w	: nominal circumscribed diameter of roller complement
F_w	: nominal inscribed diameter of roller complement
h	: height of shoulder of shaft and housing
$r_{as\ max}$	: actually measured maximum radius of rounding of corner of shaft and housing
$r_{s\ min}$	: dimension of actually measured minimum chamfer of bearing
S_a	: recess in back face side of outer ring in respect to cage of tapered roller bearing

S_b : recess in front face side of outer ring in respect to cage of tapered roller bearing

5 Mounting dimensions

5.1 Rounding of corner of shaft and housing

The actually measured maximum radius of rounding of corner of shaft and housing ($r_{as\ max}$) on which the radial bearing or the thrust bearing is mounted shall correspond to the dimension of actually measured minimum chamfer of bearing ($r_{s\ min}$), and shall be according to Table 1.

5.2 Height and diameter of shoulder of shaft and housing

5.2.1 Radial bearing

The height of shoulder of shaft on which the radial bearing is mounted shall correspond to the dimension of actually measured minimum chamfer of bearing ($r_{s\ min}$), and shall be according to Table 1. For the diameter of shoulder of shaft (d_a), the value obtained by adding twice the height of shoulder of bearing (h) to the nominal inside diameter thereof (d) shall be the minimum.

The height of shoulder of housing shall correspond to the dimension of actually measured minimum chamfer of bearing ($r_{s\ min}$), and shall be according to Table 1. For the diameter of shoulder of housing (D_a), the value obtained by subtracting twice the height of shoulder of bearing from the nominal outside diameter thereof (D) shall be the maximum.

NOTE : The diameter of shoulder of shaft or the diameter of shoulder of housing shall be the diameter such that the chamfer part is excluded from the dimension of outside diameter of shoulder of shaft or the dimension of inside diameter of shoulder of housing, respectively.

5.2.2 Thrust bearing

The diameter of shoulder of shaft (d_a) and the diameter of shoulder of housing (D_a) on which the thrust ball bearing with flat back face or the self-aligning thrust roller bearing is mounted shall be according to Table 2 and Table 3, respectively.

5.3 Mounting dimensions for subunit and others of bearing

5.3.1 Cylindrical roller bearing

The dimension of outside diameter of shoulder of shaft (d_c) on which a subunit²⁾ of separable type cylindrical roller bearing is mounted, the dimension of outside diameter of inner ring stopper, etc. (d_b , d_d) and the dimension of inside diameter of shoulder of housing (D_b) shall be according to Table 4.

Note²⁾ The subunit mentioned in this Standard shall be the outer ring with rollers (and cage) and the single body of inner ring freely separable from the roller bearing, and the inner ring with rollers (and cage) and the single body of outer ring.

5.3.2 Machined ring needle roller bearing

The dimension of outside diameter of inner ring stopper, etc. (d_b) on which a subunit of separable type machined ring needle roller bearing is mounted shall be according to Table 5.

5.3.3 Tapered roller bearing

The dimension of outside diameter of inner ring stopper, etc. (d_b), the dimension of inside diameter of shoulder of housing (D_o) and the dimension of inside diameter of outer ring stopper, etc. (D_b) for preventing the contact of the cage which is protruding from the side face of the outer ring with the adjacent part (or component) shall be according to Table 6.

6 Fits

6.1 Radial bearing

The fit between the radial bearing and the shaft or the housing shall generally be according to Table 7 and Table 8, and the following.

- a) The fit between the inner ring and the shaft of the bearing subjected to the rotating inner ring load shall be the interference fit or the transition fit. The interference shall be made larger relative to the load.
- b) The fit between the inner ring and the shaft of the bearing subjected to the indeterminate direction load shall be the interference fit or the transition fit.
- c) The fit between the inner ring and the shaft of the bearing subjected to the stationary inner ring load shall be the clearance fit or the transition fit.
- d) The fit between the outer ring and the housing of the bearing subjected to the stationary outer ring load shall be the clearance fit or the transition fit.
- e) The fit between the outer ring and the housing of the bearing subjected to the indeterminate direction load shall be the transition fit or the interference fit.
- f) The fit between the outer ring and the housing of the bearing subjected to the rotating outer ring load shall be the interference fit or the transition fit. The interference shall be made larger relative to the load.

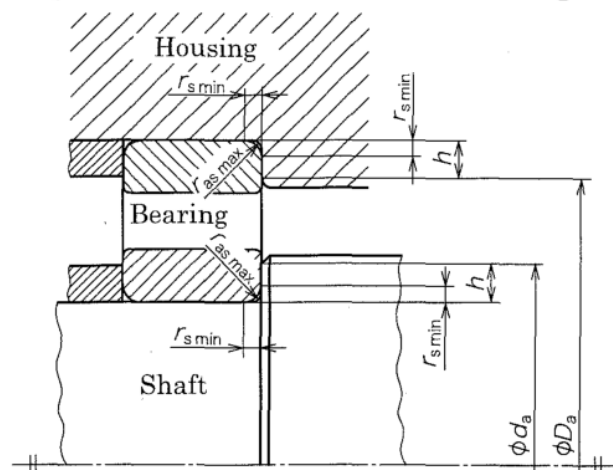
6.2 Thrust bearing

The fit between the thrust bearing and the shaft or the housing shall generally be according to Table 9 and Table 10, and the following.

- a) The fit between the inner ring and the shaft of the thrust bearing subjected to the centric axial load only shall be the transition fit.
- b) The fit between the inner ring and the shaft of the self-aligning thrust roller bearing subjected to the combined load shall be according to the same references as a) to c) of 6.1.
- c) The sufficient clearance shall be provided between the outer ring and the housing of the thrust bearing subjected to the centric axial load only.
- d) The fit between the outer ring and the housing of the self-aligning thrust roller

bearing subjected to the combined load shall be according to the same references as d) to f) of 6.1.

Table 1 Radii of rounding of corner of shaft and housing, and heights of shoulders of shaft and housing for radial bearing



Unit: mm

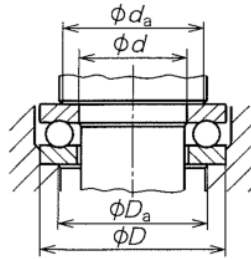
$r_{s \min}$	$r_{as \max}$	For general case a)	For particular case b)
		h Minimum	
0.1	0.1	0.4	
0.15	0.15	0.6	
0.2	0.2	0.8	
0.3	0.3	1.25	1
0.6	0.6	2.25	2
1	1	2.75	2.5
1.1	1	3.5	3.25
1.5	1.5	4.25	4
2	2	5	4.5
2.1	2	6	5.5
2.5	2	6	5.5
3	2.5	7	6.5
4	3	9	8
5	4	11	10
6	5	14	12
7.5	6	18	16
9.5	8	22	20

The minimum value of d_a and the maximum value of D_a shall be according to 5.2.1.

Notes a) In the case where a large axial load is applied, the height of larger shoulder than this value is required.

b) It is used in the case where an axial load is small. These values are not suitable for the tapered roller bearing, angular contact ball bearing and self-aligning roller bearing.

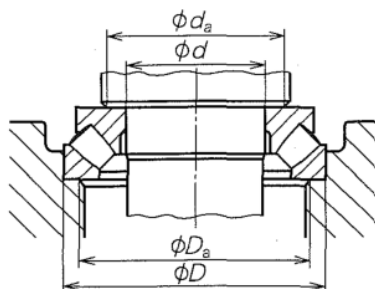
Table 2 Diameters of shoulders of shaft and housing for thrust bearing with flat back face



Unit: mm

d	Bearing series											
	511			512			513			514		
	D	d_a Min.	D_a Max.	D	d_a Min.	D_a Max.	D	d_a Min.	D_a Max.	D	d_a Min.	D_a Max.
10	24	18	16	26	20	16	—	—	—	—	—	—
12	26	20	18	28	22	18	—	—	—	—	—	—
15	28	23	20	32	25	22	—	—	—	—	—	—
17	30	25	22	35	28	24	—	—	—	—	—	—
20	35	29	26	40	32	28	—	—	—	—	—	—
25	42	35	32	47	38	34	52	41	36	60	46	39
30	47	40	37	52	43	39	60	48	42	70	54	46
35	52	45	42	62	51	46	68	55	48	80	62	53
40	60	52	48	68	57	51	78	63	55	90	70	60
45	65	57	53	73	62	56	85	69	61	100	78	67
50	70	62	58	78	67	61	95	77	68	110	86	74
55	78	69	64	90	76	69	105	85	75	120	94	81
60	85	75	70	95	81	74	110	90	80	130	102	88
65	90	80	75	100	86	79	115	95	85	140	110	95
70	95	85	80	105	91	84	125	103	92	150	118	102
75	100	90	85	110	96	89	135	111	99	160	125	110
80	105	95	90	115	101	94	140	116	104	170	133	117
85	110	100	95	125	109	101	150	124	111	180	141	124
90	120	108	102	135	117	108	155	129	116	190	149	131
100	135	121	114	150	130	120	170	142	128	210	165	145
110	145	131	124	160	140	130	190	158	142	230	181	159
120	155	141	134	170	150	140	210	173	157	250	196	174
130	170	154	146	190	166	154	225	186	169	270	212	188
140	180	164	156	200	176	164	240	199	181	280	222	198
150	190	174	166	215	189	176	250	209	191	300	238	212
160	200	184	176	225	199	186	270	225	205	—	—	—
170	215	197	188	240	212	198	280	235	215	—	—	—
180	225	207	198	250	222	208	300	251	229	—	—	—
190	240	220	210	270	238	222	320	266	244	—	—	—
200	250	230	220	280	248	232	340	282	258	—	—	—
220	270	250	240	300	268	252	—	—	—	—	—	—
240	300	276	264	340	299	281	—	—	—	—	—	—
260	320	296	284	360	319	301	—	—	—	—	—	—
280	350	322	308	380	339	321	—	—	—	—	—	—
300	380	348	332	420	371	349	—	—	—	—	—	—
320	400	368	352	440	391	369	—	—	—	—	—	—
340	420	388	372	460	411	389	—	—	—	—	—	—
360	440	408	392	500	442	418	—	—	—	—	—	—

Table 3 Diameters of shoulders of shaft and housing for thrust self-aligning roller bearing



Unit: mm

d	Bearing series								
	292			293			294		
	D	$d_a^{a)}$ Min.	D_a Max.	D	$d_a^{a)}$ Min.	D_a Max.	D	$d_a^{a)}$ Min.	D_a Max.
60	—	—	—	—	—	—	130	90	108
65	—	—	—	—	—	—	140	100	115
70	—	—	—	—	—	—	150	105	125
75	—	—	—	—	—	—	160	115	132
80	—	—	—	—	—	—	170	120	140
85	—	—	—	150	115	135	180	130	150
90	—	—	—	155	120	140	190	135	157
100	—	—	—	170	130	150	210	150	175
110	—	—	—	190	145	165	230	165	190
120	—	—	—	210	160	180	250	180	205
130	—	—	—	225	170	195	270	195	225
140	—	—	—	240	185	205	280	205	235
150	—	—	—	250	195	215	300	220	250
160	—	—	—	270	210	235	320	230	265
170	—	—	—	280	220	245	340	245	285
180	—	—	—	300	235	260	360	260	300
190	—	—	—	320	250	275	380	275	320
200	280	235	255	340	265	295	400	290	335
220	300	260	275	360	285	315	420	310	355
240	340	285	305	380	300	330	440	330	375
260	360	305	325	420	330	365	480	360	405
280	380	325	345	440	350	390	520	390	440
300	420	355	380	480	380	420	540	410	460
320	440	375	400	500	400	440	580	435	495
340	460	395	420	540	430	470	620	465	530
360	500	420	455	560	450	495	640	485	550
380	520	440	475	600	480	525	670	510	575
400	540	460	490	620	500	550	710	540	610
420	580	490	525	650	525	575	730	560	630
440	600	510	545	680	550	600	780	595	670
460	620	530	570	710	575	630	800	615	690
480	650	555	595	730	595	650	850	645	730
500	670	575	615	750	615	670	870	670	750

Note ^{a)} In the case where a large axial load is applied, the value of d_a shall be such that it sufficiently supports the rib of inner ring.

Table 4 Mounting dimensions of cylindrical roller bearing

