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Rolling bearings — Aligning thrust ball bearings and aligning seat washers — Boundary dimensions

Roulements — Butées à billes sphériques et contreplaques sphériques — Dimensions d'encombrement

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Foreword

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ISO 20516 was prepared by Technical Committee ISO/TC 4, *Rolling bearings*.

Rolling bearings — Aligning thrust ball bearings and aligning seat washers — Boundary dimensions

1 Scope

This International Standard specifies dimensions of single-direction and double-direction aligning thrust ball bearings with and without aligning seat washers.

2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 582, *Rolling bearings — Chamfer dimensions — Maximum values*

ISO 5593, *Rolling bearings — Vocabulary*

ISO 15241, *Rolling bearings — Symbols for quantities*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 5593 and the following apply.

3.1
aligning thrust ball bearing
⟨single-direction bearing⟩ thrust ball bearing which can accommodate permanent angular misalignment between its axis and the axis of its housing by means of an aligning housing washer

NOTE The spherical back face of the aligning housing washer mates with a matching concave spherical surface either in an aligning seat washer or its housing.

3.2
aligning thrust ball bearing
⟨double-direction bearing⟩ thrust ball bearing which can accommodate permanent angular misalignment between its axis and the axis of its housing by means of aligning housing washers

NOTE The spherical back faces of the aligning housing washers mate with matching concave spherical surfaces either in aligning seat washers or their housings.

3.3
single-direction aligning thrust ball bearing
aligning thrust ball bearing intended to support axial load in one direction only

3.4
double-direction aligning thrust ball bearing
aligning thrust ball bearing intended to support axial load in both directions

3.5
central shaft washer
central washer which is intended to be mounted on a shaft

4 Symbols

For the purposes of this document, the symbols given in ISO 15241 and the following apply.

The symbols given in Figures 1 to 4 and the values given in Tables 1 to 6 denote nominal dimensions unless specified otherwise.

NOTE Unless specified otherwise, the symbols are applicable to both single-direction and double-direction bearings.

A	centre height of aligning surface
B	height of central shaft washer, double-direction bearing
C	height of aligning seat washer
D	outside diameter of aligning housing washer
D_1	bore diameter of aligning housing washer
$D_{1s\ min}$	smallest single bore diameter of aligning housing washer
D_2	bore diameter of aligning seat washer
D_3	outside diameter of aligning seat washer
d	bore diameter of shaft washer, single-direction bearing
d_1	outside diameter of shaft washer, single-direction bearing
$d_{1s\ max}$	largest single outside diameter of shaft washer, single-direction bearing
d_2	bore diameter of central shaft washer, double-direction bearing
d_3	outside diameter of central shaft washer, double-direction bearing
$d_{3s\ max}$	largest single outside diameter of central shaft washer, double-direction bearing
R	radius of aligning surface of aligning housing washer and aligning seat washer
r	back face chamfer dimension of shaft washer, single-direction bearing and of aligning seat washer
$r_{s\ min}$	smallest single back face chamfer dimension of shaft washer, single-direction bearing and of aligning seat washer
r_1	face chamfer dimension of central shaft washer, double-direction bearing
$r_{1s\ min}$	smallest single face chamfer dimension of central shaft washer, double-direction bearing
T	bearing height, single-direction aligning thrust ball bearing
T_1	bearing height, single-direction aligning thrust ball bearing with aligning seat washer
T_2	bearing height, double-direction aligning thrust ball bearing
T_3	bearing height, double-direction aligning thrust ball bearing with aligning seat washers

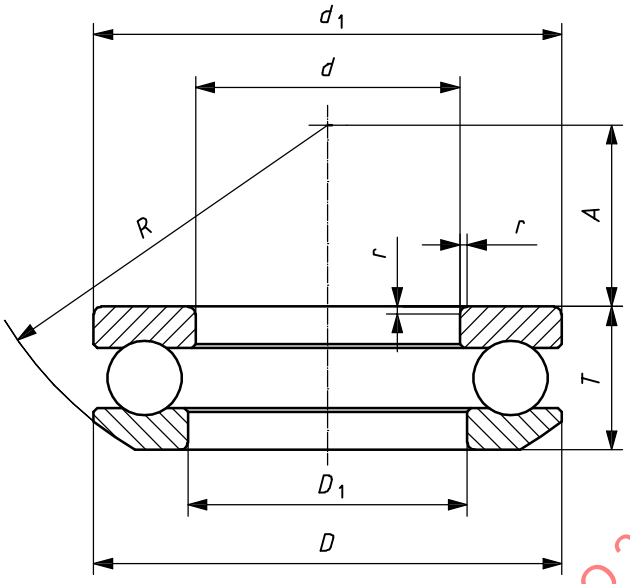

Figure 1 — Single-direction aligning thrust ball bearing

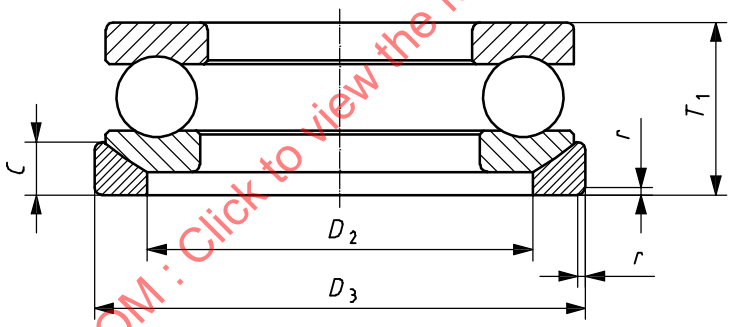

Figure 2 — Single-direction aligning thrust ball bearing with aligning seat washer

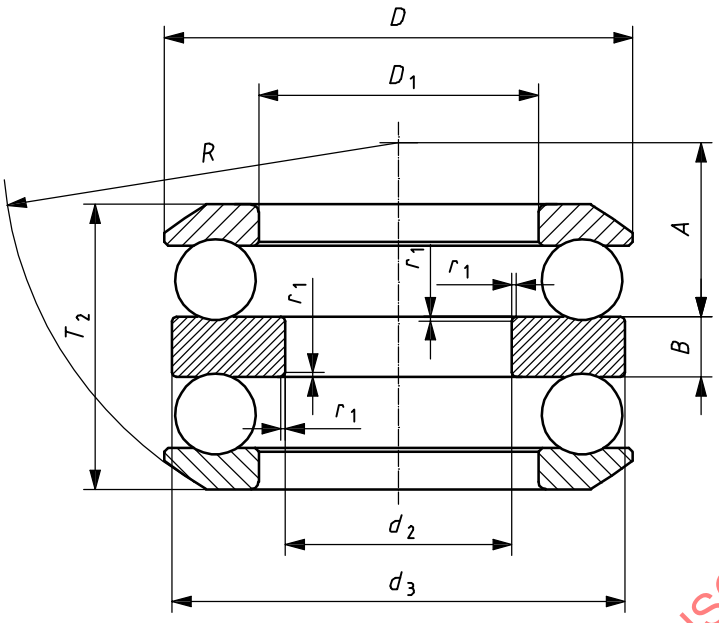

Figure 3 — Double-direction aligning thrust ball bearing

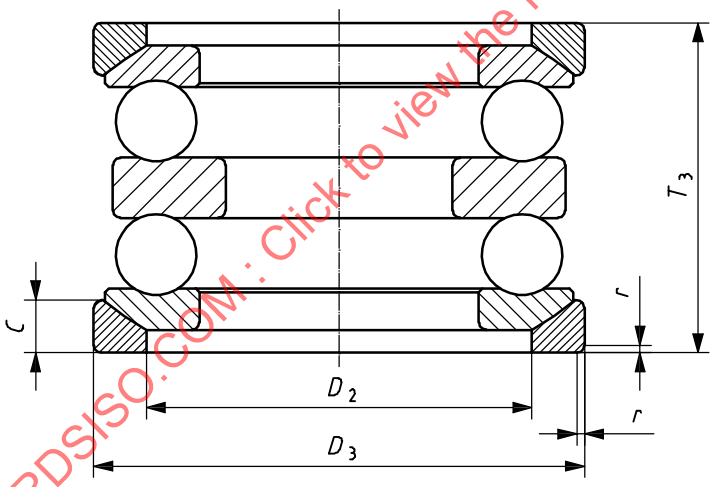

Figure 4 — Double-direction aligning thrust ball bearing with aligning seat washers

5 Boundary dimensions

5.1 General

The corresponding largest single chamfer dimensions to the $r_{s\,min}$ and $r_{1s\,min}$ dimensions in Tables 1 to 6 are given in ISO 582. The exact shape of the chamfer surface is not specified, but its contour in an axial plane shall not be allowed to project beyond an imaginary circular arc, of radius $r_{s\,min}$, tangential to the washer back face and the bore or outside cylindrical surface of the washer. For the washer face and the bore cylindrical surface, the same applies to $r_{1s\,min}$.

Chamfer dimensions r and r_1 apply only at the corners indicated in Figures 1 to 4. No dimensions are given for other corners; however, they should not be sharp.

5.2 Single-direction aligning thrust ball bearings and single-direction aligning thrust ball bearings with aligning seat washer

Dimensions for single-direction aligning thrust ball bearings and single-direction aligning thrust ball bearings with aligning seat washer are given in Tables 1 to 3.

Table 1 — Single-direction bearings — Diameter series 2

Dimensions in millimetres

d	D	$d_{1s\ max}$	$D_{1s\ min}$	T max.	A	R	D_2	D_3	T_1	C	$r_{s\ min}$
10	26	26 [a]	12	11,6	8,5	22	18	28	13	3,5	0,6
12	28	28 [a]	14	11,4	11,5	25	20	30	13	3,5	0,6
15	32	32 [a]	17	13,3	12	28	24	35	15	4	0,6
17	35	35 [a]	19	13,2	16	32	26	38	15	4	0,6
20	40	40 [a]	22	14,7	18	36	30	42	17	5	0,6
25	47	47 [a]	27	16,7	19	40	36	50	19	5,5	0,6
30	52	52 [a]	32	17,8	22	45	42	55	20	5,5	0,6
35	62	62 [a]	37	19,9	24	50	48	65	22	7	1
40	68	68 [a]	42	20,3	28,5	56	55	72	23	7	1
45	73	73 [a]	47	21,3	26	56	60	78	24	7,5	1
50	78	78 [a]	52	23,5	32,5	64	62	82	26	7,5	1
55	90	90 [a]	57	27,3	35	72	72	95	30	9	1
60	95	95 [a]	62	28	32,5	72	78	100	31	9	1
65	100	100 [a]	67	28,7	40	80	82	105	32	9	1
70	105	105 [a]	72	28,8	38	80	88	110	32	9	1
75	110	110 [a]	77	28,3	49	90	92	115	32	9,5	1
80	115	115 [a]	82	29,5	46	90	98	120	33	10	1
85	125	125 [a]	88	33,1	52	100	105	130	37	11	1
90	135	135 [a]	93	38,5	45	100	110	140	42	13,5	1,1
100	150	150 [a]	103	40,9	52	112	125	155	45	14	1,1
110	160	160 [a]	113	40,2	65	125	135	165	45	14	1,1
120	170	170 [a]	123	40,8	61	125	145	175	46	15	1,1
130	190	187	133	47,9	67	140	160	195	53	17	1,5
140	200	197	143	48,6	87	160	170	210	55	17	1,5
150	215	212	153	53,3	79	160	180	225	60	20,5	1,5
160	225	222	163	54,7	74	160	190	235	61	21	1,5
170	240	237	173	58,7	91	180	200	250	65	21,5	1,5
180	250	247	183	58,2	112	200	210	260	66	21,5	1,5
190	270	267	194	65,7	98	200	230	280	73	23	2
200	280	277	204	65,3	125	225	240	290	74	23	2
220	300	297	224	65,6	118	225	260	310	75	25	2
240	340	335	244	81,6	122	250	290	350	92	30	2,1
260	360	355	264	82,8	152	280	305	370	93	30	2,1
280	380	375	284	85	143	280	325	390	94	31	2,1
300	420	415	304	100,5	164	320	360	430	112	34	3
320	440	435	325	100,5	157	320	380	450	112	36	3
340	460	455	345	100,3	199	360	400	470	113	36	3
360	500	495	365	116,7	172	360	430	510	130	43	4

[a] If $d_{1s\ max}$ and D have the same nominal value, their tolerances shall be specified so that there is clearance between the shaft washer outside surface and the bore of a housing with nominal diameter equal to D.

Table 2 — Single-direction bearings — Diameter series 3

Dimensions in millimetres

d	D	$d_{1s\ max}$	$D_{1s\ min}$	T max.	A	R	D_2	D_3	T_1	C	$r_{s\ min}$
25	52	52 [a]	27	19,8	21	45	38	55	22	6	1
30	60	60 [a]	32	22,6	22	50	45	62	25	7	1
35	68	68 [a]	37	25,6	24	56	52	72	28	7,5	1
40	78	78 [a]	42	28,5	28	64	60	82	31	8,5	1
45	85	85 [a]	47	30,1	25	64	65	90	33	10	1
50	95	95 [a]	52	34,3	28	72	72	100	37	11	1,1
55	105	105 [a]	57	39,3	30	80	80	110	42	11,5	1,1
60	110	110 [a]	62	38,3	41	90	85	115	42	11,5	1,1
65	115	115 [a]	67	39,4	38,5	90	90	120	43	12,5	1,1
70	125	125 [a]	72	44,2	43	100	98	130	48	13	1,1
75	135	135 [a]	77	48,1	37	100	105	140	52	15	1,5
80	140	140 [a]	82	47,6	50	112	110	145	52	15	1,5
85	150	150 [a]	88	53,1	43	112	115	155	58	17,5	1,5
90	155	155 [a]	93	54,6	40	112	120	160	59	18	1,5
100	170	170 [a]	103	59,2	46	125	135	175	64	18	1,5
110	190	187	113	67,2	51	140	150	195	72	20,5	2
120	210	205	123	74,1	63	160	165	220	80	22	2,1
130	225	220	134	80,3	53	160	177	235	86	26	2,1
140	240	235	144	84,9	68	180	190	250	92	26	2,1
150	250	245	154	83,7	89,5	200	200	260	92	26	2,1
160	270	265	164	91,7	77	200	215	280	100	29	3
170	280	275	174	91,3	105	225	220	290	100	29	3
180	300	295	184	99,3	91	225	240	310	109	32	3
190	320	315	195	111	104	250	255	330	121	33	4
200	340	335	205	118,4	92	250	270	350	130	38	4

[a] If $d_{1s\ max}$ and D have the same nominal value, their tolerances shall be specified so that there is clearance between the shaft washer outside surface and the bore of a housing with nominal diameter equal to D.

Table 3 — Single-direction bearings — Diameter series 4

Dimensions in millimetres

d	D	$d_{1s\ max}$	$D_{1s\ min}$	T max.	A	R	D_2	D_3	T_1	C	$r_{s\ min}$
25	60	60 [a]	27	26,4	19	50	42	62	29	8	1
30	70	70 [a]	32	30,1	20	56	50	75	33	9	1
35	80	80 [a]	37	34	23	64	58	85	37	10	1,1
40	90	90 [a]	42	38,2	26	72	65	95	42	12	1,1
45	100	100 [a]	47	42,4	29	80	72	105	46	12,5	1,1
50	110	110 [a]	52	45,6	35	90	80	115	50	14	1,5
55	120	120 [a]	57	50,5	28	90	88	125	55	15,5	1,5
60	130	130 [a]	62	54	34	100	95	135	58	16	1,5
65	140	140 [a]	68	60,2	40	112	100	145	65	17,5	2
70	150	150 [a]	73	63,6	34	112	110	155	69	19,5	2
75	160	160 [a]	78	69	42	125	115	165	75	21	2
80	170	170 [a]	83	72,2	36	125	125	175	78	22	2,1
85	180	177	88	77	47	140	130	185	83	23	2,1
90	190	187	93	81,2	40	140	140	195	88	25,5	2,1
100	210	205	103	90	50	160	155	220	98	27	3
110	230	225	113	99,7	59	180	170	240	109	29	3
120	250	245	123	107,3	70	200	185	260	118	32	4
130	270	265	134	115,2	58	200	200	280	128	38	4
140	280	275	144	117	83	225	206	290	131	38	4
150	300	295	154	125,9	69	225	225	310	140	41	4
160	320	315	164	135,3	84	250	240	330	150	41,5	5
170	340	335	174	141	74	250	255	350	156	46	5
180	360	355	184	148,3	97	280	270	370	164	46,5	5

[a] If $d_{1s\ max}$ and D have the same nominal value, their tolerances shall be specified so that there is clearance between the shaft washer outside surface and the bore of a housing with nominal diameter equal to D.

5.3 Double-direction aligning thrust ball bearings and double-direction aligning thrust ball bearings with aligning seat washers

Dimensions for double-direction aligning thrust ball bearings and double-direction aligning thrust ball bearings with aligning seat washers are given in Tables 4 to 6.

Table 4 — Double-direction bearings — Diameter series 2

Dimensions in millimetres

d [a]	d_2	D	$d_{3s\ max}$	$D_{1s\ min}$	T_2 max.	B	A	R	D_2	D_3	T_3	C	$r_{s\ min}$	$r_{1s\ min}$
15	10	32	32 [b]	17	24,6	5	10,5	28	24	35	28	4	0,6	0,3
20	15	40	40 [b]	22	27,4	6	16	36	30	42	32	5	0,6	0,3
25	20	47	47 [b]	27	31,4	7	16,5	40	36	50	36	5,5	0,6	0,3
30	25	52	52 [b]	32	32,6	7	20	45	42	55	37	5,5	0,6	0,3
35	30	62	62 [b]	37	37,8	8	21	50	48	65	42	7	1	0,3
40	30	68	68 [b]	42	38,6	9	25	56	55	72	44	7	1	0,6
45	35	73	73 [b]	47	39,6	9	23	56	60	78	45	7,5	1	0,6
50	40	78	78 [b]	52	42	9	30,5	64	62	82	47	7,5	1	0,6
55	45	90	90 [b]	57	49,6	10	32,5	72	72	95	55	9	1	0,6
60	50	95	95 [b]	62	50	10	30,5	72	78	100	56	9	1	0,6
65	55	100	100 [b]	67	50,4	10	38,5	80	82	105	57	9	1	0,6
70	55	105	105 [b]	72	50,6	10	36,5	80	88	110	57	9	1	1
75	60	110	110 [b]	77	49,6	10	47,5	90	92	115	57	9,5	1	1
80	65	115	115 [b]	82	51	10	45	90	98	120	58	10	1	1
85	70	125	125 [b]	88	59,2	12	49,5	100	105	130	67	11	1	1
90	75	135	135 [b]	93	69	14	42	100	110	140	76	13,5	1,1	1
100	85	150	150 [b]	103	72,8	15	49	112	125	155	81	14	1,1	1
110	95	160	160 [b]	113	71,4	15	62	125	135	165	81	14	1,1	1
120	100	170	170 [b]	123	71,6	15	58,5	125	145	175	82	15	1,1	1,1
130	110	190	189,5	133	85,8	18	63	140	160	195	96	17	1,5	1,1
140	120	200	199,5	143	86,2	18	83,5	160	170	210	99	17	1,5	1,1
150	130	215	214,5	153	95,6	20	74,5	160	180	225	109	20,5	1,5	1,1
160	140	225	224,5	163	97,4	20	70	160	190	235	110	21	1,5	1,1
170	150	240	239,5	173	104,4	21	87	180	200	250	117	21,5	1,5	1,1
180	150	250	249	183	102,4	21	108,5	200	210	260	118	21,5	1,5	2
190	160	270	269	194	116,4	24	93,5	200	230	280	131	23	2	2
200	170	280	279	204	115,6	24	120,5	225	240	290	133	23	2	2
220	190	300	299	224	115,2	24	114	225	260	310	134	25	2	2

[a] d is the bore diameter of the shaft washer of the corresponding diameter series 2, single-direction bearing, given in Table 1.

[b] If $d_{3s\ max}$ and D have the same nominal value, their tolerances shall be specified so that there is clearance between the shaft washer outside surface and the bore of a housing with nominal diameter equal to D.