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ISO

INTERNATIONAL ORGANIZATION FOR STANDARDIZATION

ISO RECOMMENDATION

R 15

PART I

ROLLING BEARINGS
RADIAL BEARINGS
BOUNDARY DIMENSIONS

GENERAL PLAN
Diameter Series 8, 9, 0, 1, 2, 3 and 4

2nd EDITION
December 1968

This second edition supersedes section 1 of ISO Recommendation R 15 - 1955 and section 1 of ISO Recommendation R 104 - 1959.

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BRIEF HISTORY

The ISO Recommendation R 15, Part I, *Rolling bearings – Radial bearings – Boundary dimensions – General plan – Diameter Series 8, 9, 0, 1, 2, 3 and 4*, was drawn up by Technical Committee ISO/TC 4, *Rolling bearings*, the Secretariat of which is held by the Sveriges Standardiseringskommission (SIS).

This ISO Recommendation cancels and replaces section 1 of ISO Recommendation R 15-1955, *Ball and roller bearings*, and section 1 of ISO Recommendation R 104-1959, *Ball and roller bearings – Boundary dimensions.*

Work on this question by the Technical Committee began in 1955 and led, in 1963, to the adoption of a Draft ISO Recommendation.

In April 1964, this Draft ISO Recommendation (No. 358) was circulated to all the ISO Member Bodies for enquiry. It was approved, subject to a few modifications of an editorial nature, by the following Member Bodies:

Argentina	Hungary	Spain
Australia	India	Sweden
Austria	Israel	Switzerland
Canada	Italy	Turkey
Chile	Japan	United Kingdom
Colombia	Korea, Rep. of	U.S.A.
Czechoslovakia	Netherlands	U.S.S.R.
France	Poland	Yugoslavia
Germany	Portugal	
Greece	Romania	

No Member Body opposed the approval of the Draft.

The Draft ISO Recommendation was then submitted by correspondence to the ISO Council, which decided, in November 1967, to accept it as an ISO Recommendation.

The validity of the vote was however called into question, owing to the fact that the text placed before the Council included two new widths which had not been submitted to all ISO Member Bodies for prior approval. Acceptance of the Draft was therefore rescinded.

When voting on the two new values in May 1968, a majority of the Member Bodies approved them. No negative ballot was recorded.

The Draft ISO Recommendation was then re-submitted by correspondence to the ISO Council, which decided, in December 1968, to accept the document as an ISO RECOMMENDATION.

ISO Recommendation R 15 December 1968

PART I

ROLLING BEARINGS
RADIAL BEARINGS
BOUNDARY DIMENSIONS

GENERAL PLAN

Diameter Series 8, 9, 0, 1, 2, 3 and 4

INTRODUCTION

1. The object of the General Plan is to reduce the number of radial bearing sizes enough to ensure economic production and yet to provide a sufficient number of sizes to satisfy present and future needs of bearing users. These needs are very comprehensive and varying. Therefore the Plan has to embrace a wide range of numerically determined sizes and proportions and may even be extended by ISO in accordance with the general rules given in section 3.

2. The General Plan is to be considered as a guide for national standardizing organizations. National standards can with advantage cover a restricted range of sizes, but refer to this ISO Recommendation as the rational source of any extension. Especially when standardizing sizes of particular bearing types, national organizations should consider their standards very carefully with a view to keeping the number of bearing sizes as small as is compatible with a good overall national economy, excluding sizes not manufactured and not required for the time being.

   Bearing manufacturers should select from the national standard the sizes and proportions appropriate to the bearing type and to the purpose under consideration.

   Bearing users should select bearing types and sizes from the manufacturers specifications, giving preference to bearings whose dimensions conform to the national standard. As all bearings may not be in current production at any particular time, it is advisable for user designers to approach bearing manufacturers during the early stages of design for information regarding the availability of the bearings.

3. The General Plan comprises

   (*a*) numerically determined nominal boundary dimensions (see section 2, Tables 1 to 7);

   (*b*) general rules for the extension of the Plan (see section 3).

   The General Plan does not contain any directions pertaining to the internal design of bearings or any indication as to their availability.

4. The chamfer dimensions given in Tables 1 to 7 do not necessarily apply to

   (*a*) the groove side of bearing rings with snap ring groove,

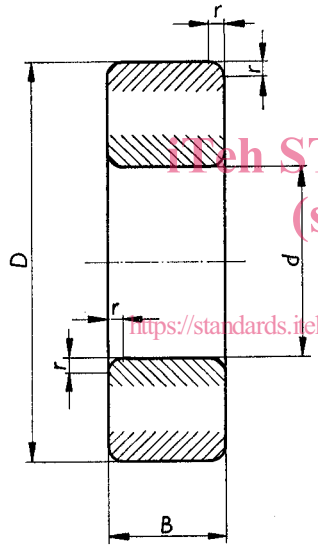
   (*b*) the flangeless side of thin cylindrical roller-bearing rings,

   (*c*) the non-thrust side of angular contact bearing rings,

   (*d*) inner rings of bearings with tapered bore.

5. This ISO Recommendation does not apply to tapered roller-bearings.

1. SYMBOLS



d = *bearing bore diameter*

D = *bearing outside diameter*

B = *bearing width (individual inner and outer rings)*

r = *inner and outer ring chamfer dimension*

$r_{nominal}$ = *nominal chamfer dimension**

* Nominal chamfer dimensions do not control the shape of the bearing corner, i.e. the profile of the bearing corners created by the chamfering or rounding off.

2. NUMERICALLY DETERMINED BOUNDARY DIMENSIONS

2.1 Diameter series 8

TABLE 1

Dimensions in millimetres

Bore diameter	Outside diameter	Dimension series								
		08	18	28	38	48	58	68	08	18-68
d	D	Width B							Chamfer $r_{nominal}$	
0.6	2.5	—	1	—	1.4	—	—	—	—	0.15
1	3	—	1	—	1.5	—	—	—	—	0.15
1.5	4	—	1.2	—	2	—	—	—	—	0.2
2	5	—	1.5	—	2.3	—	—	—	—	0.2
2.5	6	—	1.8	—	2.6	—	—	—	—	0.3
3	7	—	2	—	3	—	—	—	—	0.3
4	9	—	2.5	3.5	4	—	—	—	—	0.3
5	11	—	3	4	5	—	—	—	—	0.3
6	13	—	3.5	5	6	—	—	—	—	0.3
7	14	—	3.5	5	6	—	—	—	—	0.3
8	16	—	4	5	6	8	—	—	—	0.4
9	17	—	4	5	6	8	—	—	—	0.4
10	19	—	5	6	7	9	—	—	—	0.5
12	21	—	5	6	7	9	—	—	—	0.5
15	24	—	5	6	7	9	—	—	—	0.5
17	26	—	5	6	7	9	—	—	—	0.5
20	32	4	7	8	10	12	16	22	0.5	0.5
22	34	4	7	—	10	—	16	22	0.5	0.5
25	37	4	7	8	10	12	16	22	0.5	0.5
28	40	4	7	—	10	—	16	22	0.5	0.5
30	42	4	7	8	10	12	16	22	0.5	0.5
32	44	4	7	—	10	—	16	22	0.5	0.5
35	47	4	7	8	10	12	16	22	0.5	0.5
40	52	4	7	8	10	12	16	22	0.5	0.5
45	58	4	7	8	10	13	18	23	0.5	0.5
50	65	5	7	10	12	15	20	27	0.5	0.5
55	72	7	9	11	13	17	23	30	0.5	0.5
60	78	7	10	12	14	18	24	32	0.5	0.5
65	85	7	10	13	15	20	27	36	0.5	1
70	90	8	10	13	15	20	27	36	0.5	1
75	95	8	10	13	15	20	27	36	0.5	1
80	100	8	10	13	15	20	27	36	0.5	1
85	110	9	13	16	19	25	34	45	0.5	1.5
90	115	9	13	16	19	25	34	45	0.5	1.5
95	120	9	13	16	19	25	34	45	0.5	1.5
100	125	9	13	16	19	25	34	45	0.5	1.5
105	130	9	13	16	19	25	34	45	0.5	1.5
110	140	10	16	19	23	30	40	54	1	1.5
120	150	10	16	19	23	30	40	54	1	1.5
130	165	11	18	22	26	35	46	63	1	2
140	175	11	18	22	26	35	46	63	1	2
150	190	13	20	24	30	40	54	71	1	2
160	200	13	20	24	30	40	54	71	1	2
170	215	14	22	27	34	45	60	80	1	2
180	225	14	22	27	34	45	60	80	1	2

TABLE 1 *(concluded)*

Dimensions in millimetres

Bore diameter *d*	Outside diameter *D*	Dimension series 08	18	28	38	48	58	68	08	18-68
		Width *B*							Chamfer $r_{nominal}$	
190	240	16	24	30	37	50	67	90	1.5	2.5
200	250	16	24	30	37	50	67	90	1.5	2.5
220	270	16	24	30	37	50	67	90	1.5	2.5
240	300	19	28	36	45	60	80	109	1.5	3
260	320	19	28	36	45	60	80	109	1.5	3
280	350	22	33	42	52	69	95	125	2	3
300	380	25	38	48	60	80	109	145	2.5	3.5
320	400	25	38	48	60	80	109	145	2.5	3.5
340	420	25	38	48	60	80	109	145	2.5	3.5
360	440	25	38	48	60	80	109	145	2.5	3.5
380	480	31	46	60	75	100	136	180	3	3.5
400	500	31	46	60	75	100	136	180	3	3.5
420	520	31	46	60	75	100	136	180	3	3.5
440	540	31	46	60	75	100	136	180	3	3.5
460	580	37	56	72	90	118	160	218	3.5	4
480	600	37	56	72	90	118	160	218	3.5	4
500	620	37	56	72	90	118	160	218	3.5	4
530	650	37	56	72	90	118	160	218	3.5	4
560	680	37	56	72	90	118	160	218	3.5	4
600	730	42	60	78	98	128	175	236	4	4
630	780	48	69	88	112	150	200	272	4	5
670	820	48	69	88	112	150	200	272	4	5
710	870	50	74	95	118	160	218	290	5	5
750	920	54	78	100	128	170	230	308	5	6
800	980	57	82	106	136	180	243	325	5	6
850	1030	57	82	106	136	180	243	325	5	6
900	1090	60	85	112	140	190	258	345	6	6
950	1150	63	90	118	150	200	272	355	6	6
1000	1220	71	100	128	165	218	300	400	6	8
1060	1280	71	100	128	165	218	300	400	6	8
1120	1360	78	106	140	180	243	325	438	6	8
1180	1420	78	106	140	180	243	325	438	6	8
1250	1500	80	112	145	185	250	335	450	8	8
1320	1600	88	122	165	206	280	375	500	8	8
1400	1700	95	132	175	224	300	400	545	8	10
1500	1820	—	140	185	243	315	—	—	—	10
1600	1950	—	155	200	265	345	—	—	—	10
1700	2060	—	160	206	272	355	—	—	—	10
1800	2180	—	165	218	290	375	—	—	—	12
1900	2300	—	175	230	300	400	—	—	—	12
2000	2430	—	190	250	325	425	—	—	—	12

2.2 Diameter series 9

TABLE 2

Dimensions in millimetres

Bore diameter d	Outside diameter D	Dimension series 09	19	29	39	49	59	69	09	19-69
		Width B							Chamfer $r_{nominal}$	
1	4	—	1.6	—	2.3	—	—	—	—	0.2
1.5	5	—	2	—	2.6	—	—	—	—	0.3
2	6	—	2.3	—	3	—	—	—	—	0.3
2.5	7	—	2.5	—	3.5	—	—	—	—	0.3
3	8	—	3	—	4	—	—	—	—	0.3
4	11	—	4	—	5	—	—	—	—	0.3
5	13	—	4	—	6	10	—	—	—	0.4
6	15	—	5	—	7	10	—	—	—	0.4
7	17	—	5	—	7	10	—	—	—	0.5
8	19	—	6	—	9	11	—	—	—	0.5
9	20	—	6	—	9	11	—	—	—	0.5
10	22	—	6	8	10	13	16	22	—	0.5
12	24	—	6	8	10	13	16	22	—	0.5
15	28	—	7	8.5	10	13	18	23	—	0.5
17	30	—	7	8.5	10	13	18	23	—	0.5
20	37	7	9	11	13	17	23	30	0.5	0.5
22	39	7	9	11	13	17	23	30	0.5	0.5
25	42	7	9	11	13	17	23	30	0.5	0.5
28	45	7	9	11	13	17	23	30	0.5	0.5
30	47	7	9	11	13	17	23	30	0.5	0.5
32	52	7	10	13	15	20	27	36	0.5	1
35	55	7	10	13	15	20	27	36	0.5	1
40	62	8	12	14	16	22	30	40	0.5	1
45	68	8	12	14	16	22	30	40	0.5	1
50	72	8	12	14	16	22	30	40	0.5	1
55	80	9	13	16	19	25	34	45	0.5	1.5
60	85	9	13	16	19	25	34	45	0.5	1.5
65	90	9	13	16	19	25	34	45	0.5	1.5
70	100	10	16	19	23	30	40	54	1	1.5
75	105	10	16	19	23	30	40	54	1	1.5
80	110	10	16	19	23	30	40	54	1	1.5
85	120	11	18	22	26	35	46	63	1	2
90	125	11	18	22	26	35	46	63	1	2
95	130	11	18	22	26	35	46	63	1	2
100	140	13	20	24	30	40	54	71	1	2
105	145	13	20	24	30	40	54	71	1	2
110	150	13	20	24	30	40	54	71	1	2
120	165	14	22	27	34	45	60	80	1	2
130	180	16	24	30	37	50	67	90	1.5	2.5
140	190	16	24	30	37	50	67	90	1.5	2.5
150	210	19	28	36	45	60	80	109	1.5	3
160	220	19	28	36	45	60	80	109	1.5	3
170	230	19	28	36	45	60	80	109	1.5	3
180	250	22	33	42	52	69	95	125	2	3

TABLE 2 *(concluded)*

Dimensions in millimetres

Bore diameter	Outside diameter	Dimension series								
		09	19	29	39	49	59	69	09	19-69
d	*D*	Width *B*							Chamfer $r_{nominal}$	
190	260	22	33	42	52	69	95	125	2	3
200	280	25	38	48	60	80	109	145	2.5	3.5
220	300	25	38	48	60	80	109	145	2.5	3.5
240	320	25	38	48	60	80	109	145	2.5	3.5
260	360	31	46	60	75	100	136	180	3	3.5
280	380	31	46	60	75	100	136	180	3	3.5
300	420	37	56	72	90	118	160	218	3.5	4
320	440	37	56	72	90	118	160	218	3.5	4
340	460	37	56	72	90	118	160	218	3.5	4
360	480	37	56	72	90	118	160	218	3.5	4
380	520	44	65	82	106	140	190	250	4	5
400	540	44	65	82	106	140	190	250	4	5
420	560	44	65	82	106	140	190	250	4	5
440	600	50	74	95	118	160	218	290	5	5
460	620	50	74	95	118	160	218	290	5	5
480	650	54	78	100	128	170	230	308	5	6
500	670	54	78	100	128	170	230	308	5	6
530	710	57	82	106	136	180	243	325	5	6
560	750	60	85	112	140	190	258	345	6	6
600	800	63	90	118	150	200	272	355	6	6
630	850	71	100	128	165	218	300	400	6	8
670	900	73	103	136	170	230	308	412	6	8
710	950	78	106	140	180	243	325	438	6	8
750	1000	80	112	145	185	250	335	450	8	8
800	1060	82	115	150	195	258	355	462	8	8
850	1120	85	118	155	200	272	365	488	8	8
900	1180	88	122	165	206	280	375	500	8	8
950	1250	95	132	175	224	300	400	545	8	10
1000	1320	103	140	185	236	315	438	580	8	10
1060	1400	109	150	195	250	335	462	615	10	10
1120	1460	109	150	195	250	335	462	615	10	10
1180	1540	115	160	206	272	355	488	650	10	10
1250	1630	122	170	218	280	375	515	690	10	10
1320	1720	128	175	230	300	400	545	710	10	10
1400	1820	—	185	243	315	425	—	—	—	12
1500	1950	—	195	258	335	450	—	—	—	12
1600	2060	—	200	265	345	462	—	—	—	12
1700	2180	—	212	280	355	475	—	—	—	12
1800	2300	—	218	290	375	500	—	—	—	15
1900	2430	—	230	308	400	530	—	—	—	15

2.3 Diameter series 0

TABLE 3

Dimensions in millimetres

Bore diameter	Outside diameter	Dimension series								
		00	10	20	30	40	50	60	00	10-60
d	D	Width B							Chamfer $r_{nominal}$	
1.5	6	—	2.5	—	3	—	—	—	—	0.3
2	7	—	2.8	—	3.5	—	—	—	—	0.3
2.5	8	—	2.8	—	4	—	—	—	—	0.3
3	9	—	3	—	5	—	—	—	—	0.3
4	12	—	4	—	6	—	—	—	—	0.4
5	14	—	5	—	7	—	—	—	—	0.4
6	17	—	6	—	9	—	—	—	—	0.5
7	19	—	6	8	10	—	—	—	—	0.5
8	22	—	7	9	11	14	19	25	—	0.5
9	24	—	7	10	12	15	20	27	—	0.5
10	26	—	8	10	12	16	21	29	—	0.5
12	28	7	8	10	12	16	21	29	0.5	0.5
15	32	8	9	11	13	17	23	30	0.5	0.5
17	35	8	10	12	14	18	24	32	0.5	0.5
20	42	8	12	14	16	22	30	40	0.5	1
22	44	8	12	14	16	22	30	40	0.5	1
25	47	8	12	14	16	22	30	40	0.5	1
28	52	8	12	15	18	24	32	43	0.5	1
30	55	9	13	16	19	25	34	45	0.5	1.5
32	58	9	13	16	20	26	35	47	0.5	1.5
35	62	9	14	17	20	27	36	48	0.5	1.5
40	68	9	15	18	21	28	38	50	0.5	1.5
45	75	10	16	19	23	30	40	54	1	1.5
50	80	10	16	19	23	30	40	54	1	1.5
55	90	11	18	22	26	35	46	63	1	2
60	95	11	18	22	26	35	46	63	1	2
65	100	11	18	22	26	35	46	63	1	2
70	110	13	20	24	30	40	54	71	1	2
75	115	13	20	24	30	40	54	71	1	2
80	125	14	22	27	34	45	60	80	1	2
85	130	14	22	27	34	45	60	80	1	2
90	140	16	24	30	37	50	67	90	1.5	2.5
95	145	16	24	30	37	50	67	90	1.5	2.5
100	150	16	24	30	37	50	67	90	1.5	2.5
105	160	18	26	33	41	56	75	100	1.5	3
110	170	19	28	36	45	60	80	109	1.5	3
120	180	19	28	36	46	60	80	109	1.5	3
130	200	22	33	42	52	69	95	125	2	3
140	210	22	33	42	53	69	95	125	2	3
150	225	24	35	45	56	75	100	136	2	3.5
160	240	25	38	48	60	80	109	145	2.5	3.5
170	260	28	42	54	67	90	122	160	2.5	3.5
180	280	31	46	60	74	100	136	180	3	3.5

TABLE 3 *(concluded)*

Dimensions in millimetres

Bore diameter	Outside diameter	Dimension series								
		00	10	20	30	40	50	60	00	10-60
d	*D*	Width *B*							Chamfer $r_{nominal}$	
190	290	31	46	60	75	100	136	180	3	3.5
200	310	34	51	66	82	109	150	200	3	3.5
220	340	37	56	72	90	118	160	218	3.5	4
240	360	37	56	72	92	118	160	218	3.5	4
260	400	44	65	82	104	140	190	250	4	5
280	420	44	65	82	106	140	190	250	4	5
300	460	50	74	95	118	160	218	290	5	5
320	480	50	74	95	121	160	218	290	5	5
340	520	57	82	106	133	180	243	325	5	6
360	540	57	82	106	134	180	243	325	5	6
380	560	57	82	106	135	180	243	325	5	6
400	600	63	90	118	148	200	272	355	6	6
420	620	63	90	118	150	200	272	355	6	6
440	650	67	94	122	157	212	280	375	6	8
460	680	71	100	128	163	218	300	400	6	8
480	700	71	100	128	165	218	300	400	6	8
500	720	71	100	128	167	218	300	400	6	8
530	780	80	112	145	185	250	335	450	8	8
560	820	82	115	150	195	258	355	462	8	8
600	870	85	118	155	200	272	365	488	8	8
630	920	92	128	170	212	290	388	515	8	10
670	980	100	136	180	230	308	425	560	8	10
710	1030	103	140	185	236	315	438	580	8	10
750	1090	109	150	195	250	335	462	615	10	10
800	1150	112	155	200	258	345	475	630	10	10
850	1220	118	165	212	272	365	500	670	10	10
900	1280	122	170	218	280	375	515	690	10	10
950	1360	132	180	236	300	412	560	730	10	10
1000	1420	136	185	243	308	412	560	750	10	10
1060	1500	140	195	250	325	438	600	800	12	12
1120	1580	145	200	265	345	462	615	825	12	12
1180	1660	155	212	272	355	475	650	875	12	12
1250	1750	—	218	290	375	500	—	—	—	12
1320	1850	—	230	300	400	530	—	—	—	15
1400	1950	—	243	315	412	545	—	—	—	15
1500	2120	—	272	355	462	615	—	—	—	15
1600	2240	—	280	365	475	630	—	—	—	15
1700	2360	—	290	375	500	650	—	—	—	18
1800	2500	—	308	400	530	690	—	—	—	18

2.4 Diameter series 1

TABLE 4

Dimensions in millimetres

Bore diameter d	Outside diameter D	Dimension series 01	11	21	31	41	01	11-41
		Width B					Chamfer $r_{nominal}$	
100	165	21	30	39	52	65	2	3
105	175	22	33	42	56	69	2	3
110	180	22	33	42	56	69	2	3
120	200	25	38	48	62	80	2.5	3
130	210	25	38	48	64	80	2.5	3
140	225	27	40	50	68	85	2.5	3.5
150	250	31	46	60	80	100	3	3.5
160	270	34	51	66	86	109	3	3.5
170	280	34	51	66	88	109	3	3.5
180	300	37	56	72	96	118	3.5	4
190	320	42	60	78	104	128	4	4
200	340	44	65	82	112	140	4	4
220	370	48	69	88	120	150	4	5
240	400	50	74	95	128	160	5	5
260	440	57	82	106	144	180	5	5
280	460	57	82	106	146	180	5	6
300	500	63	90	118	160	200	6	6
320	540	71	100	128	176	218	6	6
340	580	78	106	140	190	243	6	6
360	600	78	106	140	192	243	6	6
380	620	78	106	140	194	243	6	6
400	650	80	112	145	200	250	8	8
420	700	88	122	165	224	280	8	8
440	720	88	122	165	226	280	8	8
460	760	95	132	175	240	300	8	10
480	790	100	136	180	248	308	8	10
500	830	106	145	190	264	325	10	10
530	870	109	150	195	272	335	10	10
560	920	115	160	206	280	355	10	10
600	980	122	170	218	300	375	10	10
630	1030	128	175	230	315	400	10	10
670	1090	136	185	243	336	412	10	10
710	1150	140	195	250	345	438	12	12
750	1220	150	206	272	365	475	12	12
800	1280	155	212	272	375	475	12	12
850	1360	165	224	290	400	500	15	15
900	1420	165	230	300	412	515	15	15
950	1500	175	243	315	438	545	15	15
1000	1580	185	258	335	462	580	15	15
1060	1660	190	265	345	475	600	15	18
1120	1750	—	280	365	475	630	—	18
1180	1850	—	290	388	500	670	—	18
1250	1950	—	308	400	530	710	—	18
1320	2060	—	325	425	560	750	—	18
1400	2180	—	345	450	580	775	—	22
1500	2300	—	355	462	600	800	—	22