BS ISO 20515:2012

BSI Standards Publication

Rolling bearings — Radial bearings, retaining slots — Dimensions and tolerances

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National foreword

This British Standard is the UK implementation of ISO 20515:2012. It supersedes BS ISO 20515:2007 which is withdrawn.

The UK participation in its preparation was entrusted to Technical Committee MCE/7, Rolling bearings.

A list of organizations represented on this committee can be obtained on request to its secretary.

This publication does not purport to include all the necessary provisions of a contract. Users are responsible for its correct application.

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INTERNATIONAL STANDARD

ISO 20515

Second edition
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Rolling bearings — Radial bearings, retaining slots — Dimensions and tolerances

Roulements — Roulements radiaux, encoches de retenue — Dimensions et tolérances

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Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.

The main task of technical committees is to prepare International Standards. Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights.

ISO 20515 was prepared by Technical Committee ISO/TC 4, *Rolling bearings*, Subcommittee SC 12, *Ball bearings*.

This second edition cancels and replaces the first edition (ISO 20515:2007), of which it constitutes a minor revision. In particular, a new Figure 2 and a corrected title for Table 6 have been added.

INTERNATIONAL STANDARD ISO 20515:2012(E)

Rolling bearings — Radial bearings, retaining slots — Dimensions and tolerances

1 Scope

This International Standard specifies dimensions and tolerances of retaining slots to be used for outer rings of single-row angular contact ball bearings, four-point-contact ball bearings and radial cylindrical roller bearings. The retaining slots are not suitable for use in the outer rings of sealed and shielded radial ball bearings, nor in the outer rings of radial cylindrical roller bearings without ribs.

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 15, *Rolling bearings — Radial bearings — Boundary dimensions, general plan*

ISO 1132-1, *Rolling bearings — Tolerances — Part 1: Terms and definitions*

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 1132-1 and ISO 5593 and the following apply.

3.1
retaining slot
angled slot in an outer ring at the intersection of the outside surface and the face of the ring

NOTE The slot is to provide a simple means of preventing rotation of the outer ring of a bearing.

4 Symbols

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

The symbols (except those for tolerances) shown in Figure 1, and the values given in Tables 1 to 6, denote nominal dimensions, unless specified otherwise.

NOTE Figures 1 and 2 show four-point-contact ball bearings with one retaining slot and two retaining slots, respectively.

b retaining slot width

D outside diameter of outer ring

h retaining slot depth

r_0 fillet radius at bottom of retaining slot

t retaining slot symmetry or position tolerance

Δ_{bs} deviation of a single retaining slot width

Δ_{hs} deviation of a single retaining slot depth

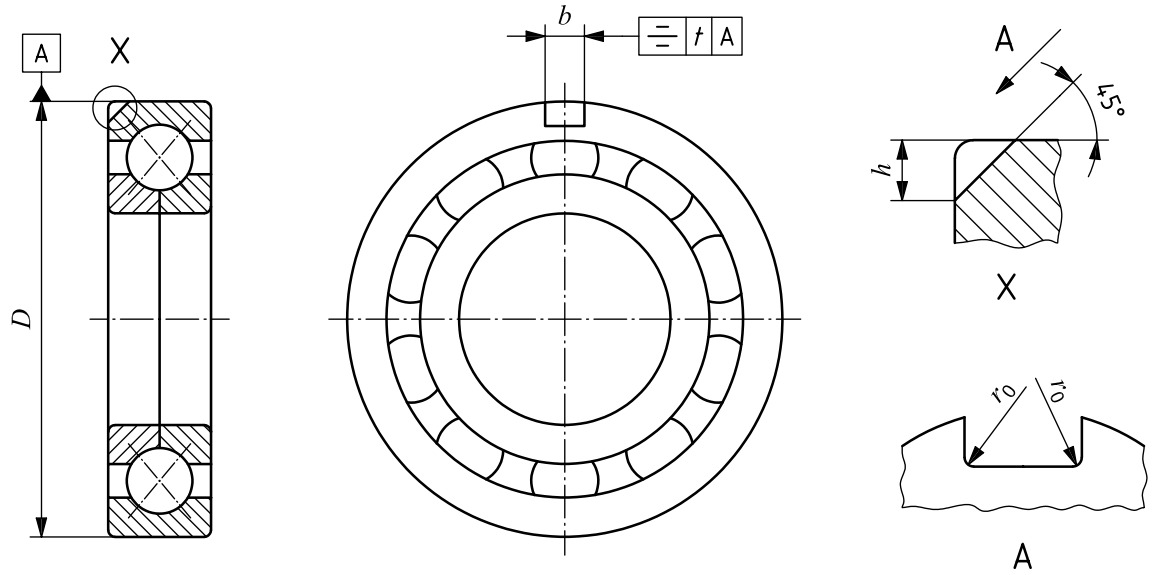

Figure 1 — Retaining slot in radial bearing with one retaining slot

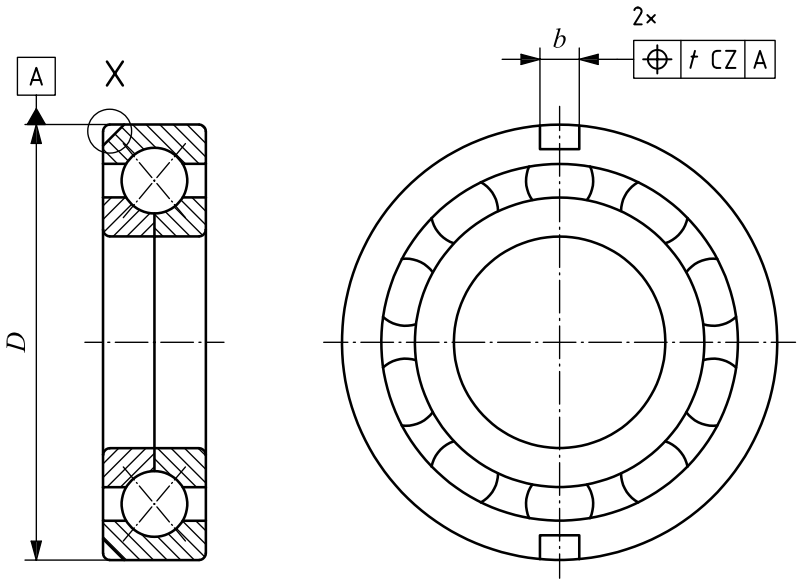

Figure 2 — Retaining slot in radial bearing with two diametrically opposed retaining slots

5 Dimensions

5.1 General

The dimensions for retaining slots in single-row angular contact ball bearings and four-point-contact ball bearings of diameter series 0, 2, 3 and 4, and radial cylindrical roller bearings of dimension series 10, 02E, 22E, 03E, 23E and 04, are given in Tables 1 and 2, respectively.

The diameter series and dimension series referred to in Tables 1 and 2 are those defined in ISO 15.

NOTE For radial cylindrical roller bearings of dimension series 02E, 22E, 03E and 23E, the E signifies that they are of a design having reinforced roller and cage assembly and increased radial load-carrying capacity.

5.2 Single-row angular contact ball bearings and four-point-contact ball bearings

Table 1 — Diameter series 0, 2, 3 and 4

Dimensions in millimetres

D	Diameter series											
	0			2			3			4		
	h	b	r_0 max.	h	b	r_0 max.	h	b	r_0 max.	h	b	r_0 max.
40	—	—	—	2,5	3,5	0,5	—	—	—	—	—	—
47	2,5	3,5	0,5	3	4,5	0,5	3,5	4,5	0,5	—	—	—
50	—	—	—	3	4,5	0,5	—	—	—	—	—	—
52	3	3,5	0,5	3	4,5	0,5	3,5	4,5	0,5	3,5	4,5	0,5
55	3	3,5	0,5	—	—	—	—	—	—	—	—	—
56	—	—	—	—	—	—	3,5	4,5	0,5	—	—	—
58	3	3,5	0,5	3	4,5	0,5	—	—	—	—	—	—
62[a]	3,5[a]	4,5[a]	0,5[a]	3,5	4,5	0,5	3,5	4,5	0,5	3,5	4,5	0,5
65	—	—	—	3,5	4,5	0,5	—	—	—	—	—	—

Table 1 *(continued)*

D	Diameter series											
	0			**2**			**3**			**4**		
	h	b	r_0 max.	h	b	r_0 max.	h	b	r_0 max.	h	b	r_0 max.
68	3,5	4,5	0,5	—	—	—	3,5	4,5	0,5	—	—	—
72	—	—	—	3,5	4,5	0,5	3,5	4,5	0,5	3,5	4,5	0,5
75[a]	4[a]	5,5[a]	0,5[a]	—	—	—	4	5,5	0,5	—	—	—
80[a]	4[a]	5,5[a]	0,5[a]	4	5,5	0,5	4	5,5	0,5	4	5,5	0,5
85	—	—	—	4	5,5	0,5	—	—	—	—	—	—
90	4	5,5	0,5	4	5,5	0,5	4	5,5	0,5	4	5,5	0,5
95	4	5,5	0,5	—	—	—	—	—	—	—	—	—
100[a]	5[a]	6,5[a]	0,5[a]	5	6,5	0,5	5	6,5	0,5	5	6,5	0,5
110	5	6,5	0,5	5	6,5	0,5	5	6,5	0,5	5	6,5	0,5
115	5	6,5	0,5	—	—	—	—	—	—	—	—	—
120	—	—	—	6,5	6,5	0,5	8,1	6,5	1	8,1	6,5	1
125	5	6,5	0,5	6,5	6,5	0,5	—	—	—	—	—	—
130	5	6,5	0,5	6,5	6,5	0,5	8,1	6,5	1	8,1	6,5	1
140[a]	5	6,5	0,5	8,1[a]	6,5[a]	1[a]	8,1	6,5	1	8,1	6,5	1
145	5	6,5	0,5	—	—	—	—	—	—	—	—	—
150	6,5	6,5	0,5	8,1	6,5	1	10,1	8,5	2	10,1	8,5	2
160	6,5	6,5	0,5	8,1	6,5	1	10,1	8,5	2	10,1	8,5	2
170	6,5	6,5	0,5	8,1	6,5	1	10,1	8,5	2	—	—	—
180	6,5	6,5	0,5	10,1	8,5	2	11,7	10,5	2	11,7	10,5	2
190	—	—	—	10,1	8,5	2	11,7	10,5	2	11,7	10,5	2
200	8,1	6,5	1	10,1	8,5	2	11,7	10,5	2	11,7	10,5	2
210	8,1	6,5	1	—	—	—	—	—	—	11,7	10,5	2
215	—	—	—	11,7	10,5	2	11,7	10,5	2	—	—	—
225	8,1	6,5	1	—	—	—	11,7	10,5	2	11,7	10,5	2
230	—	—	—	11,7	10,5	2	—	—	—	—	—	—
240	10,1	8,5	2	—	—	—	11,7	10,5	2	11,7	10,5	2
250	—	—	—	11,7	10,5	2	—	—	—	11,7	10,5	2
260	11,7	10,5	2	—	—	—	11,7	10,5	2	11,7	10,5	2
270	—	—	—	11,7	10,5	2	—	—	—	—	—	—
280	11,7	10,5	2	—	—	—	12,7	10,5	2	12,7	10,5	2
290	11,7	10,5	2	12,7	10,5	2	—	—	—	—	—	—
300	—	—	—	—	—	—	12,7	10,5	2	—	—	—
310	12,7	10,5	2	12,7	10,5	2	—	—	—	12,7	10,5	2
320	—	—	—	12,7	10,5	2	12,7	10,5	2	—	—	—

Table 1 *(continued)*

D	Diameter series											
	0			**2**			**3**			**4**		
	h	b	r_0 max.	h	b	r_0 max.	h	b	r_0 max.	h	b	r_0 max.
340	12,7	10,5	2	12,7	10,5	2	12,7	10,5	2	12,7	10,5	2
360	12,7	10,5	2	12,7	10,5	2	12,7	10,5	2	12,7	10,5	2
380	—	—	—	—	—	—	12,7	10,5	2	12,7	10,5	2
400	12,7	10,5	2	12,7	10,5	2	12,7	10,5	2	12,7	10,5	2
420	15	12,5	2,5	—	—	—	15	12,5	2,5	15	12,5	2,5
440	—	—	—	15	12,5	2,5	—	—	—	15	12,5	2,5
460	15	12,5	2,5	—	—	—	15	12,5	2,5	15	12,5	2,5
480	15	12,5	2,5	15	12,5	2,5	—	—	—	15	12,5	2,5
500	—	—	—	15	12,5	2,5	15	12,5	2,5	—	—	—

[a] These values are not suitable for single-row angular contact ball bearings or four-point-contact ball bearings with a contact angle of less than 35°.

5.3 Radial cylindrical roller bearings

Table 2 — Dimension series 10, 02E, 22E, 03E, 23E and 04

Dimensions in millimetres

D	Dimension series											
	10			02E, 22E			03E, 23E			04		
	h	b	r_0 max.	h	b	r_0 max.	h	b	r_0 max.	h	b	r_0 max.
47	—	—	—	2,5	3,5	0,5	—	—	—	—	—	—
52	—	—	—	2,5	3,5	0,5	2,5	3,5	0,5	—	—	—
62	2,5	3,5	0,5	3	4,5	0,5	3	4,5	0,5	—	—	—
68	2,5	3,5	0,5	—	—	—	—	—	—	—	—	—
72	—	—	—	3,5	4,5	0,5	4	5,5	0,5	5	6,5	0,5
75	3	4,5	0,5	—	—	—	—	—	—	—	—	—
80	3	4,5	0,5	4	5,5	0,5	4	5,5	0,5	5	6,5	0,5
85	—	—	—	4	5,5	0,5	—	—	—	—	—	—
90	4	5,5	0,5	4	5,5	0,5	5	6,5	0,5	5	6,5	0,5
95	4	5,5	0,5	—	—	—	—	—	—	—	—	—
100	4	5,5	0,5	4	5,5	0,5	5	6,5	0,5	6,5	6,5	0,5
110	4	5,5	0,5	5	6,5	0,5	6,5	6,5	0,5	6,5	6,5	0,5
115	4	5,5	0,5	—	—	—	—	—	—	—	—	—
120	—	—	—	5	6,5	0,5	6,5	6,5	0,5	6,5	6,5	0,5
125	5	6,5	0,5	5	6,5	0,5	—	—	—	—	—	—
130	5	6,5	0,5	5	6,5	0,5	8,1	6,5	1	6,5	6,5	0,5
140	6,5	6,5	0,5	6,5	6,5	0,5	8,1	6,5	1	8,1	6,5	1
145	6,5	6,5	0,5	—	—	—	—	—	—	—	—	—
150	6,5	6,5	0,5	6,5	6,5	0,5	8,1	6,5	1	8,1	6,5	1
160	6,5	6,5	0,5	6,5	6,5	0,5	8,1	6,5	1	8,1	6,5	1
170	6,5	6,5	0,5	8,1	6,5	1	8,1	6,5	1	—	—	—
180	6,5	6,5	0,5	8,1	6,5	1	10,1	8,5	2	10,1	8,5	2
190	—	—	—	8,1	6,5	1	10,1	8,5	2	10,1	8,5	2
200	8,1	6,5	1	8,1	6,5	1	11,7	10,5	2	11,7	10,5	2
210	8,1	6,5	1	—	—	—	—	—	—	12,7	10,5	2
215	—	—	—	10,1	8,5	2	11,7	10,5	2	—	—	—
225	10,1	8,5	2	—	—	—	11,7	10,5	2	12,7	10,5	2
230	—	—	—	10,1	8,5	2	—	—	—	—	—	—
240	10,1	8,5	2	—	—	—	11,7	10,5	2	12,7	10,5	2
250	—	—	—	11,7	10,5	2	—	—	—	12,7	10,5	2
260	11,7	10,5	2	—	—	—	11,7	10,5	2	12,7	10,5	2
270	—	—	—	11,7	10,5	2	—	—	—	—	—	—

Table 2 *(continued)*

D	Dimension series											
	10			**02E, 22E**			**03E, 23E**			**04**		
	h	b	r_0 max.	h	b	r_0 max.	h	b	r_0 max.	h	b	r_0 max.
280	11,7	10,5	2	—	—	—	12,7	10,5	2	15	12,5	2,5
290	11,7	10,5	2	12,7	10,5	2	—	—	—	—	—	—
300	—	—	—	—	—	—	15	12,5	2,5	—	—	—
310	12,7	10,5	2	12,7	10,5	2	—	—	—	15	12,5	2,5
320	—	—	—	12,7	10,5	2	15	12,5	2,5	—	—	—
340	12,7	10,5	2	12,7	10,5	2	15	12,5	2,5	15	12,5	2,5
360	12,7	10,5	2	12,7	10,5	2	—	—	—	15	12,5	2,5
380	—	—	—	—	—	—	—	—	—	20	15,5	3
400	—	—	—	—	—	—	—	—	—	20	15,5	3
420	—	—	—	—	—	—	—	—	—	20	15,5	3
440	—	—	—	—	—	—	—	—	—	20	15,5	3
460	—	—	—	—	—	—	—	—	—	20	15,5	3
480	—	—	—	—	—	—	—	—	—	20	15,5	3

6 Tolerances

The tolerances for retaining slots in single-row angular contact ball bearings and four-point-contact ball bearings of diameter series 0, 2, 3 and 4, and radial cylindrical roller bearings of dimension series 10, 02E, 22E, 03E, 23E and 04, are given in Tables 3 to 6.

The diameter series and dimension series referred to in Tables 3 and 4 are those defined in ISO 15.

Table 3 — Retaining slot depth for single-row angular contact ball bearings and four-point-contact ball bearings

Dimensions and tolerance values in millimetres

h	Diameter series			
	0		2, 3 and 4	
	Δ_{hs}		Δ_{hs}	
	high	low	high	low
2,5 3 3,5 4 5 6,5 8,1 10,1 11,7	+0,5	0	+1	0
12,7 15	+1,4	0	+1,4	0

Table 4 — Retaining slot depth for radial cylindrical roller bearings

Dimensions and tolerance values in millimetres

h	Dimension series			
	10		02E, 22E, 03E, 23E and 04	
	Δ_{hs}		Δ_{hs}	
	high	low	high	low
2,5 3 3,5 4 5 6,5 8,1 10,1 11,7	+0,5	0	+1	0
12,7 15	+1,4	0	+1,4	0
20	+2	0	+2	0

Table 5 — Retaining slot width

Dimensions and tolerance values in millimetres

b	Δ_{bs}	
	high	low
3,5 4,5 5,5	+0,2	0
6,5 8,5 10,5	+0,4	0
12,5 15,5	+0,6	0

Table 6 — Retaining slot symmetry and position tolerance

Dimensions and tolerance values in millimetres

D		t
>	≤	max.
—	290	0,2
290	—	0,4

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