

ISO

INTERNATIONAL ORGANIZATION FOR STANDARDIZATION

ISO RECOMMENDATION

R 300

PART I

ISO IDENTIFICATION CODE FOR ROLLING BEARINGS

GROUP I - RADIAL BALL AND ROLLER BEARINGS

GROUP II - THRUST BALL AND ROLLER BEARINGS

GROUP III - TAPERED ROLLER BEARINGS, METRIC SERIES

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BRIEF HISTORY

The ISO Recommendation R 300 / Part I, *ISO Identification Code for Rolling Bearings: Group I – Radial ball and roller bearings — Group II – Thrust ball and roller bearings — Group III – Tapered roller bearings, metric series*, was drawn up by Technical Committee ISO/TC 4, *Ball and Roller Bearings*, the Secretariat of which is held by the Sveriges Standardiseringskommission (SIS).

Work on this question by the Technical Committee began in 1953 and led, in 1959, to the adoption of a Draft ISO Recommendation.

In October 1959, this Draft ISO Recommendation (No. 157) 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:

Australia	Greece	Romania
Austria	Hungary	Spain
Burma	India	Sweden
Canada	Italy	Switzerland
Chile	Japan	United Kingdom
Czechoslovakia	Netherlands	U.S.A.
Finland	New Zealand	U.S.S.R.
France	Poland	Yugoslavia
Germany	Portugal	

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 April 1963, to accept it as an ISO RECOMMENDATION.

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ISO IDENTIFICATION CODE FOR ROLLING BEARINGS

GROUP I – RADIAL BALL AND ROLLER BEARINGS

GROUP II – THRUST BALL AND ROLLER BEARINGS

GROUP III – TAPERED ROLLER BEARINGS, METRIC SERIES

INTRODUCTION

Purpose of the Code

The ISO Identification Code for Rolling Bearings has been developed to identify and, as far as possible, describe each bearing, on the basis of complete dimensional and functional interchangeability.

The Code provides a universal language for describing and identifying bearings for the purpose of facilitating communications between the user and the manufacturer. The Code is also meant to simplify the handling by the user's personnel of identical bearings, made by different manufacturers and identified by different numbers, whose meaning may be difficult to interpret, since the various designation systems used by the several manufacturers are not identical, and generally differ from this Code.

The Code is not meant to give any intimation whatsoever of the availability of different bearing executions. For such purpose, the bearing manufacturers' catalogues should be consulted.

Scope of the Code

The ISO Identification Code applies only to those ball and roller bearings whose boundary dimensions and tolerances are in agreement with the ISO Recommendations.

The Code makes no provisions for the numbering or identification of component parts of separable type bearings or internal construction details, as no such details are the subject of ISO Recommendations.

Tapered mounting sleeves are not identified by this ISO Rolling Bearing Identification Code, but have been covered by the ISO Identification Code for Adapter and Withdrawal Sleeves (see Appendix 2, page 44). The sleeve code number does not form part of the bearing code number.

All amendments or expansions of the ISO Rolling Bearing Identification Code, including the Appendices, are allowed only if accepted by ISO.

Structure of the Code

The structure of the Code is a system of alternating groups of figures and letters.

The Code identifies the type and size of a ball or roller bearing by means of one group of figures indicating the bearing bore diameter, followed by one group of letters, indicating the bearing basic type, and one more group of figures, indicating the outside diameter and the width (or height) of the bearing. The code number thus obtained is called the *Basic Number* and should always be shown.

Specific bearing characteristics conditioned by installation requirements may be identified by a *Supplementary Number* consisting of alternating groups of letters and figures. Each such group is called a *Section*. The indicators in each section vary in number according to the complexity of information conveyed by each; also, each section of letters or figures deals only with one specific subject, and hence, should always be considered as a unit.

As the alphabetical and numerical sections alternate, it is evident that in addition to conveying specific information each intermediate section also serves as a separator to keep otherwise similar sections apart. If an intermediate section is not used, it therefore should be replaced by a letter or a figure to serve as a separator. The letter X and the figure 0 are used for this purpose.

TABLE 1. — Schematic arrangement of a complete code number

Section 1			Section 2	Section 3	Section 4	Section 5
Basic Number			Supplementary Number			
Bore	Type	Outside diameter and width (or height)	Modification of design	Internal fit and tolerances	Lubricants and preservatives	Special requirements
0000	AAA	00	AAAA	00	A	000

In the above Table, the figure 0 represents any Code figure, and the letter A any Code letter. The symbols 0 and A in Table 1 therefore indicate whether figures or letters are used in the different sections, and also the number of Code symbols in each section.

It has not been deemed advisable to number all the complex products of the bearing industry in an exactly uniform manner. The basic principle is uniform, but the practical structure of the numbers varies somewhat according to the general class of bearing. The Code is therefore divided into three groups:

Group I
Group II and
Group III

GROUP I comprises those ball bearings, cylindrical roller bearings and self-aligning roller bearings whose space between raceways is oriented mainly parallel to the axis of rotation, and which are primarily intended to carry radial or combined radial and thrust loads, pure thrust loads being only incidental. Group I bearings are therefore referred to as *radial bearings*.

GROUP II comprises all those ball and roller bearings whose space between raceways is oriented mainly perpendicular to the axis of rotation, and which are primarily intended to carry thrust loads. They are referred to as *thrust bearings*.

GROUP III comprises tapered roller bearings, Metric Series.

The different groups are identified by the first type Code letter as shown in the following Table:

TABLE 2. — Designation of general type of bearing

Group	First letter of type symbol	Class of bearing
I	B	Radial ball bearings
	R	Cylindrical roller bearings
	S	Self-aligning roller bearings
II	T	Thrust ball and roller bearings
III	K	Tapered roller bearings, Metric Series

Application of the Code

It is necessary that the requirements as set forth in the Code be exactly followed. A thorough study of the complete Code and the construction and content of each section should therefore precede any endeavour to apply or interpret the Code.

Inasmuch as ball and roller bearings of different makes are not standardized in internal details of construction, the Code should be applied with caution, in order to avoid the use of identical numbers for bearings of a given type and size, but of different internal design or with different properties which may materially affect the functional interchangeability. Conversely, there are many cases in which bearings with different numbers may be dimensionally and functionally interchangeable.

Table 3 (page 7) contains references to the pages in the Code on which the applicable symbols are to be found.

Boundary dimensions and tolerance values may be found in the relevant ISO Recommendations (see list of references, page 8).

TABLE 3. — ISO Identification Code for Ball and Roller Bearings: Brief Outline

Basic Number			Supplementary Number									
Section 1			Section 2		Section 3		Section 4	Section 5				
Type and boundary dimensions			Modification of design		Internal fit and tolerances		Lubricants and preservatives	Special requirements				
Bore	Type	Outside diameter and width (or height)	Cage and separators	Shields and seals	Bearing ring modification: Snap ring groove Tapered bore Miscellaneous	Internal fit			Tolerances			
0000	AAA	00	A	AA	A	Duplex mounting	0	0				
Bore diameter expressed in millimetres, column "d" of ISO Recommendations: R 15 * and R 104 **	Radial ball bearings: pages 10, 11 and 12 Radial roller bearings: pages 10, 13, 14 and 15 Thrust ball and roller bearings: pages 28 and 29 Tapered roller bearings, Metric Series: page 36	Expressed in dimension series numbers from ISO Recommendations: R 15 * and R 104 **	Radial ball bearings: pages 16, 17, 18, 19, 20, 21 and 22 <table><tr><td>Cage</td><td>Bearing ring modification</td></tr><tr><td>A</td><td>A</td></tr></table> Radial roller bearings: pages 16, 17, 20, 21 and 22 Thrust ball and roller bearings: pages 30 and 31 Tapered roller bearings, Metric Series: pages 37 and 38		Cage	Bearing ring modification	A	A	Radial ball and roller bearings Definitions: Page 23 Thrust ball and roller bearings Definitions: page 32 Tapered roller bearings, Metric Series Definitions: page 39 Values: see ISO Recommendation R 201 ***		Radial ball and roller bearings: pages 24 and 25 Thrust ball and roller bearings: page 33 Tapered roller bearings, Metric Series: page 40	Appendix 1: pages 42 and 43 Radial ball and roller bearings: page 26 Thrust ball and roller bearings: page 34 Tapered roller bearings, Metric Series: page 41
Cage	Bearing ring modification											
A	A											
Basic Number always used			When no symbol is needed in one or more intermediate columns, use "X" to separate columns. When entire section is not needed, use cage symbol or "X" to separate Sections 1 and 3		When section is not needed, use "0" to separate Sections 2 and 4		When section is not needed, use "X" to separate Sections 3 and 5	Not shown, when not required				

* See list of references (page 8): No. 1, section 1.

** See list of references (page 8): No. 2.

*** See list of references (page 8): No. 14.

LIST OF REFERENCES RELATING TO BALL AND ROLLER BEARINGS

BOUNDARY DIMENSIONS OF RADIAL BEARINGS

1. ISO Recommendation R 15, *Ball and Roller Bearings*:
Section 1, "General Plan for boundary dimensions of radial bearings (except tapered roller bearings)";
Section 4, "Bearings with locating snap ring";
Section 5, "General Plan for boundary dimensions of single-direction thrust bearings with flat seat".
2. ISO Recommendation R 104, *Ball and Roller Bearings—Boundary Dimensions*:
Section 1, "Radial bearings (except tapered roller bearings)—Intermediate boundary dimensions";
Section 2, "Double-direction thrust bearings with flat seats – Boundary dimensions".
3. ISO Recommendation under preparation on *Tapered Roller Bearings—Metric Series—Boundary Dimensions*, at present Draft ISO Recommendation No. 154:
Section 2, "Boundary dimensions";
Section 3, "Intermediate boundary dimensions".
4. ISO Recommendation under preparation on *Radial Bearings—General Plan for Boundary Dimensions of Radial Bearings (Except Tapered Roller Bearings)* (revision of ISO Recommendation R 15, section 1), at present Draft ISO Recommendation No. 358, under preparation.
5. ISO Recommendation under preparation on *Bearings with Locating Snap Ring* (revision of ISO Recommendation R 15, section 4), at present Draft ISO Recommendation No. 360.
6. ISO Recommendation under preparation on *Single-Direction Thrust Bearings—General Plan for Boundary Dimensions of Single-Direction Thrust Bearings with Flat Seat* (revision of ISO Recommendation R 15, section 5), at present Draft ISO Recommendation No. 361, under preparation.
7. ISO Recommendation under preparation on *Tapered Roller Bearings—Metric Series—Extension*, at present Draft ISO Recommendation No. 472, under preparation.

BOUNDARY DIMENSIONS OF ACCESSORIES

8. ISO Recommendation R 113, *Ball and Roller Bearings—Accessories*:
Section 1, "Tapered mounting sleeves: Boundary dimensions".

NORMAL TOLERANCES

9. ISO Recommendation R 15, *Ball and Roller Bearings*:
Section 2, "Normal tolerances for radial bearings (except tapered roller bearings)";
Section 3, "Normal tolerances for tapered bore of radial bearings Taper 1:12".
10. ISO Recommendation R 199, *Rolling Bearings—Thrust Ball Bearings with Flat Seats—Normal Tolerances*.
11. ISO Recommendation under preparation on *Radial Bearings—Normal Tolerances (Except Tapered Roller Bearings)* (revision of ISO Recommendation R 15, section 2), at present Draft ISO Recommendation No. 359.
12. ISO Recommendation under preparation on *Tapered Roller Bearings—Metric Series—Normal Tolerances*, at present Draft ISO Recommendation No. 415, under preparation.

TOLERANCE CLASSES 6, 5 AND 4

13. ISO Recommendation under preparation on *Radial Bearings—Tolerance Classes 6, 5 and 4*, at present Draft ISO Recommendation No. 280.

INTERNAL CLEARANCE

14. ISO Recommendation R 201, *Rolling Bearings—Radial Internal Clearance in Unloaded Radial Groove Type Ball Bearings with Cylindrical Bore—Values*.
15. ISO Recommendation under preparation on *Self-Aligning Roller Bearings—Radial Internal Clearance*, at present Draft ISO Recommendation No. 470, under preparation.

1. GROUP I: RADIAL BALL AND ROLLER BEARINGS

A bearing number in Group I is divided into five sections, of which Section 1 constitutes the *Basic Number* and should always be shown. Sections 2 to 5 constitute the *Supplementary Number*.

No symbol in Section 1 should be omitted.

When Sections 2 to 5 are not needed, no symbol is shown in any of these sections.

When one or more intermediate sections are not needed, the cage symbol or the letter X is used for Section 2, the figure 0 for Section 3 and the letter X for Section 4, to space the other sections apart. Unused sections that otherwise would end a number are not shown.

TABLE 4. — Schematic arrangement of Group I

Group I: Radial ball and roller bearings									
Basic Number			Supplementary Number						
Section 1			Section 2			Section 3		Section 4	Section 5
Type and boundary dimensions			Modification of design			Internal fit and tolerances		Lubricants and pre-servatives	Special requirements
Bore	Type	Outside diameter and width	Cage and separators	Shields and seals	Bearing rings	Internal fit	Tolerances		
				Duplex mounting modification					
0000	AAA	00	A	AA	A	0	0	A	000

Section 1 (Basic Number) comprises symbols indicating bearing type and main boundary dimensions: bore, outside diameter and width, as shown on pages 10 to 15.

Section 2 (Modification of design) establishes suffix letters indicating cage type or its modification, as well as those relating to shields, seals, snap ring groove, tapered bore and other modifications of regular design, as shown on pages 16 to 22.

Section 3 (Internal fit and tolerances) establishes suffix figures indicating data, as shown on page 23.

Section 4 (Lubricants and preservatives) establishes suffix letters to identify types of lubricants and preservatives, as shown on pages 24 and 25.

Section 5 (Special requirements) establishes suffix figures for specification items, as shown on page 26 and in Appendix 1.

Group I, Section 1

1.1 Section 1: Basic Number

TABLE 5. — Schematic arrangement of Section 1

Section 1: Basic Number		
Bore	Type	Outside diameter and width
0000	AAA	00

1.1.1 Bore

The bearing bore is identified by code figures expressing the bore diameter in millimetres, in accordance with the ISO “General Plan for Boundary Dimensions of Radial Bearings (except Tapered Roller Bearings)”. *

1.1.2 Type

Radial bearing types are identified by two or three code letters, of which the first letter indicates *the general type* of bearing, as shown in the list below:

Symbols showing general type of bearing

Symbol	General type of bearing
B	Radial ball bearings
R	Cylindrical roller bearings
S	Self-aligning roller bearings

The bearing type symbols showing detailed specifications are listed in clause 1.1.4, pages 11 to 15.

1.1.3 Outside diameter and width

The above-mentioned ISO General Plan for Boundary Dimensions * provides various outside diameters for each bore and a number of width series for each diameter series. A certain width series in a certain diameter series is called a *dimension series*, which is identified by a two-digit dimension series number.

The outside diameter and the width of the bearing are therefore identified by the dimension series number.

* See list of references (page 8): No. 1, section 1.

1.1.4 Bearing type symbols

A. BALL BEARINGS

1. Ball bearings, single row, radial contact

Symbol	Description	
BC	Non-filling slot assembly	
BL	Filling slot assembly	
BH	Non-separable counter-bore assembly	
BM	Separable assembly	

2. Ball bearings, single row, angular contact *

Symbol	Description	
BN	Non-separable Nominal contact angle : from above 10° to and including 22°	
BNS	Separable outer ring Nominal contact angle : from above 10° to and including 22°	
BNT	Separable inner ring Nominal contact angle : from above 10° to and including 22°	
BA	Non-separable Nominal contact angle : from above 22° to and including 32°	
BAS	Separable inner ring Nominal contact angle : from above 22° to and including 32°	
BT	Non-separable Nominal contact angle : from above 32° to and including 45°	
BY	Two-piece outer ring	
BZ	Two-piece inner ring	

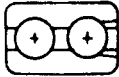
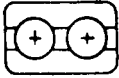
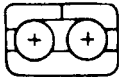
* A line through the ball contact points forms an acute angle with a perpendicular to the bearing axis of rotation.

Group I, Section 1

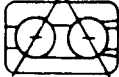
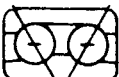
3. Ball bearings, single row, radial contact, spherical outside surface

Symbol	Description	
BCA	Non-filling slot assembly	
BLA	Filling slot assembly	

4. Ball bearings, double row, radial contact

Symbol	Description	
BF	Filling slot assembly	
BK	Non-filling slot assembly	
BHA	Non-separable Two-piece outer ring	

5. Ball bearings, double row, angular contact

Symbol	Description	
BD	Filling slot assembly Vertex of contact angles inside bearing	
BE	Filling slot assembly Vertex of contact angles outside bearing	
BJ	Non-filling slot assembly Vertex of contact angles inside bearing	
BG	Non-filling slot assembly Vertex of contact angles outside bearing	
BAA	Non-separable Vertex of contact angles inside bearing Two-piece outer ring	
BVV	Separable Vertex of contact angles outside bearing Two-piece inner ring	
BB	No cage Vertex of contact angles inside bearing Free-turning ring with separating balls	

6. Ball bearings, double row, self-aligning

Symbol	Description	
BS	Raceway of outer ring spherical	

B. ROLLER BEARINGS**1. Cylindrical roller bearings, single row, non-locating type**

Symbol	Description	
RU	Inner ring without ribs Double-ribbed outer ring Inner ring separable	
RUP	Inner ring without ribs Double-ribbed outer ring with one loose rib Both rings separable	
RUA	Inner ring without ribs Double-ribbed outer ring Inner ring separable Spherical outside surface	
RN	Double-ribbed inner ring Outer ring without ribs Outer ring separable	
RNS	Double-ribbed inner ring Outer ring without ribs Outer ring separable Spherical outside surface	
RAB	Inner ring without ribs Single-ribbed outer ring Both rings separable	
RM	Inner ring without ribs Rollers located by cage end rings or internal snap rings recessed in outer ring Inner ring separable	
RNU	Inner ring without ribs Outer ring without ribs Both rings separable	

2. Cylindrical roller bearings, single row, one-direction-locating type

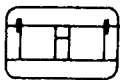
Symbol	Description	
RR	Single-ribbed inner ring Outer ring with two internal snap rings Inner ring separable	
RJ	Single-ribbed inner ring Double-ribbed outer ring Inner ring separable	
RJP	Single-ribbed inner ring Double-ribbed outer ring with one loose rib Both rings separable	
RF	Double-ribbed inner ring Single-ribbed outer ring Outer ring separable	
RS	Single-ribbed inner ring Outer ring with one rib and one internal snap ring Inner ring separable	
RAA	Single-ribbed inner ring Single-ribbed outer ring Both rings separable	

Group I, Section 1

3. Cylindrical roller bearings, single row, two-direction-locating type

Symbol	Description	
RK	Double-ribbed inner ring Outer ring with two internal snap rings Non-separable	
RC	Double-ribbed inner ring Double-ribbed outer ring Non-separable	
RG	Inner ring, with one rib and one snap ring Double-ribbed outer ring Non-separable	
RP	Double-ribbed inner ring Double-ribbed outer ring with one loose rib Outer ring separable	
RY	Double-ribbed inner ring Outer ring with one rib and one internal snap ring Non-separable	
RCS	Double-ribbed inner ring Double-ribbed outer ring Non-separable Spherical outside surface	
RT	Double-ribbed inner ring with one loose rib Double-ribbed outer ring Inner ring separable	

4. Cylindrical roller bearings, double row, non-locating type

Symbol	Description	
RA	Inner ring without ribs Three integral ribs on outer ring Inner ring separable	
RD	Three integral ribs on inner ring Outer ring without ribs Outer ring separable	
RE	Inner ring without ribs Outer ring without ribs, with two internal snap rings Inner ring separable	

5. Cylindrical roller bearings, double-row, two direction-locating type

Symbol	Description	
RB	Three integral ribs on inner ring Outer ring without ribs, with two internal snap rings Non-separable	