

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).

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 preservatives	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	

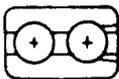
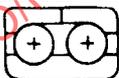
* A line through the ball contact points forms an acute angle with a perpendicular to the bearing axis of rotation.

Group I, Section 1

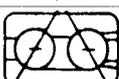
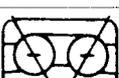
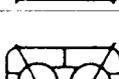
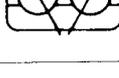
3. Ball bearings, single row, radial contact, spherical outside surface

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

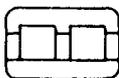
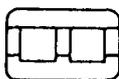
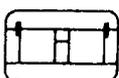
Symbol	Description	
RR	Single-ribbed inner ring Outer ring with two internal snap rings Inner ring separable	
RJ	Single-ribbed inner ring Double-ribbed outer ring Inner ring separable	
RJP	Single-ribbed inner ring Double-ribbed outer ring with one loose rib Both rings separable	
RF	Double-ribbed inner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

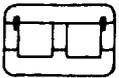
3. Cylindrical roller bearings, single row, two-direction-locating type

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	

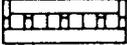
4. Cylindrical roller bearings, double row, non-locating type

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	

6. Cylindrical roller bearings, multi-row, non-locating type

Symbol	Description	
RV	Inner ring without ribs Double-ribbed outer ring (loose ribs) Both rings separable	

7. Self-aligning roller bearings, single row

Symbol	Description	
SR	Inner ring with ribs Raceway of outer ring spherical Radial contact	
SA	Raceway of outer ring spherical Angular contact	
SB	Raceway of inner ring spherical Angular contact	

8. Self-aligning roller bearings, double row

Symbol	Description	
SD	Three integral ribs on inner ring Raceway of outer ring spherical	
SE	Raceway of outer ring spherical Separate centre guide ring in outer ring	
SW	Raceway of inner ring spherical	
SC	Raceway of outer ring spherical Rollers guided by separate axially floating guide ring on inner ring	

EXAMPLE

50BC02

50 = 50 mm bore diameter

BC = Ball bearing, single row, radial contact, non-filling slot assembly

02 = Dimension series 02, in which a 50 mm bore bearing has 90 mm outside diameter and 20 mm width (see ISO Recommendation R 15, *Ball and Roller Bearings*, page 16)

Group I, Section 2

1.2 Section 2: Modification of design

When required to supplement the Basic Number of a ball or roller bearing, Section 2 expresses the data shown below by means of a letter code arranged

in four or more columns for ball bearings, see Table 6 below.

in two or more columns for roller bearings, see Table 7 below.

When this section is used, column 1 should always be shown. The unused column or columns, which would otherwise end a number, are not shown. For ball bearings, the intermediate unused columns should be represented by the letter X.

When this section is not needed, but Sections 3, 4 or 5 are required, a bearing manufacturer should show the actual cage symbol, whereas a bearing user may replace the section by a single X, if type of cage is not mandatory.

A. BALL BEARINGS

TABLE 6. — Schematic arrangement of Section 2

Section 2: Modification of design			
Column 1	Column 2	Column 3	Column 4
Cage and separators	Shields and seals		Bearing ring modification
	Duplex mounting modification		
A	A	A	A

B. ROLLER BEARINGS

TABLE 7. — Schematic arrangement of Section 2

Section 2: Modification of design	
Column 1	Column 2
Cage and separators	Bearing ring modifications
A	A

1.2.1 Cage and separators

The cage or separators symbol is placed in column 1.

When no Supplementary Number is shown, the bearing is provided with manufacturer's regular cage.

When a Supplementary Number is needed, a bearing manufacturer should show the actual cage symbol, whereas a bearing user may specify X, if type of cage is not mandatory.

When X is specified, any type of cage may be furnished, unless Section 5, "Special requirements", calls for a particular type or execution of the cage. In the latter case, the letter X in column 1 of this section is used only as a spacer.

Cage and separator symbols

Symbol				Description
Columns				
1	2	3	4	
X				Cage, any type acceptable Spacer when a bearing requires supplementary coding of special cage specified in Section 5
A				Cage, steel, sheet or strip form, ring centred
J				Cage, steel, sheet, strip or wire form, centred by rolling elements
F				Cage, steel, not in sheet, strip or wire form
Y				Cage, non-ferrous metal, sheet or strip form, centred by rolling elements
B				Cage, non-ferrous metal, sheet or strip form, ring centred
K				Cage, bronze or brass, not in sheet, strip or wire form, ring centred
M				Cage, bronze or brass, not in sheet, strip or wire form, centred by rolling elements
H				Cage, light metal, not in sheet, strip or wire form, ring centred
P				Cage, porous metal
D				Cage, non-metallic, ring centred
T				Cage, non-metallic, centred by rolling elements
Z				Separators or spring spacers
V				No cage or separators



EXAMPLES

50BC02

No Supplementary Number = Ball bearing with manufacturer's regular cage

50BC02J

J = Cage, steel, sheet, strip or wire form, centred by rolling elements

1.2.2 Shields and seals

A. BALL BEARINGS

1.2.2.1 When a single shield or seal is used in the normal position, the location will be indicated by placing the shield or the seal symbol in the second column. The normal position for a shield or seal is defined as follows:

- (a) for basically symmetrical ball bearings, e.g. type BC on either side
- (b) for tapered-bore ball bearings, excepting filling-slot and non-separable counter-bore ball bearings on the large bore side
- (c) for filling-slot ball bearings opposite the filling-slot side
- (d) for counter-bore ball bearings, e.g. type BH opposite the large bore side of the outer ring
- (e) for basically symmetrical ball bearings with snap ring groove opposite snap ring groove

Groupe I, Section 2

- 1.2.2.2 When a single shield or seal is used in the reverse (opposite the normal) side of the bearing, its location will be designated by placing the shield or the seal symbol in the third column.
- 1.2.2.3 When a combination of shield and seal is used, the shield symbol is placed in its proper column with respect to the normal position according to 1.2.2.1 and 1.2.2.2 above. The seal symbol will fall in the other column.
- 1.2.2.4 For two shields or two seals, use columns 2 and 3, placing the symbols in alphabetical order.
- 1.2.2.5 When a contact seal is used, a bearing manufacturer should show the actual seal symbol, whereas a bearing user may specify G, if type of contact seal is not mandatory.

Shield and seal symbols

Symbol				Description	Examples
Columns					
1	2	3	4		
	X	X		Spacer used when subsequent symbol is required	
	A	A		Shield, removably fastened	
	P	P		Shield, permanently fastened	
	G	G		Contact seal, any type acceptable	
	B	B		Non-impervious contact seal, removably fastened	
	S	S		Non-impervious contact seal, permanently fastened	
	M	M		Non-impervious contact seal, combined with internal slinger, permanently fastened	
	D	D		Impervious contact seal, removably fastened	
	E	E		Impervious contact seal, permanently fastened	
	H	H		Labyrinth type seal, permanently fastened	
	K	K		Labyrinth type seal, removably fastened	
	V	V		Contact seal with external slinger, permanently fastened	

EXAMPLES



50BC02XE

X = Cage, any type of cage is acceptable

E = Single impervious contact seal, permanently fastened



50BC02XPE

X = Cage, any type of cage is acceptable

P = Shield, permanently fastened

E = Impervious contact seal, permanently fastened

1.2.3 Duplex mounting modification

A. BALL BEARINGS

Bearings of types BC, BH, BM, BN, BA and BT may be modified for duplex mounting.

The symbol for pairs of such bearings is placed in column 2 or column 3.

When the bearings in a duplex mounting are not provided with any shield or seal, the duplexing symbol is shown only in column 2.

When the bearings are provided with shield or seal, the symbol is shown in the column not required for the shield or seal symbol.

The symbol for single bearings modified for duplex mounting is placed in column 4.

Symbols for ball bearings modified for duplex mounting

Symbol				Description
Columns				
1	2	3	4	
	R	R		Pair of bearings modified for duplex mounting back-to-back
	U	U		Pair of bearings modified for duplex mounting face-to-face
	T	T		Pair of bearings modified for duplex mounting in tandem
			D	Single bearing modified for duplex mounting back-to-back, face-to-face, or in tandem

EXAMPLES

50BA02XXXD

BA = Ball bearing, single row, angular contact, non-separable, nominal contact angle from above 22° to and including 32°

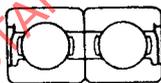
D = Single ball bearing modified for duplex mounting back-to-back, face-to-face or in tandem



50BA02XR

R = Pair of ball bearings modified for duplex mounting back-to-back

50BC02XPU



P = Each individual ball bearing with one shield, permanently fastened

U = Pair of ball bearings modified for duplex mounting face-to-face

Group I, Section 2

1.2.4 Bearing ring modification

A bearing ring modification symbol is placed
 in column 4 for ball bearings,
 in column 2 for roller bearings.

When two or three symbols listed under clauses 1.2.4.1, 1.2.4.2 and 1.2.4.3 below are used simultaneously, they should be written, in the order indicated,

in column 4 or in column 2 respectively, and
 in one or two more columns.

1.2.4.1 SNAP RING GROOVE

A. BALL BEARINGS

Different symbols are used for indicating the normal or the reverse (opposite the normal) position of a snap ring groove.

The *normal* position of a snap ring groove is defined as follows:

- (a) for basically symmetrical bearings with cylindrical bore;
 e.g. type BC with shield or seal either side:
 use "normal position" symbol
- (b) for basically symmetrical bearings with tapered bore;
 e.g. type BC with tapered bore small bore side
- (c) for filling-slot bearings; e.g. type BL filling-slot side
 or for non-separable counter-bore bearings;
 e.g. type BH counter-bore side

Snap ring groove symbols for ball bearings

Symbol				Description
Columns				
1	2	3	4	
			N	Snap ring groove on outside surface, snap ring <i>not</i> included: in <i>normal</i> position
			A	in reverse (or opposite the normal) position
			G	Snap ring groove on outside surface, snap ring included: in <i>normal</i> position
			C	in reverse (or opposite the normal) position

EXAMPLES

50BC02XPXN



- X = Cage, any type of cage is acceptable
- PX = Single shield in normal position, i.e. opposite snap ring groove side
- N = Snap ring groove on outside surface, snap ring not included

50BC02XXPN



- X = Cage, any type of cage is acceptable
- XP = Single shield in reverse position, i.e. on snap ring groove side
- N = Snap ring groove on outside surface, snap ring not included

B. ROLLER BEARINGS

Different symbols are used for indicating the normal or the reverse (opposite the normal) position of a snap ring groove.

The *normal* position of a snap ring groove on outside surface is defined as follows:

- (a) for symmetrical roller bearings with cylindrical bore and outside surface, and types RR, RJ and RT either side: use “normal position” symbol
- (b) for roller bearings types RF, RS, RY, RAA and RAB integral rib side of the outer ring
- (c) for roller bearings type RG opposite side to integral rib side of the inner ring
- (d) for tapered bore roller bearings (excepting type RY) small bore side of tapered bore

Snap ring groove symbols for roller bearings

Symbol		Description
Columns		
1	2	
	N	Snap ring groove on outside surface, snap ring <i>not</i> included: in <i>normal</i> position
	A	
	G	Snap ring groove on outside surface, snap ring included: in <i>normal</i> position
	C	

1.2.4.2 TAPERED BORE**A. BALL BEARINGS**

Different symbols are used for indicating the normal or the reverse (opposite the normal) position of a tapered bore.

The *normal* position of a tapered bore is defined as having the small bore side:

- (a) for basically symmetrical bearings;
e.g. type BC with shield or seal and snap ring groove on either side: use “normal position” symbol
- (b) for filling-slot bearings; e.g. type BL on filling-slot side
or for counter-bore bearings; e.g. type BH on counter-bore side of outer ring

Group I, Section 2

Tapered bore symbols for ball bearings

Symbol				Description
Columns				
1	2	3	4	
			K	Tapered bore 1:12 in normal position
			U	Tapered bore 1:12 in reverse (or opposite the normal) position



EXAMPLE

50BS02JXXK

BS = Ball bearing, double row, self-aligning, raceway of outer ring spherical

J = Cage, steel, sheet or strip form, centred by rolling elements

K = Tapered bore 1:12

B. ROLLER BEARINGS

A tapered bore symbol is applicable only to roller bearings with symmetrical inner ring.

Tapered bore symbols for roller bearings

Symbol		Description
Columns		
1	2	
	K	Tapered bore 1:12
	T	Tapered bore 1:30

1.2.4.3 MISCELLANEOUS MODIFICATIONS

A. BALL BEARINGS

Symbols for miscellaneous bearing ring modifications

Symbol				Description	Example
Columns					
1	2	3	4		
			L	Modification for lubrication through an outer bearing part	

B. ROLLER BEARINGS

Symbols for miscellaneous bearing ring modifications

Symbol		Description
Columns		
1	2	
	L	Modification for lubrication through an outer bearing part
	Z	Separate thrust collar included (in cylindrical roller bearings)

EXAMPLES

200SD23XL

X = Cage, any type of cage is acceptable

L = Lubrication through an outer bearing part

200SD23XKL

K = Tapered bore 1:12

L = Lubrication through an outer bearing part



1.3 Section 3: Internal fit and tolerances

When required to supplement the Basic Number of a ball or roller bearing, Section 3 expresses the data shown below by means of a figure code arranged in two columns.

When this section is used, column 1 should always be shown, but column 2 can be omitted when not otherwise needed.

When this section is not needed, but Sections 4 or 5 are required, it is replaced by a single 0.

For single row angular contact ball and roller bearings, excepting types BY and BZ, the internal fit symbol is always 0.

TABLE 8. — Schematic arrangement of Section 3

Section 3: Internal fit and tolerances	
Column 1	Column 2
Internal fit	Tolerances
0	0

Internal fit and tolerance symbols

Symbol		Description
Columns		
1	2	
0		Normal internal clearance *
1		Internal clearance less than for group 2
2		Internal clearance less than normal
3		Internal clearance greater than normal
4		Internal clearance greater than for group 3
5		Internal clearance greater than for group 4
		For duplex and double row bearings:
7		Preload, light
8		Preload, medium
9		Preload, heavy
	0	Normal tolerances for ball and roller bearings **
	6	Tolerance class 6 for ball and roller bearings ***
	5	Tolerance class 5 for ball and roller bearings ***
	4	Tolerance class 4 for ball and roller bearings ***

EXAMPLES

50BC02X3

X = No modification of design

3 = Internal clearance greater than normal

50BC02X06

X = No modification of design

0 = Normal internal clearance

6 = Tolerance class 6

* See list of references (page 8): No. 14;
No. 15.

** See list of references (page 8): No. 9, sections 2 and 3;
No. 11.

*** See list of references (page 8): No. 13.

Group I, Section 4

1.4 Section 4: Lubricants and preservatives

The purpose of Section 4 is to provide a means of identifying the kind of lubricant or preservative present in a bearing when delivered. The quantity of lubricant used is not subject to coding. The kind and quantity of lubricant to be used under actual service conditions should, if possible, be determined by test on the installation. Temperatures shown in the description below are to be considered approximate.

TABLE 9. — Schematic arrangement of Section 4

Section 4: Lubricants and preservatives
A

Lubricant and preservative symbols

Symbol	Description
X	Manufacturer's regular preservative or lubricant for the particular bearing involved
C	Extreme low temperature grease, serviceable from $-73\text{ }^{\circ}\text{C}$ or $-100\text{ }^{\circ}\text{F}$ and, for short periods, up to $+107\text{ }^{\circ}\text{C}$ or $+225\text{ }^{\circ}\text{F}$
R	Extreme low temperature silicone grease, serviceable from $-73\text{ }^{\circ}\text{C}$ or $-100\text{ }^{\circ}\text{F}$ and, for short periods, up to $+205\text{ }^{\circ}\text{C}$ or $+400\text{ }^{\circ}\text{F}$
K	Low temperature grease, serviceable from $-54\text{ }^{\circ}\text{C}$ or $-65\text{ }^{\circ}\text{F}$
L	Low temperature grease, serviceable from $-54\text{ }^{\circ}\text{C}$ or $-65\text{ }^{\circ}\text{F}$ and, for short periods, up to $+121\text{ }^{\circ}\text{C}$ or $+250\text{ }^{\circ}\text{F}$
N	Medium temperature grease, serviceable from $-54\text{ }^{\circ}\text{C}$ or $-65\text{ }^{\circ}\text{F}$ and, for short periods, up to $+52\text{ }^{\circ}\text{C}$ or $+125\text{ }^{\circ}\text{F}$

(continued)

Lubricant and preservative symbols (*concluded*)

Symbol	Description
T	Medium temperature grease, serviceable from $-40\text{ }^{\circ}\text{C}$ or $-40\text{ }^{\circ}\text{F}$ and, for short periods, up to $+121\text{ }^{\circ}\text{C}$ or $+250\text{ }^{\circ}\text{F}$
P	Medium temperature grease, serviceable from $-30\text{ }^{\circ}\text{C}$ or $-22\text{ }^{\circ}\text{F}$ and, for short periods, up to $+121\text{ }^{\circ}\text{C}$ or $+250\text{ }^{\circ}\text{F}$
M	Medium temperature grease, serviceable from $-18\text{ }^{\circ}\text{C}$ or $0\text{ }^{\circ}\text{F}$ and, for short periods, up to $+121\text{ }^{\circ}\text{C}$ or $+250\text{ }^{\circ}\text{F}$
H	High temperature grease, serviceable from $-20\text{ }^{\circ}\text{C}$ or $-5\text{ }^{\circ}\text{F}$ and, for short periods, up to $+135\text{ }^{\circ}\text{C}$ or $+275\text{ }^{\circ}\text{F}$
S	High temperature silicone grease, serviceable from $-18\text{ }^{\circ}\text{C}$ or $0\text{ }^{\circ}\text{F}$ and, for short periods, up to $+149\text{ }^{\circ}\text{C}$ or $+300\text{ }^{\circ}\text{F}$
W	Water-repellent grease, serviceable between $-18\text{ }^{\circ}\text{C}$ or $0\text{ }^{\circ}\text{F}$ and $+107\text{ }^{\circ}\text{C}$ or $+225\text{ }^{\circ}\text{F}$
D	General purpose, low temperature lubricating oil
E	Low volatility, aircraft instrument type, lubricating oil
F	General purpose, low temperature, anti-corrosion lubricating oil
G	Petroleum base, anti-corrosion compound, hot application
B	General purpose, anti-corrosion slush, oil type

EXAMPLE

50BC02J0B

B = General purpose, anti-corrosion slush, oil type

Group I, Section 5

1.5 Section 5: Special requirements

The symbol numbers in Section 5 cover special requirements or refinements which in no way affect the boundary dimensions of a bearing and which cannot be represented by Sections 2, 3 and 4.

Each number has the same determinate meaning, regardless of bearing type or size.

TABLE 10. — Schematic arrangement of Section 5

Section 5: Special requirements
000

The symbol numbers refer to the tabulated data listed in Appendix 1.

EXAMPLE

50BC02J0X11

11 = Surfaces of all steel bearing parts coated by the black iron oxide process

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2. GROUP II: THRUST BALL AND ROLLER BEARINGS

A bearing number in Group II 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 11. — Schematic arrangement of Group II

Group II: Thrust 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		Tolerances	Lubricants and preservatives	Special requirements
Bore	Type	Outside diameter and height	Cage and separators	Additional modifications			
0000	AAA	00	A	A	0	A	000

Section 1 (Basic Number) comprises symbols indicating bearing type and main boundary dimensions: bore, outside diameter and height, as shown on pages 28 and 29.

Section 2 (Modification of design) establishes suffix letters indicating cage type and other modifications of regular design, as shown on pages 30 and 31.

Section 3 (Tolerances) establishes suffix figures indicating tolerance data, as shown on page 32.

Section 4 (Lubricants and preservatives) establishes suffix letters to identify types of lubricants and preservatives, as shown on page 33.

Section 5 (Special requirements) establishes suffix figures for specification items, as shown on page 34 and in Appendix 1.

Group II, Section 1

2.1 Section 1: Basic Number

TABLE 12. — Schematic arrangement of Section 1

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

2.1.1 Bore

The bearing bore is identified by code figures expressing the bore diameter in millimetres in accordance with the relevant ISO Recommendations covering boundary dimensions for single * and double ** direction thrust bearings.

2.1.2 Type

Thrust bearing types are identified by two or three code letters, of which the first letter, T, indicates that the bearing belongs to Group II.

The bearing type symbols are listed in clause 2.1.4, page 29.

2.1.3 Outside diameter and height

The above-mentioned ISO boundary dimensions (clause 2.1.1) provide various outside diameters for each bore and a number of height series for each diameter series. A certain height 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 height of the bearing are therefore identified by the dimension series number.

* See list of references (page 8): No. 1, section 5.

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

2.1.4 Thrust bearing type symbols

A. THRUST BALL BEARINGS

Symbol	Description	
TA	Single-direction, grooved raceways, flat seats	
TDC	Double-direction, grooved raceways, flat seats, small bore centre washer	
TAA	Single row, angular contact where a line through the ball contact points forms an angle from above 45° to and including 75° with a perpendicular to the bearing axis of rotation	

B. THRUST ROLLER BEARINGS

Symbol	Description	
TS	Self-aligning, single-direction, flat seats, asymmetrical barrel-shaped rollers	
TSA	Self-aligning, single-direction, flat seats, symmetrical barrel-shaped rollers	

EXAMPLES

50TA12

50 = 50 mm bore diameter of small bore washer

TA = Thrust ball bearing, single-direction, grooved raceways, flat seats

12 = Dimension series 12, in which a 50 mm bore thrust ball bearing has 78 mm outside diameter and 22 mm height (see ISO Recommendation R 15, page 30)

50TDC22

50 = 50 mm maximum shaft shoulder diameter = bore diameter, in millimetres, of small bore washer of corresponding single-direction thrust ball bearing

TDC = Thrust ball bearing, double-direction, grooved raceways, flat seats, small bore centre washer

22 = Dimension series 22, in which a 50 mm bore thrust ball bearing has 78 mm outside diameter, 39 mm height, 40 mm bore diameter of centre washer and 9 mm thickness of centre washer (see ISO Recommendation R 104, page 7)

Group II, Section 2

2.2 Section 2: Modification of design

When required to supplement the Basic Number of a thrust bearing, Section 2 expresses the data shown below by means of a letter code arranged in one or two columns.

When this section is used, column 1 should always be shown, but column 2 can be omitted when not otherwise needed.

When this section is not needed, but Sections 3, 4 or 5 are required, a bearing manufacturer should show the actual cage symbol, whereas a bearing user may replace the section by a single X, if type of cage is not mandatory.

TABLE 13. — Schematic arrangement of Section 2

Section 2: Modifications of design	
Column 1	Column 2
Cage and separators	Additional modifications
A	A

2.2.1 Cage and separators

The cage or separator symbol is placed in column 1.

When no Supplementary Number is shown, the thrust bearing is provided with manufacturer's regular cage.

When a Supplementary Number is needed, a bearing manufacturer should show the actual cage symbol, whereas a bearing user may specify X, if type of cage is not mandatory.

When X is specified, any type of cage may be furnished, unless Section 5, "Special requirements", calls for a particular type or execution of the cage. In the latter case, the letter X in column 1 of this section is used only as a spacer.

Cage and separator symbols

Symbol		Description
Columns		
1	2	
X		Cage, any type acceptable This symbol is used as a spacer, when a bearing requires supplementary coding of special cage in Section 5
A		Cage, steel, sheet or strip form, ring centred
J		Cage, steel, sheet, strip or wire form, centred by rolling elements
F		Cage, steel, not in sheet, strip or wire form
Y		Cage, non-ferrous metal, sheet or strip form, centred by rolling elements
B		Cage, non-ferrous metal, sheet or strip form, ring centred
K		Cage, bronze or brass, not in sheet, strip or wire form, ring centred
M		Cage, bronze or brass, not in sheet, strip or wire form, centred by rolling elements
H		Cage, light metal, not in sheet, strip or wire form, ring centred
P		Cage, porous metal
D		Cage, non-metallic, ring centred
T		Cage, non-metallic, centred by rolling elements
Z		Separators or spring spacers
V		No cage or separators

2.2.2 Additional modifications

When additional modifications are necessary, a letter code symbol, accepted by ISO, is placed in column 2.

Group II, Section 3

2.3 Section 3: Tolerances

TABLE 14. — Schematic arrangement of Section 3

Section 3: Tolerances
0

Tolerance symbol

Symbol	Description
0	Normal tolerances *

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* See List of references (page 8): No. 10.

2.4 Section 4: Lubricants and preservatives

The purpose of Section 4 is to provide a means of identifying the kind of lubricant or preservative present in a bearing when delivered. The quantity of lubricant used is not subject to coding. The kind and quantity of lubricant to be used under actual service conditions should, if possible, be determined by test on the installation. Temperatures shown below are to be considered as approximate.

TABLE 15. — Schematic arrangement of Section 4

Section 4: Lubricants and preservatives
A

Lubricant and preservative symbols

Symbol	Description
X	Manufacturer's regular preservative or lubricant for the particular bearing involved
C	Extreme low temperature grease, serviceable from -73°C or -100°F and, for short periods, up to $+107^{\circ}\text{C}$ or $+225^{\circ}\text{F}$
R	Extreme low temperature silicone grease, serviceable from -73°C or -100°F and, for short periods, up to $+205^{\circ}\text{C}$ or $+400^{\circ}\text{F}$
K	Low temperature grease, serviceable from -54°C or -65°F
L	Low temperature grease, serviceable from -54°C or -65°F and, for short periods, up to $+121^{\circ}\text{C}$ or $+250^{\circ}\text{F}$
N	Medium temperature grease, serviceable from -54°C or -65°F and, for short periods, up to $+52^{\circ}\text{C}$ or $+125^{\circ}\text{F}$
T	Medium temperature grease, serviceable from -40°C or -40°F and, for short periods, up to $+121^{\circ}\text{C}$ or $+250^{\circ}\text{F}$
P	Medium temperature grease, serviceable from -30°C or -22°F and, for short periods, up to $+121^{\circ}\text{C}$ or $+250^{\circ}\text{F}$
M	Medium temperature grease, serviceable from -18°C or 0°F and, for short periods, up to $+121^{\circ}\text{C}$ or $+250^{\circ}\text{F}$
H	High temperature grease, serviceable from -20°C or -5°F and, for short periods, up to $+135^{\circ}\text{C}$ or $+275^{\circ}\text{F}$
S	High temperature silicone grease, serviceable from -18°C or 0°F and, for short periods, up to $+149^{\circ}\text{C}$ or $+300^{\circ}\text{F}$
W	Water-repellent grease, serviceable from -18°C or 0°F and up to $+107^{\circ}\text{C}$ or $+225^{\circ}\text{F}$
D	General purpose, low temperature lubricating oil
E	Low volatility, aircraft instrument type, lubricating oil
F	General purpose, low temperature, anti-corrosion lubricating oil
G	Petroleum base anti-corrosion compound, hot application
B	General purpose, anti-corrosion slush, oil type

Group II, Section 5

2.5 Section 5: Special requirements

The symbol numbers in Section 5 cover special requirements or refinements which in no way affect the boundary dimensions of a bearing and which cannot be represented by Sections 2, 3 and 4.

Each number has the same determinate meaning, regardless of bearing type or size.

TABLE 16. — Schematic arrangement of Section 5

Section 5: Special requirements
000

The symbol numbers refer to the tabulated data listed in Appendix 1.

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3. GROUP III: TAPERED ROLLER BEARINGS, METRIC SERIES

A bearing number in Group III 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 17. — Schematic arrangement of Group III

Group III: Tapered roller bearings, Metric Series								
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	Cage	Bearing rings	Internal fit	Tolerances		
0000	AAA	00	A	A	0	0	A	000

Section 1 (Basic Number) comprises symbols indicating bearing type and main boundary dimensions: bore, outside diameter, inner ring width and overall bearing width, as shown on page 36.

Section 2 (Modification of design) establishes suffix letters indicating cage type, tapered bore and other modifications of regular design, as shown on pages 37 and 38.

Section 3 (Internal fit and tolerances) establishes suffix figures indicating data, as shown on page 39.

Section 4 (Lubricants and preservatives) establishes suffix letters to identify types of lubricants and preservatives, as shown on page 40.

Section 5 (Special requirements) establishes suffix figures for specification items, as shown on page 41 and in Appendix 1.