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Rolling bearings — Vocabulary
Roulements — Vocabulaire
Подшипники качения — Словарь



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Contents

Page

Foreword	iv
Introduction	v
1 Scope	1
2 Normative references	1
3 Terms and definitions	1
3.1 Mechanical bearings	1
3.1.1 Rolling bearings	1
3.1.2 Radial bearings	7
3.1.3 Thrust bearings	9
3.1.4 Ball bearings	10
3.1.5 Roller bearings	15
3.2 Bearing parts	18
3.2.1 General	18
3.2.2 Features of bearing parts	21
3.2.3 Bearing rings	23
3.2.4 Bearing washers	26
3.2.5 Rolling elements	28
3.2.6 Cages	31
3.3 Bearing arrangements and subunits	33
3.3.1 Bearing arrangements	33
3.3.2 Subunits	34
3.3.3 Rolling element and cage assemblies	35
3.4 Dimensions and feature identifications	36
3.4.1 Dimension plans, series and other feature identifications	36
3.4.2 Planes	37
3.4.3 Boundary dimensions	38
3.4.4 Dimensions of subunits and parts	40
3.5 Dimensions associated with tolerances	43
3.5.1 Widths of inner and outer rings	43
3.5.2 Roller dimensions	43
3.5.3 Internal clearance	44
3.6 Torque, loads and life	44
3.6.1 Torque	44
3.6.2 Actual loads	44
3.6.3 Equivalent loads	46
3.6.4 Life	46
3.6.5 Calculation factors	46
3.7 Miscellaneous	47
3.7.1 Housings and bearing units	47
3.7.2 Location and securing	49
Bibliography	100
Index	101

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.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular, the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

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. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see www.iso.org/patents).

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

For an explanation of the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT), see www.iso.org/iso/foreword.html.

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

This fourth edition cancels and replaces the third edition (ISO 5593:2019), which has been technically revised.

The main changes compared to the previous edition are as follows: some definitions, figures and notes have been modified.

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

Introduction

0.1 General

This document provides a list of terms and associated descriptions that are commonly applied in the field of rolling bearings and their technology. The document contains a list of terms which have found general acceptance and a common usage.

This document also includes terms which are precisely defined in other rolling bearing standards in the rolling bearing industry.

ISO/TC 4 standards associated with GPS published after this document can contain additional terms and definitions.

0.2 Organization of the vocabulary

This document contains:

- terms, with their definition, in mixed order and grouped by topic;
- figures with index numbers of relevant terms;
- alphabetical listings of the terms, with their index numbers.

0.3 Organization of the figures

The figures are principally arranged in the same order as the terms they illustrate.

Each figure gives the index numbers of relevant terms. A figure usually shows only one example of several existing forms of a bearing or part. In most cases, the figures are simplified and leave out unnecessary details.

Rolling bearings — Vocabulary

1 Scope

This document defines terms applied in the field of rolling bearings and their technology.

This document includes terms related to all types of rolling bearings wherein the principal degree of freedom is continuous rotation around an axis enabled by an ordered set of rolling elements between two circular raceways such that loads can be transmitted between them in a particular range of either radial or axial directions, or both. This document also includes accessories to these products.

The following types of terms are not included:

- terms specified in ISO 76, ISO 281 and ISO 1132-1;
- terms which are narrowly applied in only one specialized rolling bearing International Standard.

2 Normative references

There are no normative references in this document.

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

ISO and IEC maintain terminology databases for use in standardization at the following addresses:

- ISO Online browsing platform: available at <https://www.iso.org/obp>
- IEC Electropedia: available at <https://www.electropedia.org/>

3.1 Mechanical bearings

3.1.1 Rolling bearings

3.1.1.1 bearing

mechanical component by means of which a moving part in relative motion is supported and/or guided with respect to other parts of a mechanism

3.1.1.2 rolling bearing

bearing operating with rolling (rather than sliding) motion between the parts supporting load and moving in relation to each other

Note 1 to entry: See [Figures 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32](#) and [33](#).

Note 2 to entry: It comprises raceway members and rolling elements with or without means for either their spacing or guiding, or both.

Note 3 to entry: It may be designed to support radial load, axial load or combined radial and axial load.

3.1.1.3

single-row bearing

single-row rolling bearing

rolling bearing with one row of rolling elements

Note 1 to entry: See [Figures 1, 2, 3, 4, 6, 8, 9, 10, 11, 12, 13, 14, 15, 17, 21, 22, 23, 24, 27, 28, 29, 30, 31](#) and [158](#).

3.1.1.4

double-row bearing

double-row rolling bearing

rolling bearing with two rows of rolling elements

Note 1 to entry: See [Figures 5, 7, 16, 20, 25](#) and [26](#).

3.1.1.5

multi-row bearing

multi-row rolling bearing

rolling bearing with more than two rows of rolling elements

Note 1 to entry: See [Figure 19](#).

Note 2 to entry: It is preferable to specify the number of rows and type of bearing, for example, “four-row (radial) cylindrical roller bearing”.

3.1.1.6

insert bearing

insert ball bearing

radial ball bearing with a spherical outside surface and an extended inner ring with a locking device

Note 1 to entry: See [Figure 8](#).

Note 2 to entry: It is technically possible to have insert bearings with rollers as rolling elements. Such bearings are however so rare that, for practical use in the bearing industry, the terms “insert bearing” and “insert ball bearing” are considered to be synonymous.

3.1.1.7

full complement bearing

full complement rolling bearing

rolling bearing in which the sum of the clearances between the rolling elements in each row is less than the diameter of the rolling elements

Note 1 to entry: See [Figures 14, 22, 23](#) and [157](#).

Note 2 to entry: Full complement bearings are without a cage or separators usually.

Note 3 to entry: The sum of the clearances between the rolling elements in each row is small enough to give satisfactory function of the bearing.

3.1.1.8

angular contact bearing

angular contact rolling bearing

rolling bearing designed to support a combination of radial and axial loads

Note 1 to entry: See [Figures 4, 5, 7, 9, 10, 12, 16, 17, 20, 21, 27, 29](#) and [31](#).

3.1.1.9

rigid bearing

rigid rolling bearing

rolling bearing which resists angular misalignment between the axes of its raceways

Note 1 to entry: See [Figures 1, 2, 3, 4, 5, 6, 8, 9, 10, 11, 12, 13, 14, 17, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29](#) and [30](#).

3.1.1.10**self-aligning bearing****self-aligning rolling bearing**

rolling bearing which can accommodate angular misalignment and angular motion between the axes of its rings or washers due to one raceway being spherical

Note 1 to entry: See [Figures 7, 15, 16, 31](#) and [158](#).

3.1.1.11**external-aligning bearing****external-aligning rolling bearing**

rolling bearing which can accommodate angular misalignment between its axis and the axis of its housing by means of a spherical form on one ring or washer surface, which mates with a complementary seat surface in an aligning housing ring, in an aligning seat washer or in the housing

Note 1 to entry: See [Figures 8, 58](#) and [120](#).

3.1.1.12**separable bearing****separable rolling bearing**

rolling bearing with separable bearing ring or other subunits

Note 1 to entry: See [Figures 6, 9, 10, 11, 12, 13, 14, 19, 21, 24, 25, 26, 28, 29, 30, 31, 35, 36, 39, 40](#) and [41](#).

3.1.1.13**non-separable bearing****non-separable rolling bearing**

rolling bearing from which, after final manufacturing assembly, neither of its bearing ring can be freely separated

Note 1 to entry: See [Figures 1, 2, 3, 4, 5, 7, 8, 15, 16, 17, 20, 22, 23](#) and [27](#).

3.1.1.14**split bearing****split rolling bearing**

rolling bearing with rings and the cage, when used, divided into two semi-circular pieces to facilitate mounting

Note 1 to entry: See [Figure 18](#).

3.1.1.15**metric bearing****metric rolling bearing**

rolling bearing designed with boundary dimensions and tolerances in metric units

3.1.1.16**metric series bearing****metric series rolling bearing**

metric rolling bearing which conforms to the ISO dimension plan

3.1.1.17**inch bearing****inch rolling bearing**

rolling bearing designed with boundary dimensions and tolerances in inches

3.1.1.18**inch series bearing****inch series rolling bearing**

inch rolling bearing which conforms to an inch dimension plan

3.1.1.19

open bearing

open rolling bearing

rolling bearing with neither seals nor shields

Note 1 to entry: See [Figures 1, 4, 5, 6, 7, 9, 10, 11, 12, 13, 15, 16, 17, 18, 19, 21, 24, 25, 26, 27, 28, 29, 30](#) and [31](#).

3.1.1.20

sealed bearing

sealed rolling bearing

rolling bearing which is fitted with a seal on one or both sides

Note 1 to entry: See [Figures 2, 8](#) and [20](#).

3.1.1.21

shielded bearing

shielded rolling bearing

rolling bearing which is fitted with a shield on one or both sides

Note 1 to entry: See [Figure 3](#).

3.1.1.22

capped bearing

capped rolling bearing

rolling bearing which is fitted with one or two seals, one or two shields or with one seal and one shield

Note 1 to entry: See [Figures 2, 3, 8](#) and [20](#).

3.1.1.23

pre-lubricated bearing

pre-lubricated rolling bearing

rolling bearing which has been charged with lubricant by the manufacturer

3.1.1.24

airframe bearing

airframe rolling bearing

rolling bearing which, by reason of design or execution, is intended for use in the general structure of an aircraft, including its control systems

3.1.1.25

instrument precision bearing

instrument precision rolling bearing

rolling bearing which, by reason of design or execution, is intended for use in instruments

3.1.1.26

railway axlebox bearing

railway axlebox rolling bearing

rolling bearing which, by reason of design or execution, is intended for use in railway axleboxes

Note 1 to entry: See [Figure 20](#).

3.1.1.27

matched bearing

matched rolling bearing

rolling bearing in a matched pair or a matched stack

3.1.1.28**coated bearing****coated rolling bearing**

rolling bearing with one or more bearing rings or bearing washers and/or the rolling elements fully or partly covered (coated) by means of a specifically defined surface coating method

Note 1 to entry: See [Figures 114](#) and [115](#).

Note 2 to entry: The coating may also be applied to additional integral bearing parts such as cages and shields but, if only the additional integral bearing parts are coated, the term “coated bearing” should not be used.

3.1.1.29**insulated bearing****insulated rolling bearing**

rolling bearing which prevents the passage of electric current and/or the equalization of different voltage potentials in a given insulation class

Note 1 to entry: See [Figures 114](#), [115](#), [116](#) and [117](#).

Note 2 to entry: Commonly, either the bearing outside surface, faces and chamfers of the outer ring or the bearing bore, faces and chamfers of the inner ring are provided with an insulating layer of, for example, oxide ceramics or polymer resins.

Note 3 to entry: The insulation can, alternatively, be provided by means of the rolling elements if they are all made of a non-conductive material, for example as in some types of hybrid bearings.

3.1.1.30**hybrid bearing****hybrid rolling bearing**

rolling bearing in which the rolling elements are made of ceramic material and at least one bearing ring or bearing washer is made of bearing steel

Note 1 to entry: See [Figure 116](#).

Note 2 to entry: Hybrid bearings for some special applications have a limited number of their rolling elements made of ceramic material with the remainder being made of bearing steel.

3.1.1.31**ceramic bearing****ceramic rolling bearing**

rolling bearing in which the bearing rings/washers and the rolling elements are made of ceramic material

Note 1 to entry: See [Figure 117](#).

3.1.1.32**sensor bearing****sensor rolling bearing****sensorized bearing****sensorized rolling bearing**

rolling bearing with one or more integrated sensors which consist of either electromechanical or electronic, or both type of components

Note 1 to entry: See [Figure 118](#).

Note 2 to entry: Temperature, speed, displacement, vibration and forces are typical items that can be monitored.

Note 3 to entry: Signal transfer to evaluation equipment is generally via cable, but can be by wireless connection.

3.1.1.33

heat stabilized bearing

heat stabilized rolling bearing

rolling bearing able to withstand specified exposure temperatures and maintain dimensional stability

Note 1 to entry: Achieved by tempering components.

3.1.1.34

combined bearing

combined rolling bearing

rolling bearing which has two sets of rolling elements in a bearing individually supporting radial load and axial load respectively

Note 1 to entry: See [Figure 119](#).

3.1.1.35

duplex bearing

duplex rolling bearing

stack of two rolling bearings selected or manufactured to have predetermined characteristics when mounted together

Note 1 to entry: See [Figures 77](#), [78](#) and [79](#).

3.1.1.36

face-to-face duplex bearing

face-to-face duplex rolling bearing

duplex bearing matched in X-arrangement

stack of two matched bearings mounted with the front faces of their outer rings in contact with each other

Note 1 to entry: See [Figure 78](#).

Note 2 to entry: See [3.3.1.4](#).

3.1.1.37

tandem duplex bearing

tandem duplex rolling bearing

stack of two matched bearings mounted with the back face of the outer ring of one bearing in contact with the front face of the outer ring of the next bearing

Note 1 to entry: See [Figure 79](#).

Note 2 to entry: See [3.3.1.5](#).

3.1.1.38

back-to-back duplex bearing

back-to-back duplex rolling bearing

duplex bearing matched in O-arrangement

stack of two matched bearings mounted with the back faces of their outer rings in contact with each other

Note 1 to entry: See [Figure 77](#).

Note 2 to entry: See [3.3.1.3](#).

3.1.1.39

bearing with interchangeable subunit

rolling bearing with interchangeable subunit

rolling bearing designed and manufactured so that its function is kept properly when any subunit from the same group of separable (rolling) bearings is assembled with it

Note 1 to entry: Refer to *interchangeable subunit* ([3.3.2.2](#)).

3.1.1.40**bearing with non-interchangeable subunit****rolling bearing with non-interchangeable subunit**

rolling bearing having a subunit with which it is uniquely paired and not designed and manufactured to keep its function when assembled with a subunit from any other of the same group of the separable rolling bearings

Note 1 to entry: Refer to *non-interchangeable subunit* ([3.3.2.3](#)).

3.1.2 Radial bearings**3.1.2.1****radial bearing****radial rolling bearing**

rolling bearing designed to support primarily radial load

Note 1 to entry: See [Figures 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22](#) and [23](#).

Note 2 to entry: Some radial rolling bearings are designed to support a pure radial or axial load as well as a combination of radial and axial loads.

Note 3 to entry: Its principal parts are inner ring, outer ring and rolling elements with or without a cage.

3.1.2.2**radial contact bearing****radial contact rolling bearing**

rolling bearing designed to support primarily a radial load, having a nominal contact angle of 0°

Note 1 to entry: See [Figures 1, 2, 3, 8, 11, 13, 14, 15, 18, 19, 22](#) and [23](#).

3.1.2.3**angular contact radial bearing****angular contact radial rolling bearing**

rolling bearing designed to support primarily a combined radial and axial load

Note 1 to entry: See [Figures 4, 5, 7, 9, 10, 12, 16, 17, 20](#) and [21](#).

3.1.2.4**tapered bore bearing****tapered bore rolling bearing**

radial rolling bearing having an inner ring with tapered bore

Note 1 to entry: See [Figures 7](#) and [19](#).

3.1.2.5**flanged bearing****flanged rolling bearing**

radial rolling bearing with an external radial flange on one of its rings, usually the outer ring

Note 1 to entry: See [Figure 21](#).

3.1.2.6**track roller****track roller rolling bearing**

radial rolling bearing with a heavy section outer ring, intended for use as a roller to roll on a track

Note 1 to entry: See [Figures 22](#) and [23](#).

Note 2 to entry: It is intended for use as a roller to roll on a cam track.

3.1.2.7

yoke-type track roller

yoke-type track roller rolling bearing

track roller rolling bearing intended for mounting in a yoke

Note 1 to entry: See [Figure 22](#).

3.1.2.8

stud-type track roller

stud-type track roller rolling bearing

track roller rolling bearing in which the inner member is extended on one side in the form of a shaft for cantilever mounting of the bearing

Note 1 to entry: See [Figure 23](#).

3.1.2.9

universal matching bearing

universal matching rolling bearing

radial rolling bearing which, when used together with one or more similar bearing(s), selected at random, yields predetermined characteristics in a paired or stack mounting

3.1.2.10

bearing with cylindrical bore

rolling bearing with cylindrical bore

radial rolling bearing having an inner ring with cylindrical bore

Note 1 to entry: See [Figures 1, 2, 3, 4, 5, 6, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 20, 21](#) and [22](#).

3.1.2.11

bearing with cylindrical outside surface

rolling bearing with cylindrical outside surface

radial rolling bearing with an outer ring with cylindrical outside surface

Note 1 to entry: See [Figures 1, 2, 3, 4, 5, 6, 7, 9, 10, 11, 12, 13, 14, 15, 16, 17, 19](#) and [20](#).

3.1.2.12

bearing with spherical outside surface

rolling bearing with spherical outside surface

radial rolling bearing with an outer ring with spherical outside surface

Note 1 to entry: See [Figures 8, 46](#) and [58](#).

3.1.2.13

bearing with locating snap ring groove

rolling bearing with locating snap ring groove

rolling bearing having a snap ring groove in the outer ring outside surface

Note 1 to entry: See [Figure 97](#).

3.1.2.14

bearing with locating snap ring

rolling bearing with locating snap ring

rolling bearing having a locating snap ring fitted in a groove on the outer ring outside surface

Note 1 to entry: See [Figure 34](#).

3.1.2.15

bearing with adapter sleeve assembly

rolling bearing with adapter sleeve assembly

rolling bearing combined with an adapter sleeve assembly

Note 1 to entry: See [Figure 154](#).

3.1.2.16**radial bearing with aligning housing ring****radial rolling bearing with aligning housing ring**

rolling bearing combined with an aligning housing ring

Note 1 to entry: See [Figure 58](#).**3.1.3 Thrust bearings****3.1.3.1****thrust bearing****thrust rolling bearing**

rolling bearing designed to support primarily axial load

Note 1 to entry: See [Figures 24, 25, 26, 27, 28, 29, 30](#) and [31](#).

Note 2 to entry: Some thrust rolling bearings are designed to support a combination of axial and radial loads.

Note 3 to entry: Its principal parts are shaft washer, housing washer and rolling elements with or without a cage.

3.1.3.2**axial contact bearing****axial contact rolling bearing**

rolling bearing designed to support an axial load, having a nominal contact angle of 90°

Note 1 to entry: See [Figures 24, 25, 26, 28](#) and [30](#).**3.1.3.3****angular contact thrust bearing****angular contact thrust rolling bearing**

rolling bearing designed to support a combination of axial and radial loads

Note 1 to entry: See [Figures 27, 29](#) and [31](#).**3.1.3.4****single-direction thrust bearing****single-direction thrust rolling bearing**

thrust rolling bearing intended to support axial load in one direction only

Note 1 to entry: See [Figures 24, 26, 28, 29, 30](#) and [31](#).**3.1.3.5****double-direction thrust bearing****double-direction thrust rolling bearing**

thrust rolling bearing intended to support axial load in both directions

Note 1 to entry: See [Figures 25](#) and [27](#).**3.1.3.6****double-row double-direction thrust bearing****double-row double-direction thrust rolling bearing**

double-direction thrust rolling bearing having two rows of rolling elements, each supporting axial load in one direction only

Note 1 to entry: See [Figure 25](#).**3.1.3.7****thrust bearing with flat back faces****thrust rolling bearing with flat back faces**

thrust rolling bearing in which the back faces of the housing and shaft washers are flat

Note 1 to entry: See [Figures 24, 25, 26, 28, 29, 30](#) and [31](#).

3.1.3.8

aligning thrust bearing

aligning thrust rolling bearing

thrust rolling bearing which can accommodate angular misalignment between the axes of its raceways and the housing

Note 1 to entry: See [Figures 31, 61](#) and [96](#).

3.1.4 Ball bearings

3.1.4.1

ball bearing

rolling bearing with balls as rolling elements

Note 1 to entry: See [Figures 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 24, 25, 26, 27](#) and [33](#).

3.1.4.2

radial ball bearing

rolling bearing with balls as rolling elements designed to primarily support radial load

Note 1 to entry: See [Figures 1, 2, 3, 4, 5, 6, 7, 8, 9](#) and [10](#).

3.1.4.3

groove ball bearing

radial ball bearing where the raceways of which are grooves generally with a cross-section of an arc of a circle with a radius slightly larger than half the ball diameter

Note 1 to entry: See [Figures 1, 2, 3, 4, 5, 6, 8, 9](#) and [10](#).

3.1.4.4

deep groove ball bearing

radial ball bearing in which each ring has uninterrupted raceway grooves with a cross-section matching about one-third of the ball circumference

Note 1 to entry: See [Figures 1, 2, 3](#) and [8](#).

3.1.4.5

filling slot bearing

filling slot ball bearing

groove ball bearing having a filling slot in one shoulder of each ring

Note 1 to entry: See [Figure 5](#).

Note 2 to entry: Filling slots are commonly used to permit the insertion of a larger number of balls.

3.1.4.6

counterbored ball bearing

groove ball bearing with one outer ring shoulder completely or partly removed

Note 1 to entry: See [Figure 6](#).

3.1.4.7

magneto bearing

magneto ball bearing

radial contact groove ball bearing with one outer ring shoulder completely removed, making this ring separable

Note 1 to entry: See [Figure 6](#).

3.1.4.8**three-point-contact bearing**
three-point-contact ball bearing

single-row angular contact ball bearing in which, when under purely radial load, each loaded ball makes contact with one of the raceways at two points and with the other raceway at one point

Note 1 to entry: See [Figure 9](#).

Note 2 to entry: Under pure axial load on the bearing, each ball makes contact with each raceway at only one point.

Note 3 to entry: This bearing is used as a thrust bearing even though its nominal contact angle is generally less than 45°.

3.1.4.9**four-point-contact bearing**
four-point-contact ball bearing

single-row angular contact ball bearing in which, when under purely radial load, each loaded ball makes contact with each of the two raceways at two points

Note 1 to entry: See [Figures 10](#) and [27](#).

Note 2 to entry: Under pure axial load on the bearing, each ball makes contact with each raceway at only one point.

Note 3 to entry: This bearing is used as a thrust bearing even though its nominal contact angle is generally less than 45°.

3.1.4.10**thrust ball bearing**

thrust rolling bearing with balls as rolling elements designed to primarily support axial load

Note 1 to entry: See [Figures 24](#), [25](#), [26](#) and [27](#).

3.1.4.11**single-row double-direction thrust ball bearing**

four-point-contact ball bearing designed to support axial load in both directions

Note 1 to entry: See [Figure 27](#).

Note 2 to entry: Under pure axial load on the bearing, each ball makes contact with each raceway at only one point.

3.1.4.12**double-row single-direction thrust ball bearing**

single-direction thrust rolling bearing having two concentric rows of balls where both supporting loads are in the same direction

Note 1 to entry: See [Figure 26](#).

3.1.4.13**single-row ball bearing**

ball bearing with one row of balls

Note 1 to entry: See [Figures 1](#), [2](#), [3](#), [4](#), [6](#), [8](#), [9](#) and [10](#).

Note 2 to entry: These bearings are commonly understood to be single-row radial ball bearings.

3.1.4.14**double-row ball bearing**

ball bearing with two rows of balls

Note 1 to entry: See [Figures 5](#) and [7](#).

Note 2 to entry: These bearings are commonly understood to be double-row radial ball bearings.

3.1.4.15

multi-row ball bearing

ball bearing with more than two rows of balls

Note 1 to entry: It is preferable to specify the number of rows and type of bearing, for example, “four-row (radial) ball bearing”.

Note 2 to entry: These bearings are commonly understood to be multi-row radial ball bearings.

3.1.4.16

full complement ball bearing

ball bearing without a cage

Note 1 to entry: See [Figure 157](#).

Note 2 to entry: The sum of the clearances between the balls in each row is less than the diameter of the balls and is small enough to give satisfactory function of the bearing.

Note 3 to entry: This bearing is commonly understood to be full complement radial ball bearings.

3.1.4.17

angular contact ball bearing

rolling bearing with balls as rolling elements designed to support primarily a combined radial and axial load

Note 1 to entry: See [Figures 4](#) and [27](#).

3.1.4.18

open ball bearing

ball bearing with neither seals nor shields

Note 1 to entry: See [Figure 1](#).

3.1.4.19

sealed ball bearing

ball bearing which is fitted with a seal on one or both sides

Note 1 to entry: See [Figures 2, 8](#) and [44](#).

3.1.4.20

shielded ball bearing

ball bearing which is fitted with a shield on one or both sides

Note 1 to entry: See [Figures 3](#) and [45](#).

3.1.4.21

capped ball bearing

ball bearing which is fitted with one or two seals, one or two shields, or with one seal and one shield

Note 1 to entry: See [Figures 2, 3](#) and [8](#).

3.1.4.22

pre-lubricated ball bearing

ball bearing which has been charged with lubricant by the manufacturer

3.1.4.23

airframe ball bearing

ball bearing which, by reason of design or execution, is intended for use in the general structure of an aircraft including its control systems

3.1.4.24**instrument precision ball bearing**

ball bearing which, by reason of design or execution, is intended for use in instruments

3.1.4.25**matched ball bearing**

ball bearing in a matched pair or a matched stack

3.1.4.26**coated ball bearing**

ball bearing with either one or more bearing rings or bearing washers, or the balls fully or partly covered by means of a specifically defined surface coating method, or both

Note 1 to entry: The coating can also be applied to additional integral bearing parts such as cages and shields but, if only the additional integral bearing parts are coated, the term “coated bearing” should not be used.

3.1.4.27**insulated ball bearing**

ball bearing which prevents either the passage of electric current or the equalization of different voltage potentials in a given insulation class, or both

Note 1 to entry: See [Figures 114, 115, 116 and 117](#).

Note 2 to entry: Commonly, either the bearing outside surface, faces and chamfers of the outer ring or the bearing bore, faces and chamfers of the inner ring are provided with an insulating layer of, for example, oxide ceramics or polymer resins.

Note 3 to entry: The insulation can, alternatively, be provided by means of the balls if they are all made of a non-conductive material, for example, as in some types of hybrid bearing.

3.1.4.28**hybrid ball bearing**

ball bearing in which the balls are made of ceramic material and at least one of the rings or washers are made of bearing steel

Note 1 to entry: See [Figure 116](#).

3.1.4.29**ceramic ball bearing**

ball bearing in which the bearing rings/washers and the balls are made of ceramic material

Note 1 to entry: See [Figure 117](#).

3.1.4.30**sensor ball bearing****sensorized ball bearing**

ball bearing with one or more integrated sensors which consist of electromechanical and/or electronic components

Note 1 to entry: See [Figure 118](#).

Note 2 to entry: Temperature, speed, displacement, vibration and forces are typical items that can be monitored.

Note 3 to entry: Signal transfer to evaluation equipment is generally via cable but can be by wireless connection.

3.1.4.31**bearing with truncated balls**

bearing with symmetrically truncated balls as rolling elements

Note 1 to entry: See [Figure 121](#).

Note 2 to entry: This type of bearing is not recently used.

3.1.4.32

heat stabilized ball bearing

ball bearing able to withstand specified exposure temperatures and maintain dimensional stability

Note 1 to entry: Achieved by tempering components.

3.1.4.33

single-row angular contact ball bearing with two-piece inner ring

single-row angular contact ball bearing of which inner ring is separated into two pieces on the radial plane

Note 1 to entry: See [Figures 9](#) and [10](#).

3.1.4.34

single-row angular contact ball bearing with two-piece outer ring

single-row angular contact ball bearing of which the outer ring is separated into two pieces in the radial plane

Note 1 to entry: See [Figure 122](#).

3.1.4.35

double-row angular contact ball bearing with vertex of contact angles inside the bearing

double-row ball bearing of “X” design

double-row angular contact ball bearing in which the axial distance between the contact points of one row of balls and another row of balls on the inner ring is smaller than that distance on the outer ring

Note 1 to entry: See [Figure 123](#).

3.1.4.36

double-row angular contact ball bearing with vertex of contact angles outside the bearing

double-row ball bearing of “O” design

double-row angular contact ball bearing in which the axial distance between the contact points of one row of balls and another row of balls on the inner ring is larger than that distance on the outer ring

Note 1 to entry: See [Figure 124](#).

3.1.4.37

self-aligning ball bearing

single-row self-aligning ball bearing

double-row self-aligning ball bearing

rolling bearing with balls as rolling elements and having a spherical raceway in the outer ring enabling angular alignment within the raceway

Note 1 to entry: See [Figures 7](#) and [158](#).

Note 2 to entry: “self-aligning ball bearing” includes “single row” and “double row”

3.1.4.38

angular contact thrust ball bearing

thrust ball bearing, designed to support primarily a combined radial and axial load

Note 1 to entry: See [Figure 149](#).

3.1.4.39

aligning thrust ball bearing

aligning thrust rolling bearing with balls as rolling elements

Note 1 to entry: See [Figure 61](#) and [96](#).

3.1.4.40**single-direction aligning thrust ball bearing**

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

Note 1 to entry: See [Figure 96](#).

3.1.4.41**double-direction aligning thrust ball bearing**

aligning thrust ball bearing intended to support axial load in both directions

Note 1 to entry: See [Figure 61](#). The bearing in [Figure 61](#) also includes aligning seat washers.

3.1.4.42**aligning thrust ball bearing with aligning seat washer**

aligning thrust (rolling) bearing with seat washer(s) that handle angular misalignment between the shaft and housing axes and having balls as rolling elements

Note 1 to entry: See [Figures 61](#) and [96](#).

3.1.4.43**single-direction aligning thrust ball bearing with an aligning seat washer**

aligning thrust ball bearing with aligning seat washer that can carry load in one direction only

Note 1 to entry: See [Figure 96](#).

3.1.4.44**double-direction aligning thrust ball bearing with aligning seat washers**

aligning thrust ball bearing with an aligning seat washer that can carry load in both directions

Note 1 to entry: See [Figure 61](#).

3.1.5 Roller bearings**3.1.5.1****roller bearing**

rolling bearing with rollers as rolling elements

Note 1 to entry: See [Figures 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 28, 29, 30, 31](#) and [32](#).

3.1.5.2**radial roller bearing**

rolling bearing with rollers as rolling elements designed to primarily support the radial load

Note 1 to entry: See [Figures 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22](#) and [23](#).

3.1.5.3**cylindrical roller bearing**

radial roller bearing with cylindrical rollers as rolling elements

Note 1 to entry: See [Figures 11, 17, 18](#) and [19](#).

3.1.5.4**tapered roller bearing**

angular contact radial rolling bearing with tapered rollers as rolling elements designed to support combined radial and axial loads

Note 1 to entry: See [Figures 12, 20](#) and [21](#).

3.1.5.5

needle roller bearing

radial roller bearing with needle rollers as rolling elements

Note 1 to entry: See [Figures 13, 14, 22](#) and [23](#).

3.1.5.6

drawn cup needle roller bearing

radial needle roller bearing with a thin pressed outer ring (drawn cup)

Note 1 to entry: See [Figure 14](#).

Note 2 to entry: The bearing is usually employed without an inner ring.

Note 3 to entry: It can have one closed end or both ends open.

3.1.5.7

convex roller bearing

radial roller bearing with convex rollers as rolling elements

Note 1 to entry: See [Figure 16](#).

3.1.5.8

concave roller bearing

radial roller bearing with concave rollers as rolling elements

Note 1 to entry: See [Figure 15](#).

3.1.5.9

toroidal roller bearing

single-row self-aligning radial roller bearing with convex rollers as rolling elements and rings with raceway radii larger than half the outer ring raceway diameter

Note 1 to entry: See [Figure 150](#).

3.1.5.10

spherical roller bearing

radial roller bearing with convex rollers as rolling elements and having a spherical raceway in the outer ring enabling angular alignment within the raceways

Note 1 to entry: See [Figure 16](#).

Note 2 to entry: Generally, this bearing is double-row but there are also single-row variants.

3.1.5.11

crossed roller bearing

angular contact rolling bearing with one row of rollers, each roller positioned crosswise in relation to the adjacent rollers, such that an axial load in one direction is supported by half the roller set (every second roller) whilst an axial load in the opposite direction is carried by the other half of the roller set

Note 1 to entry: See [Figure 17](#).

3.1.5.12

thrust roller bearing

thrust rolling bearing having rollers as rolling elements and designed to support primarily an axial load

Note 1 to entry: See [Figures 28, 29, 30](#) and [31](#).

3.1.5.13

thrust cylindrical roller bearing

thrust roller bearing with cylindrical rollers as rolling elements

Note 1 to entry: See [Figure 28](#).

3.1.5.14**thrust tapered roller bearing**

thrust roller bearing with tapered rollers as rolling elements

Note 1 to entry: See [Figure 29](#).

3.1.5.15**thrust needle roller bearing**

thrust roller bearing with needle rollers as rolling elements

Note 1 to entry: See [Figure 30](#).

3.1.5.16**thrust spherical roller bearing****self-aligning thrust roller bearing**

roller bearing, having convex rollers as rolling elements, allowing angular displacement of the raceway axis due to the spherical form of the housing washer raceway and designed primarily to support axial load

Note 1 to entry: See [Figure 31](#).

3.1.5.17**single-row roller bearing**

roller bearing with one row of rollers

Note 1 to entry: See [Figures 11, 12, 13, 14, 15, 17, 21, 22](#) and [23](#).

Note 2 to entry: These bearings are commonly understood to be single-row radial roller bearings.

3.1.5.18**double-row roller bearing**

roller bearing with two rows of rollers

Note 1 to entry: See [Figures 16, 20, 42, 43, 56, 125](#) and [126](#).

Note 2 to entry: These bearings are commonly understood to be double-row radial roller bearings.

3.1.5.19**multi-row roller bearing**

roller bearing with more than two rows of rollers

Note 1 to entry: See [Figure 19](#).

Note 2 to entry: These bearings are commonly understood to be multi-row radial roller bearings.

Note 3 to entry: It is preferable to specify the number of rows and type of bearing, for example, “four-row roller bearing” or “four-row radial roller bearing”.

3.1.5.20**full complement roller bearing****full complement radial roller bearing**

roller bearing without a cage

Note 1 to entry: See [Figures 14, 22, 23](#) and [157](#).

Note 2 to entry: The sum of the clearances between the rollers in each row is less than the diameter of the rollers and is small enough to give satisfactory function of the bearing.

3.1.5.21**heat stabilized roller bearing**

roller bearing able to withstand specified exposure temperatures and maintain dimensional stability

Note 1 to entry: Achieved by tempering components.

3.1.5.22

tapered double inner ring bearing
tapered double raceway inner ring bearing

TDI

double-row tapered roller bearing having one inner ring with two raceways and two outer rings

Note 1 to entry: See [Figure 125](#).

3.1.5.23

tapered double outer ring bearing
tapered double raceway outer ring bearing

TDO

double-row tapered roller bearing having one outer ring with two raceways and two inner subunits

Note 1 to entry: See [Figure 126](#).

3.1.5.24

needle roller bearing with machined rings

radial needle roller bearing with solid machined rings

3.2 Bearing parts

3.2.1 General

3.2.1.1

bearing part

rolling bearing part

individual part comprising a rolling bearing but excluding all accessories

3.2.1.2

bearing ring

rolling bearing ring

annular part of a radial rolling bearing incorporating one or more raceways

Note 1 to entry: See [Figures 34](#) and [35](#).

3.2.1.3

bearing washer

rolling bearing washer

annular part of a thrust rolling bearing incorporating one or more raceways

Note 1 to entry: See [Figure 36](#).

3.2.1.4

separable bearing ring

bearing ring which can be independently and freely separated from a complete rolling bearing

Note 1 to entry: See [Figures 35](#), [40](#) and [41](#).

3.2.1.5

interchangeable bearing ring

separable bearing ring which can be replaced by another ring of a similar group without impairing the function of the bearing

Note 1 to entry: See [Figure 35](#).

3.2.1.6**single-split bearing ring**

bearing ring which is split or fractured across its raceway(s), in one place only, to facilitate manufacturing and/or mounting

Note 1 to entry: See [Figure 37](#).

3.2.1.7**double-split bearing ring**

bearing ring which is split or fractured across its raceway(s), in two places in (basically) an axial plane, to facilitate either manufacturing assembly or mounting, or both

Note 1 to entry: See [Figure 38](#).

Note 2 to entry: The two splits are generally diametrically opposite one another.

3.2.1.8**two-piece bearing ring**

bearing ring divided into two annular pieces in a plane perpendicular to its axis, each piece incorporating at least part of a raceway

Note 1 to entry: See [Figure 39](#).

3.2.1.9**loose rib**

separable flat washer the outer or inner part of which serves as an inner ring rib or outer ring rib for a radial cylindrical roller bearing

Note 1 to entry: See [Figure 40](#).

3.2.1.10**thrust collar****separate thrust collar**

separable ring having an L-shaped section, the outer part of which serves as an inner ring rib for a radial cylindrical roller bearing

Note 1 to entry: See [Figure 41](#).

3.2.1.11**guide ring**

separate ring in a roller bearing with two or more rows of rollers, used to separate the rows and to guide the rollers

Note 1 to entry: See [Figure 42](#).

3.2.1.12**locating snap ring**

single-split ring of constant section, used in a snap ring groove to locate axially a rolling bearing in its housing or on its shaft

Note 1 to entry: See [Figure 34](#).

3.2.1.13**retaining snap ring**

single-split ring of constant section, used in a snap ring groove to serve as a rib retaining the rollers or the cage (with rolling elements) in a rolling bearing

Note 1 to entry: See [Figure 153](#).

3.2.1.14

spacer

ring spacer

annular part used between two bearing rings or bearing washers or the two parts of a two-piece bearing ring or two-piece bearing washer to maintain a specified axial distance between them

Note 1 to entry: See [Figures 43](#) and [56](#).

3.2.1.15

seal

bearing seal

circular closure comprising one or several parts, affixed to one bearing ring or bearing washer and extending towards the other ring or washer, with which it makes contact or forms a narrow labyrinth-shaped gap, for the purpose of preventing leakage of lubricant or ingress of foreign substances

Note 1 to entry: See [Figure 44](#).

3.2.1.16

shield

bearing shield

circular closure, usually of pressed sheet metal, affixed to one bearing ring or bearing washer and extending towards the other ring or washer, covering the interspace but not making contact with the other ring or washer

Note 1 to entry: See [Figure 45](#).

3.2.1.17

flinger

slinger

component part attached to an inner ring or shaft washer to supplement, by centrifugal action, the protection of a rolling bearing against ingress of foreign substances

Note 1 to entry: See [Figure 46](#).

3.2.1.18

rolling element

bearing component which rolls between raceways

Note 1 to entry: See [Figures 34](#), [35](#), [36](#), [47](#), [62](#), [63](#), [64](#), [65](#), [66](#), [67](#), [68](#) and [69](#).

3.2.1.19

cage

rolling bearing cage

bearing part which partly surrounds all or several of the rolling elements and moves with them

Note 1 to entry: See [Figures 34](#), [35](#), [36](#), [70](#), [71](#), [72](#), [73](#), [74](#), [75](#), [76](#), [130](#), [131](#), [151](#) and [152](#).

Note 2 to entry: Its purpose is to space the rolling elements and generally also to guide and/or retain them in the bearing.

3.2.1.20

separator

rolling element separator

bearing part which is placed between adjacent rolling elements and moves with them, the main purpose being to space the rolling element

Note 1 to entry: See [Figure 47](#).

3.2.1.21**labyrinth seal**

external seal forming a narrow gap to keep closure without contact between rotary and stationary parts

Note 1 to entry: See [Figure 156](#).

3.2.2 Features of bearing parts**3.2.2.1****raceway**

surface of a load supporting ring or washer of a rolling bearing, suitably prepared as a rolling track for the rolling elements

Note 1 to entry: See [Figures 48, 49, 50](#) and [52](#).

3.2.2.2**straight raceway**

raceway whose generatrix is a straight line

Note 1 to entry: See [Figure 49](#).

3.2.2.3**crowned raceway**

straight raceway which has a continuous slightly convex profile

Note 1 to entry: The crowned raceway serves to prevent stress concentration at the ends of contacts between rollers and the raceway.

3.2.2.4**spherical raceway**

raceway with a surface shape which is part of a sphere

Note 1 to entry: See [Figures 50](#) and [52](#).

3.2.2.5**raceway groove**

raceway of a ball bearing in the form of a groove, generally with a cross-section of an arc of a circle with a radius slightly larger than half the ball diameter

Note 1 to entry: See [Figures 48](#) and [60](#).

3.2.2.6**shoulder****groove shoulder**

flank of a raceway groove

Note 1 to entry: See [Figure 48](#).

3.2.2.7**rib**

narrow ridge parallel to the direction of rolling, projecting from a raceway surface, generally for the purpose of supporting and/or guiding and/or retaining the rolling elements in a roller bearing

Note 1 to entry: See [Figures 49](#) and [50](#).

3.2.2.8**cage riding land**

cylindrical surface of a bearing ring intended to guide a cage radially

Note 1 to entry: See [Figures 49](#) and [50](#).

3.2.2.9

filling slot

slot in a rib or a shoulder of a bearing ring to permit the insertion of rolling elements

Note 1 to entry: See [Figure 51](#).

3.2.2.10

face

side face

face of a ring

outer surface of a ring perpendicular to the axis of the ring

Note 1 to entry: See [Figures 48, 49, 50](#) and [51](#).

3.2.2.11

bearing bore

bore of the inner ring or shaft washer of a rolling bearing

Note 1 to entry: See [Figures 49, 50, 51](#) and [60](#).

3.2.2.12

cylindrical bore

bearing bore or bore of a bearing part of cylindrical form

Note 1 to entry: See [Figures 49, 51](#) and [60](#).

3.2.2.13

tapered bore

bearing bore or bore of a bearing part of tapered form

Note 1 to entry: See [Figure 50](#).

3.2.2.14

bearing outside surface

outside diameter surface of the outer ring or the housing washer of a rolling bearing

Note 1 to entry: See [Figures 48, 51, 52](#) and [60](#).

3.2.2.15

ring chamfer

surface of a bearing ring joining the bore or outside surface with one of the faces of the ring

Note 1 to entry: See [Figures 48](#) and [49](#).

3.2.2.16

grinding undercut

groove or slot at the root of a rib or flange of a bearing ring or bearing washer to facilitate grinding

Note 1 to entry: See [Figures 49](#) and [50](#).

3.2.2.17

sealing contact surface

surface with which a seal is intended to make sliding contact

Note 1 to entry: See [Figure 44](#).

3.2.2.18

seal groove

annular groove intended for the retention of a bearing seal

Note 1 to entry: See [Figure 44](#).

3.2.2.19**snap ring groove**

annular groove to accommodate a locating snap ring or a retaining snap ring

Note 1 to entry: See [Figure 48](#).

3.2.2.20**lubrication groove**

groove in a bearing part for conveying lubricant

Note 1 to entry: See [Figures 42](#) and [43](#).

3.2.2.21**lubrication hole**

hole in a bearing part for conveying lubricant to the rolling elements

Note 1 to entry: See [Figures 42](#), [43](#) and [112](#).

3.2.2.22**face of a washer**

surface of a washer perpendicular to the axis of the washer and opposite to the raceway

Note 1 to entry: See [Figure 52](#).

3.2.2.23**washer chamfer**

surface of a bearing washer joining the bore or outside surface with one of the faces of the washer

Note 1 to entry: See [Figure 52](#).

3.2.2.24**shield groove**

groove intended for the retention of a bearing shield

Note 1 to entry: See [Figure 45](#).

3.2.2.25**retaining slot**

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

Note 1 to entry: See [Figure 155](#).

Note 2 to entry: The purpose of the slot is to provide a simple means of preventing rotation of the outer ring of a bearing in relation to the application where it is mounted.

3.2.3 Bearing rings**3.2.3.1****inner ring****bearing inner ring**

bearing ring incorporating the raceway(s) on its outside surface

Note 1 to entry: See [Figures 34](#), [35](#), [49](#), [50](#), [54](#) and [56](#).

3.2.3.2**outer ring****bearing outer ring**

bearing ring incorporating the raceway(s) on its inside surface

Note 1 to entry: See [Figures 34](#), [35](#), [48](#) and [54](#).

3.2.3.3

double inner ring

double raceway inner ring

bearing inner ring having two raceways

Note 1 to entry: See [Figures 42, 50](#) and [125](#).

3.2.3.4

double outer ring

double raceway outer ring

bearing outer ring having two raceways

Note 1 to entry: See [Figure 56](#).

3.2.3.5

extended inner ring

bearing inner ring extended on one or both sides

Note 1 to entry: See [Figure 46](#).

Note 2 to entry: It is done in order to improve the guidance of a shaft in its bore and/or to permit either the fixing of a locking device or to provide additional space for sealing devices, or both.

3.2.3.6

stepped inner ring

inner ring with one or both shoulders completely or partly removed

Note 1 to entry: See [Figure 4](#).

3.2.3.7

counterbored outer ring

outer ring with one or both shoulders completely or partly removed

Note 1 to entry: See [Figure 6](#).

3.2.3.8

drawn cup

bearing drawn cup

bearing outer ring made of sheet metal drawn to shape

Note 1 to entry: See [Figure 57](#).

Note 2 to entry: Commonly an outer ring of a needle roller radial bearing with one end closed (closed end drawn cup) or both ends open.

3.2.3.9

flanged outer ring

bearing outer ring with a flange

Note 1 to entry: See [Figure 55](#).

3.2.3.10

aligning outer ring

bearing outer ring having a spherical outside surface to accommodate permanent angular misalignment between its axis and the axis of its housing

Note 1 to entry: See [Figure 58](#).

3.2.3.11**aligning housing ring**

ring used between an aligning outer ring and a housing bore, having a spherical inside surface matching the spherical outside surface of the aligning outer ring

Note 1 to entry: See [Figure 58](#).

3.2.3.12**spherical outside surface**

outside diameter surface, for example, of a bearing outer ring, having the form of part of the surface of a sphere

Note 1 to entry: See [Figures 46](#) and [58](#).

3.2.3.13**back face****back face of a bearing ring**

face of a bearing ring which is intended to support the axial load

Note 1 to entry: See [Figures 53](#) and [54](#).

3.2.3.14**front face****front face of a bearing ring**

face of a bearing ring which is not intended to support axial load

Note 1 to entry: See [Figures 53](#) and [54](#).

3.2.3.15**outer ring flange**

flange on the outside of a bearing outer ring for the purposes of axially locating the bearing in its housing and to support axial load

Note 1 to entry: See [Figure 55](#).

3.2.3.16**flange back face****outer ring flange back face**

side of an outer ring flange which is intended to support the axial load

Note 1 to entry: See [Figure 55](#).

3.2.3.17**inner ring back face rib**

rib on the back face of the raceway of an inner ring, intended to support the roller large end faces axial loads

Note 1 to entry: See [Figure 54](#).

Note 2 to entry: This term applies to tapered roller bearing.

3.2.3.18**inner ring front face rib**

rib on the front face of the raceway of an inner ring, intended to retain the rollers

Note 1 to entry: See [Figures 54](#) and [59](#).

Note 2 to entry: This term applies to tapered roller bearing.

3.2.3.19

outer ring front face rib

rib on the front face of the raceway of an outer ring, intended to support the roller large end faces axial loads

Note 1 to entry: See [Figure 59](#)

Note 2 to entry: This term applies to tapered roller bearing.

3.2.3.20

centre rib

central integral rib of a bearing ring with two raceways

Note 1 to entry: See [Figure 50](#).

3.2.3.21

inner ring back face chamfer

surface joining the back face of a bearing inner ring with the bore of the ring

Note 1 to entry: See [Figure 53](#).

3.2.3.22

outer ring back face chamfer

surface joining the back face of a bearing outer ring with the outside surface of the ring

Note 1 to entry: See [Figure 53](#).

3.2.3.23

inner ring front face chamfer

surface joining the front face of a bearing inner ring with the bore of the ring

Note 1 to entry: See [Figure 53](#).

3.2.3.24

outer ring front face chamfer

surface joining the front face of a bearing outer ring with the outside surface of the ring

Note 1 to entry: See [Figure 53](#).

3.2.3.25

inner ring with rib

inner ring having guiding rib

Note 1 to entry: See [Figure 127](#).

3.2.3.26

outer ring with rib

outer ring having guiding rib

Note 1 to entry: See [Figure 128](#).

3.2.4 Bearing washers

3.2.4.1

shaft washer

bearing washer which is intended to be mounted on a shaft and having raceway(s) on one or both of its end faces

Note 1 to entry: See [Figures 36](#) and [60](#).

3.2.4.2**housing washer**

bearing washer which is intended to be mounted in a housing and having a raceway(s) on one of its end faces

Note 1 to entry: See [Figures 36](#), [52](#) and [60](#).

3.2.4.3**central washer****central shaft washer**

bearing washer having a raceway on each face, used between the two rows of rolling elements of a double-row, double-direction thrust rolling bearing, which is intended to be mounted on a shaft

Note 1 to entry: See [Figure 61](#).

3.2.4.4**aligning housing washer**

housing washer having a spherical back face to accommodate permanent angular misalignment between its axis and the axis of its housing

Note 1 to entry: See [Figure 61](#).

3.2.4.5**aligning seat washer**

washer used between an aligning housing washer and the thrust-supporting surface of a housing, one face of which has a concave spherical surface matching the spherical back face of the aligning housing washer

Note 1 to entry: See [Figure 61](#).

3.2.4.6**spherical back face**

housing washer back face which is convex with a spherical form centred on the rotational axis and tangential to a plane perpendicular to the rotational axis

Note 1 to entry: See [Figure 61](#).

3.2.4.7**shaft washer back face**

face of a shaft washer intended to support axial load which is a flat plane perpendicular to the rotational axis, generally opposite a raceway face

Note 1 to entry: See [Figures 36](#) and [60](#).

3.2.4.8**shaft washer back face chamfer**

surface joining the shaft washer back face with the bore of the washer

Note 1 to entry: See [Figure 60](#).

3.2.4.9**housing washer back face**

face of a housing washer intended to support axial load, generally opposite a raceway face

Note 1 to entry: See [Figures 52](#) and [60](#).

3.2.4.10**housing washer back face chamfer**

surface joining the housing washer back face with the outside surface of the washer

Note 1 to entry: See [Figures 52](#) and [60](#).

3.2.4.11

separable bearing washer

bearing washer which can be independently and freely separated from a complete rolling bearing

3.2.4.12

interchangeable bearing washer

separable bearing washer which can be replaced by another washer of a similar group without impairing the function of the bearing

3.2.4.13

thrust washer

bearing washer for a thrust needle roller and cage assembly

Note 1 to entry: See [Figure 30](#).

3.2.4.14

flat back face

bearing washer back face which is a flat plane perpendicular to the rotational axis, generally opposite a raceway face

Note 1 to entry: See [Figures 24](#) and [25](#).

3.2.4.15

housing thrust washer

thrust washer that is intended to be mounted in a housing

Note 1 to entry: See [Figure 24](#).

3.2.4.16

shaft thrust washer

thrust washer that is intended to be mounted on a shaft

Note 1 to entry: See [Figure 24](#).

3.2.5 Rolling elements

3.2.5.1

ball

spherical rolling element

3.2.5.2

roller

rolling element having an axis of symmetry and being circular in cross-section in any plane perpendicular to that axis

Note 1 to entry: See [Figures 62, 63, 64, 65, 66, 67, 68](#) and [69](#).

3.2.5.3

ball complement

total of the balls in a particular rolling bearing

3.2.5.4

ball set

balls in one row of a rolling bearing

3.2.5.5

cylindrical roller

roller with a basically cylindrical surface

Note 1 to entry: See [Figures 62](#) and [68](#).

3.2.5.6**needle roller**

cylindrical roller of small diameter with a large ratio of length to diameter

Note 1 to entry: See [Figure 63](#).

Note 2 to entry: It is generally accepted that the length is between 3 times and 10 times the diameter, which does not usually exceed 6 mm.

Note 3 to entry: The ends of a needle roller may be one of several shapes.

3.2.5.7**long cylindrical roller**

cylindrical roller with a large ratio of length to diameter

Note 1 to entry: It is generally accepted that the length is more than three times the diameter, which exceeds 6 mm.

3.2.5.8**tapered roller**

roller with a basically tapered surface

Note 1 to entry: See [Figure 64](#).

Note 2 to entry: The general shape is that of a truncated cone.

3.2.5.9**convex roller**

roller where the outside surface has a convex curvature in a plane containing its axis

Note 1 to entry: See [Figures 66](#) and [67](#).

3.2.5.10**concave roller**

roller where the outside surface has a concave curvature in a plane containing its axis

Note 1 to entry: See [Figure 65](#).

3.2.5.11**convex symmetrical roller**

convex roller where the outside surface is symmetrical about the plane perpendicular to the roller axis through the middle of the roller

Note 1 to entry: See [Figure 66](#).

3.2.5.12**convex asymmetrical roller**

convex roller where the outside surface is asymmetrical about the plane perpendicular to the roller axis through the middle of the roller

Note 1 to entry: See [Figure 67](#).

3.2.5.13**crowned roller**

cylindrical roller or tapered roller where the outside surface has a continuous slightly convex curvature in a plane containing the roller axis to prevent stress concentration at the ends of the contacts between the roller and the raceways

3.2.5.14

relieved end roller

roller with a slight modification of diameter at the ends of its outside surface to prevent stress concentration at the ends of the contacts between the roller and the raceways

Note 1 to entry: See [Figure 68](#).

3.2.5.15

spiral wound roller

roller made by winding steel strip in helical form

Note 1 to entry: See [Figure 69](#).

3.2.5.16

roller end face

surface at the end of a roller, perpendicular to the roller axis

Note 1 to entry: See [Figure 62](#).

3.2.5.17

roller large end face

face at the large end of a tapered roller or a convex asymmetrical roller

Note 1 to entry: See [Figures 64](#) and [67](#).

3.2.5.18

roller small end face

face at the small end of a tapered roller or a convex asymmetrical roller

Note 1 to entry: See [Figures 64](#) and [67](#).

3.2.5.19

roller recess

indentation, dimple or undercut about the centre of a roller end face

Note 1 to entry: See [Figure 64](#).

3.2.5.20

roller chamfer

surface joining the outside surface of a roller with one of the roller end faces

Note 1 to entry: See [Figures 62](#), [64](#) and [67](#).

3.2.5.21

truncated ball

roller with spherical curvature to the axis, where the transition point curvature radius lies on the axis and the ball roller width is 70 % of the curvature diameter

Note 1 to entry: See [Figure 129](#).

Note 2 to entry: This type of bearing is not recently used.

3.2.5.22

roller complement

total of the rollers in a particular rolling bearing

3.2.5.23

roller set

rollers in one row of a rolling bearing

3.2.6 Cages

3.2.6.1

ribbon cage

rolling bearing cage comprising one or two corrugated annular parts

Note 1 to entry: See [Figure 70](#).

3.2.6.2

snap cage

one-piece rolling bearing cage with cage prongs the form of which permits the assembling of the cage with the rolling elements by elastic deformation

Note 1 to entry: See [Figure 71](#).

3.2.6.3

window cage

one-piece rolling bearing cage having cage pockets surrounding the rolling elements

Note 1 to entry: See [Figure 72](#).

3.2.6.4

prong cage

one-piece rolling bearing cage with cage prongs

Note 1 to entry: See [Figure 73](#).

3.2.6.5

pin cage

two-piece cage with cage pins joining the two cage parts together

Note 1 to entry: See [Figure 74](#).

3.2.6.6

two-piece cage

rolling bearing cage comprising two annular parts joined together, generally by rivets, clips or cage stays

Note 1 to entry: See [Figures 70, 75](#) and [76](#).

3.2.6.7

double-split cage

rolling bearing cage which is split in two places to facilitate assembly

Note 1 to entry: See [Figure 18](#).

Note 2 to entry: The two splits are generally diametrically opposite one another.

3.2.6.8

cage pocket

aperture or gap in a rolling bearing cage to accommodate one or more rolling elements

Note 1 to entry: See [Figures 70, 71, 72, 73, 75](#) and [76](#).

3.2.6.9

cage bar

portion of a rolling bearing cage separating adjacent cage pockets

Note 1 to entry: See [Figures 72](#) and [75](#).

3.2.6.10

cage prong

cantilever cage bar projecting from the annular body of a rolling bearing cage or from one part of a two-piece cage

Note 1 to entry: See [Figures 71](#) and [73](#).

3.2.6.11

cage pin

cage stay which is cylindrical and can pass through an axial hole in a roller

Note 1 to entry: See [Figure 74](#).

3.2.6.12

cage stay

part (among several) is used to join the two annular parts of a two-piece cage together and to maintain them at a specified distance from each other

Note 1 to entry: See [Figure 76](#).

3.2.6.13

land-riding cage

ring guided cage

rolling bearing cage radially guided (centred) by a land on a bearing ring or bearing washer (cage riding land)

3.2.6.14

rolling element guided cage

rolling bearing cage radially guided (centred) by the rolling elements

3.2.6.15

riveted cage

two-piece cage joined with cage rivets

Note 1 to entry: See [Figure 70](#).

3.2.6.16

stayed cage

two-piece cage joined with cage stays

Note 1 to entry: See [Figure 76](#).

3.2.6.17

cage with bent tabs

two-piece cage manufactured by pressing process and joined by bending tabs provided in one of the cage parts

Note 1 to entry: See [Figure 151](#).

3.2.6.18

machined cage

cage manufactured by machining

3.2.6.19

pressed cage

cage manufactured by pressing process

Note 1 to entry: See [Figure 130](#).

3.2.6.20**moulded cage**

cage manufactured by moulding process

Note 1 to entry: See [Figure 131](#).

3.2.6.21**welded cage**

cage manufactured by joining two or more pieces together by welding process

3.2.6.22**cage rivet**

rivet intended to join two cage parts

Note 1 to entry: See [Figure 70](#).

3.3 Bearing arrangements and subunits**3.3.1 Bearing arrangements****3.3.1.1****paired mounting**

arrangement of two rolling bearings mounted side-by-side on the same shaft such that they operate as a unit, mounted back-to-back, face-to-face or tandem

Note 1 to entry: See [Figures 77, 78](#) and [79](#).

3.3.1.2**stack mounting**

arrangement of three or more rolling bearings mounted side-by-side on the same shaft such that they operate as a unit

Note 1 to entry: See [Figure 80](#).

3.3.1.3**back-to-back arrangement**

arrangement of two rolling bearings mounted side-by-side with the back faces of their outer rings adjacent

Note 1 to entry: See [Figure 77](#).

3.3.1.4**face-to-face arrangement**

arrangement of two rolling bearings mounted side-by-side with the front faces of their outer rings adjacent

Note 1 to entry: See [Figure 78](#).

3.3.1.5**tandem arrangement**

arrangement of two or more rolling bearings mounted side-by-side with the back face of the outer ring of one bearing adjacent to the front face of the outer ring of the next bearing

Note 1 to entry: See [Figure 79](#).

3.3.1.6**matched pair**

two rolling bearings which have been selected or manufactured to have predetermined characteristics, usually preload or clearance, when mounted together in a specified way

3.3.1.7

matched stack

three or more rolling bearings which have been selected or manufactured to have predetermined characteristics, usually preload or clearance, when mounted together in a specified way

3.3.2 Subunits

3.3.2.1

subunit

bearing ring or bearing washer, with or without rolling elements or with cage and rolling elements, which can be freely separated from the bearing, or rolling element and cage assembly which can be freely separated from the bearing

Note 1 to entry: See [Figures 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91](#) and [92](#).

3.3.2.2

interchangeable subunit

subunit which can be replaced by another subunit of a similar group without impairing the function of the bearing

3.3.2.3

non-interchangeable subunit

subunit which cannot be replaced by another subunit of a similar group without impairing the function of the bearing

3.3.2.4

inner ring, cage and ball assembly

subunit consisting of an inner ring, balls as rolling elements and a cage

Note 1 to entry: See [Figure 81](#).

3.3.2.5

inner subunit

tapered roller bearing subunit consisting of an inner ring, tapered rollers as rolling elements and a cage

Note 1 to entry: See [Figure 83](#).

3.3.2.6

outer ring, cage and ball assembly

subunit consisting of an outer ring, balls as rolling elements and a cage

Note 1 to entry: See [Figure 84](#).

3.3.2.7

needle roller bearing without inner ring

subunit consisting of an outer ring and needle rollers of a full complement bearing or an outer ring with needle rollers and cage

Note 1 to entry: See [Figures 57, 86](#) and [87](#).

Note 2 to entry: As required, additional description of the bearing can be included in the term, for example, "needle roller bearing, full complement, drawn cup, without inner ring" or "needle roller bearing, with cage, machined ring, without inner ring".

3.3.2.8

inner ring, cage and roller assembly

subunit consisting of an inner ring, rollers and a cage

Note 1 to entry: See [Figures 82](#) and [83](#).

3.3.2.9**outer ring, cage and roller assembly**

subunit consisting of an outer ring, rollers and a cage

Note 1 to entry: See [Figures 85, 86](#) and [87](#).

3.3.3 Rolling element and cage assemblies**3.3.3.1****rolling element and cage assembly**

subunit consisting of rolling elements and the cage of a rolling bearing

Note 1 to entry: See [Figures 88, 89, 90, 91](#) and [92](#).

3.3.3.2**ball and cage assembly**

subunit consisting of balls and the cage of a ball bearing

Note 1 to entry: See [Figures 88](#) and [89](#).

3.3.3.3**radial ball and cage assembly**

ball and cage assembly of a radial ball bearing

Note 1 to entry: See [Figure 88](#).

3.3.3.4**roller and cage assembly**

subunit consisting of rollers and the cage of a roller bearing

Note 1 to entry: See [Figures 90, 91](#) and [92](#).

3.3.3.5**radial roller and cage assembly**

roller and cage assembly of a radial roller bearing

Note 1 to entry: See [Figures 90](#) and [91](#).

Note 2 to entry: As required, a description of the type of roller can be added to the term, for example, “radial cylindrical roller and cage assembly”.

3.3.3.6**thrust ball and cage assembly**

ball and cage assembly of a thrust ball bearing

Note 1 to entry: See [Figure 89](#).

3.3.3.7**thrust roller and cage assembly**

roller and cage assembly of a thrust roller bearing

Note 1 to entry: See [Figure 92](#).

Note 2 to entry: As required, a description of the type of roller can be added to the term, for example, “thrust needle roller and cage assembly”.

3.4 Dimensions and feature identifications

3.4.1 Dimension plans, series and other feature identifications

3.4.1.1

dimension plan

system or table covering the boundary dimensions of rolling bearings

3.4.1.2

bearing series

group of rolling bearings of a specific type, with gradually increasing dimensions and in most cases with the same contact angle and a certain relationship between boundary dimensions

3.4.1.3

dimension series

combination of a width series or a height series with a diameter series and, for tapered roller bearings, an angle series

Note 1 to entry: 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.

3.4.1.4

diameter series

progressive series of bearing outside diameters, one for each standard bearing bore diameter, often with a specific relationship between the two diameters

Note 1 to entry: The diameter series are further described in the ISO dimension plans for rolling bearings, for example, ISO 15.

3.4.1.5

width series

progressive series of bearing widths, one for each bearing bore diameter of each diameter series

Note 1 to entry: The width series are further described in the ISO dimension plans for radial bearings, for example, ISO 15.

3.4.1.6

height series

progressive series of bearing heights, one for each bearing bore diameter of each diameter series

Note 1 to entry: The height series are further described in the ISO dimension plans for thrust bearings, for example, ISO 104.

3.4.1.7

angle series

specified range of contact angles

Note 1 to entry: The angle series are further described in the ISO dimension plans for tapered roller bearings, for example, ISO 355.

3.4.1.8

basic designation

basic number

combination of either a number or letter(s), or both, representing the bearing type followed by numbers representing the boundary dimensions

3.4.1.9

supplementary symbol

symbol intended to represent supplementary specification(s) of a bearing added to a basic number

Note 1 to entry: These are symbols for cage, seals, shields, ring designs, arrangement, internal clearance, tolerance class, etc.

3.4.1.10**bearing series symbol**

symbol representing bearing type and dimension series

Note 1 to entry: It consists of a bearing type symbol and a dimension series number. It is represented by a number or a number and letter(s).

3.4.1.11**bearing type symbol**

symbol, number or letter(s) representing a type of a bearing

3.4.1.12**dimension series number**

number representing dimension series

Note 1 to entry: Normally shown by a two-digit number, the first digit showing a width series number or a height series number and the second digit showing a diameter series number.

3.4.1.13**diameter series number**

number representing the diameter series

3.4.1.14**width series number**

number representing the width series

3.4.1.15**height series number**

number representing the height series

3.4.1.16**bore diameter number**

number representing a size of a nominal bearing bore diameter

Note 1 to entry: It is normally shown by a two-digit number.

3.4.1.17**contact angle symbol**

symbol representing a nominal contact angle of angular contact ball bearings and tapered roller bearings

Note 1 to entry: It is normally shown by letter(s), or letter(s) and a number.

Note 2 to entry: Refer to *angle series number* ([3.4.1.18](#)).

3.4.1.18**angle series number**

number representing an angle series of tapered roller bearings

Note 1 to entry: It is normally shown by a one-digit number.

3.4.2 Planes**3.4.2.1****reference face**

face of a bearing part designated as the reference face by the manufacturer of the bearing and which can be the datum for measurements

3.4.3 Boundary dimensions

3.4.3.1

boundary dimension

bearing boundary dimension

dimension defining the boundaries of a bearing

Note 1 to entry: Typical boundary dimensions are bore diameter, outside diameter, width (or height) and chamfer dimensions.

3.4.3.2

bore diameter

bearing bore diameter

inner ring bore diameter of a radial bearing or shaft washer bore diameter of a thrust bearing

Note 1 to entry: See [Figures 93, 94](#) and [96](#).

3.4.3.3

outside diameter

bearing outside diameter

outer ring outside diameter of a radial bearing or housing washer outside diameter of a thrust bearing

Note 1 to entry: See [Figures 93, 94](#) and [96](#).

3.4.3.4

width

bearing width

axial distance between the two faces of rings designated to bound the width of a radial bearing

Note 1 to entry: See [Figures 93](#) and [94](#).

Note 2 to entry: For a single-row tapered roller bearing, this is the axial distance between the back face of the outer ring and that of the inner ring.

3.4.3.5

height

bearing height

axial distance between the two washer back faces designated to bound the height of a thrust bearing

Note 1 to entry: See [Figure 96](#).

3.4.3.6

chamfer dimension

extension in a radial or axial direction of the surface of a ring or a washer chamfer

Note 1 to entry: See [Figures 52](#) and [93](#).

3.4.3.7

flange width

axial distance between the faces of a flange

Note 1 to entry: See [Figure 95](#).

3.4.3.8

flange height

radial dimension of a flange

Note 1 to entry: See [Figure 95](#).

Note 2 to entry: For an outer ring flange, this is the radial distance between its outside surface and the outside surface of the outer ring.

3.4.3.9**snap ring groove diameter**

diameter of the cylindrical surface of a snap ring groove

Note 1 to entry: See [Figure 97](#).

3.4.3.10**snap ring groove width**

axial distance between the faces of a snap ring groove

Note 1 to entry: See [Figure 97](#).

3.4.3.11**snap ring groove depth**

radial distance between the cylindrical surface of a snap ring groove and the cylindrical surface in which the groove is machined

Note 1 to entry: See [Figure 97](#).

3.4.3.12**radius of aligning surface**

radius of curvature of the spherical surface of an aligning housing washer, aligning seat washer, aligning outer ring or aligning housing ring

Note 1 to entry: See [Figure 96](#).

3.4.3.13**centre height of aligning surface**

axial distance between the centre of curvature of the spherical back face of an aligning housing washer and the opposite shaft washer back face of a thrust bearing

Note 1 to entry: See [Figure 96](#).

3.4.3.14**overall width of inner rings**

matched rolling bearings total axial distance from a side face of an inner ring to the other side face of a different inner ring when more than two inner rings are combined in matched rolling bearings, double-row rolling bearings or multi-row rolling bearings

Note 1 to entry: It can include one or more spacers.

3.4.3.15**overall width of outer rings**

matched rolling bearings total axial distance from a side face of an outer ring to the other side face of a different outer ring when more than two outer rings are combined in matched rolling bearings, double-row rolling bearings or multi-row rolling bearings

Note 1 to entry: It can include one or more spacers.

3.4.3.16**stand
stickout**

axial distance between side faces of outer and inner rings at the same side under no axial internal clearance in the bearing

Note 1 to entry: See [Figure 132](#).

Note 2 to entry: For the term “stand”, it can be “stand in” or “stand out”.

3.4.4 Dimensions of subunits and parts

3.4.4.1

outer ring small inside diameter

inside diameter of outer ring back face

diameter of the imaginary circle of intersection of the back face of an outer ring and the cone inscribed in the outer ring, tangential to its raceway at the nominal contact points

Note 1 to entry: See [Figure 95](#).

Note 2 to entry: This term applies to tapered roller bearing.

3.4.4.2

outer ring raceway angle

angle included between two lines tangential to the raceway of an outer ring at the nominal contact points and in a plane containing the outer ring axis

Note 1 to entry: See [Figure 94](#).

Note 2 to entry: This term applies to tapered roller bearing.

3.4.4.3

ring width

axial distance between the two side faces of a rolling bearing ring

Note 1 to entry: See [Figures 93](#) and [94](#).

3.4.4.4

washer height

axial distance between the two outermost faces of a rolling bearing washer

Note 1 to entry: See [Figure 96](#).

3.4.4.5

ball diameter

distance between two parallel planes tangential to the surface of a ball

3.4.4.6

roller diameter

distance between two parallel planes tangential to the cylindrical surface of a roller

3.4.4.7

roller length

distance between the two radial planes which just contain the extremities of a roller

Note 1 to entry: For the calculation of load ratings, however, the applicable “roller length” is the theoretical length of contact between a roller and that raceway where the contact is the shortest.

3.4.4.8

bore diameter of roller complement

diameter of the theoretical inscribed cylinder within all of the rollers

Note 1 to entry: See [Figure 98](#).

Note 2 to entry: This term applies to radial bearing without inner ring.

3.4.4.9

bore diameter of a ball and cage assembly

theoretical ball complement bore diameter of a radial ball and cage assembly

Note 1 to entry: See [Figure 88](#).

3.4.4.10**outside diameter of a ball and cage assembly**

theoretical ball complement outside diameter of a radial ball and cage assembly

Note 1 to entry: See [Figure 88](#).

3.4.4.11**bore diameter of a thrust ball and cage assembly**

bore diameter of the cage of a thrust ball and cage assembly

Note 1 to entry: See [Figure 89](#).

3.4.4.12**outside diameter of a thrust ball and cage assembly**

outside diameter of the cage of a thrust ball and cage assembly

Note 1 to entry: See [Figure 89](#).

3.4.4.13**outside diameter of roller set**

diameter of the theoretical cylinder circumscribed around one row of rollers

Note 1 to entry: See [Figure 99](#).

Note 2 to entry: This term applies to radial bearing without outer ring.

3.4.4.14**outside diameter of roller complement**

diameter of the theoretical cylinder circumscribed around all of the rollers

Note 1 to entry: This term applies to radial bearing without outer ring.

3.4.4.15**bore diameter of a roller and cage assembly****bore diameter of a radial roller and cage assembly**

theoretical roller complement bore diameter of a radial roller and cage assembly

Note 1 to entry: See [Figure 99](#).

3.4.4.16**outside diameter of a roller and cage assembly****outside diameter of a radial roller and cage assembly**

theoretical roller complement outside diameter of a radial roller and cage assembly

Note 1 to entry: See [Figure 82](#).

3.4.4.17**bore diameter of a thrust roller and cage assembly**

bore diameter of the cage of a thrust roller and cage assembly

Note 1 to entry: See [Figure 100](#).

3.4.4.18**outside diameter of a thrust roller and cage assembly**

outside diameter of the cage of a thrust roller and cage assembly

Note 1 to entry: See [Figure 100](#).

3.4.4.19**raceway groove radius**

curvature radius of the raceway groove at the axial plane

Note 1 to entry: See [Figure 133](#).

3.4.4.20

raceway groove depth

depth of the raceway groove at the axial plane

Note 1 to entry: See [Figure 134](#).

Note 2 to entry: If the height of shoulders on both sides is different, the depth is generally measured from the higher side.

3.4.4.21

raceway width

raceway groove width

distance between the ribs of the roller bearing raceway on both sides or between the shoulders of the raceway groove

Note 1 to entry: See [Figure 135](#).

3.4.4.22

roller diameter at large end

diameter of an imaginary circle which appears on the intersection between the tapered surface and the spherical surface on the large end face

Note 1 to entry: See [Figure 136](#).

Note 2 to entry: This term applies to tapered roller bearing.

3.4.4.23

roller diameter at small end

diameter of an imaginary circle which appears on the intersection between the tapered surface and a radial plane tangential to the small end face

Note 1 to entry: See [Figure 136](#).

Note 2 to entry: This term applies to tapered roller bearing.

3.4.4.24

rib width

axial dimension of a rib

Note 1 to entry: See [Figure 137](#).

3.4.4.25

outside diameter of mounted snap ring

outside diameter of mounted locating snap ring

outside diameter of a locating snap ring after mounted in the snap ring groove

Note 1 to entry: See [Figure 138](#).

3.4.4.26

snap ring section height

radial dimension of the cross section of locating snap ring

Note 1 to entry: See [Figure 138](#).

3.4.4.27

snap ring thickness

snap ring width

axial distance of the cross section of locating snap ring

Note 1 to entry: See [Figure 138](#).