
Rolling bearings — Vocabulary

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Published in Switzerland

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Foreword

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

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.

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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 <https://standards.iteh.ai/catalog/standards/iso/68361a78-e5db-47ca-a524-360e92bb7c88/iso-5593-2023>

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](#).