
**Plain bearings — Terms, definitions,
classification and symbols —**

**Part 1:
Design, bearing materials and their
properties**

*Paliers lisses — Termes, définitions, classification et symboles —
Partie 1: Conception, matériaux pour paliers et leurs propriétés*

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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 on 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 the following URL: www.iso.org/iso/foreword.html.

This document was prepared by Technical Committee ISO/TC 123, *Plain bearings*, Subcommittee SC 6, *Terms and common items*.

This fourth edition cancels and replaces the third edition (ISO 4378-1:2009), which has been technically revised. The following changes have been made:

- editorial revision of the document;
- addition of [Figures 3, 4, 5, 6, 7, 8, 9, 18, 19, 36, 37, 40, 44](#) and [49](#) and technical revision of the other figures;
- revision of clause numbers.

A list of all the parts in the ISO 4378 series can be found on the ISO website.

Introduction

As there is a large number of multiple designations in the domain of plain bearings, there is a considerable risk of error in the interpretation of standards and technical literature. This uncertainty leads to the continuous addition of supplementary designations, which only serves to increase the misunderstanding.

This document is an attempt to establish a uniform basic system of designations of design, bearing materials and their properties.

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Plain bearings — Terms, definitions, classification and symbols —

Part 1: Design, bearing materials and their properties

1 Scope

This document specifies the most commonly used terms relating to design, bearing materials and their properties of plain bearings with their definitions and classification.

For some terms and word combinations, their short forms are given, which can be used where they are unambiguous. Self-explanatory terms are given without definitions.

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 terminological databases for use in standardization at the following addresses:

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

3.1 General terms

3.1.1 bearing

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

3.1.2 plain bearing sliding bearing

bearing (3.1.1) in which the type of relative motion is sliding

3.1.3 plain bearing unit

mechanical component of a tribological system including a *plain bearing* (3.1.2), its supporting part (e.g. a housing), a shaft and a lubricating system

3.2 Types of plain bearings and classification

3.2.1 Classification according to the type of load

3.2.1.1 statically loaded plain bearing

plain bearing (3.1.2) operating under a load constant in magnitude and direction

3.2.1.2

dynamically loaded plain bearing

plain bearing (3.1.2) operating under a load changing in magnitude and/or direction

3.2.2 Classification according to the direction of the acting load

3.2.2.1

plain journal bearing

journal bearing

plain bearing (3.1.2) in which the load acts radially to the axis of the rotating shaft

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

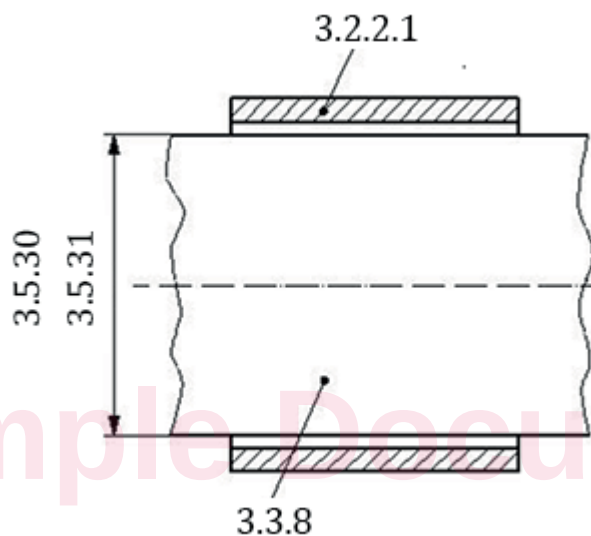


Figure 1 — Plain journal bearing

3.2.2.2

plain thrust bearing

thrust bearing

plain bearing (3.1.2) in which the load acts along the axis of the rotating shaft

Note 1 to entry: See [Figure 2](#).

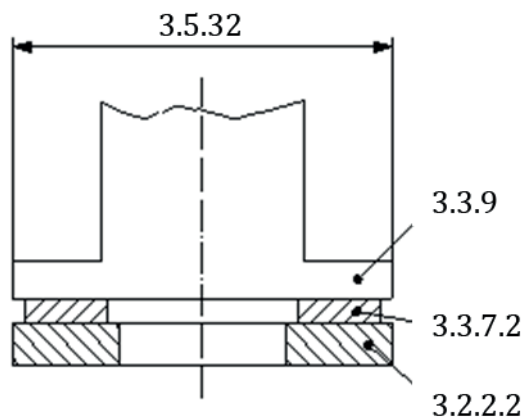


Figure 2 — Plain thrust bearing

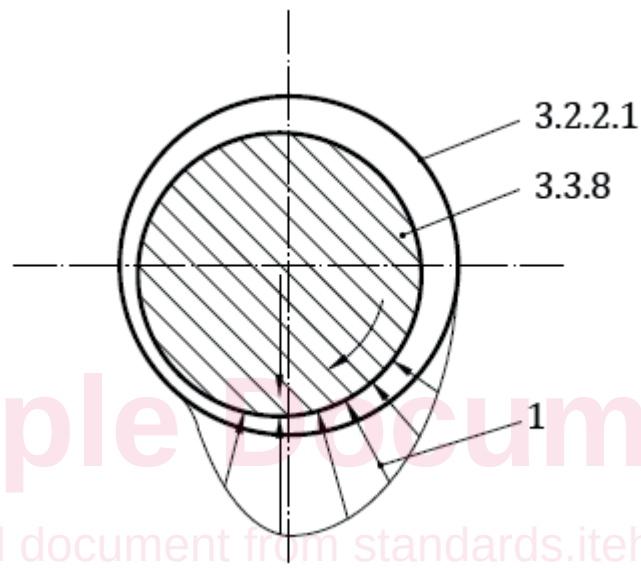
3.2.2.3**journal thrust bearing****flanged bearing**

plain bearing (3.1.2) capable of supporting a load in both the axial and radial directions

3.2.3 Classification according to the type of lubrication**3.2.3.1****hydrodynamic bearing**

plain bearing (3.1.2) operating under conditions of hydrodynamic lubrication

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

**Key**

1 oil film pressure distribution

Figure 3 — Hydrodynamic bearing

3.2.3.2

hydrostatic bearing

externally pressurized bearing

plain bearing (3.1.2) operating under conditions of hydrostatic lubrication

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

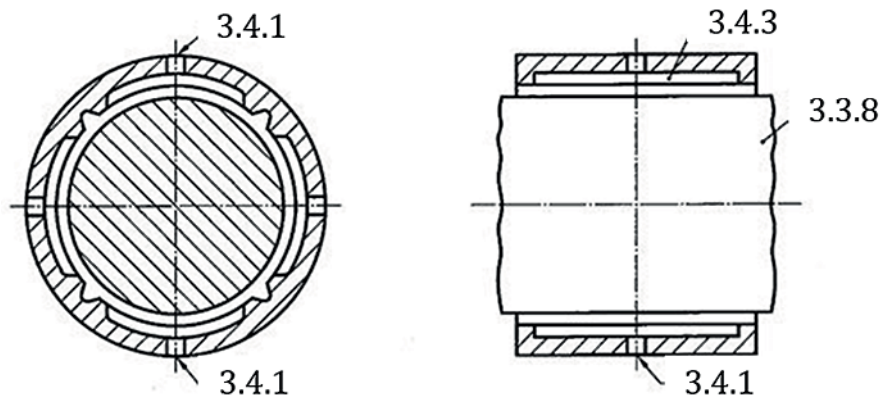


Figure 4 — Hydrostatic bearing

3.2.3.3

hydrodynamic gas bearing

hydrodynamic air bearing

plain bearing (3.1.2) operating under conditions of hydrodynamic gas/air lubrication

3.2.3.4

hydrostatic gas bearing

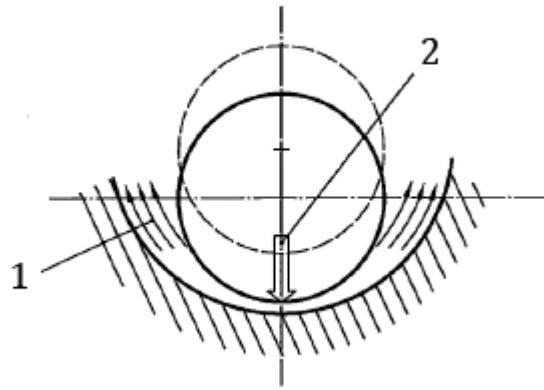
hydrostatic air bearing

plain bearing (3.1.2) operating under conditions of hydrostatic gas/air lubrication

3.2.3.5**squeeze film bearing**

plain bearing (3.1.2) in which complete separation of sliding surfaces is caused by the pressure developed in the lubricant film as a result of their approach in the direction normal to the surface

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

**Key**

- 1 lubricant
- 2 load

Figure 5 — Squeeze film bearing

3.2.3.6**hybrid bearing**

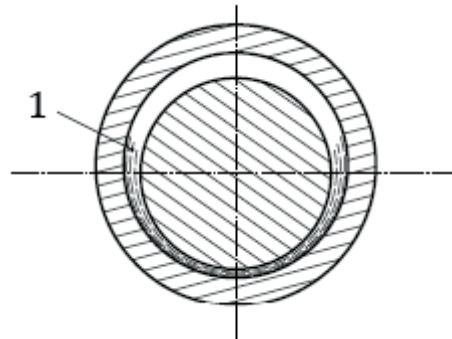
plain bearing (3.1.2) operating under conditions of both hydrostatic and hydrodynamic lubrication

3.2.3.7

solid-film lubricated bearing

plain bearing (3.1.2) operating with a solid lubricant

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



Key

1 solid lubricant

Figure 6 — Solid film lubricated bearing

3.2.3.8

unlubricated bearing

plain bearing (3.1.2) operating without a lubricant

3.2.3.9

self-lubricating bearing

plain bearing (3.1.2) lubricated by the *bearing material* (3.6.1), by the material components or by solid lubricant overlays