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

**Part 2:
Friction and wear**

Paliers lisses — Termes, définitions, classification et symboles —

Partie 2: Frottement et usure

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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. (standards.iteh.ai)

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This third edition cancels and replaces the second edition (ISO 4378-2:2009), which has been technically revised. The following changes have been made:

- editorial revision of the document;
- addition of 6 new 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 friction and wear.

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Plain bearings — Terms, definitions, classification and symbols —

Part 2: Friction and wear

1 Scope

This document specifies the most commonly used terms relating to friction and wear 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

external friction

force and its phenomenon of resistance to the relative motion between two bodies, originating at the contact area of their surfaces and directed tangentially to them

3.1.2

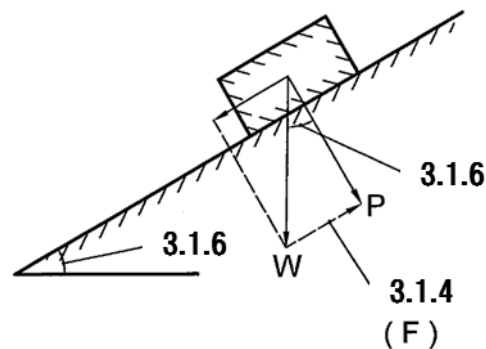
internal friction

force and its phenomenon of resistance to the relative motion of particles or mass of a body with respect to other particles or mass in the same body

3.1.3 friction

force and its phenomenon of resistance to the relative motion working tangentially with respect to the common boundary between two bodies when, under the action of an external force, one body moves or is at rest relative to the surface of the other

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



Key

W weight of material
P normal force
F friction force

iTeh STANDARD PREVIEW (standards.iteh.ai) Figure 1 — Friction

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**3.1.4
friction force**
force due to *friction* ([3.1.3](#))

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

**3.1.5
coefficient of friction**

ratio of the *friction force* ([3.1.4](#)) between two bodies to the normal force pressing these bodies together

**3.1.6
friction angle**

angle, the tangent of which is equal to the ratio of the *friction force* ([3.1.4](#)) to the normal force, or *coefficient of friction* ([3.1.5](#))

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

**3.1.7
wear**
process of wear or the result of a *wear process* ([3.1.8](#))

**3.1.8
wear process**

process of a loss of substance from a solid body surface in frictional conditions, which appears as a gradual decrease of body dimensions and/or change of shape

Note 1 to entry: Rarely, in a broader sense, is there a process of permanent increase of body dimensions on the surface without loss of substance.

3.1.9**wear rate**

amount of *wear* (3.1.7) per unit sliding distance or per interval of time

Note 1 to entry: A distinction is made between “momentary” (at a definite moment) and “mean” wear rate (during a definite interval of time).

3.1.10**specific wear rate****wear intensity**

value of amount of *wear* (3.1.7) divided by the product of sliding distance (or time) and load; that is, the ratio of *wear rate* (3.1.9) to the load

Note 1 to entry: Wear can be expressed in the units of length, volume, mass, etc.

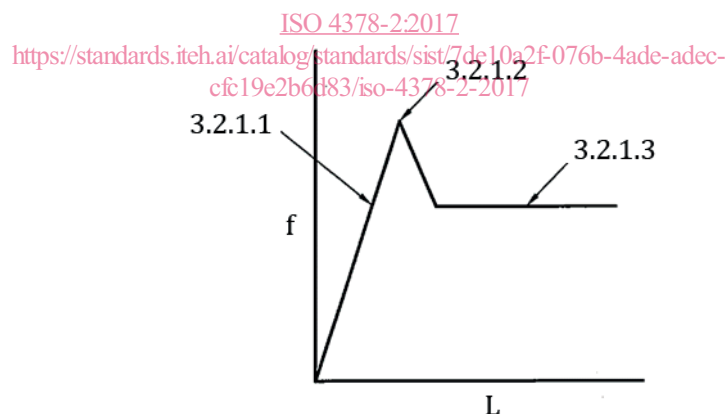
Note 2 to entry: Wear intensity is distinguished as “momentary” or as “mean” wear intensity.

3.2 Types and characteristics of external friction and classification**3.2.1 Classification according to the presence of relative motion****3.2.1.1****static friction**

friction (3.1.3) and its phenomena that occur between two contacting bodies before the start of relative motion under increasing external force

Note 1 to entry: Friction that occurs at an extremely low sliding speed is also referred to as static friction.

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

**Key**

f friction

L sliding distance

Figure 2 — Friction according to relative motion

3.2.1.2**maximum static friction**

friction (3.1.3) and its phenomena that occur between two contacting bodies just before the start of relative motion under gradually increasing external force

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