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**Plain bearings — Handling of plain bearings**

*Paliers lisses — Manipulation des paliers lisses*

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# Contents

	Page
<b>Foreword</b> .....	<b>v</b>
<b>Introduction</b> .....	<b>vi</b>
<b>1 Scope</b> .....	<b>1</b>
<b>2 Normative references</b> .....	<b>1</b>
<b>3 Terms and definitions</b> .....	<b>1</b>
<b>4 Storage and transportation</b> .....	<b>1</b>
4.1 General.....	1
4.2 Storage and transportation by packing.....	1
4.2.1 General.....	1
4.2.2 Purpose of packing.....	1
4.2.3 Packing method.....	2
4.2.4 Packing material.....	2
4.2.5 Unpacking.....	2
4.3 Storage and transportation in containers.....	2
4.3.1 General.....	2
4.3.2 Purpose of storage and transportation in containers.....	2
4.3.3 Points to notice at storage and transportation.....	3
4.3.4 Other methods of storage and transportation.....	3
4.3.5 Attachment of test and quality certificate.....	3
4.4 Selection of rust inhibitors and cleaning agents.....	3
4.5 Storage environment.....	3
4.5.1 Warehouse or storage room.....	3
4.5.2 Ambient temperature of storage room.....	3
4.5.3 Environmental humidity for storage room.....	3
4.5.4 First-in first-out.....	4
4.6 Handling.....	4
4.7 Documentation.....	4
<b>5 Method of installation of plain bearings</b> .....	<b>4</b>
5.1 Points to consider during plain bearings installation.....	4
5.1.1 Plain bearings.....	4
5.1.2 Housing.....	4
5.1.3 Press-fit method.....	4
5.1.4 Screw -fixing method.....	5
5.1.5 Keyed joint method.....	5
5.1.6 Retaining ring fixing method.....	5
5.1.7 Shrink fitting by cooling.....	5
5.1.8 Shrink fitting by heating.....	5
5.1.9 Points to notice during installation of plain bearings.....	6
5.1.10 Points to notice after installation of plain bearings.....	6
5.2 Mating shaft and assembly inspection.....	6
5.2.1 Mating shaft.....	6
5.2.2 Installation of shaft.....	6
5.2.3 Check of operation.....	6
<b>6 Operation</b> .....	<b>6</b>
6.1 Cleaning (flushing) of lubrication system.....	6
6.2 Running-in.....	6
6.3 Supervision during operation.....	7
6.3.1 Control and check items.....	7
6.3.2 Record.....	7
<b>7 Replacement of plain bearings</b> .....	<b>7</b>
7.1 General.....	7
7.2 Dismounting of plain bearings.....	7

7.3 Replacement by new plain bearings .....	8
<b>Bibliography</b> .....	<b>9</b>

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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](http://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](http://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](http://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*.

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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](http://www.iso.org/members.html).

## Introduction

The purpose of this document is to give appropriate methods of handling plain bearings. Alternative practises may be adopted as agreed between bearing suppliers and their customers.

Inappropriate handling can cause premature damage to bearings and should be avoided.

This document provides four clauses for the handling of plain bearings:

- storage and transportation;
- installation (fitting);
- operation (running);
- replacement (exchange of bearing).

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# Plain bearings — Handling of plain bearings

## 1 Scope

This document specifies requirements and guidance on the storage, transportation, handling, installation, operation and replacement of plain bearings and related parts.

## 2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 4378-1, *Plain bearings — Terms, definitions, classification and symbols — Part 1: Design, bearing materials and their properties*

## 3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 4378-1 apply.

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

- ISO Online browsing platform: available at <https://www.iso.org/obp>
- IEC Electropedia: available at <http://www.electropedia.org/>  
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## 4 Storage and transportation

### 4.1 General

The plain bearings are stored and transported after manufacture until installation into machines. In this period, they shall be protected from damage, deterioration, deformation and contamination by foreign matter.

### 4.2 Storage and transportation by packing

#### 4.2.1 General

The plain bearings are stored and transported by using sheets, bags or boxes. The environment shall be taken into consideration and respected when packing materials are manufactured, e.g. by implementing an environmental management system such as ISO 14001.

#### 4.2.2 Purpose of packing

Plain bearings are protected against damage by impact load during storage and transportation and against rust and contaminants such as dust and moisture by using packing materials with a rust-preventive function.

On the outside of the package, the contents should be indicated (type, name, part number, size, number of pieces, production lot number, etc.) in order to identify the contents without removing the protective packaging.

Packaging should be robust enough to withstand long-term storage without damage to the contents.

When bearings of the same type and size are packed in groups, indication of the contents should be the same as when individually packed. However, the number of packed plain bearings should also be indicated clearly on each pack.

#### 4.2.3 Packing method

Plain bearings should be packed so that they can be easily unpacked at the receiving inspection by the users or before their installation. However, the packing shall remain intact whilst transported and during storage so that the product is unaffected by vibration and environmental changes.

#### 4.2.4 Packing material

Packing material shall be suitable for the purpose of packing as given in [4.2.2](#).

Materials that produce fibrous waste, paper dust and the like, which could adhere to plain bearings and impair their function, shall not be used.

Examples of packing materials are: rust inhibitor paper sheet, oil-impregnated paper sheet (see [4.4](#)), polyethylene-coated paper (laminated paper), polyethylene sheet, foamed polystyrene, foamed polyurethane sheet (buffer material).

Deoxygenating agents may be utilized in conjunction with oil-less/oil-free packing.

#### 4.2.5 Unpacking

At the time of unpacking, damage to the plain bearings by knives, scissors or sharp tools used to open packaging should be prevented.

In order to prevent damage to the plain bearings and misuse, they should be unpacked just before the receiving inspection or just before they are installed.

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### 4.3 Storage and transportation in containers

#### 4.3.1 General

Examples of types of containers are: cardboard boxes, corrugated boxes, plastic containers and metal containers.

#### 4.3.2 Purpose of storage and transportation in containers

Containers are used to store and transport multiple plain bearings of the same type. Sometimes, individually packed plain bearings are stored in a container.

The container storage aims:

- to prevent plain bearings from becoming lost or getting scattered during transportation or storage,
- to prevent plain bearings from being deformed and damaged by vibration and shock during transportation,
- to prevent plain bearings from being damaged when bearings are badly stacked during warehouse storage,
- to prevent contamination of plain bearings.

The materials and design of containers used in automated assembly shall be agreed by the suppliers and customers.

Containers shall be suitable for the purpose of packing as given in [4.2.2](#).



### 4.3.3 Points to notice at storage and transportation

When multiple plain bearings are stored and transported together, impingement between bearings caused by product movement during transportation should be prevented. Such impingement can be avoided by partitioning the container.

### 4.3.4 Other methods of storage and transportation

Large and heavy plain bearings should be packed in a water-resistant, corrugated-cardboard box or a wooden box. For plain bearings with a special shape, a purpose-built container should be used for storage and transportation.

### 4.3.5 Attachment of test and quality certificate

A test certificate or quality certificate for the plain bearings should be attached to the container if necessary, as agreed between the plain bearing supplier and the customer.

## 4.4 Selection of rust inhibitors and cleaning agents

Specification of the rust inhibitors and cleaning agents used during bearing assembly and receiving inspection operations and their method of use should be agreed between the suppliers and their customers.

When plain bearings are cleaned before receiving inspection and/or installation of the bearings, rust inhibitors or lubricants of the prescribed type shall be applied immediately afterwards in order to protect the bearings from rusting.

## 4.5 Storage environment

### 4.5.1 Warehouse or storage room

Direct or reflected sunlight should be prevented from heating plain bearings stored in a warehouse or storage room.

Storage facilities should be clean, dry and dust-free.

The storage facility should be kept tidy and in good order to facilitate the transfer of plain bearings into and out of store.

### 4.5.2 Ambient temperature of storage room

Bearings should not be stored at excessively high ambient temperatures in order to prevent creep deformation or stress relaxation deformation in polymer sliding bearings due to residual stress.

The lubricant should be prevented from leaking out of oil-impregnated bearings under high temperature. When oil-impregnated plain bearings are stored for a long time, they sometimes need to be impregnated again with lubricant prior to their installation and use.

### 4.5.3 Environmental humidity for storage room

Plain bearings containing ferrous materials should be stored in a dry room, as they can rust in a high humidity environment.

Plain polymer bearings should be stored in a room with controlled humidity as some types can experience size and shape change through moisture absorption.