
Plain bearings — Pad materials for tilting pad bearings

Paliers lisses — Matériaux des patins pour paliers à patins oscillants

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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 123, *Plain bearings*, Subcommittee SC 7, *Special types of plain bearings*.

This third edition cancels and replaces the second edition (ISO 14287:2018), which has been technically and editorially revised. The main changes compared to the previous edition are as follows:

- The scope has been changed to allow the use of other materials if they have been proven to be suitable for the operating requirements.
- The document has been rewritten so that the format is consistent with other standards related to materials for multilayer plain bearings.
- The composition of SnSb8Cu4 referenced in [Table 1](#) has been corrected and alternative lining materials have been added to [Tables 1, 2, 3](#) and [4](#).

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.

Plain bearings — Pad materials for tilting pad bearings

1 Scope

This document specifies requirements for some commonly used pad lining materials utilized on tilting pad bearings. The requirements in this document are expressed by specifying the chemical composition of the lining materials. Other lining materials can be used if they have been proven to be equally suitable at the required operating conditions. Descriptive characteristics of the lining materials are given along with the appropriate selection of pad backing and pivot materials.

2 Normative references

There are no normative references in this document.

3 Terms and definitions

No terms and definitions are listed in this document.

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 <https://www.electropedia.org/>

4 Requirements

4.1 Lining materials

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4.1.1 Chemical composition

The chemical composition of alloy elements and compounds of the materials covered by this document shall be within the limits specified in [Tables 1, 2, 3 and 4](#).

If the purchaser's requirements necessitate limits for any element not specified, or limits different from those already specified, these should be agreed upon between manufacturer and purchaser.

WARNING — Lead's (Pb) toxicity was recognized, and its use has since been phased out of many applications. However, many countries still allow the sale of products that expose humans to lead. Lead is a neurotoxin.



GHS 07



GHS 08



GHS 09

4.1.2 Mechanical properties

Mechanical properties of linings can be expected to vary in individual cases due to the range of possible elemental and compound compositions of a specified alloy, the marked influence exerted by the cooling conditions an alloy experiences and the influence of the backing material. Consequently, material properties for lining materials shall be the subject of agreement between the manufacturer and purchaser.

4.1.3 Selection of lining materials

Guidance on properties and selection materials is given in [Annex A](#).

4.2 Backing materials

Requirements for suitable backing materials can be found in ISO 6280. Other backing materials can be used if they have been proven in service and an optimum bond, between the backing material and the lining material, is ensured by control of the manufacturing process.

4.3 Pivot materials

Pivot materials are usually selected in combination with the type of pivot design in order to minimize pivot wear and ensure pivot stresses remain within acceptable limits. In some cases, the requirements for the pivot material cannot be satisfied by the chosen pad backing material, leading to the use of a separate pivot, or 'insert'. Various factors determine the type of pivot to be used, including the magnitude of the load, requirements for self-aligning capability and the degree of pivot flexibility permitted for the application. Due to these factors, pivot materials cannot be specified in isolation of the design and, consequently, shall be the subject of agreement between the manufacturer and purchaser.

Table 1 — Tin-based white metals

Chemical element	Chemical composition (mass fraction, %)		
	SnSb8Cu4	SnSb10Cu5	SnSb12Cu6Zn
Sn	Remainder (ca. 89)	Remainder (ca. 87)	Remainder (ca. 81)
Sb	7 to 8	8,5 to 10	11 to 13
Cu	3 to 4	3,5 to 5	5,5 to 6,5
Zn	—	—	0,3 to 0,7
Ag	—	—	0,05 to 0,15
Impurities			
Pb	< 0,35	< 0,35	< 0,06
As	< 0,1	< 0,1	< 0,03
Bi	< 0,08	< 0,08	< 0,06
Fe	< 0,1	< 0,1	< 0,03
Al	< 0,01	< 0,005	< 0,01
Zn	< 0,01	< 0,005	—
Cd	< 0,05	< 0,05	< 0,03
Ni	—	—	< 0,06
Total others	0,2	0,2	0,2

NOTE Data is valid for raw materials in the shape of ingots or welding wires.