



**SLOVENSKI STANDARD**  
**SIST ISO 4383:2002**  
**01-marec-2002**

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Plain bearings -- Multilayer materials for thin-walled plain bearings

Paliers lisses -- Matériaux multicouches pour paliers lisses minces

Ta slovenski standard je istoveten z: **ISO 4383:2000**

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**ICS:**

21.100.10      Drsni ležaji                      Plain bearings

**SIST ISO 4383:2002**

**en**

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# INTERNATIONAL STANDARD

**ISO  
4383**

Third edition  
2000-04-15

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## Plain bearings — Multilayer materials for thin-walled plain bearings

*Paliers lisses — Matériaux multicouches pour paliers lisses minces*

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Reference number  
ISO 4383:2000(E)

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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.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 3.

Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

Attention is drawn to the possibility that some of the elements of this International Standard may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights.

International Standard ISO 4383 was prepared by Technical Committee ISO/TC 123, *Plain bearings*, Subcommittee SC 2, *Materials and lubricants, their properties, characteristics, test methods and testing conditions*.

This third edition cancels and replaces the second edition (ISO 4383:1991), which has been technically revised.

Annex A of this International Standard is for information only. (standards.iteh.ai)

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# Plain bearings — Multilayer materials for thin-walled plain bearings

## 1 Scope

This International Standard specifies requirements for multilayer materials for the manufacture of thin-walled plain bearings (half bearings, bushes, thrust washers). The multilayer material consists of a steel backing, the bearing layer (cast, sintered, roll bonded) and possibly an electrodeposited overlay.

NOTE Environmental concerns will, in the future, restrict the use of some materials such as lead.

## 2 Normative references

The following normative documents contain provisions which, through reference in this text, constitute provisions of this International Standard. For dated references, subsequent amendments to, or revisions of, any of these publications do not apply. However, parties to agreements based on this International Standard are encouraged to investigate the possibility of applying the most recent editions of the normative documents indicated below. For undated references, the latest edition of the normative document referred to applies. Members of ISO and IEC maintain registers of currently valid International Standards.

ISO 4381, *Plain bearings — Lead and tin casting alloys for multilayer plain bearings*.

ISO 4382-1, *Plain bearings — Copper alloys — Part 1: Cast copper alloys for solid and multilayer thick-walled plain bearings*.

ISO 6691, *Thermoplastic polymers for plain bearings — Classification and designation*.

## 3 Requirements

### 3.1 Chemical composition

The chemical composition shall be within the limits specified in Tables 1 to 5, where single figures denote maximum values.

### 3.2 Steel backings

The chemical composition of the steel for backings shall be the subject of agreement between manufacturer and purchaser. In general, low carbon steel will be used.

For the bronze/polymer composite materials listed in Table 4, copper-coated steel may be used.

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### 3.3 Bearing layers

Bearing metals based on lead and tin shall be in accordance with Table 1.

Bearing metals based on copper shall be in accordance with Table 2.

Bearing metals based on aluminium shall be in accordance with Table 3.

Bearing layers based on sintered porous bronze and polymers shall be in accordance with Table 4.

NOTE There is now a new class of aluminium-based materials containing both aluminium and silicon or manganese as well as a "soft" material such as lead or tin. Detailed information is available from individual manufacturers.

### 3.4 Overlays

Overlays in accordance with Table 5 may be applied for bearing metal layers as indicated in Table A.2. The thickness of the overlay and any additional layers between the bearing metal layer and the overlay shall be the subject of agreement between the manufacturer and purchaser.

### 3.5 Properties and selection of materials

Guidance on bearing metal hardness in strip form and uses of bearing metals is given in annex A.

## 4 Designation

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EXAMPLE

A multilayer material consisting of a steel backing, the bearing metal CuPb24Sn as cast (G) and the overlay PbSn10Cu2 is designated as follows:

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**Bearing metal ISO 4383 - G - CuPb24Sn - PbSn10Cu2**

**Table 1 — Lead and tin alloys (see ISO 4381)**

Chemical element	Chemical composition, % (m/m)			
	PbSb10Sn6	PbSb15SnAs	PbSb15Sn10	SnSb8Cu4
Pb	Remainder	Remainder	Remainder	0,35
Sb	9 to 11	13,5 to 15,5	14 to 16	7 to 8
Sn	5 to 7	0,9 to 1,7	9 to 11	Remainder
Cu	0,7	0,7	0,7	3 to 4
As	0,25	0,8 to 1,2	0,6	0,1
Bi	0,1	0,1	0,1	0,08
Zn	0,01	0,01	0,01	0,01
Al	0,01	0,01	0,01	0,01
Fe	0,1	0,1	0,1	0,1
Total others	0,2	0,2	0,2	0,2



Table 2 — Copper alloys

Chemical element	Chemical composition, % (m/m)				
	CuPb10Sn10 <sup>a</sup> G - cast P - sintered	CuPb17Sn5 G - cast	CuPb24Sn4 G - cast P - sintered	CuPb24Sn G - cast P - sintered	CuPb30 P - sintered
Cu	Remainder	Remainder	Remainder	Remainder	Remainder
Pb	9 to 11	14 to 20	19 to 27	19 to 27	26 to 33
Sn	9 to 11	4 to 6	3 to 4,5	0,6 to 2	0,5
Zn	0,5	0,5	0,5	0,5	0,5
P	0,1	0,1	0,1	0,1	0,1
Fe	0,7	0,7	0,7	0,7	0,7
Ni	0,5	0,5	0,5	0,5	0,5
Sb	0,5	0,5	0,5	0,5	0,5
Total others	0,5	0,5	0,5	0,5	0,5

<sup>a</sup> The chemical composition of this alloy differs from that of solid and multilayer thick-walled plain bearings (see ISO 4382-1).

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Table 3 — Aluminium alloys

Chemical element	Chemical composition, % (m/m)			
	AlSn20Cu	AlSn6Cu	AlSi11Cu	AlZn5Si1,5Cu1Pb1Mg
Al	Remainder	Remainder	Remainder	Remainder
Cu	0,7 to 1,3	0,7 to 1,3	0,7 to 1,3	0,8 to 1,2
Sn	16,5 to 22,5	5,5 to 7	0,2	0,2
Ni	0,1	1,3	0,1	0,2
Si	0,7 <sup>a</sup>	0,7 <sup>a</sup>	10 to 12	1 to 2
Fe	0,7 <sup>a</sup>	0,7 <sup>a</sup>	0,3	0,6
Mn	0,7 <sup>a</sup>	0,7 <sup>a</sup>	0,1	0,3
Ti	0,2	0,2	0,1	0,2
Pb	—	—	—	0,7 to 1,3
Zn	—	—	—	4,4 to 5,5
Mg	—	—	—	0,6
Total others	0,5	0,5	0,3	0,4

<sup>a</sup> Total Si + Fe + Mn content shall not exceed 1 %.