
**Plain bearings — Aluminium alloys for
solid bearings**

Paliers lisses — Alliages d'aluminium pour paliers massifs

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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/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 6279:2006), which has been technically revised.

Plain bearings — Aluminium alloys for solid bearings

1 Scope

This document specifies the composition and properties of preferred cast aluminium alloys for use in solid plain bearings. Other alloys can be specified with agreement between the manufacturer and user.

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 4384-2, *Plain bearings — Hardness testing of bearing metals — Part 2: Solid materials*

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:

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

4 Composition and mechanical properties

4.1 Composition

Preferred compositions are given in [Table 1](#).

Methods of analysis shall be mutually agreed between the manufacturer and user.

4.2 Mechanical properties

Mechanical properties are given in [Table 1](#).

Tensile strength and elongation are mandatory properties that are the subject of quality control checks carried out by the material manufacturers.

Hardness is a mandatory property that may be checked on individual bearings.

Typical values of other properties are given for design guidance.

5 Test methods

The tensile test shall be carried out as agreed between the manufacturer and user.

Test methods and mandatory values shall be agreed between the manufacturer and user.

Hardness testing shall be carried out in accordance with ISO 4384-2.

Table 1 — Aluminium alloys

Aluminium alloy							
	AlSn6Cu	AlSn6CuNi	AlSn20Cu	AlZn4,5SiCuMg	AlZn5SiCuMg	AlSi12CuMgNi	
Chemical composition (mass fraction in %)							
Chemical element	Al	Remainder	Remainder	Remainder	Remainder	Remainder	Remainder
	Sn	5,5 to 6,5	5,5 to 7	17,5 to 22,5	0,2 max.	0,2 max.	—
	Cu	1,3 to 1,7	0,7 to 1,3	0,7 to 1,3	0,9 to 1,2	0,9 to 1,2	0,8 to 1,5
	Ni	0,2 max.	0,7 to 1,3	—	0,2 max.	0,2 max.	1,3 max.
	Si	0,3 max.	0,7 max.	0,7 max.	1,0 to 2,0	1,2 to 2,0	11,0 to 13,0
	Fe	0,4 max.	0,7 max.	0,7 max.	0,4 max.	0,6 max.	0,7 max.
	Mn	0,2 max.	0,1 max.	0,7 max.	0,3 max.	0,3 max.	0,3 max.
	Zn	0,2 max.	—	—	4,4 to 5,0	5,0 to 5,5	0,3 max.
	Mg	0,1 max.	—	—	0,4 to 0,6	0,4 to 0,6	0,8 to 1,3
	Ti	0,05 to 0,2	0,2 max.	—	0,02 to 0,15	0,02 to 0,15	0,2 max.
Total other elements, max.	0,5	0,5	0,5	0,5	0,5	0,5	
Mechanical properties							
Hardness Brinell HB10/1 000/10	35 to 40	35 to 45	30 to 55	48 to 56	50 to 60	90 to 120	
Tensile strength R_m MPa	130 to 140	110 to 140	110 to 130	160 to 200	180 to 220	200 to 250	
Elongation A %	30 to 36	10 to 20	28 to 32	20 to 22	19 to 21	0,3 to 0,8	
0,2 % Proof stress $R_{p0,2}$ MPa	50 to 60	45 to 60	40 to 60	80 to 110	100 to 120	190 to 230	
Elastic modulus E GPa	≈ 69	≈ 71	≈ 63	≈ 75	≈ 75	≈ 75	
Thermal expansion α $10^{-6}/K$	≈ 23	≈ 23	≈ 24	≈ 23	≈ 23	≈ 21	
Thermal conductivity λ W/(m · K)	≈ 160	≈ 160	≈ 155	≈ 170	≈ 170	≈ 184	
Density ρ $10^3 kg/m^3$	≈ 2,9	≈ 2,9	≈ 3,12	≈ 2,9	≈ 2,9	≈ 2,7	

6 Designation

The designation shall include the following information, in the order given:

- “Aluminium alloy”;
- reference to this document, i.e. ISO 6279;
- name of alloy.

EXAMPLE The aluminium alloy AlSn6Cu is designated by the following:

Aluminium alloy ISO 6279 – AlSn6Cu