INTERNATIONAL STANDARD 1338

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Cast copper alloys — Composition and mechanical properties

Cupro-alliages moulés — Composition et caractéristiques mécaniques

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FOREWORD

ISO (the International Organization for Standardization) is a worldwide federation of national standards institutes (ISO member bodies). The work of developing International Standards is carried out through ISO technical committees. Every member body interested in a subject for which a technical committee has been set up 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.

Draft International Standards adopted by the technical committees are circulated to the member bodies for approval before their acceptance as International Standards by the ISO Council.

International Standard ISO 1338 was developed by Technical Committee ISO/TC 26, *Copper and copper alloys*, and was circulated to the member bodies in December 1975.

It has been approved by the member bodies of the following countries :

Australia	Germany	Spain
Austria	Hungary	Sweden
Belgium	India	Switzerland
Canada	Ireland	Turkey
Chile	Japan	United Kingdom
Denmark	Poland	U.S.S.R.
Finland	Romania	Yugoslavia
France	South Africa, Rep. of	

The member body of the following country expressed disapproval of the document on technical grounds :

U.S.A.

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Cast copper alloys — Composition and mechanical properties

1 SCOPE AND FIELD OF APPLICATION

The International Standard specifies the composition of cast ingots and castings and the minimum mechanical properties of castings of the following copper alloys :

- copper-zinc alloys (brasses),
- copper-aluminium alloys (aluminium bronzes),
- copper-tin alloys (bronzes),

currently available in commercial quantities.

2 COMPOSITION

The compositions given in tables 1 to 22 show the principal elements. If the purchaser's requirements necessitate different limits for certain elements other than those included in the alloy designation, these should be by agreement.

All elements shall be analysed in ingots. It is the responsibility of the founder to ensure that the appropriate composition limits apply to castings.

3 MECHANICAL PROPERTIES

The following mechanical properties of test bars included in the tables are minimum values :

R_m : the tensile strength, in newtons per square millimetre;

$R_{p0,2}$: 0,2 % proof stress, in newtons per square millimetre;

A : the elongation in per cent, calculated on the basis of an initial gauge length L_o given by the formula $L_o = 5{,}65\sqrt{S_o}$, where S_o is the initial cross-section of the gauge length of the test piece.

The properties of separately cast test bars used for sand and permanent mould castings are for information only until test bar designs have been standardized.

For continuous and centrifugal castings, the mechanical properties should be fixed by agreement for sections greater than 50 mm.

4 TEST BARS

In the case of sand casting and permanent mould casting, the test bars are cast separately. In the case of continuous casting, the test bars are taken from the casting and in the case of centrifugal casting, they may be taken from the casting.

The test bars may be tested either as cast or machined.

Cast test bars shall have diameters between 12 and 25 mm; machined test bars shall have a finished diameter between 10 and 18 mm. In the latter case, a diameter of 14,0 ± 0,5 mm is recommended.

In the case of sand castings for alloys with a long freezing range, for example copper-tin alloys (gun metals, phosphorus bronzes) and copper-lead-tin alloys (leaded bronzes), a test bar fed at one or both ends is recommended.

For other alloys, for example short freezing range alloys like copper-aluminium alloys (aluminium bronzes) and copper-zinc alloys (brasses), a test bar fed all along its length is preferred.

NOTE — When special requirements are indicated "by agreement", this means "agreement between the supplier and purchaser".