INTERNATIONAL STANDARD ISO 426/I

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Wrought copper-zinc alloys — Chemical composition and forms of wrought products — Part I : Non-leaded, special and high tensile alloys

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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 426/I was drawn up by Technical Committee ISO/TC 26, *Copper and copper alloys,* and circulated to the Member Bodies in November 1971.

It has been approved by the Member Bodies of the following countries :

Austria	India	Spain
Belgium	Ireland	Sweden
Canada	Italy	Switzerland
Czechoslovakia	Japan	Thailand
Denmark	Netherlands	Turkey
Egypt, Arab Rep. of	New Zealand	United Kingdom
Finland	Norway	U.S.A.
France	Portugal	U.S.S.R.
Germany	Romania	
Hungary	South Africa, Rep. of	

The Member Body of the following country expressed disapproval of the document on technical grounds :

Chile

This International Standard, together with ISO 426/II, cancels and replaces ISO Recommendation R 426-1965.

Printed in Switzerland

Wrought copper-zinc alloys — Chemical composition and forms of wrought products — Part I : Non-leaded, special and high tensile alloys

1 SCOPE AND FIELD OF APPLICATION

This International Standard specifies the chemical composition and lists the forms of wrought products of the following wrought copper alloys :

- copper-zinc alloys (non-leaded brasses);
- special copper-zinc alloys (special brasses);
- high tensile copper-zinc alloys (high tensile brasses);

currently available in commercial quantities.

For wrought copper-zinc-lead alloys (leaded brasses), see ISO 426/II.

2 CHEMICAL COMPOSITION

2.1 The chemical compositions given in Tables 1 to 3 show only the main constituent elements and usual impurities. It is the responsibility of the supplier to ensure that any element not specifically limited by this International Standard is not present in an amount such as is generally accepted as having an adverse effect on the product. If the purchaser's requirements necessitate limits for any element not specified, these should be agreed upon between supplier and purchaser.

The designations shown are in accordance with the principles laid down in ISO/R 1190, *Copper and copper alloys — Code of designation.*

2.2 The range of available high tensile copper-zinc alloy compositions is extremely wide. There are many special alloys of this type that have particular properties which may be superior in some respects to those possessed by alloys falling within the compositional range shown in Table 3. These special alloys are too numerous and too varied to be suitable for standardization.

The compositional range shown in Table 3 includes a range of high tensile copper-zinc alloys made by many countries. These alloys will meet the requirements to be indicated in the tables of mechanical properties.

Where a particular physical property requirement, such as special corrosion resistance, is desired by the user of the alloy, he is advised to consult the manufacturer regarding a suitable composition.

3 FORMS OF WROUGHT PRODUCTS

In Table 4,

— X indicates the main forms manufactured (see section 4).

— (X) indicates forms manufactured in smaller quantities, for example in certain countries only or for special purposes.

If no symbol is given, the form is not considered of importance for that type of copper alloy, but it does not necessarily indicate that such a product cannot be manufactured.

4 MECHANICAL PROPERTIES

Mechanical properties for all forms of wrought products for which the symbol X is given in Table 4, are defined in the following International Standards[1] :

- ISO 1634, for rolled flat products (plate, sheet, strip);
- ISO 1635, for tubes for general purposes;
- ISO 1636, for tubes for condensers and heat exchangers;
- ISO 1637, for solid products in straight length (rod, bar);
- ISO 1638, for drawn solid products in coils or on reels (wire);
- ISO 1639, for extruded sections;
- ISO 1640, for forgings.

1) At present at the stage of draft.

TABLE 1 – **Copper-zinc alloys (non-leaded brasses)**

Designation	Chemical composition %					Average density
			Maximum impurities			
	Cu[1]	Zn	Fe	Pb	Total	kg/dm³
Cu Zn5	94,0 to 96,0	The rest	0,1	0,05	0,3	8,85
Cu Zn10	89,0 to 91,0		0,1	0,05	0,4	8,80
Cu Zn15	84,0 to 86,0		0,1	0,05	0,4	8,75
Cu Zn20	78,5 to 81,5		0,1	0,05	0,4	8,65
Cu Zn30	68,5 to 71,5[2]		0,1	0,05	0,4	8,55
Cu Zn33	65,5 to 68,5		0,1	0,1	0,4	8,50
Cu Zn37	62,0 to 65,5		0,2	0,3	0,5[3]	8,45
Cu Zn40	59,0 to 62,0		0,2	0,3	0,5[3]	8,40

1) Nickel up to a maximum of 0,3 % to count as copper.
2) As 0,02 to 0,06 if required.
3) Excluding Pb.

TABLE 2 – **Special copper-zinc alloys (special brasses)**

Designation	Chemical composition %									Average density
						Maximum impurities				
	Cu	Sn	Al	As	Zn	Fe	Pb	P	Total	kg/dm³
Cu Zn20 Al2	76,0 to 79,0	–	1,8 to 2,5	0,02 to 0,06[1]	The rest	0,07	0,07	0,015	0,3	8,35
Cu Zn28 Sn1	70,0 to 73,0	0,9 to 1,3	–	0,02 to 0,06[2]		0,07	0,07	–	0,3	8,55
Cu Zn38 Sn1	59,5 to 63,5	0,5 to 1,5	–	–		0,2	0,2	–	0,5	8,40

1) or Sb.
2) or Sb or P.

TABLE 3 – **High tensile copper-zinc alloys (high tensile brasses)**

Designation	Chemical composition %									Average density
	Cu	Al	Fe	Mn	Zn	Sn max.	Pb max.	Ni max.	Total other max.	kg/dm³
Cu Zn39 Al Fe Mn	56,0 to 61,0	0,2 to 1,5[1]	0,2 to 1,5	0,2 to 2,0	The rest	1,2	1,5	2,0	0,5	8,3

1) For good soldering, less than 0,2 %.