

ISO

INTERNATIONAL ORGANIZATION FOR STANDARDIZATION

ISO RECOMMENDATION R 1336

WROUGHT ALLOYED COPPERS

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BRIEF HISTORY

The ISO Recommendation R 1336, *Wrought alloyed coppers*, was drawn up by Technical Committee ISO/TC 26, *Copper and copper alloys*, the Secretariat of which is held by the Deutscher Normenausschuss (DNA).

Work on this question led to the adoption of Draft ISO Recommendation No. 1337, which was circulated to all the ISO Member Bodies for enquiry in October 1967. It was approved, subject to a few modifications of an editorial nature, by the following Member Bodies :

Australia	India	Portugal
Belgium	Iran	South Africa, Rep. of
Brazil	Israel	Spain
Canada	Italy	Sweden
Chile	Japan	Switzerland
Czechoslovakia	Korea, Dem. P. Rep. of	Turkey
Finland	Mexico	U.A.R.
France	Netherlands	United Kingdom
Germany	Norway	U.S.S.R.
Greece	Poland	Yugoslavia

No Member Body opposed the approval of the Draft.

This Draft ISO Recommendation was subsequently divided into two parts, which were submitted by correspondence to the ISO Council. The latter decided to accept them as ISO RECOMMENDATIONS.

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1. SCOPE

This ISO Recommendation relates to chemical compositions, electrical properties and forms of semi-manufactured products of wrought alloyed coppers, currently available in commercial quantities.

Principles of classification are given in an Appendix.

2. CHEMICAL COMPOSITION

The chemical compositions given in Table 1 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 ISO Recommendation 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.

TABLE 1

Designation	Chemical composition %			Average density kg/dm ³
	Cu	Alloying elements	Other elements	
CuAg0.05	The remainder	Ag 0.02 – 0.08	Oxygen max. 0.06	8.9
CuAg0.1		Ag 0.08 – 0.12	Total max. 0.1	
CuAg0.05(P)		Ag 0.02 – 0.08	P 0.001 – 0.005	8.9
CuAg0.1(P)		Ag 0.08 – 0.12	Total max. 0.1	
CuAs(P) [Cu-DPA]		As 0.15 – 0.50	P 0.013 – 0.050 Total max. 0.3	8.9
CuCd1		Cd 0.7 – 1.3	Total max. 0.3	8.9
CuCr1		Cr 0.3 – 1.2	Total max. 0.3	8.9
CuS(P0.01)		S 0.20 – 0.50	P 0.004 – 0.012 Total max. 0.1	8.9
CuS(P0.03)			P 0.013 – 0.050 Total max. 0.1	
CuTe		Te 0.3 – 0.8	Oxygen-free Total max. 0.2	8.9
CuTe(P)			P 0.004 – 0.012 Total max. 0.2	

3. ELECTRICAL PROPERTIES

TABLE 2

Designation	Electrical properties in the annealed temper ⁽¹⁾		
	Maximum resistivity at 20 °C	Maximum conductivity at 20 °C	
	$\frac{\Omega \cdot \text{mm}^2}{\text{m}}$	$\frac{\text{m}}{\Omega \cdot \text{mm}^2}$	% IACS
CuAg0.05	0.017 544 ...	57.00	98.28
CuAg0.1			
CuAg0.05(P)	0.017 544 ...	57.00	98.28
CuAg0.1(P)			
CuAs(P) [Cu-DPA]	(≈ 0.04)	(≈ 25)	(≈ 43)
CuCd1	0.022 22 ... ⁽²⁾	45.00 ⁽²⁾	77.59 ⁽²⁾
CuCr1	0.238 1 ... ⁽³⁾	42.00 ⁽³⁾	72.41 ⁽³⁾
CuS(P0.01)	(≈ 0.02)	(≈ 50)	(≈ 86)
CuS(P0.03)	(≈ 0.022)	(≈ 45)	(≈ 78)
CuTe	(≈ 0.02)	(≈ 50)	(≈ 86)
CuTe(P)	(≈ 0.02)	(≈ 50)	(≈ 86)

(1) Values given in parentheses are for information only, but are not specified.

(2) For the temper H (strain hardened).

(3) For the temper fully heat treated.

4. FORMS OF SEMI-MANUFACTURED PRODUCTS

TABLE 3

Designation	Plate Sheet	Strip	Rod Bar	Extruded sections ⁽¹⁾	Tube ⁽²⁾	Wire	Forgings		
CuAg0.05		X	X			X			
CuAg0.1									
CuAg0.05(P)		X	X					X	
CuAg0.1(P)									
CuAs(P) [Cu-DPA]	X		X		X ⁽³⁾		X		
CuCd1			X			X			
CuCr1	(X)	(X)	X	(X)	(X)	(X)	X		
CuS(P0.01)			X						
CuS(P0.03)			X						
CuTe			X						
CuTe(P)			X						

X indicates the main forms manufactured (see section 5).

(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, but it does not necessarily indicate that such a product cannot be manufactured.

(1) Sections or shapes made by extruding or by a combination of extruding and drawing.

(2) Tubes for general purposes.

(3) Also for condenser and heat exchanger tubes.