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ISO RECOMMENDATION

R 1337

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1st EDITION

April 1971

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BRIEF HISTORY

The ISO Recommendation R 1337, *Wrought 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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ISO Recommendation | R 1337 | April 1971

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1. SCOPE

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

Principles of classification are given in an Appendix.

2. CHEMICAL COMPOSITION

If the purchaser's requirements necessitate limits for any element not specified in Table 1, these should be agreed upon between supplier and purchaser.

TABLE 1

Designation	Chemical composition %	Average density kg/dm³
Cu-ETP	Cu (+ Ag) min. 99.90	8.9
Cu-FRHC	Cu (+ Ag) min. 99.90	8.9
Cu-FRTP	Cu (+ Ag) min. 99.85	8.9
Cu-OF	Cu (+ Ag) min. 99.95	8.9
Cu-DLP	Cu (+ Ag) min. 99.90 P 0.005 – 0.012	8.9
Cu-DHP	Cu (+ Ag) min. 99.85 P 0.013 – 0.050	8.9

3. ELECTRICAL PROPERTIES

TABLE 2

Designation	Electrical properties in the annealed temper		
	Maximum resistivity at 20 °C	Minimum conductivity at 20 °C	
	$\frac{\Omega \cdot mm^2}{m}$	$\frac{m}{\Omega \cdot mm^2}$	% IACS
Cu-ETP	0.017 241 . . .(1) 0.017 544 . . .	58.00(1) 57.00	100.0(1) 98.28
Cu-FRHC	0.017 241 . . .(1) 0.017 544 . . .	58.00(1) 57.00	100.0(1) 98.28
Cu-FRTP	(≈ 0.02)(2)	(≈ 50)(2)	(≈ 86)(2)
Cu-OF	0.017 241 . . .	58.00	100.0
Cu-DLP	(≈ 0.017 8)(3)	(≈ 56)(3)	(≈ 97)(3)
Cu-DHP	(≈ 0.025)(2)	(≈ 40)(2)	(≈ 69)(2)

(1) Wire is usually supplied with maximum resistivity of 0.017 241 . . . $\Omega \cdot mm^2/m$ at 20 °C (minimum conductivity 100.0 % IACS or 58.00 $m/\Omega \cdot mm^2$), if the national standards do not specify anything else.
Other forms, however, are only so supplied if agreed between supplier and purchaser.
(2) For information only, but not specified.
(3) For information only; electrical property requirements should be agreed between supplier and purchaser.

4. FORMS OF SEMI-MANUFACTURED PRODUCTS

TABLE 3

Designation	Plate Sheet	Strip	Rod Bar	Extruded sections(1)	Tube(2)	Wire	Forgings
Cu-ETP	X	X	X	(X)	X	X	(X)
Cu-FRHC	X	X	X	(X)	X	X	(X)
Cu-FRTP	X	X	X	(X)			
Cu-OF	X	X	X	(X)	(X)	(X)	(X)
Cu-DLP	(X)	(X)	X	(X)	(X)		
Cu-DHP	X	X	X	(X)	X(3)		

X indicates the main manufactured forms (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.

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