

Revised

ISO

INTERNATIONAL ORGANIZATION FOR STANDARDIZATION

**ISO RECOMMENDATION
R 427**

CLASSIFICATION OF TIN BRONZES AND SPECIAL TIN BRONZES

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BRIEF HISTORY

The ISO Recommendation R 427, *Classification of Tin Bronzes and Special Tin Bronzes*, 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 by the Technical Committee began in 1960 and led, in 1962, to the adoption of a Draft ISO Recommendation.

In December 1962, this Draft ISO Recommendation (No. 544) was circulated to all the ISO Member Bodies for enquiry. It was approved, subject to a few modifications of an editorial nature, by the following Member Bodies:

Australia	Germany	Romania
Belgium	Greece	Spain
Brazil	India	Sweden
Canada	Iran	Switzerland
Chile	Italy	Turkey
Denmark	Japan	United Kingdom
Finland	Netherlands	Yugoslavia
France	Poland	

One Member Body opposed the approval of the Draft:

U.S.S.R.

The Draft ISO Recommendation was then submitted by correspondence to the ISO Council, which decided, in March 1965, to accept it as an ISO RECOMMENDATION.

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CLASSIFICATION OF TIN BRONZES AND SPECIAL TIN BRONZES

1. SCOPE

This ISO Recommendation relates to the chemical composition and forms of semi-manufactured products of the following wrought copper alloys:

Tin bronzes,
Special tin bronzes,

currently available in commercial quantities.

It is intended as a classification and not as a specification for the various types. For the classification principles, see Appendix.

2. GENERAL

The chemical compositions given below 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.

3. CHEMICAL COMPOSITION (PER CENT)

3.1 Tin bronzes

TABLE 1

Designation	Sn	P	Cu	Maximum impurities				Average density* kg/dm ³
				Fe	Pb	Zn	Other elements Total	
Cu Sn5	3.0-5.5	0-0.4	The re- main- der	0.1	0.1	0.5	0.3	8.85
Cu Sn7	5.5-7.5	0-0.4		0.1	0.1	0.5	0.3	8.80
Cu Sn9	7.5-10.0	0-0.4		0.1	0.1	0.5	0.3	8.80

* For information only.

3.2 Special tin bronzes

TABLE 2

Designation	Sn	Zn	Pb	P	Cu	Maximum impurities			Average density* kg/dm ³
						Fe	Pb	Other elements Total	
Cu Sn4 Zn4	3.0-5.0	3.0-5.0	—	0-0.1	The re- main- der	0.1	0.1	0.3	8.8
Cu Sn4 Pb4 Zn4	3.0-5.0	3.0-5.0	3.0-5.0	0-0.4		0.1	—	0.3	8.9

For information only.

4. FORMS OF SEMI-MANUFACTURED PRODUCTS

TABLE 3

Alloy	Plate, Sheet	Strip	Rod, Bar	Sections*	Tube	Wire	Forgings
Tin bronzes							
Cu Sn5	(x)	x	x	(x)	(x)	x	
Cu Sn7	x	x	x	(x)	x	x	
Cu Sn9	(x)	x	x	(x)	x		
Special tin bronzes							
Cu Sn4 Zn4	(x)	x	x	(x)	x	(x)	
Cu Sn4 Pb4 Zn4	(x)	x	(x)				

* Sections or shapes made by extruding, or by a combination of extruding and drawing.

x indicates the main forms manufactured.

(x) indicates forms manufactured in smaller quantities, e.g. in certain countries only or for special purposes.

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