This international standard was developed in accordance with internationally recognized principles on standardization established in the Decision on Principles for the Development of International Standards, Guides and Recommendations issued by the World Trade Organization Technical Barriers to Trade (TBT) Committee.

Designation: B30 – 23

Standard Specification for Copper Alloys in Ingot and Other Remelt Forms[1]

This standard is issued under the fixed designation B30; the number immediately following the designation indicates the year of original adoption or, in the case of revision, the year of last revision. A number in parentheses indicates the year of last reapproval. A superscript epsilon (ε) indicates an editorial change since the last revision or reapproval.

This standard has been approved for use by agencies of the U.S. Department of Defense.

1. Scope*

1.1 This specification covers the requirements for copper alloys in ingot and other forms including granules, nuggets, pellets, or shot for remelting for the manufacturing of castings having the Copper Alloy UNS No. designation, commercial designations and nominal composition shown in Table 1 and Table 2. Product delivered in forms other than ingot shall be upon agreement between the supplier and purchaser.

1.2 A cross reference of Copper Alloy UNS Nos. and copper alloy casting specifications is given in Table 3.

1.3 The values stated in inch-pound units are to be regarded as standard. The values given in parentheses are mathematical conversions to SI units that are provided for information only and are not considered standard.

1.4 *This international standard was developed in accordance with internationally recognized principles on standardization established in the Decision on Principles for the Development of International Standards, Guides and Recommendations issued by the World Trade Organization Technical Barriers to Trade (TBT) Committee.*

2. Referenced Documents

2.1 The following documents of the issue in effect on date of material purchase form a part of this specification to the extent referenced herein:

2.2 *ASTM Standards:*[2]

B22/B22M Specification for Bronze Castings for Bridges and Turntables
B61 Specification for Steam or Valve Bronze Castings
B62 Specification for Composition Bronze or Ounce Metal Castings
B66 Specification for Bronze Castings for Steam Locomotive Wearing Parts
B67 Specification for Car and Tender Journal Bearings, Lined
B148 Specification for Aluminum-Bronze Sand Castings
B176 Specification for Copper-Alloy Die Castings
B194 Specification for Copper-Beryllium Alloy Plate, Sheet, Strip, and Rolled Bar
B208 Practice for Preparing Tension Test Specimens for Copper Alloy Sand, Permanent Mold, Centrifugal, and Continuous Castings
B271/B271M Specification for Copper-Base Alloy Centrifugal Castings
B369 Specification for Copper-Nickel Alloy Castings
B427 Specification for Gear Bronze Alloy Castings
B505/B505M Specification for Copper Alloy Continuous Castings
B584 Specification for Copper Alloy Sand Castings for General Applications
B763/B763M Specification for Copper Alloy Sand Castings for Valve Applications
B770 Specification for Copper-Beryllium Alloy Sand Castings for General Applications
B806 Specification for Copper Alloy Permanent Mold Castings for General Applications
E8/E8M Test Methods for Tension Testing of Metallic Materials
E29 Practice for Using Significant Digits in Test Data to Determine Conformance with Specifications
E54 Test Methods for Chemical Analysis of Special Brasses and Bronzes (Withdrawn 2002)[3]
E62 Test Methods for Chemical Analysis of Copper and Copper Alloys (Photometric Methods) (Withdrawn 2010)[3]
E76 Test Methods for Chemical Analysis of Nickel-Copper Alloys (Withdrawn 2003)[3]
E255 Practice for Sampling Copper and Copper Alloys for the Determination of Chemical Composition (Withdrawn 2023)[3]
E478 Test Methods for Chemical Analysis of Copper Alloys

[1] This specification is under the jurisdiction of ASTM Committee B05 on Copper and Copper Alloys and is the direct responsibility of Subcommittee B05.05 on Castings and Ingots for Remelting.

Current edition approved April 1, 2023. Published May 2023. Originally approved in 1919. Last previous edition approved in 2022 as B30 – 22. DOI: 10.1520/B0030-23.

[2] For referenced ASTM standards, visit the ASTM website, www.astm.org, or contact ASTM Customer Service at service@astm.org. For *Annual Book of ASTM Standards* volume information, refer to the standard's Document Summary page on the ASTM website.

[3] The last approved version of this historical standard is referenced on www.astm.org.

***A Summary of Changes section appears at the end of this standard**

Copyright © ASTM International, 100 Barr Harbor Drive, PO Box C700, West Conshohocken, PA 19428-2959. United States

TABLE 1 Nominal Compositions

Alloy Name	Copper Alloy UNS No.	Previously Used Designation	Commercial Designation	Nominal Composition, %												
				Copper	Tin	Lead	Zinc	Nickel	Sulfur	Iron	Aluminum	Manganese	Antimony	Silicon	Niobium	Bismuth
Leaded red brass	C83450	...	...	88	2.5	2	6.5	1	...	...	...	...	...	...	...	...
Low-lead sulfur tin bronze	C83470	...	...	93	4	...	2	0.5	0.5	...	...	...	...	...	...	...
Leaded red brass	C83600	4A	85-5-5-5 or No. 1 composition	85	5	5	5	...	...	...	...	...	...	...	...	...
	C83800	4B	commercial red brass, 83-4-6-7	83	4	6	7	...	...	...	...	...	...	...	...	...
Low-lead semi-red brass	C84020	...	...	85.5	3	...	9	1.2	0.38	...	...	...	...	...	...	...
	C84030	...	...	85.5	3	...	9	1.2	0.38	...	...	...	0.8	...	...	...
Leaded semi-red brass	C84200	...	semi-red brass, 80-5-2-13	80	5	2	13	...	...	...	...	...	...	...	...	...
	C84400	5A	valve composition 81-3-7-9	81	3	7	9	...	...	...	...	...	...	...	...	...
	C84800	5B	semi-red brass, 76-2½-6½-15	76	2.5	6.5	15	...	...	...	...	...	...	...	...	...
Leaded yellow brass	C85200	6A	high-copper yellow brass	72	1	3	24	...	...	...	...	...	...	...	...	...
	C85400	6B	commercial No. 1 yellow brass	67	1	3	29	...	...	...	...	...	...	...	...	...
Yellow brass	C85470[A]	...	...	62.5	2.5	...	34.3	...	...	...	0.5	...	...	...	...	...
Leaded yellow brass	C85700	6C	60–40 leaded yellow (naval) brass	61	1	1	37	...	...	...	...	...	...	...	...	...
	C85800	...	die-cast yellow brass	62	1	1	36	...	...	...	...	...	...	...	...	...
	C86100	...	high-strength manganese bronze	67	...	...	21	...	...	3	5	4	...	...	...	...
Leaded high-strength yellow brass and high-strength yellow brass	C86200	8B	high-strength manganese bronze	63	...	...	27	...	...	3	4	3	...	...	...	...
	C86300	8C	high-strength manganese bronze	61	...	...	27	...	...	3	6	3	...	...	...	...
	C86400	7A	leaded manganese bronze	58	1	1	38	...	...	1	0.5	0.5	...	...	...	...
	C86500	8A	No. 1 manganese bronze	58	...	...	39	...	...	1	1	1	...	...	...	...
	C86700	...	leaded manganese bronze	58	1	1	34	...	...	2	2	2	...	...	...	...
Silicon bronze	C87300	...	silicon bronze	95	...	...	...	...	...	...	...	1	...	4	...	...
Silicon brass	C87400	13A	silicon brass	82	...	0.5	14	...	...	...	...	...	...	3.5	...	...
	C87500	13B	...	82	...	...	14	...	...	...	...	...	...	4	...	...
Silicon bronze	C87600	...	silicon bronze	91	...	...	5	...	...	...	...	...	...	4	...	...
	C87610	...	silicon bronze	92	...	...	4	...	...	...	...	...	...	4	...	...
	C87700	...	silicon bronze	88.5	...	...	8	...	...	...	...	...	...	3	...	...
	C87710	...	silicon bronze	86	...	...	10	...	...	...	...	...	...	4	...	...
Silicon brass	C87800	...	die-cast silicon brass	82	...	...	14	...	...	...	...	...	...	4	...	...
	C87845[B]	...	...	76	...	...	21.26	...	...	...	...	...	...	2.7	...	...
	C87850[C]	...	Silicon brass	76	...	...	20.9	...	...	...	...	...	...	3	...	...
Bismuth tin bronze	C89320[D]	...	lead-free bronze	89	6	...	...	...	...	...	...	...	...	...	...	...
Bismuth selenium brass	C89510[E]	...	lead-free bronze	87	5.0	...	5.0	...	...	...	...	...	...	...	...	1.0
	C89520[F]	...	lead-free brass	86	5.5	...	5	...	...	...	...	...	...	...	...	1.9
	C89530[G]	...	...	86.5	4.7		8.0	...	...	...	...	...	...	...	...	1.5
	C89535[G]	...	...	86.5	3.0		7.0	0.65	...	...	...	...	...	...	...	1.4
Bismuth brass	C89537	...	...	85.0	4.5	...	9.0	...	...	...	...	...	...	0.9	...	1.7
Bismuth selenium yellow brass	C89540[H]	...	lead-free yellow brass	61	0.8	...	36	0.5	...	0.3	0.4	...	...	...	...	0.9
	C89545[I]	...	...	69.0	...	...	29.0	0.5	...	...	1.0	...	...	...	...	0.55
Bismuth brass	C89570[J]	...	...	60.5	0.8	...	36.5	0.32	...	...	0.5	...	...	...	...	1.0
	C89720[K]	...	...	67.5	1	...	29.8	...	...	...	0.5	...	...	0.5	...	0.7
Bismith red brass	C89833	...	Lead-free brass	89	5	...	3	...	...	...	...	...	...	...	...	2.2
Bismuth Bronze	C89836	...	lead-free bronze	89.5	5.5	...	3.0	...	...	...	...	...	...	...	...	2.0
	C89838	...	...	81.5	2.75	...	15.0	...	...	...	...	...	...	...	...	0.55
Bismuth semi-red brass	C89844	...	cast bismuth brass	84.5	4	...	8	...	...	...	...	...	...	...	...	3
	C89845	...	...	85.0	4.0	...	7.5	2.0	...	...	...	...	...	...	...	1.5
Tin bronze and leaded tin bronze	C90300	1B	88-8-0-4 or modified “G” bronze	88	8	...	4	...	...	...	...	...	...	...	...	...
Low-lead tin bronze	C90420	...	...	87.5	8	...	3	...	0.38	...	...	...	...	...	...	...
Tin bronze and leaded tin bronze	C90500	1A	88-10-0-2 or “G” bronze	88	10	...	2	...	...	...	...	...	...	...	...	...
	C90700	...	89-11 gear bronze	89	11	...	...	...	...	...	...	...	...	...	...	...
	C90800	...	88-12 gear bronze	88	12	...	...	...	...	...	...	...	...	...	...	...
	C91000	...	85-15 tin bronze	85	15	...	...	...	...	...	...	...	...	...	...	...
	C91100	...	84-16 tin bronze	84	16	...	...	...	...	...	...	...	...	...	...	...
	C91300	...	81-19 tin bronze or bell metal	81	19	...	...	...	...	...	...	...	...	...	...	...
	C91600	...	nickel gear bronze	88	10.5	...	...	1.5	...	...	...	...	...	...	...	...
	C91700	...	nickel gear bronze	86.5	12	...	...	1.5	...	...	...	...	...	...	...	...