



Designation: B 152/B 152M – 00

Used in USDOE-NE standards

Standard Specification for Copper Sheet, Strip, Plate, and Rolled Bar¹

This standard is issued under the fixed designation B 152/B 152M; 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 Department of Defense.

1. Scope*

1.1 This specification² establishes the requirements for copper sheet, strip, plate, and rolled bar produced from the following coppers.

Copper UNS No.	Previous Designa- tion ⁴	Type of Copper
C10100	OFE	Oxygen-free electronic
C10200 ^B	OF	Oxygen-free without residual deoxidants
C10300	...	Oxygen-free extra low phosphorus
C10400, C10500, C10700	OFS	Oxygen-free, silver bearing
C10800	...	Oxygen-free low phosphorus
C10910	...	Low oxygen
C11000 ^B	ETP	Electrolytic tough pitch
C11300, C11400, C11600 ^B	STP	Silver bearing tough pitch
C12000	DLP	Phosphorized, low residual phos- phorus
C12200 ^B	DHP	Phosphorized, high residual phos- phorus
C12300	DPS	Phosphorized, silver bearing
C14200	DPA	Phosphorus deoxidized, arsenical
C14420	...	Tin bearing tellurium copper
C14530	...	Tin tellurium bearing copper

⁴Except Copper UNS No. C10300 (oxygen-free extra low phosphorus), No. C10800 (oxygen-free low phosphorus), and C10910 (low oxygen), these types of copper are classified in Classification B 224.

^BSAE Specification CA101 conforms to Copper UNS No. C10100; SAE Specification CA102 conforms to the requirements for Copper UNS No. C10200; SAE Specification CA110 conforms to the requirements for Copper UNS No. C11000; SAE Specifications CA113, CA114, and CA116 conform to the requirements for Copper UNS Nos. C11300, C11400, and C11600; SAE Specification CA120 conforms to Copper UNS No. C12000; and SAE Specification CA122 conforms to the requirements for Copper UNS No. C12200.

NOTE 1—Each of the coppers listed has unique properties that can make it suitable for specific applications. The purchaser should consult with the supplier to determine which copper would be best suited for the intended application.

NOTE 2—Copper UNS Nos. C10400, C10500, C10700, C11300, C11400, and C11600 identify coppers with specific silver content (see Table 1).

¹ This specification is under the jurisdiction of ASTM Committee B05 on Copper and Copper Alloys and is the direct responsibility of Subcommittee B05.01 on Plate, Sheet, and Strip.

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² For ASME Boiler and Pressure Vessel Code applications see related Specification SB-152 in Section 10 of that Code.

NOTE 3—This specification is not intended to cover material rolled to ounce-weight thicknesses. Such material is covered by Specification B 370.

Plates for locomotive fireboxes are covered by Specification B 11.

Flat copper products with finished (rolled or drawn) edges (flat wire and strip) are also covered by Specification B 272.

1.1.1 When no specific copper is identified in the contract or purchase order, the supplier may furnish product from any of the listed coppers.

1.2 The values stated in inch-pound units are to be regarded as the standard. The SI values given in parentheses are provided for information only.

1.3 The following safety hazards caveat only pertains to the test method portion, Section 14 of this specification: *This standard does not purport to address all of the safety concerns, if any, associated with its use. It is the responsibility of the user of this standard to establish appropriate safety and health practices and determine the applicability of regulatory limitations prior to use.*

2. Referenced Documents

2.1 ASTM Standards:

- B 11 Specification for Copper Plates for Locomotive Fireboxes³
- B 170 Specification for Oxygen-Free Electrolytic Copper—Refinery Shapes⁴
- B 193 Test Method for Resistivity of Electrical Conductor Materials⁵
- B 216 Specification for Tough-Pitch Fire-Refined Copper—Refinery Shapes⁴
- B 224 Classification of Coppers⁴
- B 248 Specification for General Requirements for Wrought Copper and Copper-Alloy Plate, Sheet, Strip, and Rolled Bar⁴
- B 248M Specification for General Requirements for Wrought Copper and Copper-Alloy Plate, Sheet, Strip, and Rolled Bar [Metric]⁴
- B 272 Specification for Copper Flat Products with Finished (Rolled or Drawn) Edges (Flat Wire and Strip)⁴

³ Discontinued—see 1980 Annual Book of ASTM Standards, Part 6.

⁴ Annual Book of ASTM Standards, Vol 02.01.

⁵ Annual Book of ASTM Standards, Vol 02.03.

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

TABLE 1 Chemical Requirements

Element	Composition, %																	
	Copper UNS No.																	
	C10100 ^A	C10200	C10300	C10400 ^B	C10500 ^B	C10700 ^B	C10800	C10910	C11000	C11300 ^C	C11400 ^C	C11600 ^C	C12000	C12200	C12300 ^D	C14200	C14420 ^E	C14530 ^F
Copper (incl silver), min	99.99 ^G	99.95	99.95 ^H	99.95	99.95	99.95	99.95 ^H	99.95	99.90	99.90	99.90	99.90	99.90	99.9	99.90	99.4	99.90	99.90
Phosphorus	^A	...	0.001–0.005	...	...	...	0.005–0.012	...	...	...	...	...	0.004–0.012	0.015–0.040	0.015–0.040	0.015–0.040	...	0.001–0.010
Arsenic	^A	...	...	...	...	...	...	...	...	...	...	...	...	...	...	0.15–0.50	...	...
Oxygen, max	0.0005	0.0010	...	0.0010	0.0010	0.0010	...	0.0050	...	...	...	...	...	...	...	...	...	...
Silver	^A	...	...	8 ^I	10 ^I	25 ^I	...	...	...	8 ^I	10 ^I	25 ^I	...	...	4 ^I	...	...	...
Selenium + tellurium, max	^A	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	0.05	0.023
Tellurium	^A	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	0.005–0.05	0.003–0.023
Tin	^A	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	0.04–0.15	0.003–0.023

^AImpurity maximums in ppm of C10100 shall be: antimony 4, arsenic 5, bismuth 1.0, cadmium 1, iron 10, lead 5, manganese 0.5, nickel 10, oxygen 5, phosphorus 3, selenium 3, silver 25, sulfur 15, tellurium 2, tin 2, and zinc 1.

^BC10400, C10500, and C10700 are oxygen-free coppers with the addition of a specified amount of silver. The compositions of these alloys are equivalent to C10200 plus the intentional addition of silver.

^CC11300, C11400, C11500, and C11600 are electrolytic tough-pitch copper with silver additions. The compositions of these alloys are equivalent to C11000 plus the intentional addition of silver.

^DCopper UNS No. C12300 is produced by the addition of silver to phosphorus-deoxidized copper.

^EIncludes Te + Sn.

^FIncludes Cu + Ag + Sn + Te + Se.

^GCopper shall be determined by difference between impurity total and 100 %.

^HCopper + silver + phosphorus, min.

^IValues are minimum silver Troy oz/Avoirdupois ton (1 oz/ton is equivalent to 0.0034 %).



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