



Standard Specification for Copper and Copper-Alloy Seamless Condenser and Heat Exchanger Tubes With Integral Fins¹

This standard is issued under the fixed designation B 359/B 359M; 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 seamless copper and copper alloy tubing on which the external or internal surface, or both, has been modified by a cold-forming process to produce an integral enhanced surface for improved heat transfer.

1.2 *Units*—The values stated in either in-pound units or SI units are to be regarded separately as the standard. Within the text, the SI units are shown in brackets. The values stated in each system are not exact equivalents; therefore, each system shall be used independently of the other. Combining values from the two systems could result in nonconformance with the specification.

1.3 The tubes are typically used in surface condensers, evaporators, and heat exchangers.

1.4 The product shall be produced of the following coppers or copper alloys, as specified in the ordering information.

Copper or Copper Alloy UNS No.	Type of Metal
C10100	Oxygen-free electronic
C10200	Oxygen-free without residual deoxidants
C10300	Oxygen-free, extra low phosphorus
C10800	Oxygen-free, low phosphorus
C12000	DLP Phosphorized, low residual phosphorus (See Note 1)
C12200	DHP, Phosphorized, high residual phosphorus (See Note 1)
C14200	DPA Phosphorized arsenical (See Note 1)
C19200	Phosphorized, 1 % iron
C23000	Red Brass
C44300	Admiralty Metal Types B, C, and
C44400	D
C44550	D
C60800	Aluminum Bronze
C68700	Aluminum Brass Type B
C70400	95-5 Copper-Nickel
C70600	90-10 Copper-Nickel

C70620	90-10 Copper-Nickel (Modified for Welding)
C71000	80-20 Copper-Nickel Type A
C71500	70-30 Copper-Nickel
C71520	70-30 Copper-Nickel (Modified for Welding)
C72200	Copper-Nickel

NOTE 1—Designations listed in Classification B 224.

1.5 The following safety hazard caveat pertains only to the test methods described in 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.*

1.6 Product produced in accordance with the Supplementary Requirements section for military applications shall be produced only to the inch-pound system of this specification.

2. Referenced Documents

2.1 ASTM Standards:

- B 153 Test Method for Expansion (Pin Test) of Copper and Copper-Alloy Pipe and Tubing³
- B 154 Test Method for Mercurous Nitrate Test for Copper and Copper Alloys³
- B 170 Specification for Oxygen-Free Electrolytic Copper—Refinery Shapes³
- B 224 Classification of Coppers³
- B 601 Classification for Temper Designations for Copper and Copper Alloys—Wrought and Cast³
- B 846 Terminology for Copper and Copper Alloys³
- B 858 Test Method for Determination of Susceptibility to Stress Corrosion Cracking in Copper Alloys Using the Ammonia Vapor Test³
- B 900 Practice for Packaging of Copper and Copper-Alloy Mill-Products for U. S. Government Agencies³
- E 3 Test Methods of Preparation of Metallographic Specimens⁴
- E 8 Test Methods for Tension Testing of Metallic Materials⁴
- E 8M Test Methods for Tension Testing of Metallic Materials (Metric)⁴

¹ This specification is under the jurisdiction of ASTM Committee B05 on Copper and Copper Alloys and is the direct responsibility of Subcommittee B05.04 on Pipe and Tube.

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² For ASME Boiler and Pressure Vessel Code applications see related Specification SB-359 in Section II of that Code.

³ *Annual Book of ASTM Standards*, Vol 02.01.

⁴ *Annual Book of ASTM Standards*, Vol 03.01.

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