



Designation: B306 – 26

Standard Specification for Copper Drainage Tube (DWV)¹

This standard is issued under the fixed designation B306; 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 seamless copper tube (DWV) produced from copper UNS No. C12200 and intended for sanitary drainage, waste, and vent piping.

NOTE 1—Fittings used for soldered or brazed connections in drainage, waste, or vent systems are described in ASME Standards B16.23 and B16.29 and CSA Standard B158.1.

NOTE 2—The assembly of copper drainage, waste, and vent systems by soldering is described in Practice B828.

NOTE 3—Solders for joining copper drainage, waste, or vent systems are described in Specification B32. The requirement for acceptable fluxes for these systems are described in Specification B813.

1.2 *Units*—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.

1.3 The following hazard statement pertains only to the test method(s) 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, health, and environmental practices and determine the applicability of regulatory limitations prior to use.*

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 *ASTM Standards*:²

B32 Specification for Solder Metal

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

B813 Specification for Water Flushable Liquid and Paste Fluxes for Soldering of Copper and Copper Alloy Tube
B828 Practice for Making Capillary Joints by Soldering of Copper and Copper Alloy Tube and Fittings
B846 Terminology for Copper and Copper Alloys
B900 Practice for Packaging of Copper and Copper Alloy Mill Products for U.S. Government Agencies
E8/E8M Test Methods for Tension Testing of Metallic Materials
E18 Test Methods for Rockwell Hardness of Metallic Materials
E29 Practice for Using Significant Digits in Test Data to Determine Conformance with Specifications
E53 Test Method for Determination of Copper in Unalloyed Copper by Gravimetry (Withdrawn 2022)³
E62 Test Methods for Chemical Analysis of Copper and Copper Alloys (Photometric Methods) (Withdrawn 2010)³
E243 Practice for Electromagnetic (Eddy Current) Examination of Copper and Copper-Alloy Tubes
E255 Practice for Sampling Copper and Copper Alloys for the Determination of Chemical Composition

2.2 *ASME Standards*:⁴

ASME Boiler and Pressure Vessel Code
B16.23 Cast Copper Alloy Solder Joint Drainage Fittings: DWV
B16.29 Wrought Copper and Copper Alloy Solder Joint Drainage Fittings—DWV

2.3 *CSA Standard*:⁵

B158.1 Cast Brass Solder Joints Drainage, Waste, and Vent Fittings

3. Terminology

3.1 For definitions of terms related to copper and copper alloys, refer to Terminology B846.

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

⁴ Available from American Society of Mechanical Engineers (ASME), ASME International Headquarters, Two Park Ave., New York, NY 10016-5990, <http://www.asme.org>.

⁵ Available from Canadian Standards Association (CSA), 178 Rexdale Blvd., Toronto, ON M9W 1R3, Canada, <http://www.csagroup.org>.

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

TABLE 1 Standard Dimensions, Weights, and Tolerances for Diameter and Wall Thickness

NOTE 1—All tolerances in this table are plus and minus except where otherwise noted.

Nominal or Standard Drainage Tube Size, in.	Outside Diameter, in. (mm)	Tolerance in Average Outside Diameter, ^A in. (mm)	Wall Thickness, in. (mm)		Theoretical Weight, lb/ft (kg/m)
			Actual	Tolerance	
1¼	1.375 (34.9)	0.0015 (0.038)	0.040 (1.02)	0.003 (0.076)	0.650 (0.967)
1½	1.625 (41.3)	0.002 (0.051)	0.042 (1.07)	0.003 (0.076)	0.809 (1.20)
2	2.125 (54.0)	0.002 (0.051)	0.042 (1.07)	0.004 (0.10)	1.07 (1.59)
3	3.125 (79.4)	0.002 (0.051)	0.045 (1.14)	0.004 (0.10)	1.69 (2.51)
4	4.125 (105)	0.002 (0.051)	0.058 (1.47)	0.007 (0.18)	2.87 (4.27)
5	5.125 (130)	0.002 (0.051)	0.072 (1.83)	0.008 (0.20)	4.43 (6.59)
6	6.125 (156)	0.002 (0.051)	0.083 (2.11)	0.008 (0.20)	6.10 (9.08)
8	8.125 (206)	+0.002 (0.051) –0.004 (0.10)	0.109 (2.77)	0.011 (0.28)	10.6 (15.8)

^A The average outside diameter is the average, at any one cross section, of the maximum and minimum measured diameters (usually at or very close to 90° to each other).

4. Ordering Information

4.1 Include the following specified choices when placing orders for product under this specification, as applicable:

- 4.1.1 ASTM designation and year of issue (for example, B306 – 02);
- 4.1.2 Copper UNS No.;
- 4.1.3 Temper;
- 4.1.4 Dimensions (Section 11 and Table 1);
- 4.1.5 Quantity—total weight or total length or number of pieces of each size; and
- 4.1.6 Intended application.

4.2 The following options are available but may not be included unless specified at the time of placing of the order, when required:

- 4.2.1 Heat identification or traceability,
- 4.2.2 Tensile test (8.1),
- 4.2.3 Pneumatic test (9.3),
- 4.2.4 Certification (Section 20),
- 4.2.5 Test report (Section 21),
- 4.2.6 When product is purchased for agencies of the U.S. Government, and
- 4.2.7 Rockwell hardness.
- 4.2.8 If product is ordered for ASME Boiler and Pressure Vessel Code application (see Certification Section 20).

5. Material and Manufacture

5.1 Materials:

5.1.1 The material of manufacture shall be a form (billets, bars, or tube) of the copper UNS No. C12200 of such purity and soundness as to be suitable for processing into the products prescribed herein.

5.2 Manufacture:

5.2.1 The product shall be manufactured by such hot working or cold working processes as to produce a uniform wrought structure in the finished product.

5.2.2 The product shall be hot or cold worked to the finished size, and subsequently annealed, when required, to meet the temper properties specified.

NOTE 4—Tubes are normally joined with soldered fittings.

6. Chemical Composition

6.1 The material shall conform to the following requirements listed in Table 2 for UNS No. C12200 specified in the ordering information.

6.1.1 Results of the analysis on a product sample shall conform to the composition requirements within the permitted analytical variance specified in Table 2.

6.1.2 These composition limits do not preclude the presence of other elements. By agreement between the manufacturer and purchaser, limits may be established and analysis required for unnamed elements.

7. Temper

7.1 Tube shall be furnished in the H58 temper.

8. Mechanical Property Requirements

8.1 Tensile Strength Requirements:

8.1.1 Products furnished under this specification shall conform to the tensile requirements prescribed in Table 3, when tested in accordance with Test Methods E8/E8M.

8.1.2 Tensile tests need not be performed except when specified in the contract or purchase order.

8.1.3 Acceptance or rejection based upon mechanical properties shall depend on tensile strength.

8.2 Rockwell Hardness:

8.2.1 The Rockwell hardness values given in Table 3 are for general information and assistance in testing and shall not be used as a basis for product rejection.

8.2.2 By agreement between the manufacturer and the purchaser, and when specified in the contract or purchase order, the product shall conform to the Rockwell hardness requirement prescribed in Table 3, when tested in accordance with Test Methods E18.

9. Nondestructive Testing

9.1 The tubes furnished shall be capable of conforming with the test requirements of any one of the following tests.

TABLE 2 Chemical Composition – Wt %

Copper; incl silver, % (min)	99.9
Phosphorous, %	0.015–0.040