

Standard Specification for Copper-Brazed Steel Tubing¹

This standard is issued under the fixed designation A 254; 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 specification covers double-wall, copper-brazed steel tubing suitable for general engineering uses, particularly in the automotive, refrigeration, and stove industries for fuel lines, brake lines, oil lines, heating and cooling units, and the like.

1.2 The values stated in inch-pound units are to be regarded as the standard.

2. Referenced Documents

2.1 ASTM Standards:

A 370 Test Methods and Definitions for Mechanical Testing of Steel Products²

E 30 Test Methods for Chemical Analysis of Steel, Cast Iron, Open-Hearth Iron, and Wrought Iron³

E 59 Practice for Sampling Steel and Iron for Determination of Chemical Composition⁴

2.2 Society of Automotive Engineers Standard:

J 533 Flares for Tubing⁵

3. Ordering Information

3.1 Orders for material under this specification should include the following, as required to describe the desired material adequately:

- 3.1.1 Quantity (feet, metres),
- 3.1.2 Name of material (copper-brazed steel tubing),
- 3.1.3 Type, where necessary (see Fig. 1) (normally the type is not specified),
- 3.1.4 Size (outside diameter and wall thickness; normally inside diameter should not be specified),
- 3.1.5 Length (specific or random),
- 3.1.6 Inside surface cleanliness where required (see Section 8),

¹ This specification is under the jurisdiction of ASTM Committee A01 on Steel, Stainless Steel, and Related Alloys and is the direct responsibility of Subcommittee A01.09 on Carbon Steel Tubular Products.

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² Annual Book of ASTM Standards, Vol 01.03.

³ Discontinued 1995; see 1994 Annual Book of ASTM Standards, Vol 03.05.

⁴ Discontinued 1996; see 1995 Annual Book of ASTM Standards, Vol 03.05. Replaced by E 1806 (Vol 03.06).

⁵ Available from Society of Automotive Engineers, Inc. 400 Commonwealth Dr., Warrendale, PA 15096-0001.



Single-Strip Type



Double-Strip Type

Single-Strip Type

Double-Strip Type

FIG. 1 Brazed Tubing, Double-Wall, 360-deg Brazed Construction

3.1.7 External coating, where required (see Section 7 and Supplementary Requirement S2), and

3.1.8 Special or supplementary requirements or exceptions to specification.

4. Manufacture

4.1 The steel may be made by any process.

4.2 If a specific type of melting is required by the purchaser, it shall be as stated on the purchase order.

4.3 The primary melting may incorporate separate degassing or refining and may be followed by secondary melting, such as electroslag remelting or vacuum-arc remelting. If secondary melting is employed, the heat shall be defined as all of the ingots remelted from a single primary heat.

4.4 Steel may be cast in ingots or may be strand cast. When steel of different grades is sequentially strand cast, identification of the resultant transition material is required. The producer shall remove the transition material by an established procedure that positively separates the grades.

4.5 The tubing shall be made by rolling steel strip into the form of tubing and subsequently copper brazing in a reducing atmosphere.

4.6 Tubing shall be constructed as shown in Fig. 1.

4.7 Tubing shall be suitably tested after brazing by the manufacturer to ensure freedom from leaks and detrimental flaws.

5. Chemical Composition

5.1 The steel shall conform to the requirements as to chemical composition prescribed in Table 1.

5.2 *Heat Analysis*—An analysis of each heat of steel shall be made by the steel manufacturer to determine the percentages of the elements specified. If secondary melting processes are employed, the heat analysis shall be obtained from one remelted ingot or the product of one remelted ingot of each primary melt. The chemical composition thus determined, or