



Standard Specification for Seamless Cold-Drawn Carbon Steel Tubing for Hydraulic System Service¹

This standard is issued under the fixed designation A 822; 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.

1. Scope

1.1 This specification covers nominal wall thickness, seamless, cold-drawn carbon steel tubing intended for use in hydraulic systems and in other similar applications where forming operations require tight radius bending and flaring.

1.2 Tubing sizes and thicknesses usually furnished to this specification are $\frac{1}{8}$ to $3\frac{1}{2}$ in. (3.2 to 88.9 mm) in outside diameter and 0.035 to 0.134 in. (0.9 to 3.4 mm) inclusive, in nominal wall thickness. Tubing having other dimensions may be furnished, provided such tubing complies with all other requirements of this specification.

1.3 Mechanical property requirements do not apply to tubing smaller than $\frac{1}{8}$ in. (3.2 mm) in inside diameter or 0.015 in. (0.4 mm) in thickness.

1.4 Optional supplementary requirements are provided and, when desired, shall be so stated in the order.

1.5 Values stated in inch-pound units are to be regarded as the standard.

2. Referenced Documents

2.1 ASTM Standards:

- A 450/A 450M Specification for General Requirements for Carbon, Ferritic Alloy, and Austenitic Alloy Steel Tubes²
- A 751 Test Methods, Practices, and Terminology for Chemical Analysis of Steel Products³

3. Description of a Term Specific to This Standard

3.1 *lot—for tension and hardness test requirements*, the term “lot” applies to all tubes, prior to cutting, of the same nominal diameter and wall thickness which are produced from the same heat of steel. When final heat treatment is in a batch-type furnace, a lot shall include only those tubes of the same size and the same heat which are heat treated in the same furnace charge. When the final heat treatment is in a continuous

furnace, a lot shall include all tubes of the same size and heat, heat treated in the same furnace at the same temperature, time at heat, and furnace speed.

4. Ordering Information

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

- 4.1.1 Quantity (feet, metres, or number of lengths),
- 4.1.2 Name of material (seamless tubing),
- 4.1.3 Manufacture (cold-drawn),
- 4.1.4 Tube size (outside diameter and nominal wall thickness),
- 4.1.5 Length (specific or random),
- 4.1.6 Test report required (see section on Certification of Specification A 450/A 450M),
- 4.1.7 Specification designation, and
- 4.1.8 End use of material.

5. General Requirements

5.1 Material furnished under this specification shall conform to the applicable requirements of the latest edition of Specification A 450, unless otherwise provided herein.

6. Manufacture

6.1 Tubes shall be made by the seamless process and shall be cold drawn to size.

7. Heat Treatment

7.1 Tubes shall be heated after the final cold working operation to a temperature of at least 1200°F (650°C).

8. Chemical Composition

8.1 Steel shall conform to the chemical composition requirements prescribed in Table 1.

9. Mechanical Properties

9.1 *Tensile Properties*—Material shall conform to the tensile properties prescribed in Table 2.

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 01.01.

³ *Annual Book of ASTM Standards*, Vol 01.03.