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Standard Specification for Seamless Carbon-Molybdenum Alloy-Steel Boiler and Superheater Tubes[1]

This standard is issued under the fixed designation A 209/A 209M; 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[2] covers several grades of minimum-wall-thickness, seamless, carbon-molybdenum alloy-steel, boiler and superheater tubes.

1.2 This specification covers tubes ½ to 5 in. [12.7 to 127 mm] inclusive, in outside diameter and 0.035 to 0.500 in. [0.9 to 12.7 mm], inclusive, in minimum wall thickness.

1.3 An optional supplementary requirement is provided and, when desired, shall be so stated in the order.

1.4 The values stated in either inch-pound units or SI units are to be regarded separately as standard. Within the text, the SI units are shown in brackets. The values stated in each system are not exact equivalents; therefore, each system must be used independently of the other. Combining values from the two systems may result in nonconformance with the specification. The inch-pound units shall apply unless the "M" designation of this specification is specified in the order.

2. Referenced Documents

2.1 *ASTM Standards:*

A 450/A450M Specification for General Requirements for Carbon, Ferritic Alloy, and Austenitic Alloy Steel Tubes[3]

A 941 Terminology Relating to Steel, Stainless Steel, Related Alloys, and Ferroallys[3]

3. Terminology

3.1 *Definitions*—For definitions of terms used in this specification, refer to Terminology A 941.

4. Ordering Information

4.1 Orders for material under this specification shall 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 tubes),

4.1.3 Grade (Table 1),

4.1.4 Manufacture (hot-finish or cold-finished),

4.1.5 Size (outside diameter and minimum wall thickness),

4.1.6 Length (specific or random),

4.1.7 Test reported required (see Certification Section of Specification A 450/A 450M),

4.1.8 Specification designation, and

4.1.9 Special requirements and any supplementary requirements selected.

5. General Requirements

5.1 Material furnished under this specification should conform to the applicable requirements of the current edition of Specification A 450/A 450M, unless otherwise provided herein.

6. Manufacture

6.1 *Steelmaking Practice*—The steel shall be killed.

6.2 The tubes shall be made by the seamless process and shall be either hot-finished or cold-finished, as specified.

7. Heat Treatment

7.1 Hot-finished tubes shall be heat treated at a temperature of 1200°F [650°C] or higher. Cold-finished tubes shall, after the final cold finishing, be heat treated at a temperature of 1200°F [650°C] or higher, or tubing may be furnished in the full-annealed, isothermal annealed, or normalized and tempered condition. If furnished in the normalized and tempered condition, the minimum tempering temperature shall be 1200°F [650°C].

8. Chemical Composition

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

9. Product Analysis

9.1 An analysis shall be made by the manufacturer of one billet or one tube from each heat. The chemical composition thus determined, shall conform to the requirements specified.

9.2 If the original test for product analysis fails, retests of two additional billets or tubes shall be made. Both retests for the elements in question shall meet the requirements of the specification; otherwise all remaining material in the heat or lot

[1] This specification is under the jurisdiction of ASTM Committee A-1 on Steel, Stainless Steel, and Related Alloys, and is the direct responsibility of Subcommittee A01.10 on Tubing.

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[2] For ASME Boiler and Pressure Vessel Code application see related Specification SA-209 in Section II of that Code.

[3] *Annual Book of ASTM Standards,* Vol 01.01.