



Designation: A 1020/A 1020M – 01

Standard Specification for Steel Tubes, Carbon and Carbon Manganese, Fusion Welded, for Boiler, Superheater, Heat Exchanger and Condenser Applications¹

This standard is issued under the fixed designation A 1020/A 1020M; 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 minimum wall thickness welded tubes made from carbon and carbon manganese steels listed in Table 1, with various grades intended for use in boiler, superheater, heat exchanger or condenser applications.

1.2 The tubing sizes and thicknesses usually furnished to this specification are $\frac{1}{4}$ in. [6.3 mm] to 5 in. [127 mm] in outside diameter and 0.015 to 0.375 in. [0.4 to 9.5 mm], inclusive, in wall thickness. Tubing having other dimensions may be furnished provided such tubes comply 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 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 the specification is specified in the order.

1.5 Optional supplementary requirements are provided and when desired, shall be so stated on the purchase order.

1.6 *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 requirements prior to use.*

2. Referenced Documents

2.1 ASTM Standards:

A 450/A 450M Specification for General Requirements for Carbon, Ferritic Alloy, and Austenitic Alloy Steel Tubes

E 213 Practice for Ultrasonic Examination of Metal Pipe and Tubing

E 273 Practice for Ultrasonic Examination of Longitudinal Welded Pipe and Tubing

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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TABLE 1 Chemical Requirements, Composition, %

Element	Grade A Low Carbon Steel	Grade C Medium Carbon Steel	Grade D Carbon Manganese Steel
Carbon	0.06–0.18	0.30 max	0.27 max
Manganese	0.27–0.63	0.80 max	1.00–1.50
Phosphorus	0.035 max	0.035 max	0.030 max
Sulfur	0.035 max	0.035 max	0.015 max
Silicon	No Requirement	No Requirement	0.10 min

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, meters, or number of lengths).

3.1.2 Name of material (welded tubes).

3.1.3 Grade (Table 1).

3.1.4 Size (outside diameter and minimum wall thickness).

3.1.5 Length (specific or random).

3.1.6 Optional requirements (product analysis, hydrostatic or nondestructive electric test, crush test and bar coding).

3.1.7 Test report required (see Certification Section of Specification A 450/A 450M).

3.1.8 Specification designation.

3.1.9 Optional supplementary requirements are provided and when desired, shall be designated on the order.

4. General Requirements

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

5. Materials and Manufacture

5.1 All steels shall be killed.

5.2 The tubes shall be made by an automatic fusion welding process with no addition of filler metal.

6. Heat Treatment

6.1 After welding, all tubes shall be heat treated at a temperature of 1650°F [900°C] or higher and followed by cooling in air or in the cooling chamber of a controlled atmosphere furnace. Cold drawn tubes shall be heat treated