



Designation: A 735/A 735M – 99

Standard Specification for Pressure Vessel Plates, Low-Carbon Manganese- Molybdenum-Columbium Alloy Steel, for Moderate and Lower Temperature Service¹

This standard is issued under the fixed designation A 735/A 735M; 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 reappraisal. A superscript epsilon (ϵ) indicates an editorial change since the last revision or reappraisal.

1. Scope

1.1 This specification covers low-carbon manganese-molybdenum-columbium alloy steel plates for piping components and welded pressure vessels.

1.2 Four different classes are covered, which provide various tensile strength properties. A Charpy V-notch energy absorption requirement of 20 ft-lbf [27J] at -50°F [-45°C] is specified for all grades.

1.2.1 *Classes 1 and 2* provide minimum yield strength levels of 65 ksi [450 MPa] and 70 ksi [485 MPa] respectively. Both classes can be provided in the as-rolled condition or in the quenched-and-tempered condition.

1.2.2 *Class 3* provides a minimum yield strength level of 75 ksi [515 MPa]. This grade can be provided in the as-rolled and precipitation heat-treated condition or in the quenched-and-tempered condition.

1.2.3 *Class 4* provides a yield strength level of 80 ksi [550 MPa] in the as-rolled and precipitation heat-treated condition.

1.3 Current practice limits plate thickness furnished under this specification. The individual manufacturer should be consulted on size and thickness limitations.

1.4 Welding procedures are of fundamental importance and must be such as not to adversely affect the properties of the material, especially in the heat-affected zone. It is presupposed that welding procedures will be suitable for the materials being welded.

1.5 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.

2. Referenced Documents

2.1 *ASTM Standards:*

A 20/A 20M Specification for General Requirements for Steel Plates for Pressure Vessels²

A 435/A 435M Specification for Straight-Beam Ultrasonic Examination of Steel Plates²

A 577/A 577M Specification for Ultrasonic Angle-Beam Examination of Steel Plates²

A 578/A 578M Specification for Straight-Beam Ultrasonic Examination of Plain and Clad Steel Plates for Special Applications²

3. General Requirements and Ordering Information

3.1 Material supplied to this material specification shall conform to the requirements of Specification A 20/A 20M. These requirements outline the testing and retesting methods and procedures, permissible variations in dimensions and weight, quality, repair of defects, marking, loading, etc.

3.2 Specification A 20/A 20M also establishes the rules for compliance to the basis of purchase when purchasing material to this specification.

3.3 Certain supplementary requirements considered suitable for use with this specification are listed at the end of the specification. These include some of the standardized supplementary requirements listed in Specification A 20/A 20M as well as additional ones unique to this specification.

4. Manufacture

4.1 *Steelmaking Practice*—The steel shall be killed and shall conform to the fine austenitic grain size requirement of Specification A 20/A 20M.

5. Heat Treatment

5.1 As-rolled Class 3 and 4 products shall be precipitation heat treated in the temperature range from 1000 to 1200°F [540 to 650°C] for a time to be determined by the manufacturer. Precipitation heat treatment is a subcritical temperature thermal

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 A01.11 on Steel Plates for Boilers and Pressure Vessels.

Current edition approved June 10, 1990. Published September 1999. Originally published as A 735 – 76. Last previous edition A 735/A 735M – 90 (1996).

² *Annual Book of ASTM Standards*, Vol 01.04.