Designation: A 1041/A 1041M – 04

Standard Specification for Pressure Vessel Plates, Alloy Steel, Higher Strength Chromium-Molybdenum-Tungsten[1]

This standard is issued under the fixed designation A 1041/A 1041M; 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 chromium-tungsten-molybdenum-vanadium, with or without tantalum, alloy steel plates intended primarily for welded boilers and pressure vessels designed for elevated temperature service.

1.2 Plates are available under this specification in two grades having different alloy contents as follows:

Grade	Nominal Chromium Content, %	Nominal Tungsten Content, %	Nominal Molybdenum Content, %	Nominal Vanadium Content, %	Nominal Tantalum Content, %
315	3.00	1.50	0.75	0.25	
315T	3.00	1.50	0.75	0.25	0.10

1.3 The maximum thickness of plates is limited only by the capacity of the composition to meet the specified mechanical property requirements.

1.4 The specification is expressed in both inch-pound units and in SI units; however, unless the order specifies the applicable "M" specification designation (SI units), the plates are furnished to inch-pound units.

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 is to be used independently of the other.

2. Referenced Documents

2.1 *ASTM Standards:* [2]

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

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

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

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

3. General Requirements

3.1 Product furnished to this specification shall conform to Specification A 20/A 20M, including any supplementary requirements indicated in the purchase order or contract. Failure to comply with the general requirements of Specification A 20/A 20M constitutes nonconformance with this specification. In case of conflict between the requirements of this specification and Specification A 20/A 20M, the requirements of this specification shall prevail.

3.2 In addition to the basic requirements of this specification, certain supplementary requirements are available if additional control, testing, or examination is required to meet end use requirements. The purchaser is referred to the listed supplementary requirements in this specification and to the detailed requirements in Specification A 20/A 20M.

4. Materials and Manufacture

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

5. Heat Treatment

5.1 Except as allowed by 5.2, all plates shall be normalized at 1950 to 2050°F [1065 to 1120°C] and then tempered at 1290 to 1400°F [700 to 760°C].

5.2 Plates ordered without the heat treatment required by 5.1 shall be furnished in either the stress-relieved or annealed condition, and the purchaser shall be responsible for the heat treatment of such plates to conform to 5.1.

6. Chemical Composition

6.1 The steel shall conform to the requirements for chemical composition given in Table 1.

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

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[2] For referenced ASTM standards, visit the ASTM website, www.astm.org, or contact ASTM Customer Service at service@astm.org. For *Annual Book of ASTM Standards* volume information, refer to the standard's Document Summary page on the ASTM website.