



Designation: **A285/A285M – 12** **A285/A285M – 17**

## Standard Specification for Pressure Vessel Plates, Carbon Steel, Low- and Intermediate-Tensile Strength<sup>1</sup>

This standard is issued under the fixed designation A285/A285M; 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 ( $\epsilon$ ) indicates an editorial change since the last revision or reapproval.

*This standard has been approved for use by agencies of the U.S. Department of Defense.*

### 1. Scope\*

1.1 This specification<sup>2</sup> covers carbon steel plates of low- and intermediate-tensile strengths which may be ~~made by killed, semi-killed, capped, or rimmed steel practices at the producer's~~ skilled or semi-killed at the producer's option. These plates are intended for fusion-welded pressure vessels.

1.2 Plates under this specification are available in three grades having different strength levels as follows:

Grade	Tensile Strength, ksi [MPa]
A	45–65 [310–450]
B	50–70 [345–485]
C	55–75 [380–515]

1.3 ~~The maximum thickness of plates under this specification, for reasons of internal soundness, is limited to a maximum thickness of 2 in. [50 mm] for all grades. is limited by the capacity of the composition to meet the specified mechanical property requirements.~~

NOTE 1—For killed carbon steels only, refer to the following ASTM specifications:<sup>3</sup>

~~A 299/A 299M Pressure Vessel Plates, Carbon Steel, Manganese-Silicon.~~

~~A299/A299M Specification for Pressure Vessel Plates, Carbon Steel, Manganese-Silicon~~

~~A515/A515M Specification for Pressure Vessel Plates, Carbon Steel, for Intermediate- and Higher-Temperature Service~~

~~A516/A516M Specification for Pressure Vessel Plates, Carbon Steel, for Moderate- and Lower-Temperature Service~~

~~A 515/A 515M Pressure Vessel Plates, Carbon Steel, for Intermediate- and Higher-Temperature Service~~

~~A 516/A 516M Pressure Vessel Plates, Carbon Steel, for Moderate- and Lower-Temperature Service.~~

1.4 For plates produced from coil and furnished without heat treatment or with stress relieving only, the additional requirements, including additional testing requirements and the reporting of additional test results, of Specification **A20/A20M** apply.

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.

1.6 *This international standard was developed in accordance with internationally recognized principles on standardization established in the Decision on Principles for the Development of International Standards, Guides and Recommendations issued by the World Trade Organization Technical Barriers to Trade (TBT) Committee.*

### 2. Referenced Documents

2.1 *ASTM Standards:*<sup>3</sup>

[A20/A20M Specification for General Requirements for Steel Plates for Pressure Vessels](#)

[A299/A299M Specification for Pressure Vessel Plates, Carbon Steel, Manganese-Silicon](#)

<sup>1</sup> 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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<sup>2</sup> For ASME Boiler and Pressure Vessel Code applications, see related Specification SA-285/SA-285M in Section II of that Code.

<sup>3</sup> For referenced ASTM standards, visit the ASTM website, [www.astm.org](http://www.astm.org), or contact ASTM Customer Service at [service@astm.org](mailto:service@astm.org). For *Annual Book of ASTM Standards* volume information, refer to the standard's Document Summary page on the ASTM website.

\*A Summary of Changes section appears at the end of this standard



- [A435/A435M Specification for Straight-Beam Ultrasonic Examination of Steel Plates](#)
- [A515/A515M Specification for Pressure Vessel Plates, Carbon Steel, for Intermediate- and Higher-Temperature Service](#)
- [A516/A516M Specification for Pressure Vessel Plates, Carbon Steel, for Moderate- and Lower-Temperature Service](#)
- [A577/A577M Specification for Ultrasonic Angle-Beam Examination of Steel Plates](#)
- [A578/A578M Specification for Straight-Beam Ultrasonic Examination of Rolled Steel Plates for Special Applications](#)

**3. General Requirements and Ordering Information**

3.1 Material supplied to this material specification shall conform to Specification **A20/A20M**. These requirements outline the testing and retesting methods and procedures, permitted variations in dimensions, and mass, quality and repair of defects, marking, loading, and ordering information.

3.2 In addition to the basic requirements of this specification, certain supplementary requirements are available when 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 **A20/A20M**.

3.3 Coils are excluded from qualification to this specification until they are processed into finished plate. Plates produced from coil means plates that have been cut to individual lengths from coil. The processor directly controls, or is responsible for, the operations involved in the processing of coils into finished plates. Such operations include decoiling, leveling, cutting to length, testing, inspection, conditioning, heat treatment (if applicable), packaging, marking, loading for shipment, and certification.

NOTE 2—For plates produced from coil and furnished without heat treatment or with stress relieving only, three test results are reported for each qualifying coil. Additional requirements regarding plate produced from coil are described in Specification **A20/A20M**.

3.4 If the requirements of this specification are in conflict with the requirements of Specification **A20/A20M**, the requirements of this specification shall prevail.

**4. Heat Treatment**

4.1 Plates are normally supplied in the as-rolled condition. The plates may be ordered normalized or stress relieved, or both.

**5. Chemical Composition**

5.1 The steel shall conform to the requirements as to chemical composition as given in **Table 1**.

**6. Mechanical Properties**

6.1 *Tension Test*—The plates, as represented by the tension test specimens, shall conform to the requirements given in **Table 2**.

**7. Keywords**

7.1 carbon steel plate; low-and-intermediate strength steel plate for pressure vessels; steel plate for pressure vessels

**TABLE 1 Chemical Requirements**

Elements	Composition, %		
	Grade A	Grade B	Grade C
Carbon, max <sup>A</sup>	0.17	0.22	0.28
Manganese, max:			
Heat analysis	0.90	0.90	0.90
Product analysis	0.98	0.98	0.98
Phosphorus, max <sup>A</sup>	0.025	0.025	0.025
Sulfur, max <sup>A</sup>	0.025	0.025	0.025

<sup>A</sup> Applies to both heat and product analyses.