



## Standard Specification for Pressure Vessel Plates, Carbon Steel, Manganese-Silicon<sup>1</sup>

This standard is issued under the fixed designation A 299/A 299M; 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 ( $\epsilon$ ) indicates an editorial change since the last revision or reappraisal.

<sup>ε1</sup> NOTE—Editorial changes were made to this standard in August 1999.

### 1. Scope

1.1 This specification<sup>2</sup> covers manganese-silicon carbon steel plates for use in welded boilers and other pressure vessels.

1.2 Plates under this specification are produced in one grade only; however, the yield strength decreases on thicknesses over 1 in. [25 mm]:

Thickness	Tensile Strength, ksi [MPa]	Yield Strength, ksi [MPa]
Up to 1 in. [25 mm]	75–95 [515–655]	42 [290]
Over 1 in. [25 mm]	75–95 [515–655]	40 [275]

1.3 The maximum thickness of plates is limited only by the capacity of the composition to meet the specified mechanical property requirements; however, current practice normally limits the maximum thickness of plates furnished under this specification to 8 in. [200 mm].

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.

### 2. Referenced Documents

#### 2.1 ASTM Standards:

A 20/A 20M Specification for General Requirements for Steel Plates for Pressure Vessels<sup>3</sup>

### 3. General Requirements and Ordering Information

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

3.2 Specification A 20/A 20M also establishes the rules for

<sup>1</sup> 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 March 10, 1997. Published November 1997. Originally published as A299 – 47 T. Last previous edition A299/A 299M – 90 (1996).

<sup>2</sup> For ASME Boiler and Pressure Vessel Code applications, see related Specification SA-299/SA-299M in Section II of that Code.

<sup>3</sup> *Annual Book of ASTM Standards*, Vol 01.04.

the basis of purchase that should be complied with when purchasing material to this specification.

3.3 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. These include:

- 3.3.1 Vacuum treatment,
- 3.3.2 Additional or special tension testing,
- 3.3.3 Impact testing, and
- 3.3.4 Nondestructive examination.

3.4 The purchaser is referred to the listed supplementary requirements in this specification and to the detailed requirements in Specification A 20/A 20M.

3.5 If the requirements of this specification are in conflict with the requirements of Specification A 20/A 20M, the requirements of this specification shall prevail.

### 4. Materials and Manufacture

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

### 5. Heat Treatment

5.1 Plates 2 in. [50 mm] and under in thickness are normally supplied in the as-rolled condition. Plates may be ordered normalized or stress relieved, or both.

5.2 Plates over 2 in. [50 mm] in thickness shall be normalized.

### 6. Chemical Requirements

6.1 The steel shall conform to the requirements as to chemical composition as shown in Table 1 unless otherwise modified in accordance with Supplementary Requirement S17, Vacuum Carbon-Deoxidized Steel, in Specification A 20/A 20M.

### 7. Mechanical Properties

7.1 *Tension Test Requirements*—The material as represented by the tension-test specimens shall conform to the requirements shown in Table 2.

### 8. Keywords

8.1 carbon steel plate; pressure containing parts; pressure vessel steels; steel plates; steel plates for pressure vessel