



Designation: A 738/A738M – 00

## Standard Specification for Pressure Vessel Plates, Heat-Treated, Carbon-Manganese-Silicon Steel, for Moderate and Lower Temperature Service<sup>1</sup>

This standard is issued under the fixed designation A 738/A738M; the number immediately following the designation indicates the year of original adoption or, in the case of last 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<sup>2</sup> covers heat-treated carbon-manganese-silicon steel plates intended for use in welded pressure vessels at moderate and lower temperature service.

1.2 Material under this specification is available in three strength levels, 75 ksi [515 MPa], 85 ksi [585 MPa], and 80 ksi [550 MPa], minimum ultimate tensile strengths.

1.3 The maximum thickness of plates is limited only by the capacity of the chemical composition and heat treatment to meet the specified mechanical property requirements; however, current practice normally limits the maximum thickness of plates furnished under this specification to 6 in. [150 mm] for Grade A, 4 in. [100 mm] for Grade B, and 6 in. [150 mm] for Grade C.

1.4 Grade A is the material that, prior to 1984, was covered by Specification A 738 without a grade designation.

1.5 The values stated in either inch-pound units or SI units are to be regarded separately as standards. 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/A20M 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 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 mass, quality, repair of defects, marking, loading, etc.

<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.

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<sup>2</sup> For ASME Boiler and Pressure Vessel Code applications see related Specification SA-738/SA-738M in Section II of that Code.

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

TABLE 1 Chemical Requirements

Element	Composition, %		
	Grade A	Grade B	Grade C
Carbon, max <sup>A</sup>	0.24	0.20	0.20
Manganese:			
Heat analysis			
2.5 in. [65 mm] and under	1.50 max	0.90–1.50	1.50 max
Over 2.5 in. [65 mm] Product analysis	1.60 max	0.90–1.60	1.60 max
2.5 in. [65 mm] and under	1.62 max	0.84–1.62	1.62 max
Over 2.5 in. [65 mm] Product analysis	1.72 max	0.84–1.72	1.72 max
Phosphorus, max <sup>A</sup>	0.035	0.030	0.025
Sulfur, max <sup>A</sup>	0.035	0.030	0.025
Silicon:			
Heat analysis	0.15–0.50	0.15–0.55	0.15–0.50
Product analysis	0.13–0.55	0.13–0.60	0.13–0.55
Copper, max:			
Heat analysis	0.35	0.35	0.35
Product analysis	0.38	0.38	0.38
Nickel, max:			
Heat analysis	0.50	0.60	0.50
Product analysis	0.53	0.63	0.53
Chromium, max:			
Heat analysis	0.25	0.30	0.25
Product analysis	0.29	0.34	0.29
Molybdenum, max:			
Heat analysis			
1.5 in. [40 mm] and under	0.08	0.20	0.08
Over 1.5 in. [40 mm] Product analysis	0.08	0.30	0.08
1.5 in. [40 mm] and under	0.09	0.21	0.09
Over 1.5 in. [40 mm]	0.09	0.33	0.09
Vanadium, max:			
Heat analysis	0.07 <sup>B</sup>	0.07	0.05
Product analysis	0.08 <sup>B</sup>	0.08	0.05
Columbium, max:			
Heat analysis	0.04 <sup>B</sup>	0.04	C
Product analysis	0.05 <sup>B</sup>	0.05	C
Columbium plus Vanadium, max:			
Heat analysis	0.08 <sup>B</sup>	0.08	C
Product analysis	0.10 <sup>B</sup>	0.10	C

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

<sup>B</sup>Vanadium and columbium may be added only by agreement between the producer and the purchaser.

<sup>C</sup>For Grade C, columbium is an unspecified element.

3.2 Specification A 20/A 20M also establishes the rules for compliance to the ordering information when purchasing material to this specification.