



Designation: ~~A 662/A 662M-01^{ε1}~~ Designation: A 662/A 662M – 03 (Reapproved 2007)

Standard Specification for Pressure Vessel Plates, Carbon-Manganese-Silicon Steel, for Moderate and Lower Temperature Service¹

This standard is issued under the fixed designation A 662/A 662M; 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. ~~¹Note—Table X1.1 was included editorially in September 2002.~~

1. Scope

1.1 This specification² covers three grades of carbon-manganese-silicon steel plates intended primarily for service in welded pressure vessels where improved low temperature notch toughness is important.

1.2 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 2 in. [50 mm].

1.3 Grades A, B, and C comply substantially with the requirements of ISO Pressure Vessel Steels P9, P15, and P18, respectively.

~~1.4 For plates produced from coil, the additional requirements, including additional testing requirements and the reporting of additional test results, of Specification A20/A20M apply.~~

~~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 A 20/A 20M 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.

2. Referenced Documents

2.1 *ASTM Standards:*³

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~~ 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, permissible variations in dimensions, and mass, quality, and repair of defects, marking, loading, etc.~~

~~3.2 Specification A20/A20M also establishes the rules for the ordering information 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 the 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.~~

¹ This specification is under the jurisdiction of Committee A01 on Steel, Stainless Steel, Steel and Related Alloys and is the direct responsibility of Subcommittee A01.11 on Steel Plates for Boilers and Pressure Vessels.

Current edition approved September 10, 2001; Nov. 1, 2007. Published September 2001; March 2008. Originally published as A662-72; approved in 1972. Last previous edition A662/A662M-99; approved in 2003 as A 662/A 662M-03.

² For ASME Boiler and Pressure Vessel Code applications, see related Specification SA-662/SA-662M in Section II of that Code.

³ Annual Book of ASTM Standards, Vol 01.04.

³ 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.

~~3.4~~The purchaser is referred to the listed supplementary requirements in this specification and to the detailed requirements in Specification A20/A20M.

~~3.5~~Coiled product is excluded from qualification to this specification until it is decoiled, leveled, and cut to length. Plate produced from coil means plate that has been cut to individual lengths from a coiled product and is furnished without heat treatment. The processor decoils, levels, cuts to length, and marks the product. Except as allowed by Section 6 in Specification A20/A20M, the processor is responsible for performing and certifying all tests, examinations, repairs, inspections, and operations not intended to affect the properties of the material. For plate produced from coils, the results of the tests performed shall be reported for each qualifying coil. See Note 1. General Requirements and Ordering Information

3.1 Plates supplied to this product specification shall conform to Specification A 20/A 20M, which outlines 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 ordering information that should be complied with when purchasing plates to this specification.

3.3 In addition to the basic requirements of this specification certain supplementary requirements are available where additional control, testing, or examination is required to meet the end use requirements.

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 Coils are excluded from qualification to this specification until they are processed into finished plates. 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 1—Additional requirements regarding plate produced from coil are described in A20/A20M.

~~3.6~~If the requirements of this specification are in conflict with the requirements of Specification A20/A20M, the requirements of this specification shall prevail. 1—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 plates from coil are described in Specification A 20/A 20M.

3.6 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. 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/A20M.

5. Heat Treatment

5.1 All plates of Grade A and plates of Grades B and C over 1½ in. [40 mm] in thickness shall be normalized.

5.2 Plates of Grades B and C, 1½ in. [40 mm] and under in thickness, are normally supplied in the as-rolled condition. The plates may be ordered normalized or stress relieved, or both.

6. Chemical Requirements

~~6.1~~ The steel shall conform to the requirements as to chemical composition ~~prescribed~~given in Table 1 unless otherwise modified in accordance with Supplementary Requirement S17, Vacuum Carbon-Deoxidized Steel, in Specification A 20/A 20M/A20M.

7. Mechanical Requirements

~~7.1~~ *Tension Test Requirements*—The ~~material~~plates, as represented by the tension test specimens, shall conform to the requirements ~~prescribed~~given in Table 2.

TABLE 1 Chemical Requirements

Element	Composition, %					
	Grade A		Grade B		Grade C	
	Heat Analysis	Product Analysis	Heat Analysis	Product Analysis	Heat Analysis	Product Analysis
Carbon, max	0.14	0.17	0.19	0.22	0.20	0.24
Manganese	0.90–1.35	0.84–1.46	0.85–1.50	0.79–1.62	1.00–1.60	0.92–1.72
Phosphorus, max	0.035	0.035	0.035	0.035	0.035	0.035
Sulfur, max	0.035	0.035	0.035	0.035	0.035	0.035
Silicon	0.15–0.40	0.13–0.45	0.15–0.40	0.13–0.45	0.15–0.50	0.13–0.55