



Designation: A678/A678M – 05 (Reapproved 2009)

Standard Specification for Quenched-and-Tempered Carbon and High-Strength Low- Alloy Structural Steel Plates¹

This standard is issued under the fixed designation A678/A678M; 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 quenched-and-tempered carbon steel and high-strength low-alloy steel plates of structural quality for welded, riveted, or bolted construction.

1.2 If the steel is to be welded, it is presupposed that a welding procedure suitable for the grade of steel and intended use or service will be used.

1.3 Plates under this specification are available in four grades as follows:

Grade	Yield Strength, min, ksi [MPa]	Tensile Strength, ksi [MPa]	Maximum Thickness, in. [mm]
A	50 [345]	70–90 [485–620]	1½ [40]
B	60 [415]	80–100 [550–690]	2½ [65]
C	^A	^A	2 [50]
D	75 [515]	90–110 [620–760]	3 [75]

^A Varies with thickness. See Table 1.

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 is to be used independently of the other.

2. Referenced Documents

2.1 ASTM Standards:²

A6/A6M Specification for General Requirements for Rolled Structural Steel Bars, Plates, Shapes, and Sheet Piling
A370 Test Methods and Definitions for Mechanical Testing of Steel Products

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 A01.02 on Structural Steel for Bridges, Buildings, Rolling Stock and Ships.

Current edition approved Oct. 1, 2009. Published December 2009. Originally approved in 1973. Last previous edition approved in 2005 as A678/A678M – 05. DOI: 10.1520/A0678_A0678M-05R09.

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.

3. General Requirements for Delivery

3.1 Plates furnished under this specification shall conform to the applicable requirements of the current edition of Specification **A6/A6M** unless a conflict exists, in which case this specification shall prevail.

4. Materials and Manufacture

4.1 The requirements for fine austenitic grain size in Specification **A6/A6M** shall be met.

5. Heat Treatment

5.1 The plates shall be heat treated by heating to a temperature that produces an austenitic structure, but not exceeding 1700°F [925°C], holding a sufficient time to attain uniform heat throughout the material, quenching in a suitable medium, and tempering at not less than 1100°F [593°C]. The heat-treatment temperatures shall be reported in the test report.

6. Chemical Composition

6.1 The heat analysis shall conform to the requirements given in Table 2 for the applicable grade.

6.2 The product analysis shall conform to the requirements given in Table 2, subject to the product analysis tolerances in Specification **A6/A6M**.

7. Tension Test

7.1 The plates as represented by the test specimens shall conform to the requirements given in Table 1 specified for the applicable grade.

7.2 *Number of Tests*—One tension test shall be taken from a corner of each plate as heat treated.

8. Keywords

8.1 bolted construction; carbon; high-strength; low-alloy; plates; quenched; steel; structural steel; tempered; welded construction