



Designation: A514/A514M – 05 (Reapproved 2009)

Standard Specification for High-Yield-Strength, Quenched and Tempered Alloy Steel Plate, Suitable for Welding¹

This standard is issued under the fixed designation A514/A514M; 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.

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

1. Scope

1.1 This specification covers quenched and tempered alloy steel plates of structural quality in thicknesses of 6 in. [150 mm] and under intended primarily for use in welded bridges and other structures.

NOTE 1—All grades are not available in a maximum thickness of 6 in. [150 mm]. See [Table 1](#) for thicknesses available in each grade.

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 utilized. See Appendix X 3 of Specification [A6/A6M](#) for information on weldability.

1.3 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, without combining values in any way.

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](#)

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.

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.

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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.

4. Materials and Manufacture

4.1 The steel shall be killed and conform to the requirements for fine austenitic grain size in Specification [A6/A6M](#).

5. Heat Treatment

5.1 Except as allowed by [5.2](#), plates shall be heat treated to conform to the tensile and hardness requirements given in [Table 2](#) by heating to not less than 1650°F [900°C], quenching in water or oil, and tempering at not less than 1150°F [620°C]. The heat-treatment temperatures shall be reported in the test report.

5.2 Plates ordered without the heat treatment specified in [5.1](#) shall be stress relieved by the manufacturer, and subsequent heat treatment of the plates to conform to [5.1](#) shall be the responsibility of the purchaser.

6. Chemical Composition

6.1 The heat analysis shall conform to the requirements given in [Table 1](#).

6.2 The product analysis shall conform to the requirements given in [Table 1](#), subject to the product analysis tolerances in Specification [A6/A6M](#).

7. Mechanical Properties

7.1 *Tension Test*—The plates as represented by the tension test specimens shall conform to the tensile requirements given in [Table 2](#).

7.2 *Hardness Test*—For plates $\frac{3}{8}$ in. [10 mm] and under in thickness, a Brinell hardness test may be used instead of tension testing each plate, in which case a tension test shall be made from a corner of each of two plates per lot. A lot shall consist of plates from the same heat, thickness, prior condition, and scheduled heat treatment and shall not exceed 15 tons [15 Mg] in weight [mass]. A Brinell hardness test shall be made on each plate not tension tested and the results shall conform to the hardness requirements given in [Table 2](#).

8. Number of Tests

8.1 Except as allowed by [7.2](#), one tension test shall be taken from a corner of each plate as heat treated.