



Designation: A1043/A1043M – 05 (Reapproved2009)

Standard Specification for Structural Steel with Low Yield to Tensile Ratio for Use in Buildings¹

This standard is issued under the fixed designation A1043/A1043M; 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 two grades, 36 [250] and 50 [345] of rolled steel structural shapes and plates with low yield to tensile ratio for use in building framing or for general structural purposes.

1.2 All shape profiles with a flange width of 6 in. [150 mm] and greater described in Specification A6/A6M Annex A2 and plates up to and including 5 in. [125 mm] thick are included in this specification.

1.3 Supplementary requirements are provided for use where additional testing or additional restrictions are required by the purchaser. Such requirements apply only when specified in the purchase order.

1.4 When the steel is to be welded, a welding procedure suitable for the grade of steel and intended use or service is to be utilized. See Appendix X3 of Specification A6/A6M for information on weldability.

1.5 The text of this specification contains notes or footnotes, or both, that provide explanatory material; such notes and footnotes, excluding those in tables and figures, do not contain any mandatory requirements.

1.6 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

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 2005. Last previous edition approved in 2005 as A1043/A1043M – 05. DOI: 10.1520/A1043_A1043M-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.

Structural Steel Bars, Plates, Shapes, and Sheet Piling
A370 Test Methods and Definitions for Mechanical Testing of Steel Products
A673/A673M Specification for Sampling Procedure for Impact Testing of Structural Steel
A770/A770M Specification for Through-Thickness Tension Testing of Steel Plates for Special Applications

3. General Requirements for Delivery

3.1 Product furnished under this specification shall conform to the requirements of the current edition of Specification A6/A6M for the ordered product, unless a conflict exists, in which case this specification shall prevail.

4. Materials and Manufacture

4.1 The steel shall be killed, and such shall be affirmed in the test report by a statement of *killed steel*, a value of 0.10 % or more for the silicon content, a value of 0.015 % or more for the total aluminum content, or a value of 0.006 % or more for the titanium content.

5. Chemical Composition

5.1 The heat analysis shall conform to the requirements given in Table 1.

5.2 The steel shall conform on product analysis to the requirements given in Table 1, subject to the product analysis tolerances in Specification A6/A6M.

5.3 The maximum permissible carbon equivalent values shall be:

Grade	Thickness of Plate and Shape Flange	CE Value max %
36 [250]	All	0.37
50 [345]	≤ 2 in. [50 mm]	0.45
50 [345]	> 2 in. [50 mm]	0.47

5.3.1 The carbon equivalent value shall be based upon heat analysis. The required chemical analysis as well as the carbon equivalent shall be reported. The carbon equivalent shall be calculated using the following formula:

$$CE = C + (Mn)/6 + (Cr + Mo + V)/5 + (Ni + Cu)/15 \quad (1)$$