



## Standard Specification for Structural Steel Shapes<sup>1</sup>

This standard is issued under the fixed designation A 992/A 992M; 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 rolled steel structural shapes for use in building framing or bridges, or for general structural purposes.

1.2 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.

1.3 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 A 6/A 6M for information on weldability.

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 without combining values in any way.

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.

### 2. Referenced Documents

#### 2.1 ASTM Standards:

A 6/A 6M Specification for General Requirements for Rolled Structural Steel Bars, Plates, Shapes, and Sheet Piling<sup>2</sup>

A 370 Test Methods and Definitions for Mechanical Testing of Steel Products<sup>2</sup>

A 673/A 673M Specification for Sampling Procedure for Impact Testing of Structural Steel<sup>2</sup>

E 112 Test Methods for Determining Average Grain Size<sup>3</sup>

### 3. General Requirements For Delivery

3.1 Material furnished under this specification shall conform to the requirements of the current edition of Specification A 6/A 6M for the ordered material, unless a conflict exists, in which case this specification shall prevail.

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### 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, or a value of 0.015 % or more for the total aluminum content.

4.2 The steel shall be made to a practice producing nitrogen not greater than 0.012 %; or the steel shall be made to a practice producing nitrogen not greater than 0.015 % and one or more nitrogen-binding elements shall be added.

### 5. Chemical Composition

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

5.2 In addition to the elements listed in Table 1, test reports shall include, for information, the chemical analysis for tin. Where the amount of tin is less than 0.02 %, it shall be permissible for the analysis to be reported as “< 0.02 %.”

5.3 The steel shall conform on product analysis to the requirements prescribed in Table 1, subject to the product analysis tolerances in Specification A 6/A 6M.

5.4 The maximum permissible carbon equivalent value shall be 0.47 % for shapes in Groups 4 and 5, and 0.45 % in other shapes. The carbon equivalent value shall be based on 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:

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

### 6. Tensile Requirements

6.1 The material as represented by the test specimens shall conform to the requirements for tensile properties prescribed in Table 2.

### 7. Keywords

7.1 building framing; bridges; shapes; structural steel; welded construction

<sup>1</sup> 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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<sup>2</sup> Annual Book of ASTM Standards, Vol 01.04.

<sup>3</sup> Annual Book of ASTM Standards, Vol 03.01.