



Designation: A 1003/A 1003M – 05

## Standard Specification for Steel Sheet, Carbon, Metallic- and Nonmetallic-Coated for Cold-Formed Framing Members<sup>1</sup>

This standard is issued under the fixed designation A 1003/A 1003M; 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 reappraisal. A superscript epsilon (ε) indicates an editorial change since the last revision or reappraisal.

### 1. Scope\*

1.1 This specification covers coated steel sheet used in the manufacture of cold-formed framing members, such as, but not limited to, studs, joists, purlins, girts, and track.

1.2 The steel sheet used for cold-formed framing members includes metallic-coated, painted metallic-coated, or painted nonmetallic-coated.

1.3 The values stated in either inch-pound or SI units shall be regarded separately as standard. Within the text, SI units are shown in brackets. The values stated in each system are not exact equivalents; therefore, each system shall be used independently of the other.

1.4 Unless the order specifies the “M” designation [SI units], the product shall be furnished to inch-pound units.

1.5 The text of this specification references notes and footnotes, which provide explanatory material. These notes and footnotes, excluding those in tables and figures, shall not be considered as requirements of this specification.

### 2. Referenced Documents

#### 2.1 ASTM Standards:<sup>2</sup>

**A 463/A 463M** Specification for Steel Sheet, Aluminum-Coated, by the Hot-Dip Process

**A 568/A 568M** Specification for Steel Sheet, Carbon, and High-Strength Low-Alloy, Hot-Rolled and Cold-Rolled, General Requirements for

**A 653/A 653M** Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process

**A 755/A 755M** Specification for Steel Sheet, Metallic-Coated by the Hot-Dip Process and Prepainted by the

Coil-Coating Process for Exterior Exposed Building Products

**A 792/A 792M** Specification for Steel Sheet, 55 % Aluminum-Zinc Alloy-Coated by the Hot-Dip Process

**A 875/A 875M** Specification for Steel Sheet, Zinc-5 % Aluminum Alloy-Coated by the Hot-Dip Process

**A 879** Specification for Steel Sheet, Zinc Coated by the Electrolytic Process for Applications Requiring Designation of the Coating Mass on Each Surface

**A 902** Terminology Relating to Metallic-Coated Steel Products

**A 924/A 924M** Specification for General Requirements for Steel Sheet, Metallic-Coated by the Hot-Dip Process

**A 941** Terminology Relating to Steel, Stainless Steel, Related Alloys, and Ferroalloys

**A 1004/A 1004M** Practice for Establishing Conformance to the Minimum Expected Corrosion Characteristics of Metallic, Painted-Metallic, and Nonmetallic-Coated Steel Sheet Intended for Use as Cold-Formed Framing Members

**C 645** Specification for Nonstructural Framing Members

**C 955** Specification for Load-Bearing (Transverse and Axial) Steel Studs, Runners (Tracks), and Bracing or Bridging for Screw Application of Gypsum Board and Metal Plaster Bases

**D 714** Test Method for Evaluating Degree of Blistering of Paints

**D 1005** Test Methods for Measurement of Dry-Film Thickness of Organic Coatings Using Micrometers

**D 1654** Test Method for Evaluation of Painted or Coated Specimens Subjected to Corrosive Environments

**D 4138** Test Method for Measurement of Dry-Film Thickness of Protective Coating Systems by Destructive Means

**D 4145** Test Method for Coating Flexibility of Prepainted Sheet

#### 2.2 ISO Standard:

**ISO 9223** Corrosion of Metals and Alloys—Corrosivity of Atmospheres-Classification<sup>3</sup>

<sup>1</sup> This specification is under the jurisdiction of ASTM Committee A05 on Metallic-Coated Iron and Steel Products and is the direct responsibility of Subcommittee A05.11 on Sheet Specifications.

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<sup>2</sup> 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.

<sup>3</sup> Available from American National Standards Institute (ANSI), 25 W. 43rd St., 4th Floor, New York, NY 10036.

\*A Summary of Changes section appears at the end of this standard.



### 2.3 AISI Standard:

#### Specification for the Design of Cold-Formed Steel Structural Members<sup>4</sup>

### 3. Terminology

3.1 *Definitions*—See Terminology A 902 for definitions of general terminology relating to metallic-coated steel products, and Terminology A 941 for definitions of general terminology relating to uncoated steel sheet products.

#### 3.2 Definitions of Terms Specific to This Standard:

3.2.1 *coating sequence, n*—the unbroken or uninterrupted manufacture of coils of the same coating designation.

3.2.2 *coil coater, n*—the organization that applies paint film coatings to coils of steel sheet on continuous paint lines.

3.2.3 *producer, n*—the organization that produces the steel sheet coil product from which the cold-formed members are fabricated.

3.2.4 *purlins and girts, n*—horizontal structural members that support roof deck or panel covering with loads applied principally by bending.

3.2.5 *resample, n*—additional tests made when the original test results do not satisfy the specification requirements.

3.2.6 *retest, n*—additional test, or tests, made when the original test results do not satisfy the specification requirements and the failure is due to a mechanical condition of the test specimen.

3.2.7 *roll former, n*—the organization that produces the cold-formed members.

3.2.8 *zinc-iron alloy, n*—a dull grey coating with no spangle pattern that is produced on hot-dip zinc-coated steel sheet.

3.2.8.1 *Discussion*—Zinc-iron alloy-coating is normally dull gray in appearance when produced by the manufacture of the coated sheet. Typically, the coating contains between 8 and 12 % iron, which is the result of a diffusion reaction between the steel sheet and the zinc coating during the coating process. In most applications, this product is intended to be painted. The coating offers excellent paint adhesion. When the product is exposed to the environment without a paint coating, there is a tendency for the development of a rust-colored stain on the surface. This is caused by the presence of iron in the coating. This stain may be aesthetically objectionable to some users of cold formed framing members.

3.2.9 *aluminum coating type 1, n*—a coating of aluminum and silicon alloy on steel sheet.

3.2.9.1 *Discussion*—Aluminum-coated steel sheet type 1 provides protection from corrosion primarily through the barrier action of the coating. The aluminum-silicon alloy coating provides galvanic corrosion only in marine environments. Because this coating does not generally provide galvanic protection, rust staining may be evident at area where the base metal is exposed to the environment, such as at punch-outs, cut or sheared edges of members, and at scratches.

3.2.10 *aluminum coating type 2, n*—a coating of commercially pure aluminum on steel sheet.

3.2.10.1 *Discussion*—Aluminum-coated steel sheet type 2 provides protection from corrosion primarily through the barrier action of the coating. The aluminum coating provides galvanic corrosion only in marine environments. Because this coating does not generally provide galvanic protection, rust staining may be evident at areas where the base metal is exposed to the environment such as at punch-outs, cut or sheared edges of members, and at scratches.

#### 3.3 Suffixes:

*H, adj*—high ductility.

*L, adj*—low ductility.

*NS, adj*—nonstructural.

3.3.1 These designations are associated with aspects of the end uses of the steel products; *H* and *L* are associated with structural or load-bearing applications, and *NS* with nonstructural or nonload-bearing applications.

### 4. Classification

4.1 The steel sheet is available in the following designations:

4.1.1 Structural Grade 50 Type H (ST50H), Structural Grade 340 Type H [ST340H].

4.1.2 Structural Grade 40 Type H (ST40H), Structural Grade 275 Type H [ST275H].

4.1.3 Structural Grade 37 Type H (ST37H), Structural Grade 255 Type H [ST255H].

4.1.4 Structural Grade 33 Type H (ST33H), Structural Grade 230 Type H [ST230H].

4.1.5 Structural Grade 50 Type L (ST50L), Structural Grade 340 Type L [ST340L].

4.1.6 Structural Grade 40 Type L (ST40L), Structural Grade 275 Type L [ST275L].

4.1.7 Structural Grade 37 Type L (ST37L), Structural Grade 255 Type L [ST255L].

4.1.8 Structural Grade 33 Type L (ST33L), Structural Grade 230 Type L [ST230L].

4.1.9 Nonstructural Grade 33 (NS33), Nonstructural Grade 230 [NS230]).

NOTE 1—Abbreviated designations are shown in parenthesis or brackets.

4.2 Use of Type L steels is limited to purlins and girts (see 3.2.4).

### 5. Ordering Information

5.1 Steel sheet in coils or cut lengths shall be ordered to base metal thickness requirements expressed in increments of 0.0001 in. [0.001 mm].

5.2 Orders for product to this specification shall include the following information, as necessary to adequately describe the desired product.

5.2.1 ASTM specification number and year of issue (A 1003 – \_\_ for inch-pound units and A 1003M – \_\_ for SI units),

5.2.2 Name of the material (metallic-coated steel sheet), (painted metallic-coated steel sheet), or (painted nonmetallic-coated steel sheet), and designation (see 4.1).

5.2.2.1 See Specification A 755/A 755M for additional ordering requirements for the painted-metallic-coated steel sheet.

<sup>4</sup> Available from American Iron and Steel Institute (AISI), 1140 Connecticut Ave., Suite 705, Washington, DC 20036.