



Designation: A 1003/A 1003M – 01

Standard Specification for Steel Sheet, Carbon, Metallic- and Nonmetallic-Coated for Cold-Formed Framing Members¹

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 reapproval. A superscript epsilon (ε) indicates an editorial change since the last revision or reapproval.

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:

A 568/A 568M Specification for Steel Sheet, Carbon, and High-Strength Low-Alloy, Hot-Rolled and Cold-Rolled, General Requirements for²

A 653/A 653M Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvanealed) by the Hot-Dip Process³

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 Products³

A 792/A 792M Specification for Steel Sheet, 55 % Aluminum-Zinc Alloy-Coated by the Hot-Dip Products³

A 875/A 875M Specification for Steel Sheet, Zinc-5 % Aluminum Alloy-Coated by the Hot-Dip Process³

A 902 Terminology Relating to Metallic-Coated Steel Products³

A 924/A 924M Specification for General Requirements for Steel Sheet, Metallic-Coated by the Hot-Dip Process³

A 941 Terminology Relating to Steel, Stainless Steel, Related Alloys, and Ferroalloys⁴

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 Members³

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 Bases⁵

D 714 Test Method for Evaluating Degree of Blistering of Paints⁶

D 1005 Test Methods for Measurement of Dry-Film Thickness of Organic Coatings Using Micrometers⁶

D 1654 Test Method for Evaluation of Painted or Coated Specimens Subjected to Corrosive Environments⁶

D 4138 Test Method for Measurement of Dry-Film Thickness of Protective Coating Systems by Destructive Means⁷

D 4145 Test Method for Coating Flexibility of Prepainted Sheet⁷

2.2 ISO Standard:

ISO 9223 Corrosion of Metals and Alloys—Corrosivity of Atmospheres-Classification⁸

2.3 AISI Standard:

Specification for the Design of Cold-Formed Steel Structural Members⁹

3. Terminology

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

¹ 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.

Current edition approved October 10, 2001. Published December 2001. Originally published as A 1003 – 00. Last previous edition A 1003 – 00.

² *Annual Book of ASTM Standards*, Vol 01.03.

³ *Annual Book of ASTM Standards*, Vol 01.06.

⁴ *Annual Book of ASTM Standards*, Vol 01.01.

⁵ *Annual Book of ASTM Standards*, Vol 04.01.

⁶ *Annual Book of ASTM Standards*, Vol 06.01.

⁷ *Annual Book of ASTM Standards*, Vol 06.02.

⁸ Available from American National Standards Institute, 25 W. 43rd St., 4th Floor, New York, NY 10036.

⁹ Available from American Iron and Steel Institute, 1101 17th St., NW, Suite 1300, Washington, DC 20036.

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.

3.3 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.

5.2.3 Type of coating (metallic-coated; zinc, zinc-iron alloy, 55 % aluminum-zinc alloy, zinc-5 % aluminum alloy), (painted-metallic-coated; metallic-coating and nonmetallic-coating type), (painted nonmetallic coated: nonmetallic-coating type).

5.2.3.1 Metallic coating weight [mass] designation (see Table 1), (see 9.1).

5.2.3.2 Nonmetallic coating thickness (see 9.2 or 9.3).

5.2.4 Chemically-treated or not chemically-treated (metallic-coated only).

5.2.5 Oiled or not-oiled,

5.2.6 Dimensions (show thickness, width, and flatness requirements and length, if cut lengths). Specify the applicable table of thickness tolerances of Specification A 924/A 924M, for metallic-coated, or A 568/A 568M for nonmetallic-coated sheet that applies to the order, that is, the table of thickness tolerances for $\frac{3}{8}$ -in. [10-mm] edge distance, or the table of thickness tolerances for 1-in. [25-mm] edge distance.

5.2.7 Coil size requirements (specify maximum outside diameter (OD) acceptable inside diameter (ID), and maximum weight [mass].

**TABLE 1 Coating Weight [Mass] Requirements
(Metallic Coatings)**

Product Designation	Coating Designation
Type H and Type L	G60 [Z180] ^A A60 [Z180] ^B AZ50 [AZ150] ^C GF30 [ZGF90] ^D
Type NS	G40 [Z120] ^A A40 [Z120] ^B AZ50 [AZ150] ^C GF30 [ZGF90] ^D

^AZinc-coated steel sheet as described in Specification A 653/A 653M.

^BZinc-iron alloy-coated steel sheet as described in Specification A 653/A 653M.

^C55 % aluminum-zinc alloy-coated as described in Specification A 792/A 792M.

^DZinc-5 % aluminum alloy-coated steel sheet as described in Specification A 875/A 875M.