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Standard Specification for Load-Bearing (Transverse and Axial) Steel Studs, Runners (Tracks), and Bracing or Bridging for Screw Application of Gypsum Panel Products and Metal Plaster Bases¹

This standard is issued under the fixed designation C 955; 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 steel studs, runners (tracks), and bracing or bridging (with a base metal thickness range of not less than 0.0329 in. (0.836 mm)) for screw application of gypsum panel products and metal plaster bases in load-bearing (transverse and axial) construction assemblies. Steel of lesser thickness shall be permitted in additional engineered products.

1.2 The values stated in inch-pound units are to be regarded as the standard. The SI (metric) values given in parentheses are provided for information purposes only.

1.3 The following precautionary caveat pertains only to the test method portion, Section 8, of this specification: *This standard does not purport to address all of the safety concerns, if any, associated with its use. It is the responsibility of the user of this standard to establish appropriate safety and health practices and determine the applicability of regulatory limitations prior to use.*

2. Referenced Documents

2.1 ASTM Standards:²

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

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 1003/A 1003M Specification for Steel Sheet, Carbon, Metallic- and Nonmetallic-Coated for Cold-Formed Framing Members

C 11 Terminology Relating to Gypsum and Related Building Materials and Systems

C 954 Specification for Steel Drill Screws for the Application of Gypsum Panel Products or Metal Plaster Bases to Steel Studs from 0.033 in. (0.84 mm) to 0.112 in. (2.84 mm) in Thickness

2.2 AISI Standard:³

Specification for the Design of Cold-Formed Steel Structural Members

AISI Code of Standard Practice for Cold-Formed Steel Structural Framing Committee on Framing Standards—2006 Edition

2.3 ISO Standard:⁴

ISO 9223 Corrosion of Metals and Alloys—Corrosivity of Atmospheres—Classification

3. Terminology

3.1 *Definitions:* Definitions shall be in accordance with Terminology C 11.

3.2 *Definitions of Terms Specific to This Standard:*

3.2.1 *members, n*—studs, runners, tracks, bracing, bridging, accessories or other items manufactured in accordance with this standard.

3.2.2 *structural member, n*—a member in a steel framed system in which the loading exceeds any of the following conditions: a transverse load of 20 lbf/ft (290 N/m) of member length, or an axial load, exclusive of sheathing, of 200 lbf (890 N) per member.

4. Materials and Manufacture

4.1 Members shall be manufactured from steel meeting the requirements of Specification A 1003/A 1003M.

¹ This specification is under the jurisdiction of ASTM Committee C11 on Gypsum and Related Building Materials and Systems and is the direct responsibility of Subcommittee C11.02 on Specifications and Test Methods for Accessories and Related Products.

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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.

³ Available from American Iron and Steel Institute (AISI), 1140 Connecticut Ave., NW, Suite 705, Washington, DC 20036, <http://www.steel.org>.

⁴ Available from International Organization for Standardization (ISO), 1 rue de Varembe, Case postale 56, CH-1211, Geneva 20, Switzerland, <http://www.iso.ch>.

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

4.2 The minimum steel thickness (base steel) shall be not less than 0.0329 in. (0.84 mm).

4.3 Individual measurements before the application of protective coating shall be not less than 95 % of the specified design thickness.

4.4 Members shall have a protective coating in accordance with Table 1, CP 60 minimum.

4.5 Edges of members shall be manufactured to minimize burrs and sharp edges.

4.6 Factory punch-outs, when provided, shall be located along the centerline of the webs of members and shall have center-to-center spacing of not less than 24 in. (610 mm). Web punch-outs maximum width shall be the lesser of 0.5 times the member depth, d , or 2½ in. (64 mm). Web punch-out length shall not exceed 4 ½ in. (114 mm). Minimum distance between the end of the member and the near edge of the web punch-out shall be 10 in. (254 mm). The size of the factory punch-outs shall not exceed the size used in design and the center-to-center spacing shall not be less than that used in design.

4.7 The properties and strength of members shall be computed in accordance with the AISI Specification for the Design of Cold-Formed Steel Structural Members.

5. Performance Requirements

5.1 When tested in accordance with Section 8, members shall be capable of pulling the head of the screw below the surface of the gypsum panel product without spin out (see Fig. 1).

6. Dimensions and Permissible Variations

6.1 Data for calculating design performance shall be supplied by the manufacturer.

6.2 The width of the surface to which the sheathing board is attached shall be not less than 1¼ in. (32 mm).

6.3 Runners (track) shall be formed in a U-shaped configuration, having a depth compatible with that of the studs of the same nominal size.

6.4 Minimum height of runner (track) flanges shall be ¾ in. (19 mm).

6.5 Members shall be manufactured within the limits as shown in Table 2 and Fig. 2.

6.6 Bracing and bridging shall have configuration and steel thickness to provide secondary support for the studs in accordance with the AISI Specification for the Design of Cold-Formed Steel Structural Members.

7. Workmanship, Finish, and Appearance

7.1 The steel members shall be free of defects that interfere with the purpose for which they are intended.

8. Penetration Test

8.1 *Significance and Use*—This test method provides a procedure for evaluating the member’s ability to pull the head of a screw below the surface of the gypsum panel product. It shall be used to determine compliance with this specification. The degree of performance of this test method with service performance has not been determined.

8.2 *Apparatus shall satisfy the following:*

8.2.1 *Electric Drill* capable of 2500 r/min (free spindle speed), supplied with a screw driving bit to fit the screw used in the test.

8.3 *Materials shall satisfy the following:*

8.3.1 *Gypsum Board, Type X*, ⅝ in. (16 mm) thick.

8.3.2 *Screws*—Specification C 954, 1 in. (25.4 mm) long.

8.3.3 *Kraft Paper*, 0.010 in. (0.25 mm) thick.

TABLE 1 Coating Designations

| Coating Classification | Coating Designator | Minimum Coating Requirements | | | |
|------------------------|--------------------|---|------------------------|---------------------------|-----------------------|
| | | Zinc-Coated ^A | Zinc Iron ^B | 55 % Al-Zinc ^C | Zinc-5 % ^D |
| Metallic Coated | CP 40 | G 40 | A 40 | AZ 50 | GF 30 |
| | CP 60 | G 60 | A 60 | AZ 50 | GF 30 |
| | CP 90 | G 90 | Not Applicable | AZ 50 | GF 45 |
| Painted Metallic | PM | The metallic coated substrate shall meet the requirements of metallic coated. In addition, the paint film shall have a minimum thickness of 0.5 mil per side (primer plus topcoat) with a minimum primer thickness of 0.1 mil per side. ^E | | | |
| Painted | PTD | Non-metallic coated substrate shall be painted after roll forming and shall have a minimum paint thickness of 1.0 mil on all surfaces including edges. Use of painted product is limited to environments where the rate of corrosion is low; typically areas such as interiors of buildings and areas of low rainfall and low humidity as defined by ISO 9223, Category 1 and 2. ^{E,F} | | | |

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

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

^C 55 % Aluminum-zinc alloy-coated steel sheet as described in Specification A 792/A 792M.

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

^E In accordance with the requirements of Specification A 1003/A 1003M.

^F ISO 9223.