



Designation: C840 – 20

Standard Specification for Application and Finishing of Gypsum Board¹

This standard is issued under the fixed designation C840; 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.

This standard has been approved for use by agencies of the U.S. Department of Defense.

1. Scope*

1.1 This specification covers the minimum requirements for the methods of application and finishing of gypsum board, including related items and accessories.

1.2 Details of construction for a specific assembly to achieve the required fire resistance shall be obtained from reports of fire-resistance tests, engineering evaluations, or listings from recognized fire testing laboratories.

1.2.1 Where this specification is more stringent (size or thickness of framing; size and spacing of fasteners) than the fire-rated construction, this specification shall govern.

1.3 Where sound control is required for a gypsum board assembly, details of construction shall be in accordance with reports of acoustical tests of assemblies that have met the required acoustical values.

1.4 Unheated spaces above gypsum board ceilings shall be properly ventilated (see [Appendix X2](#)).

1.5 The various application systems are located in the following sections:

I	Application of Single-ply Gypsum Board to Wood Framing Members	8
II	Application of Two-ply Gypsum Board to Wood Framing Members	9
III	Application of Gypsum Board by Adhesive Nail-on to Wood Framing Members	10
IV	Semi-solid Gypsum Board Partitions	11
V	Solid Gypsum Board Partitions	12
VI	Application of Gypsum Board with Adhesives to Interior Masonry or Concrete Walls	13
VII	Application of Gypsum Board to Rigid Foam Insulation	14
VIII	Application of Gypsum Board to Steel Framing and Furring	15
IX	Arches and Bending Radii	16
X	Application of Gypsum Board to Receive Tile by Adhesive Application	17
XI	Exterior Application of Gypsum Wallboard and Exterior Gypsum Soffit Board	18
XII	Floating Interior Angles	19
XIII	Control (Expansion) Joints	20
XIV	Foil-backed Gypsum Board	21
XV	Application of Vinyl Faced Gypsum Board	22

1.6 The values stated in inch-pound units are to be regarded as standard. The values given in parentheses are mathematical conversions to SI units that are provided for information only and are not considered standard.

1.7 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 the specification.

1.8 The following precautionary caveat pertains only to Sections 6 – 26. *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, health, and environmental practices and determine the applicability of regulatory limitations prior to use. For specific precautionary statements, see 4.1.1, 4.1.2, and 24.5.*

1.9 *This international standard was developed in accordance with internationally recognized principles on standardization established in the Decision on Principles for the Development of International Standards, Guides and Recommendations issued by the World Trade Organization Technical Barriers to Trade (TBT) Committee.*

2. Referenced Documents

2.1 ASTM Standards:²

- [C11 Terminology Relating to Gypsum and Related Building Materials and Systems](#)
- [C475/C475M Specification for Joint Compound and Joint Tape for Finishing Gypsum Board](#)
- [C514 Specification for Nails for the Application of Gypsum Board](#)
- [C557 Specification for Adhesives for Fastening Gypsum Wallboard to Wood Framing](#)
- [C645 Specification for Nonstructural Steel Framing Members](#)
- [C754 Specification for Installation of Steel Framing Members to Receive Screw-Attached Gypsum Panel Products](#)
- [C920 Specification for Elastomeric Joint Sealants](#)

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 C11.03 on Specifications for the Application of Gypsum and Other Products in Assemblies.

Current edition approved May 1, 2020. Published June 2020. Originally approved in 1979. Last previous edition approved in 2019 as C840 – 19b. DOI: 10.1520/C0840-20.

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.

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

- [C954 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](#)
- [C955 Specification for Cold-Formed Steel Structural Framing Members](#)
- [C1002 Specification for Steel Self-Piercing Tapping Screws for Application of Gypsum Panel Products or Metal Plaster Bases to Wood Studs or Steel Studs](#)
- [C1007 Specification for Installation of Load Bearing \(Transverse and Axial\) Steel Studs and Related Accessories](#)
- [C1047 Specification for Accessories for Gypsum Wallboard and Gypsum Veneer Base](#)
- [C1396/C1396M Specification for Gypsum Board](#)
- [C1546 Guide for Installation of Gypsum Products in Concealed Radiant Ceiling Heating Systems](#)
- [E2634 Specification for Flat Wall Insulating Concrete Form \(ICF\) Systems](#)
- 2.2 *U.S. Department of Commerce Publication:*³
- [PS20 American Softwood Lumber Standard](#)
- 2.3 *ANSI Standards:*⁴
- [ANSI A108 Specifications for the Installation of Ceramic Tile](#)
- [ANSI A136.1 Specifications for Organic Adhesives for Installation of Ceramic Tile, Type I and Type II](#)
- 2.4 *AISI Standards:*⁵
- [S220 North American Standard for Cold-Formed Steel Framing – Nonstructural Members](#)
- [S240 North American Standard for Cold-Formed Steel Structural Framing](#)

3. Terminology

3.1 *Definitions*—Definitions shall be in accordance with Terminology [C11](#).

3.2 *Definitions of Terms Specific to This Standard:*

3.2.1 *critical lighting, n*—a condition where interior surfaces are flooded by natural or artificial lighting at an oblique angle.

3.2.2 *decoration, n*—paint (including primers), texture, coatings, and coverings such as wallpaper and sheet plastic materials designed to conceal or protect the surface of the gypsum board (see [Appendix X3](#)).

3.2.3 *dry type, n*—a compound in powder form to be mixed with water before use.

3.2.4 *drying type, n*—a compound that hardens by the evaporation of the vehicle used to make the paste.

3.2.5 *drywall primer, n*—a paint material specifically formulated to fill the pores and minimize the suction difference

between gypsum board surface paper and the compound used on finished joints, angles, fastener heads and accessories, and over skim coatings.

3.2.6 *face panel, n*—outside ply of multiple layer gypsum board assemblies.

3.2.7 *finished wallboard, n*—wallboard that has had the joints taped, has had the joints, fastener heads, and flanges of accessories concealed with joint compound, and has been sanded to prepare the surface to receive job applied decoration.

3.2.8 *finishing, n*—the preparation of gypsum board surfaces to receive the field application of decoration.

3.2.9 *finishing of accessories, n*—the application of compound to flanges of accessories to create a monolithic surface.

3.2.10 *flange, n*—that part of an accessory extending over the face of the gypsum wallboard intended to become a part of the monolithic plane of the prepared surface.

3.2.11 *harden, v*—a condition reached when the compound has lost its plasticity to an arbitrary degree, measured in resistance to penetration or deformation.

3.2.12 *joint photographing, n*—a condition where the finished joint areas visible after final decoration.

3.2.13 *joint treatment, n*—application of joint tape and compound to the joint between gypsum boards.

3.2.14 *laminating compound, n*—a compound (abrasive) used to adhere gypsum board to gypsum board or other monolithic materials.

3.2.15 *moderate contact, n*—the edges and ends are butted at joints but not forced together.

3.2.15.1 *Discussion*—Small gaps not greater than ¼ in. (6 mm) are acceptable (see [7.4](#)).

3.2.16 *parallel or vertical application, n*—gypsum board applied with the edges parallel to the framing member to which it is attached.

3.2.17 *perpendicular or horizontal application, n*—gypsum board application with the edges applied at right angles to the framing member to which it is attached.

3.2.18 *ready-mix type, n*—a factory-prepared compound ready to be used without the addition of water.

3.2.19 *required, adj*—pertaining to a mandatory obligation imposed by a force outside this specification, such as a building code, project specification, contract, or purchase order.

3.2.20 *setting type, n*—a compound that hardens by a chemical reaction and increases in strength through drying.

3.2.21 *skim coat, n*—a thin layer of skim coat compound applied over the entire surface of finished gypsum board.

3.2.21.1 *Discussion*—A skim coat is essentially a film of joint compound and is not applied at a readily measurable thickness. There is no specific mil thickness that constitutes a proper skim coat (see [Appendix X7](#)).

3.2.22 *skim coat compound, n*—joint compound, or a material specifically formulated and manufactured for use as a skim coat.

³ Available from U.S. Government Printing Office, Superintendent of Documents, 732 N. Capitol St., NW, Washington, DC 20401-0001, <http://www.access.gpo.gov>.

⁴ Available from American National Standards Institute (ANSI), 25 W. 43rd St., 4th Floor, New York, NY 10036, <http://www.ansi.org>.

⁵ Available from American Iron and Steel Institute (AISI), 25 Massachusetts Ave., NW, Suite 800, Washington, DC 20001, <http://www.steel.org>.

3.2.23 *specified, adj*—pertaining to a mandatory requirement of this specification or a referenced requirement (see 3.2.17).

3.2.24 *spotting fastener heads, n*—the application of compound to cover the fastener head to create a monolithic surface.

3.2.25 *taping of joints, n*—the application of compound and joint reinforcing tape to the joints between adjoining gypsum boards.

3.2.26 *treated joint, n*—a joint between gypsum boards that has been covered with joint tape and joint compound as specified in 24.3.3.1, 24.3.3.2, or 24.3.3.3.

3.2.26.1 *Discussion*—Strip moldings or similar devices shall be permitted.

4. Environmental Conditions

4.1 *Application of Gypsum Board, Joint Treatment Materials, and Adhesives*—Room temperature shall be maintained at not less than 40 °F (4 °C) during application of gypsum board except when adhesive is used for the attachment of gypsum board. For the bonding of adhesive, joint treatment, texturing, and decoration, the room temperature shall be maintained at not less than 50 °F (10 °C) for 48 h prior to application and continuously thereafter until completely dry. See X7.7 for additional detail regarding environmental control during the installation and finishing process.

4.1.1 When a temporary heat source is used, the temperature shall not exceed 95 °F (35 °C) in any given room or area.

4.1.2 Adequate ventilation shall be maintained in the working area during installation and curing period.

4.2 Gypsum board shall be protected from direct exposure to rain, snow, sunlight, or other excessive weather conditions.

NOTE 1—Where manufacturers' recommendations differ from the above, follow their recommendations.

4.3 Ready-mixed joint compounds shall be protected from freezing, exposure to extreme heat, and direct sunlight.

5. Materials and Manufacture

5.1 *Gypsum Boards*—A family of gypsum sheet products as defined in Terminology C11.

5.1.1 *Type X (Special Fire-resistant) Gypsum Wallboard, Gypsum Backing Board, Water-resistant Gypsum Backing Board, or Exterior Gypsum Soffit Board*—Gypsum board that provides a greater degree of fire resistance than regular gypsum board as defined in Specification C1396/C1396M.

5.1.2 *Foil-backed Gypsum Wallboard or Gypsum Backing Board*—Regular or Type X gypsum board with foil laminated to the back surface. The foil is a vapor retarder.

5.1.3 *Predecorated Gypsum Board*—Gypsum board with a decorative wall covering or coating applied in-plant by the gypsum board manufacturer.

5.2 *Gypsum Wallboard*—See Specification C1396/C1396M.

5.3 *Gypsum Backing Board and Coreboard*—See Specification C1396/C1396M.

5.4 *Water-resistant Gypsum Backing Board*—See Specification C1396/C1396M.

5.5 *Exterior Gypsum Soffit Board*—See Specification C1396/C1396M.

5.6 *Gypsum Ceiling Board*—See Specification C1396/C1396M.

5.7 *Finishing Materials:*

5.7.1 *Compounds*—Taping compound, finishing compound, and all-purpose compound shall meet the requirements of Specification C475/C475M.

5.7.2 Mix compounds in accordance with the manufacturers' directions.

5.7.3 *Joint Tape*—See Specification C475/C475M.

5.8 *Fasteners:*

5.8.1 *Nails*—See Specification C514.

5.8.1.1 Nails for use with pressure treated lumber shall be compatible with the preservative treated and fire retardant treated lumber.

5.8.2 *Screws:*

5.8.2.1 See Specification C1002 for screws for fastening gypsum board to wood members, steel members less than 0.033 in. (0.84 mm) in thickness, and to gypsum board.

5.8.2.2 See Specifications C754 and C954 for screws for fastening gypsum board to steel members from 0.033 to 0.112 in. (0.84 to 2.84 mm) in thickness.

5.8.2.3 Screws for use with pressure treated lumber shall be compatible with the preservative treated and fire retardant treated lumber.

5.8.3 *Staples*—No. 16 USS gauge flattened galvanized wire staples with 7/16 in. (11 mm) wide crown outside measurement. Legs shall have divergent points.

NOTE 2—Use only for the base ply of two-ply gypsum board application.

5.8.3.1 Staples for use with pressure treated lumber shall be compatible with the preservative treated and fire retardant treated lumber.

5.9 *Adhesives:*

5.9.1 *Fastening Gypsum Board to Wood Framing*—See Specification C557.

5.9.2 *Fastening Gypsum Board to Steel Framing*—As specified by the manufacturer.

5.9.3 *Laminating Gypsum Board to Gypsum Board*—Laminating compounds, taping compound, or adhesive shall be as specified by the manufacturer.

5.10 *Framing Members:*

5.10.1 Wood framing members shall conform to PS20, American Softwood Lumber Standards. The surface to which abutting edges or ends are attached shall be not less than 1½ in. (38 mm) wide. For internal corners or angles, the bearing surface shall not be less than ¾ in. (19 mm).

5.10.2 *Steel Studs, Furring Channels, and Runners:*

5.10.2.1 Non-load-bearing (see Specification C645 or AISI S220).

5.10.2.2 Load-bearing (see Specification C955 or AISI S240).

5.10.3 *Gypsum Studs*—Specification C1396/C1396M, not less than 1 in. (25 mm) thick by 6 in. (150 mm) wide. Studs shall be either solid or laminated.