



# Standard Specification for Gypsum Wallboard<sup>1</sup>

This standard is issued under the fixed designation C 36; 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 ( $\epsilon$ ) indicates an editorial change since the last revision or reapproval.

*This specification has been approved for use by agencies of the Department of Defense. Consult the DoD Index of Specifications and Standards for the specific year of issue which has been adopted by the Department of Defense.*

## 1. Scope\*

1.1 This specification covers gypsum wallboard that is designed to be used for walls, ceilings, or partitions and affords a surface suitable to receive decoration.

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

## 2. Referenced Documents

### 2.1 ASTM Standards:

- C 11 Terminology Related to Gypsum and Related Building Materials and Systems<sup>2</sup>
- C 473 Test Methods for Physical Testing of Gypsum Board Products and Gypsum Lath<sup>2</sup>
- C 645 Specification for Non-Load Bearing (Axial) Steel Studs, Runners (Tracks), and Rigid Furring Channels for Screw Application of Gypsum Board<sup>2</sup>
- E 84 Test Method for Surface Burning Characteristics of Building Materials<sup>3</sup>
- E 96 Test Methods for Water Vapor Transmission of Materials<sup>4</sup>
- E 119 Test Methods for Fire Tests of Building Construction and Materials<sup>3</sup>

## 3. Terminology

3.1 Definitions used in this standard shall be in accordance with Terminology C 11.

## 4. Materials and Manufacture

4.1 Gypsum wallboard shall consist of a noncombustible core, essentially gypsum, surfaced with paper bonded to the core.

4.1.1 Aluminum foil shall be bonded to the back surface of foil-backed gypsum wallboard.

4.2 Gypsum wallboard, type X (special fire-resistant) designates gypsum wallboard complying with this specifica-

tion that provides not less than 1-h fire-resistance for boards  $\frac{3}{8}$  in. (15.9 mm) thick or  $\frac{3}{4}$ -h fire-resistance for boards  $\frac{1}{2}$  in. (12.7 mm) thick, applied parallel with and on each side of load bearing 2 by 4 wood studs spaced 16 in. (406 mm) on centers with 6d coated nails,  $1\frac{1}{8}$  in. (48 mm) long, 0.0915 in. (2.3 mm) diameter shank,  $\frac{1}{4}$  in. (6.4 mm) diameter heads, spaced 7 in. (178 mm) on centers with wallboard joints staggered 16 in. (406 mm) on each side of the partition and tested in accordance with Test Methods E 119.

4.3 Gypsum wallboard shall have a flame spread index of not more than 25 when tested in accordance with Test Method E 84.

NOTE 1—Consult producers for independent test data on assembly details and fire resistance classifications for other types of construction. See official fire test reports for assembly particulars, materials, and classifications.

## 5. Physical Properties

5.1 Specimens shall be tested in accordance with Test Methods C 473.

5.1.1 Specimens shall be taken from the samples obtained in accordance with 8.2.

5.1.2 *Flexural Strength*—The specimens shall be tested face up and face down. The average breaking load shall be not less than the following:

Thickness, in. (mm)	Method A		Method B	
	Load, lbf (N) Bearing Edges Across Fiber of Surfacing	Load, lbf (N) Bearing Edges Parallel to Fiber of Surfacing	Load, lbf (N) Bearing Edges Across Fiber of Surfacing	Load, lbf (N) Bearing Edges Parallel to Fiber of Surfacing
$\frac{1}{4}$ (6.4)	50 (222)	20 (89)	46 (205)	16 (71)
$\frac{3}{16}$ (7.9)	65 (289)	25 (111)	62 (276)	21 (93)
$\frac{3}{8}$ (9.5)	80 (356)	30 (133)	77 (343)	26 (116)
$\frac{1}{2}$ (12.7)	110 (489)	40 (178)	107 (476)	36 (160)
$\frac{5}{8}$ (15.9)	150 (667)	50 (222)	147 (654)	46 (205)
$\frac{3}{4}$ (19.0)	170 (756)	60 (267)	167 (743)	56 (249)

5.1.3 *Humidified Deflection*—The specimens shall have an average deflection of not more than the following:

Thickness, in. (mm)	Humidified Deflection, Eighths of an inch (mm)
$\frac{1}{4}$ (6.4)	not applicable
$\frac{3}{16}$ (7.9)	not applicable
$\frac{3}{8}$ (9.5)	15 (48)
$\frac{1}{2}$ (12.7)	10 (32)
$\frac{5}{8}$ (15.9)	5 (16)
$\frac{3}{4}$ (19.0)	5 (16)

5.1.4 *Core, End, and Edge Hardness*—The specimens shall have an average hardness of not less than 15 lbf (67 N)

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<sup>2</sup> Annual Book of ASTM Standards, Vol 04.01.

<sup>3</sup> Annual Book of ASTM Standards, Vol 04.07.

<sup>4</sup> Annual Book of ASTM Standards, Vol 04.06.

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

when tested by Method A and 11 lbf (49 N) when tested by Method B.

5.1.5 *Nail Pull Resistance*—The specimen shall have an average nail-pull resistance of not less than the following:

Thickness, in. (mm)	Method A Nail Pull Resistance, lbf (N)	Method B Nail Pull Resistance, lbf (N)
¼ (6.4)	40 (178)	36 (160)
⅜ (7.9)	50 (222)	46 (205)
½ (9.5)	60 (267)	56 (249)
⅝ (12.7)	80 (356)	77 (343)
¾ (15.9)	90 (400)	87 (387)
1 (19.0)	100 (445)	97 (432)

5.2 *Foil-Backed Gypsum Wallboard:*

5.2.1 Foil-backed gypsum wallboard shall meet all of the requirements for gypsum wallboard. In addition, aluminum foil shall be bonded to the back surface.

5.2.2 When tested in accordance with Test Methods E 96 (Desiccant Method), the permeance of foil-backed gypsum wallboard shall be not more than 0.30 perm (17 ng/Pa·s·m<sup>2</sup>) for the condition of 50 % relative humidity on the face of the board, and 0 % relative humidity on the foil-covered back side of the board.

6. Dimensions and Permissible Variations

6.1 Specimens shall be taken from the samples obtained in accordance with 8.2.

6.2 Thickness, width, length, and end squareness shall be determined in accordance with Test Methods C 473.

6.2.1 *Thickness*—The nominal thickness shall be ¼, ⅜, ½, ⅝, or ¾ in. (6.4, 7.9, 9.5, 12.7, 15.9 or 19.0 mm), with permissible variations in the nominal thickness of ±⅙₆₄ in. (0.4 mm) with permissible local variations of ±⅓₃₂ in. (0.8 mm) from the nominal thickness.

6.2.2 *Width*—The nominal width shall be up to 48 in. (1220 mm), with widths up to 54 in. (1370 mm) permitted, with a permissible variation of ⅓₃₂ in. (2.4 mm) under the specified width.

6.2.3 *Length*—The nominal length and permissible variation shall be as follows:

Thickness in. (mm)	Length ft (mm)	Variation in. (mm)
¼ (6.4)	4 to 12 (1220 to 3660)	±⅓₆₄ (6.4)
⅜ (7.9)	4 to 14 (1220 to 4270)	±⅓₆₄ (6.4)
½ (9.5)	4 to 16 (1220 to 4880)	±⅓₆₄ (6.4)
⅝ (12.7)	4 to 16 (1220 to 4880)	±⅓₆₄ (6.4)
¾ (15.9)	4 to 16 (1220 to 4880)	±⅓₆₄ (6.4)
1 (19.0)	4 to 16 (1220 to 4880)	±⅓₆₄ (6.4)

6.2.4 *Tapered Edge Depth*—The average thickness of the edge of recessed or tapered edge shall be not less than 0.020 in. (0.51 mm) but not more than 0.090 in. (2.29 mm) less than the average thickness of the gypsum wallboard.

6.2.5 *End Squareness*—Corners shall be square with a permissible variation of ±⅓₆₄ in. (±3.2 mm) in the full width of the board.

6.3 *Edges and Ends*—The edges and ends shall be straight and either square, recessed, beveled, featured, tapered, or featured and tapered.

7. Workmanship, Finish, and Appearance

7.1 The surfaces of gypsum wallboard shall be true and free from imperfections that would render the wallboard

unfit for use with or without decoration.

8. Sampling

8.1 When required by the purchase agreement, samples of gypsum wallboard shall be taken at the place of manufacture or at the destination. If the samples are taken other than at the place of manufacture, such samples shall be taken within 24 h of the receipt of the material unless otherwise specified in the purchase agreement.

8.2 At least 0.25 % of the number of gypsum wallboards in a shipment, but not less than three boards, shall be so selected as to be representative of the shipment and shall constitute a sample for purpose of tests by the purchaser or user.

9. Inspection

9.1 Inspection of the gypsum wallboard shall be agreed upon between the purchaser and the supplier as part of the purchase agreement.

10. Rejection

10.1 Rejection of gypsum wallboard that fails to conform to the requirements of this specification shall be reported to the producer or supplier promptly and in writing. The notice of rejection shall contain a statement documenting how the gypsum wallboard has failed to conform to the requirements of this specification.

11. Certification

11.1 When specified in the purchase agreement, a producer's or supplier's report shall be furnished at the time of shipment certifying that the product is in compliance with this specification.

12. Packaging and Package Marking

12.1 Unless otherwise required by the purchase agreement, each board or package shall have legibly marked thereon the following: the thickness; the name of the producer or supplier; the brand name (if any); and the ASTM designation for the product.

13. Shipping, Handling and Storage

13.1 Gypsum wallboard shall be shipped so as to be kept dry.

13.2 Gypsum wallboard shall be stored so as to be kept dry. Where necessary to store gypsum wallboard outside, it shall be stacked off the ground, supported on a level platform, and fully protected from weather and direct sunlight exposure.

13.3 Gypsum wallboard shall be neatly stacked flat with care taken to prevent sagging or damage to edges, ends, and surfaces.

14. Keywords

13.1 ceiling; foil-backed; gypsum; gypsum wallboard; gypsum wallboard, type X; partitions; wall

APPENDIX

(Nonmandatory Information)

This Appendix gives general information and also suggestions for inclusions to be made elsewhere by the specifier. It is not part of this specification.

XI. ALTERNATE DEFINITION FOR TYPE X

X1.1 Gypsum wallboard, type X (special fire-resistant) designates gypsum wallboard providing a greater fire resistance than regular gypsum wallboard of the same thickness. Type X (special fire-resistant) gypsum wallboard, when tested in accordance with Test Methods E 119, shall provide the following minimum fire resistance ratings for the assemblies described:

X1.1.1 1 h for a 5/8 in. (15.9 mm) thickness applied to a partition in a single layer application on each side of 3 5/8 in. (92 mm) deep non-loadbearing galvanized steel studs complying with Specification C 645 spaced 24 in. (610 mm) on center. The 5/8 in. (15.9 mm) thick gypsum wallboard 48 in. (1220 mm) wide shall be attached using 1 in. (25 mm) long drywall screws spaced 8 in. (203 mm) on center along the edges and ends, and 12 in. (305 mm) along intermediate studs. All joints shall be oriented parallel to and located over studs and staggered on opposite sides of the assembly. All joints shall be filled with joint compound, covered with joint tape and covered with an additional coat of joint compound.

All screw heads shall be covered with joint compound; and  
 X1.1.2 2 h for a 1/2 in. (12.7 mm) thickness applied to a partition in a double layer application on each side of 2 1/2 in. (64 mm) deep non-loadbearing galvanized steel studs complying with Specification C 645 spaced 24 in. (610 mm) on center. The base layer 48 in. (1220 mm) wide shall be attached using 1 in. (25 mm) long drywall screws spaced 12 in. (305 mm) on center along board edges, ends and along intermediate studs. Joints shall be oriented parallel to and located over studs and staggered on opposite sides of the assembly. The face layer 48 in. (1220 mm) wide shall be attached using 1 5/8 in. (41 mm) long drywall screws spaced 12 in. (305 mm) along board edges, ends and along intermediate studs. Joints shall be oriented parallel to and located over studs, offset 24 in. (610 mm) from the base layer joints, and staggered on opposite sides of the assembly. All joints in the face layer shall be filled with joint compound, covered with joint tape and covered with an additional coat of joint compound. All screw heads in the face layer shall be covered with two coats of joint compound.

SUMMARY OF CHANGES

This section identifies the location of changes to this specification that have been incorporated since the last issue. Committee C-11 has highlighted those changes that affect the technical interpretation or use of this specification.

(1) The tapered edge depth range in 6.2.4 was revised from 0.015 (0.38 mm) - 0.075 in. (1.90 mm) to 0.020 (0.51 mm) - 0.090 in. (2.29 mm).

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