Designation: C 36/C 36M – 01

Standard Specification for Gypsum Wallboard[1]

This standard is issued under the fixed designation C 36/C 36M; 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 Department of Defense.

1. Scope *

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

NOTE 1—Specification C 840 contains application procedures for gypsum wallboard.

1.2 The values stated in either inch-pound or SI (metric) units are to be regarded separately as standard. Within the text, the SI units are shown in brackets. The values stated in each system shall be used independent of the other. Values from the two systems shall not be combined.

1.3 The text of this standard references notes and footnotes that provide explanatory material. These notes and footnotes (excluding those in tables and figures) shall not be considered as requirements of the standard.

2. Referenced Documents

2.1 *ASTM Standards:*

C 11 Terminology Relating to Gypsum and Related Building Materials and Systems[2]

C 473 Test Methods for Physical Testing of Gypsum Panel Products[2]

C 645 Specification for Nonstructural Steel Framing Members[2]

C 840 Specification for Application and Finishing of Gypsum Wallboard[2]

C 1264 Specification for Sampling, Inspection, Rejection, Certification, Packaging, Marking, Shipping, Handling, and Storage of Gypsum Board[2]

E 84 Test Method for Surface Burning Characteristics of Building Materials[3]

E 96 Test Methods for Water Vapor Transmission of Materials[4]

E 119 Test Methods for Fire Tests of Building Construction and Materials[3]

3. Terminology

3.1 Definitions of terms 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.

4.2 Foil-backed gypsum wallboard shall consist of gypsum wallboard with a layer of aluminum foil laminated to the back surface.

4.3 Gypsum wallboard, type X (special fire-resistant) designates gypsum wallboard complying with this specification that provides not less than 1 h fire-resistance for boards ⅝ in. [15.9 mm] thick or ¾ h fire-resistance for boards ½ in. [12.7 mm] thick, applied parallel with and on each side of load bearing 2 × 4 wood studs spaced 16 in. [406 mm] o.c. with 6d coated nails, 1⅞ in. [48 mm] long, 0.0915 in. [2.32 mm] diameter shank, ¼ in. [6.4 mm] diameter heads, spaced 7 in. [178 mm] o.c. with wallboard joints staggered 16 in. [406 mm] on each side of the partition and tested in accordance with the requirements of Test Method E 119.

NOTE 2—Consult producers for independent test data on assembly details and fire resistance classifications for other types of construction. See fire test reports, or listings from recognized fire testing laboratories, for assembly particulars, materials, and classifications.

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

5. Physical Properties

5.1 Specimens shall be taken from the samples obtained in accordance with Specification C 1264.

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

[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 C11.01 on Specifications and Test Methods for Gypsum Products.

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[2] *Annual Book of ASTM Standards,* Vol 04.01.

[3] *Annual Book of ASTM Standards,* Vol 04.07.

[4] *Annual Book of ASTM Standards,* Vol 04.06.

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

5.2.1 *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
¼ [6.4]	50 [222]	20 [89]	46 [205]	16 [71]
5⁄16 [7.9]	65 [289]	25 [111]	62 [276]	21 [93]
⅜ [9.5]	80 [356]	30 [133]	77 [343]	26 [116]
½ [12.7]	110 [489]	40 [178]	107 [476]	36 [160]
⅝ [15.9]	150 [667]	50 [222]	147 [654]	46 [205]
¾ [19.0]	170 [756]	60 [267]	167 [743]	56 [249]

5.2.2 *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]
¼ [6.4]	not required
5⁄16 [7.9]	not required
⅜ [9.5]	15 [48]
½ [12.7]	10 [32]
⅝ [15.9]	5 [16]
¾ [19.0]	5 [16]

5.2.3 *Core, End, and Edge Hardness*—The specimens shall have an average hardness of not less than 15 lbf [67 N] when tested by Method A and 11 lbf [49 N] when tested by Method B.

5.2.4 *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 [180]	36 [160]
5⁄16 [7.9]	50 [220]	46 [200]
⅜ [9.5]	60 [270]	56 [250]
½ [12.7]	80 [360]	77 [340]
⅝ [15.9]	90 [400]	87 [390]
¾ [19.0]	100 [440]	97 [430]

5.3 *Foil-Backed Gypsum Wallboard*:

5.3.1 Foil-backed gypsum wallboard shall meet all of the requirements for gypsum wallboard.

5.3.2 When tested in accordance with Test Method E 96, the permeance of foil-backed gypsum wallboard shall be not more than 0.30 perm [17 ng/Pa·s·m^2] (Desiccant Method) 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 Tolerances

6.1 Specimens shall be taken from the samples obtained in accordance with Specification C 1264.

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, 5⁄16, ⅜, ½, ⅝, ¾ in. [6.4, 7.9, 9.5, 12.7, 15.9, 19.0 mm] with tolerances in the nominal thickness of ± 1⁄64 in. [0.4 mm] with local variations of ± 1⁄32 in. [0.8 mm] from the nominal thickness.

6.2.2 *Width*—The nominal width shall be up to 48 in. [1220 mm], or up to 54 in. [1370 mm], with a tolerance of 3⁄32 in. [3 mm] under the specified width.

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

Thickness in. [mm]	Length ft. [mm]	Variation in. [mm]
¼ [6.4]	4 to 12 [1220 to 3660]	±¼ [6]
5⁄16 [7.9]	4 to 14 [1220 to 4270]	±¼ [6]
⅜ [9.5]	4 to 16 [1220 to 4880]	±¼ [6]
½ [12.7]	4 to 16 [1220 to 4880]	±¼ [6]
⅝ [15.9]	4 to 16 [1220 to 4880]	±¼ [6]
¾ [19.0]	4 to 16 [1220 to 4880]	±¼ [6]

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 tolerance of ± ⅛ in. [3 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. Finish and Appearance

7.1 The surfaces of gypsum wallboard shall be true and free from imperfections that render the gypsum wallboard unfit for use with or without decoration.

8. Sampling, Inspection, Rejection, Certification, Packaging, Marking, Shipping, Handling and Storage

8.1 Shall be in accordance with Specification C 1264.

9. Keywords

9.1 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. They are not part of this specification.

The definition of type X as given in 4.3 and the alternate definition given in this appendix, are intended only as a test to define the gypsum board as meeting the requirements of type X. These tests do not indicate a preferred application nor do they limit the use of the product in other fire rated assemblies.

All gypsum panel products for which type X is defined, except gypsum lath and gypsum shaftliner board, use the same test for type X products, therefore the type X designation indicates a consistent level of fire resistance.

X1. 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 for the assemblies described:

X1.1.1 One h for a ⅝ in. [15.9 mm] thickness applied to a partition in a single layer application on each side of 3⅝ in. [92 mm] deep non-loadbearing galvanized steel studs complying with Specification C 645, spaced 24 in. [610 mm] on center. The ⅝ 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, and,

X1.1.2 Two hours for a ½ in. [12.7 mm] thickness applied to a partition in a double layer application on each side of 2½ in. [64 mm] deep non-loadbearing galvanized steel studs complying with Specification C 645, spaced 24 in. [610 mm] on center. The 48 in. [1220 mm] wide base layer 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 48 in. [1220 mm] wide face layer shall be attached using 1⅝ 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.

SUMMARY OF CHANGES

Committee C-11 has identified the location of selected changes to this standard since the last issue, C 36/C 36M–99$^{\epsilon 1}$, that may impact the use of this standard.

(*1*) Note 2 was revised.