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## Standard Specification for Gypsum Wallboard (Hard Metric Sizes)<sup>1</sup>

This standard is issued under the fixed designation C1597M; 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.

<sup>ε1</sup> NOTE—Specification C 36/C 36M was replaced with Specification C1396/C1396M editorially in 1.2 and Referenced Documents in September 2009.

### 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 C840 contains application procedures for gypsum wallboard.

1.2 The values stated in SI units are to be regarded as standard. No other units of measurement are included in this standard. For gypsum wallboard produced to inch-pound units see Specification C1396/C1396M.

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*:<sup>2</sup>

C11 Terminology Relating to Gypsum and Related Building Materials and Systems

C473 Test Methods for Physical Testing of Gypsum Panel Products

C645 Specification for Nonstructural Steel Framing Members

C840 Specification for Application and Finishing of Gypsum Board

C1264 Specification for Sampling, Inspection, Rejection, Certification, Packaging, Marking, Shipping, Handling, and Storage of Gypsum Panel Products

C1396/C1396M Specification for Gypsum Board

E84 Test Method for Surface Burning Characteristics of Building Materials

<sup>1</sup> 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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<sup>2</sup> 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.

E96/E96M Test Methods for Water Vapor Transmission of Materials

E119 Test Methods for Fire Tests of Building Construction and Materials

### 3. Terminology

3.1 Definitions of terms shall be in accordance with Terminology C11.

### 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 hour fire-resistance for boards 16 mm thick or ¾ hour fire-resistance for boards 13 mm thick, applied parallel with and on each side of load bearing 2 × 4 wood studs spaced 400 mm o.c. with coated nails, 50 mm long, 2.0 mm diameter shank, 6.0 mm diameter heads, spaced 200 mm o.c. with wallboard joints staggered 400 mm on each side of the partition and tested in accordance with the requirements of Test Methods E119.

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 E84.

### 5. Physical Properties

5.1 Specimens shall be taken from the samples obtained in accordance with Specification C1264.

5.2 Specimens shall be tested in accordance with Test Methods C473.



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, N Bearing Edges Across Fiber of Surfacing	Load, N Bearing Edges Parallel to Fiber of Surfacing	Load, N Bearing Edges Across Fiber of Surfacing	Load, N Bearing Edges Parallel to Fiber of Surfacing
6.5	220	90	200	70
10.0	360	140	340	120
13.0	500	180	480	160
16.0	660	220	640	200
20.0	760	260	740	240

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

Thickness, mm	Humidified Deflection, mm
6.5	not required
10.0	40
13.0	30
16.0	15
20.0	15

5.2.3 *Core, End, and Edge Hardness*—The specimens shall have an average hardness of not less than 60 N when tested by Method A and 50 N when tested by Method B.

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

Thickness, mm	Method A Nail Pull Resistance, N	Method B Nail Pull Resistance, N
6.5	180	160
10.0	280	260
13.0	360	340
16.0	400	390
20.0	440	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 Methods E96/E96M, the permeance of foil-backed gypsum wallboard shall be not more than 20 ng/Pa·s·m<sup>2</sup> (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 C1264.

6.2 Thickness, width, length, and end squareness shall be determined in accordance with Test Methods C473.

6.2.1 *Thickness*—The thickness shall be 6.5, 10.0, 13.0, 16.0, 20.0 mm with tolerances in the nominal thickness of  $\pm 0.5$  mm with local variations of  $\pm 1.0$  mm from the nominal thickness.

6.2.2 *Width*—The width shall be up to 1400 mm, with a tolerance of 3 mm under the specified width.

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

Thickness mm	Length mm	Variation mm
6.5	1200 to 4000	$\pm 6$
10.0	1200 to 5000	$\pm 6$
13.0	1200 to 5000	$\pm 6$
16.0	1200 to 5000	$\pm 6$
20.0	1200 to 5000	$\pm 6$

6.2.4 *Tapered Edge Depth*—The average thickness of the edge of recessed or tapered edge shall be not less than 0.50 mm but not more than 2.5 mm less than the average thickness of the gypsum wallboard.

6.2.5 *End Squareness*—Corners shall be square with a tolerance of  $\pm 3$  mm in the full width of the board.

6.3 *Edges and Ends*—The edges and ends shall be straight and either square, 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 C1264.

## 9. Keywords

9.1 ceiling; foil-backed; gypsum; gypsum wallboard; gypsum wallboard, type X; metric units; partitions; wall

## APPENDIX

(Nonmandatory Information)

### X1. ALTERNATE DEFINITION FOR TYPE X

#### INTRODUCTION

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 wallboard 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, except lath, shaftliner, and coreboard, use the same test for type X products, therefore the type X designation indicates a consistent level of fire resistance.

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 E119, shall provide the following minimum fire resistance for the assemblies described:

X1.1.1 One hour for a 16.0 mm thickness applied to a partition in a single layer application on each side of 90 mm deep non-loadbearing galvanized steel studs complying with Specification C645, spaced 600 mm on center. The 16.0 mm thick gypsum wallboard 1200 mm wide shall be attached using 25 mm long drywall screws spaced 200 mm on center along the edges and ends, and 300 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 13.0 mm thickness applied to a partition in a double layer application on each side of 65 mm deep non-loadbearing galvanized steel studs complying with Specification C645, spaced 600 mm on center. The 1200 mm wide base layer shall be attached using 25 mm long drywall screws spaced 300 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 1200 mm wide face layer shall be attached using 40 mm long drywall screws spaced 300 mm along board edges, ends, and along intermediate studs. Joints shall be oriented parallel to and located over studs, offset 600 mm from the base layer joints, and staggered on opposite sides of the assembly.

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