



# Standard Practice for Specimen Preparation and Mounting of Textile, Paper or Vinyl Wall or Ceiling Coverings to Assess Surface Burning Characteristics<sup>1</sup>

This standard is issued under the fixed designation E 2404; 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.

## 1. Scope

1.1 This practice describes procedures for specimen preparation and mounting when testing textile, paper or vinyl (including expanded vinyl) wall or ceiling covering materials to assess flame spread and smoke development as surface burning characteristics using Test Method E 84.

1.2 Testing is conducted with Test Method E 84.

1.3 This practice does not provide pass/fail criteria that can be used as a regulatory tool.

1.4 Use the values stated in inch-pound units as the standard, in referee decisions. The values in the SI system of units are given in parentheses, for information only; see IEEE/ASTM SI-10 for further details.

1.5 This fire standard cannot be used to provide quantitative measures.

1.6 Fire testing of products and materials is inherently hazardous, and adequate safeguards for personnel and property shall be employed in conducting these tests. Fire testing involves hazardous materials, operations, and equipment. This standard gives instructions on specimen preparation and mounting, but the fire-test-response method is given in Test Method E 84. See also Section 10.

1.7 *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.*

1.8 The text of this standard references notes and footnotes which provide explanatory material. These notes and footnotes shall not be considered requirements of the standard.

## 2. Referenced Documents

2.1 *ASTM Standards:*<sup>2</sup>

C 36/C 36M Specification for Gypsum Wallboard<sup>3</sup>

C 1186 Specification for Flat Fiber-Cement Sheets

C 1396/C 1396M Specification for Gypsum Board

E 84 Test Method for Surface Burning Characteristics of Building Materials

E 136 Test Method for Behavior of Materials in a Vertical Tube Furnace at 750C

E 176 Terminology of Fire Standards

IEEE/ASTM SI-10 International System of Units (SI): The Modern Metric System

2.2 *CSA Standard:*<sup>4</sup>

CSA O121 Douglas Fir Plywood

2.3 *NIST Standard:*

~~Voluntary Product Standard PS 1-95 Construction and Industrial Plywood~~ NIST Standard:<sup>5</sup>

Voluntary Product Standard PS 1-07 Structural Plywood

## 3. Terminology

3.1 *Definitions*—For definitions of terms used in this practice refer to the terminology contained in Terminology E 176.

<sup>1</sup> This practice is under the jurisdiction of ASTM Committee E05 on Fire Standards and is the direct responsibility of Subcommittee E05.22 on Surface Burning.

Current edition approved Nov. Oct. 1, 2007-2008. Published November 2007-2008. Originally approved in 2005. Last previous edition approved in 2007 as E 2404-07a.

<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.

<sup>3</sup> Withdrawn.

<sup>4</sup> Available from Canadian Standards Association (CSA), 178 Rexdale Blvd., Toronto, ON Canada M9W 1R3.

<sup>5</sup> Available from National Institute of Standards and Technology (NIST), 100 Bureau Dr., Gaithersburg, MD 20899-3460.

### 3.2 Definitions of Terms Specific to This Standard:

3.2.1 *expanded vinyl wall or ceiling covering, n*—a wall or ceiling covering consisting of a woven textile backing, an expanded vinyl base coat layer (which is a homogeneous vinyl layer that contains a blowing agent), and a nonexpanded vinyl skin coat.

3.2.2 *paper wall or ceiling covering, n*—a wall or ceiling covering with a top layer consisting of paper or an alternative cellulosic-based material, but not consisting of a wood product.

3.2.3 *self-supporting specimen, n*—a specimen that remains in place by its own structural characteristics both before and during the fire test.

3.2.4 *textile, n*—originally a woven fabric, now generally applied to (1) staple fibers and filaments suitable for conversion to or use as yarns or for the preparation of nonwoven fabrics, (2) yarns made from natural or manufactured fibers, and (3) fabrics made from fibers as defined in (1) and (2) and from yarns.

3.2.5 *vinyl wall or ceiling covering, n*—a wall or ceiling covering produced by applying a poly(vinyl chloride) (PVC, vinyl) based coating, or laminating a preformed vinyl film, onto a woven or nonwoven fabric substrate or paper.

3.2.6 *wall or ceiling covering, n*—for purposes of this practice, a textile-, paper- or vinyl-based product designed to be attached to a wall or ceiling surface for decorative or acoustical purposes.

3.2.6.1 *Discussion*—Wall or ceiling coverings with ink or topcoat layers added as part of the manufacturing process are included in this definition.

3.2.7 *wall or ceiling covering system, n*—for purposes of this practice, an assembly of a textile wall or ceiling covering, a paper wall or ceiling covering or a vinyl wall or ceiling covering, adhesive (if used), and substrate (if it is part of the assembly) used as a wall or ceiling treatment for decorative or acoustical purposes.

3.2.7.1 *Discussion*—The wall or ceiling covering material is usually intended to be directly attached to a substrate, via adhesives or mechanical fasteners. In some cases the wall or ceiling covering system will be supported by a frame system some distance away from the wall or ceiling covering material.

## 4. Summary of Practice

4.1 This practice describes procedures for specimen preparation and mounting when testing textile, paper or vinyl (including expanded vinyl) wall or ceiling coverings to assess flame spread and smoke development as surface burning characteristics using Test Method E 84.

## 5. Significance and Use

5.1 Textile, paper and vinyl (including expanded vinyl) wall or ceiling coverings and wall or ceiling covering systems used as interior finish are often evaluated with Test Method E 84 to comply with building or life safety code requirements. This practice describes specimen preparation and mounting procedures for such materials and systems.

5.2 This practice is not applicable to the following materials:

5.2.1 Wall or ceiling coverings with exposed wood surfaces, and

5.2.2 Any wall or ceiling covering system where the top layer is not a textile material, a paper-based material or a vinyl material.

## 6. Conditioning

6.1 The test specimens shall be conditioned as described in the section on specimen conditioning in Test Method E 84.

## 7. Test Specimens

7.1 The test specimen sizes shall comply with those described in the test specimen section of Test Method E 84. The test specimens shall be butted against the vent end of the fire test chamber and shall consist of a continuous, unbroken length, or of sections joined end-to-end. The test specimens shall have a width of 20 to 24 in. (510 to 610 mm), a length of 24 ft + 12 in. – 6 in. (7.32 m + 305 mm – 152 mm) and a maximum thickness of 4 in. (101 mm).

7.2 The wall covering system test specimens shall be prepared as described in Section 8.

## 8. Test Specimen Preparation

8.1 Whenever a wall or ceiling covering system uses an adhesive to attach a wall or ceiling covering material, the adhesive specified by the manufacturer shall be used for construction of the test specimen in accordance with the wall or ceiling covering manufacturer application instructions.

8.1.1 If the wall or ceiling covering system is a factory-produced wall panel, the adhesive shall be the same one used in the manufacture of the factory-produced wall or ceiling panel.

8.2 *Wall or Ceiling Coverings Intended to be Applied Directly to a Noncombustible Wall or Ceiling Surface*—If the wall or ceiling coverings are intended to be applied directly to a noncombustible wall or ceiling surface, the specimens shall consist of the wall or ceiling covering mounted on a ¼ in. (6.3 mm) thick fiber-cement board, complying with Specification C 1186 (Grade II) and passing Test Method E 136, as described in the Annex on Cement Board Requirements of Test Method E 84. Mount the specimens on the ledges of the Test Method E 84 furnace without using additional means of support.

8.3 *Wall or Ceiling Coverings Intended to be Applied over Gypsum Board*—If the wall or ceiling coverings are intended to be applied over gypsum board, the specimens shall consist of the wall or ceiling covering mounted on a 5/8 in. (15.9 mm) thick Type