



Designation: E 2404 – 05

Standard Practice for Specimen Preparation and Mounting of Paper or Vinyl Wall Coverings to Assess Surface Burning Characteristics¹

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 (ε) 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 paper or vinyl (including expanded vinyl) wall coverings 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 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.

1.8 *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.*

2. Referenced Documents

2.1 ASTM Standards:²

C 36 Specification for Gypsum Wallboard

C 1186 Specification for Flat Non-Asbestos 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 750°C

E 176 Terminology of Fire Standards

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

2.2 CSA Standard:³

CSA O121 Douglas Fir Plywood

2.3 NIST Standard:⁴

Voluntary Product Standard PS 1-95 Construction and Industrial Plywood

3. Terminology

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

3.2 *Definitions of Terms Specific to This Standard:*

3.2.1 *expanded vinyl wall covering, n*—a wall 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 covering, n*—a wall 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 *vinyl wall covering, n*—a wall 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.

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

¹ 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.

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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.

³ Available from Canadian Standards Association (CSA), 178 Rexdale Blvd., Toronto, ON Canada M9W1R3.

⁴ Available from National Institute of Standards and Technology (NIST), 100 Bureau Dr., Stop 3460, Gaithersburg, MD 20899-3460.

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

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

4. Summary of Practice

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

5. Significance and Use

5.1 Paper and vinyl (including expanded vinyl) wall coverings and wall 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 coverings with exposed textile surfaces,
- 5.2.2 Wall coverings with exposed wood surfaces,
- 5.2.3 Any wall covering system where the top layer is not a paper-based material or a vinyl material, and
- 5.2.4 Ceiling coverings.

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

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

8.2 *Wall Coverings Intended to be Applied Directly to a Noncombustible Wall Surface*—If the wall coverings are in-

tended to be applied directly to a noncombustible wall surface, the specimens shall consist of the wall 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 Coverings Intended to be Applied over Gypsum Board*—If the wall coverings are intended to be applied over gypsum board, the specimens shall consist of the wall covering mounted on a ⅝ in. (15.9 mm) thick Type X gypsum board, complying with Specification C 36 or Specification C 1396/C 1396M. The gypsum board shall not be required to be mounted on studs. Mount the specimens on the ledges of the Test Method E 84 furnace without using additional means of support.

8.3.1 Whenever a wall covering has been tested using the test specimen described in 8.3 (over gypsum board), it shall not be required to be additionally tested mounted on a fiber-cement board.

8.4 *Wall Coverings Intended to be Applied over a Wood Substrate*—If the wall coverings are intended to be applied over a wood substrate, the specimens shall consist of the wall covering mounted on untreated plywood, with a face veneer of Douglas fir. The plywood shall have the same thickness as the wood substrate used in field practice, and shall comply with NIST Voluntary Product Standard PS 1-95, Construction and Industrial Plywood. The plywood shall carry the grade stamp of either APA The Engineered Wood Association⁵ or TECO⁶, indicating that the plywood has been graded PS 1-95 A-B and is for exterior exposure. Alternatively, the plywood shall be permitted to be stamped as conforming to CSA Standard O121 (Douglas fir plywood). Mount the specimens on the ledges of the Test Method E 84 furnace without using an additional means of support.

8.5 *Wall Coverings Intended to be Applied over Substrates other than Wood, Gypsum Board or Noncombustible Surfaces*—If the wall coverings are intended to be applied over substrates other than wood, gypsum board or noncombustible surfaces, the specimens shall consist of the wall covering mounted on the substrate to be used in field practice. Mount the specimens on the ledges of the Test Method E 84 furnace without using an additional means of support.

8.6 *Wall Coverings Not Intended to be Adhered Directly to a Wall Surface, but Intended to be Otherwise Supported by Framing or a Track System*—The specimens shall consist of the wall covering mounted for test in a manner that is representative of its installation.

9. Testing of Specimens

9.1 All testing shall be conducted using the methodology described in Test Method E 84.

⁵ Information available from APA The Engineered Wood Association, 7011 South 19th, Tacoma, WA, 98466.

⁶ Information available from TECO, 5650 Terra Court, Springfield, MA 01104.