Designation: E2573 – 17

An American National Standard

Standard Practice for Specimen Preparation and Mounting of Site-Fabricated Stretch Systems to Assess Surface Burning Characteristics[1]

This standard is issued under the fixed designation E2573; 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 a site-fabricated stretch system to assess flame spread and smoke developed as surface-burning characteristics using Test Method E84.

1.2 Testing is conducted with Test Method E84.

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

1.4 The values stated in inch-pound units are to be regarded as standard. The values given in parentheses are mathematical conversions to SI units that are provided for information only and are not considered standard. 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 E84. See also Section 10.

1.7 This practice shall not apply to vinyl stretch ceiling materials, which are covered by Practice E2599.

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.*

1.9 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.

1.10 *This international standard was developed in accordance with internationally recognized principles on standardization established in the Decision on Principles for the Development of International Standards, Guides and Recommendations issued by the World Trade Organization Technical Barriers to Trade (TBT) Committee.*

2. Referenced Documents

2.1 *ASTM Standards:*[2]

E84 Test Method for Surface Burning Characteristics of Building Materials

E176 Terminology of Fire Standards

E2599 Practice for Specimen Preparation and Mounting of Reflective Insulation, Radiant Barrier and Vinyl Stretch Ceiling Materials for Building Applications to Assess Surface Burning Characteristics

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

3. Terminology

3.1 *Definitions*—For definitions of terms used in this practice refer to Terminology E176.

3.2 *Definitions of Terms Specific to This Standard:*

3.2.1 *frame, n*—an item (plastic extrusion, wood, metal or other material) that is mounted to an existing substrate via mechanical fasteners or adhesive, that has a mechanism for holding an outer layer (fabric or vinyl) by tension.

3.2.2 *joining material, n*—the frame piece used to join two or more site fabricated stretch panels together, to create a midseam.

3.2.3 *longitudinal midseam, n*—a seam made from the joining material used in the stretch system, which is centered on the test specimen and runs the entire length of the test specimen.

3.2.4 *self-supporting specimen, n*—a specimen that remains in place by its own structural characteristics both before and during the fire test or is burnt or pyrolyzed prior to falling away from its original position.

[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.

3.2.5 *site-fabricated stretch system, n*—a system, fabricated on site and intended for acoustical, tackable or aesthetic purposes, that is comprised of three elements: *(a)* a frame (constructed of plastic, wood, metal or other material) used to hold fabric in place, *(b)* a core material (infill, with the correct properties for the application), and *(c)* an outside layer, comprised of a textile, fabric or vinyl, that is stretched taut and held in place by tension or mechanical fasteners via the frame.

3.2.6 *vinyl stretch ceiling material, n*—a vinyl material stretched and mechanically fastened to a noncombustible frame and intended to be used as a suspended ceiling without associated backing material.

3.2.7 *wide span system, n*—a system that employs a wide span fabric or vinyl, from 10 ft or more in width and minimizes the use of a midseam or "joining" material.

4. Summary of Practice

4.1 This practice describes procedures for specimen preparation and mounting when testing a site-fabricated stretch system to assess flame spread and smoke developed as surface burning characteristics using Test Method E84.

5. Significance and Use

5.1 Site-fabricated stretch systems used as interior finish are evaluated with Test Method E84 to comply with building, fire, or life safety code requirements. This practice describes specimen preparation and mounting procedures for such materials and systems.

5.2 The limitations for this procedure are those associated with Test Method E84.

5.3 *Additional Limitations*—This practice does not apply to test systems that cannot be used to produce self-supporting specimens. If the test specimen is not self-supporting, further guidance can be found in the appendix of Test Method E84.

5.4 This practice shall not apply to vinyl stretch ceiling materials, which are covered by Practice E2599.

6. Conditioning

6.1 The test specimens shall be conditioned as described in the section on specimen conditioning in Test Method E84.

7. Test Specimens

7.1 Testing is to be conducted of test specimens representing the composite site-fabricated stretch system.

7.2 The test specimen shall contain a frame, core material and an outside layer (textile, fabric or vinyl), representing the installed system being tested.

7.3 The test specimen sizes shall comply with those described in the test specimen section of Test Method E84. The test specimens shall have a width of between 20¼ in. and 24 in. (514 mm and 609 mm), a total length of 24 ft + 12 in. – 6 in. (7.32 m + 305 mm – 152 mm), a minimum thickness of 0.5 in. (13 mm) and a maximum thickness of 4 in. (101 mm). The total test specimen shall consist of sections joined end-to-end. The minimum length of each section shall be the minimum size of the system to be used in installed systems, except that the last section (furthest away from the vent end) shall be permitted to be smaller to complete the total specimen length.

NOTE 1—Typical frame lengths in installed systems are 6 to 9 ft (1848-2772 mm).

NOTE 2—Test Method E84 is intended for test specimens no thicker than 4 in. (101 mm).

7.4 If the total thickness of the installed system being tested exceeds 4 in. (101 mm), construct a test specimen with a thinner frame, using the same materials, for a total thickness of 4 in. (101 mm).

8. Test Specimen Preparation for Composite Site-Fabricated Stretch Systems

8.1 The test specimen shall be prepared according to the manufacturer's installation instructions.

8.2 The test specimen shall be self-supporting panels.

8.3 The test specimen sections shall consist of the frame material on the panel perimeters, the core material, and the textile, fabric or vinyl covering.

8.4 The test specimens shall have a longitudinal midseam (made from the frame pieces or from a joining piece) running the entire length of the specimen, to ensure that all components of the system are exposed to the flame front for the duration of the test.

8.4.1 If the site-fabricated stretch system test specimen requires support of the longitudinal midseam, it shall be supported by ¼ in. (6.3 mm) diameter steel rods spanning the width of the tunnel and spaced not closer than 24 in. (609 mm) apart.

8.5 For wide span systems (see 3.2.7), the normal "frame" piece shall be used to create the longitudinal midseam on the test specimens.

8.6 The test specimens for systems that are installed over gypsum wallboard in the field shall be prepared as discussed above, with the test specimen then attached to gypsum wallboard using the manufacturers' recommended mounting procedure. The system shall include the longitudinal midseam running the entire length of the test specimen.

8.6.1 If the gypsum wallboard is not sufficient to support the weight of the test specimen assembly, the use of ¼ in. (6.3 mm) diameter steel rods, spanning the width of the tunnel and spaced not closer than 24 in. (609 mm) apart, shall be permitted to be used to support the assembly.

9. Testing of Specimens

9.1 All testing shall be conducted using the methodology described in Test Method E84.

10. Operator Safety

10.1 The primary concerns for operator safety are associated with the fire-test-response procedure, Test Method E84, and not with the specimen preparation procedure. Safety recommendations are included in Test Method E84.

11. Report

11.1 Report the following within the Test Method E84 test report:

11.1.1 a detailed description of the system being tested, including a description of the type of frame, core and outside layer materials being used and of the relative dimensions of each.

11.1.2 a detailed description of the specimen preparation used as per Section 8 of this document.

11.1.3 measurements (thickness and width, in inches and millimeters) of the midseam (joining material) that are placed longitudinally down the center of the test specimen.

11.1.4 all observations, graphical results and the values of the flame spread index and of the smoke developed index in each test.

12. Keywords

12.1 fabric; fire; fire test; flame spread; smoke development; stretch system; textile; vinyl