



Designation: **E2599—18** **E2599 – 22**

An American National Standard

# Standard Practice for Specimen Preparation and Mounting of Reflective Insulation, Radiant Barrier and Vinyl Stretch Ceiling Materials for Building Applications to Assess Surface Burning Characteristics<sup>1</sup>

This standard is issued under the fixed designation E2599; 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 a procedure for specimen preparation and mounting when testing reflective insulation, radiant barrier and vinyl stretch ceiling materials to assess flame spread and smoke development as surface burning characteristics using Test Method **E84**.

1.2 This practice is for reflective insulation materials and radiant barrier materials intended for mechanical fastening to substrates or building structural members, or intended to be mounted to a substrate with an adhesive.

1.3 Specimens of reflective insulation materials and radiant barrier materials intended for mechanical fastening shall be prepared and mounted in accordance with **6.1**. Specimens of reflective insulation materials and radiant barrier materials intended to be mounted to a substrate with an adhesive shall be prepared and mounted in accordance with **6.2**. If the reflective insulation material or sheet radiant barrier material includes manufacturer recommended installation instructions with the option to be installed either by mechanical attachment or adhered, the insulation material shall be tested by both mounting procedures as outlined in **6.1** and **6.2**.

1.4 Specimens of vinyl stretch ceiling materials shall be prepared and mounted in accordance with **6.1**.

NOTE 1—Vinyl stretch ceiling materials are mechanically fastened.

1.5 This practice shall apply to reflective insulation materials and radiant barrier materials as defined in Section **3**.

1.6 This practice shall apply to reflective plastic core insulation materials as defined in **3.2.3**. Reflective plastic core insulation materials are one specific type of reflective insulation materials.

1.7 This practice shall apply to vinyl stretch ceiling materials as defined in Section **3**.

1.8 This practice shall not apply to rigid foam plastics with or without reflective facers.

<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 March 1, 2018; Nov. 1, 2022. Published April 2018; November 2022. Originally approved in 2009. Last previous edition approved in 2016; 2018 as **E2599-16**; **E2599-18**. DOI: [10.1520/E2599-18](https://doi.org/10.1520/E2599-18); [10.1520/E2599-22](https://doi.org/10.1520/E2599-22).

- 1.9 This practice shall not apply to site-fabricated stretch systems covered by Practice [E2573](#).
- 1.10 Testing is conducted in accordance with Test Method [E84](#).
- 1.11 This practice does not provide pass/fail criteria that can be used as a regulatory tool.
- 1.12 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.
- 1.13 This fire standard cannot be used to provide quantitative measures.
- 1.14 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 practice gives instructions on specimen preparation and mounting but the fire-test-response method is given in Test Method [E84](#). See also Section [8](#).
- 1.15 The text of this practice references notes and footnotes which provide explanatory material. These notes and footnotes (excluding those in tables and figures) shall not be considered requirements of the standard.
- 1.16 *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, health, and environmental practices and determine the applicability of regulatory limitations prior to use.*
- 1.17 *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:<sup>2</sup>

- [C168 Terminology Relating to Thermal Insulation](#)
- [C1224 Specification for Reflective Insulation for Building Applications](#)
- [C1313 Specification for Sheet Radiant Barriers for Building Construction Applications](#)
- [E84 Test Method for Surface Burning Characteristics of Building Materials](#)
- [E176 Terminology of Fire Standards](#)
- [E2231 Practice for Specimen Preparation and Mounting of Pipe and Duct Insulation Materials to Assess Surface Burning Characteristics](#)
- [E2573 Practice for Specimen Preparation and Mounting of Site-Fabricated Stretch Systems to Assess Surface Burning Characteristics](#)
- [IEEE/ASTM SI-10 International System of Units \(SI\): The Modern Metric System](#)

### 2.2 ICC Codes:<sup>3</sup>

- [International Building Code \(2021 edition\)](#)

## 3. Terminology

3.1 *Definitions:* For definitions of terms used in this practice and associated with fire issues, refer to the terminology contained in Terminologies [E176](#). For definitions of terms used in this practice and associated with thermal insulation issues refer to Terminology [C168](#).

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

3.2.1 *radiant barrier, n*—a low emittance (0.1 or less) surface used in the construction of a radiant barrier system.

#### 3.2.1.1 *Discussion*—

Radiant barrier materials are defined in Specification [C1313](#).

<sup>2</sup> For referenced ASTM standards, visit the ASTM website, [www.astm.org](http://www.astm.org), or contact ASTM Customer Service at [service@astm.org](mailto: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> Available from International Code Council (ICC), 500 New Jersey Ave., NW, 6th Floor, Washington, DC 20001, <http://www.iccsafe.org>.

3.2.2 *reflective insulation, n*—thermal insulation consisting of one or more low emittance surfaces bounding one or more enclosed air spaces.

3.2.2.1 *Discussion*—

Reflective insulation materials are defined in Specification [C1224](#).

3.2.3 *reflective plastic core insulation, n*—an insulation material packaged in rolls, with at least one exterior low emittance surface (0.1 or less) and a core material containing voids or cells.

3.2.3.1 *Discussion*—

Reflective plastic core insulation materials are one specific type of reflective insulation materials.

3.2.4 *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.

3.2.5 *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.

#### 4. Summary of Practice

4.1 This practice describes a procedure for specimen preparation and mounting when testing reflective insulation, radiant barrier and vinyl stretch ceiling materials to assess flame spread and smoke development as surface burning characteristics using Test Method [E84](#).

4.2 Reflective insulation materials and radiant barrier materials intended for mechanical fastening to substrates or building structural members, or intended to be mounted to a substrate with an adhesive shall be tested in accordance with the specimen preparation and mounting procedures described in this practice, using Test Method [E84](#).

4.3 Reflective insulation materials and radiant barrier materials intended to be used as pipe and duct insulation materials and installed without an air gap shall be tested using the specimen installation and mounting procedures described in Practice [E2231](#). Reflective insulation procedures intended to be used as pipe or duct insulation materials and installed with an air gap shall be tested using the specimen preparation and mounting procedures described in Section 6 of this practice.

4.4 Vinyl stretch ceiling materials intended to be assessed for flame spread and smoke development as surface burning characteristics using Test Method [E84](#) shall be tested in accordance with the specimen preparation and mounting requirements described in 6.1 of this Practice.

#### 5. Significance and Use

5.1 Reflective insulation, radiant barrier and vinyl stretch ceiling materials are evaluated in accordance with Test Method [E84](#) to comply with building or mechanical code requirements. This practice describes, in detail, a specimen mounting procedure for reflective insulation, radiant barrier and vinyl stretch ceiling materials.

5.2 The material shall be representative of the materials used in actual field installations.

5.3 Specimen preparation and mounting procedures for materials not described in this practice shall be added as the information becomes available.

5.4 The limitations for this procedure are those associated with Test Method [E84](#).

5.5 This practice shall not apply to rigid foam plastics with or without reflective facers.

5.6 This practice shall not apply to site-fabricated stretch systems covered by Practice [E2573](#).

6. Specimen Preparation and Mounting

6.1 Specimens of Mechanically Attached Materials:

6.1.1 Specimens shall be mechanically attached to three, steel or aluminum test frames. Each test frame shall be nominally 8.25 ft (2.5 m) by 22 to 24 in. (559 mm to 610 mm) wide by 2 in. (51 mm) deep, made from 2 in. by 2 in. by 3/16 in. (51 mm by 51 mm by 5 mm) aluminum or steel angles or equivalent. No screening or netting shall be attached to the opening of the frames where the test specimen is attached. See Fig. 1.

6.1.2 Each test on a reflective insulation material shall be conducted using a factory or field joint along the longitudinal centerline of the test specimen, with a longitudinal seam created in the approximate centerline using the same method of closure used in actual field installations.

6.1.3 It shall be permitted to represent the field joint on reflective insulation materials by introducing a longitudinal slit cut along the longitudinal centerline of the specimen facing and applying the manufacturer’s recommended field closure system (if applicable). The longitudinal slit shall not be used for radiant barriers or for vinyl stretch ceiling materials.

6.1.4 The specimens shall be of a width sufficient to cover the angle framing for attachment. Specimens shall be placed on the horizontal legs of the angle. See Section A-A of Fig. 1. The specimen shall be attached to each of the horizontal legs using

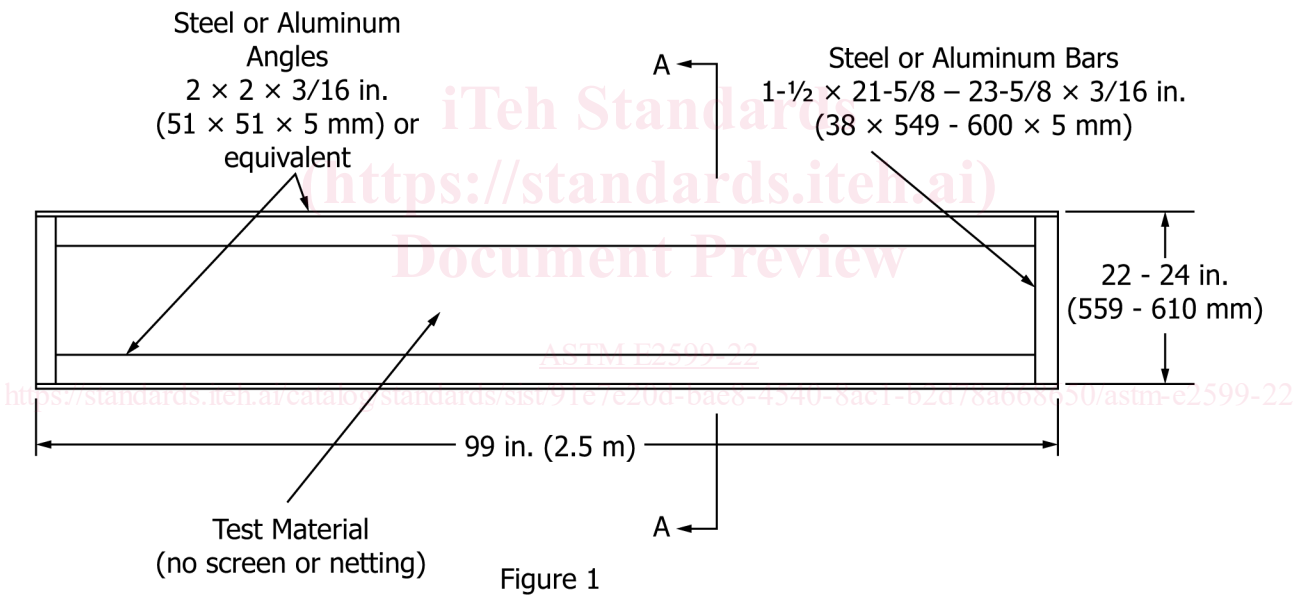
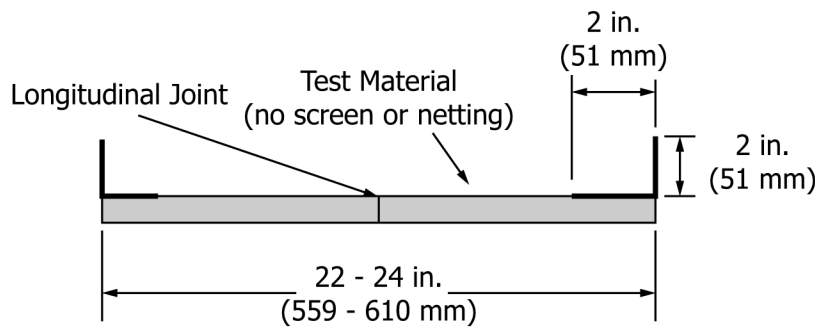


Figure 1



Section A-A

FIG. 1 Mounting Frame (three required)