Designation: E2599 – 09

Standard Practice for Specimen Preparation and Mounting of Reflective Insulation Materials and Radiant Barrier Materials for Building Applications to Assess Surface Burning Characteristics[1]

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 (ε) 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 materials and radiant barrier 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.

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

1.5 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.

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

1.7 Testing is conducted in accordance with Test Method E84.

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

1.9 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-10IEEE/ASTM SI-10 for further details.

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

1.11 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.

1.12 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.

1.13 *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]

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

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 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.

[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 *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.

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, that is less than 0.5 in. (12.7 mm) thick, 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.

4. Summary of Practice

4.1 This practice describes a procedure for specimen preparation and mounting when testing reflective insulation materials and radiant barrier 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 shall be mounted and tested in accordance with Test Method E2231.

5. Significance and Use

5.1 Reflective insulation materials and radiant barrier 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 and radiant barrier 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.

6. Specimen Preparation and Mounting

6.1 *Mechanically Attached Specimens*:

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 - 24 in.(559 - 610 mm) wide by 2 in. (51 mm) deep, made from 2 by 2 by 3/16 in. (51 by 51 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 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 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).

6.1.4 The reflective insulation or the radiant barrier 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 self-tapping screws, through bolts or similar fastening technique. Fasteners shall be placed a maximum of 24 in. (610 mm) on-center down the length on both sides of each 8-ft. (2.4 m) frame.

6.1.5 Mount the three frames with the attached specimen end-to-end on the ledges of the E84 furnace without using any auxiliary support. The specimen shall face the interior of the test chamber. The tunnel lid shall rest on the frame as to create a nominal 2-in. air gap between the insulation and lid.

6.1.6 The two transverse butt joints formed by the three frames are to be left uncovered or taped in accordance with manufacturer's application instructions.

6.2 *Adhesively Attached Specimens*:

6.2.1 Specimens shall be adhesively attached to a substrate. The substrate shall be representative of that used in actual field installation. The substrate shall consist of flat sheets cut to size as appropriate for mounting in Test Method E84.

6.2.2 Each test 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.

6.2.3 It shall be permitted to represent the field joint 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).

6.2.4 Specimens shall be mounted to the substrate using the adhesive that is representative of that used in actual field installation. The adhesive shall be applied per the manufacturer's installation directions.

6.2.5 The specimens shall be of a width sufficient to cover the substrate and the attachment of the specimen to the adhesive shall be in accordance with manufacturer's installation directions.

6.2.6 Mount the substrates with the attached specimens end-to-end on the ledges of the E84 furnace without using any auxiliary support. The specimen shall face the interior of the test chamber.

6.2.7 The transverse butt joints formed by the substrates with the attached specimens are to be left uncovered or taped in accordance with manufacturer's application instructions.

6.3 For materials that are asymmetrical in cross-section, each side of the material shall be tested separately.