



Standard Test Method for Critical Radiant Flux of Exposed Attic Floor Insulation Using an Electric Radiant Heat Energy Source¹

This standard is issued under the fixed designation C 1485; 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 test method covers a procedure for measuring the critical radiant flux of exposed attic floor insulation subjected to a flaming ignition source in a graded radiant heat energy environment inside a test chamber. The test specimen can be any attic floor insulation. This test method is not applicable to those insulations that melt or shrink away when exposed to the radiant heat energy environment or the ignition source.

1.2 This test method measures the critical radiant flux at the farthest point to which the flame advances. It provides a means for relative classification of a fire test response standard for exposed attic floor insulation. The imposed radiant flux simulation levels of thermal radiation are likely to impinge on the surface of exposed attic insulation from roof assemblies heated by the sun and by heat or flames of an incidental fire which may involve an attic space. This test method is intended to simulate an important element of fire exposure that may develop in open attics, but is not intended for use in describing flame spread behavior of insulation installed other than on an attic floor.

1.3 The values stated in SI units are to be regarded as standard. The values given in parentheses are for information only.

1.4 This standard is used to measure and describe the response of materials, products, or assemblies to heat and flame under controlled conditions, but does not by itself incorporate all factors required for fire hazard or fire risk assessment of the material, products, or assemblies under actual fire conditions.

1.5 *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:

C 168 Terminology Relating to Thermal Insulation Materials²

¹ This test method is under the jurisdiction of ASTM Committee C16 on Thermal Insulation and is the direct responsibility of Subcommittee C16.31 on Chemical and Physical Properties.

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² Annual Book of ASTM Standards, Vol. 04.06.

3. Terminology

3.1 Definitions:

3.1.1 For definitions of terms used in this specification, see Terminology C 168.

3.2 Definitions of Terms Specific to This Standard:

3.2.1 *critical radiant flux*—the level of incident radiant heat energy on the attic floor insulation system at the most distant flame-out point in W/cm^2 ($\text{Btu}/\text{ft}^2\text{s}$).

3.2.2 *flux profile*—the curve relating incident radiant heat energy on the specimen plane to distance from the point of initiation of flaming ignition, that is, 0.0 cm. (0.0 in.).

3.2.3 *graded radiant energy*—the heating element is placed on an angled plain.

3.2.4 *total flux meter*—the instrument used to measure the level of radiant heat energy incident on the specimen plane at a given point.

3.2.5 *screed*—gently remove the excess material using a metal straight edge to leave a uniform surface on the insulation flush with the top of the container.

3.2.6 *voltage regulator*—a regulated constant voltage transformer equipped with a voltmeter shall be connected between the chamber and the power source. This will be maintained at 115 ± 5 volts.

4. Summary of Test Method

4.1 A horizontally mounted insulation specimen is exposed to the heat from an electric radiant heat energy panel located above and inclined at 30° to the specimen. After a short preheat, the hottest end of the specimen is ignited with a small flame. The distance to the farthest advance of flaming is measured, converted to watts per square centimeter from a previously prepared graph of the radiant flux profile, and reported as the critical radiant flux.

5. Significance and Use

5.1 This test method is designed to provide a basis for estimating one aspect of the fire exposure behavior of exposed insulation installed on the floor of an open attic. The test environment is intended to simulate attic floor exposure to radiant heat conditions. Radiant heat has been observed and defined in full-scale attic experiments.

6. Apparatus

6.1 Radiant Panel Test Chamber: