



Designation: C1373/C1373M – 11 (Reapproved 2017)

Standard Practice for Determination of Thermal Resistance of Attic Insulation Systems Under Simulated Winter Conditions¹

This standard is issued under the fixed designation C1373/C1373M; 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 presents a laboratory procedure to determine the thermal resistance of attic insulation systems under simulated steady-state winter conditions. The practice applies only to attic insulation systems that face an open attic air space.

1.2 The thermal resistance of the insulation is inferred from calculations based on measurements on a ceiling system consisting of components consistent with the system being studied. For example, such a system might consist of a gypsum board or plywood ceiling, wood ceiling joists, and attic insulation with its top exposed to an open air space. The temperature applied to the gypsum board or plywood shall be in the range of 18 to 24°C [64 to 75°F]. The air temperature above the insulation shall correspond to winter conditions and ranges from –46°C to 10°C [–51 to 50°F]. The gypsum board or plywood ceiling shall be sealed to prevent direct airflow between the warm and cold sides of the system.

1.3 This practice applies to a wide variety of loose-fill or blanket thermal insulation products including fibrous glass, rock/slag wool, or cellulosic fiber materials; granular types including vermiculite and perlite; pelletized products; and any other insulation material that is installed pneumatically or poured in place. The practice considers the effects on heat transfer of structures, specifically the ceiling joists, substrate, for example, gypsum board, air films, and possible facings, films, or other materials that are used in conjunction with the insulation.

1.4 This practice measures the thermal resistance of the attic/ceiling system in which the insulation material has been preconditioned according to the material Specifications C549, C665, C739, and C764.

1.5 The specimen preparation techniques outlined in this standard do not cover the characterization of loose-fill materials intended for enclosed applications.

¹ This practice is under the jurisdiction of ASTM Committee C16 on Thermal Insulation and is the direct responsibility of Subcommittee C16.30 on Thermal Measurement.

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1.6 This practice is to be used to characterize material behavior under controlled steady-state laboratory conditions intended to simulate actual temperature conditions of use. The practice does not simulate forced air flow conditions.

1.7 The values stated in either SI units or inch-pound units are to be regarded separately as standard. The values stated in each system may not be exact equivalents; therefore, each system shall be used independently of the other. Combining values from the two systems may result in non-conformance with the standard.

1.7.1 All values shall be reported in both SI and inch-pound units unless specified otherwise by the client.

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 *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

C167 Test Methods for Thickness and Density of Blanket or Batt Thermal Insulations

C168 Terminology Relating to Thermal Insulation

C177 Test Method for Steady-State Heat Flux Measurements and Thermal Transmission Properties by Means of the Guarded-Hot-Plate Apparatus

C518 Test Method for Steady-State Thermal Transmission Properties by Means of the Heat Flow Meter Apparatus

C520 Test Methods for Density of Granular Loose Fill Insulations

C549 Specification for Perlite Loose Fill Insulation

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.