



Designation: C 447 – 85 (Reapproved 1995)^{€1}

Standard Practice for Estimating the Maximum Use Temperature of Thermal Insulations¹

This standard is issued under the fixed designation C 447; 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 (€) indicates an editorial change since the last revision or reapproval.

€¹ NOTE—Editorial changes were made and Keywords were added editorially in April 1995.

1. Scope

1.1 This practice covers estimation of the maximum use temperature of thermal insulation including loose fill, blanket, block, board, and preformed pipe insulation. It is based upon selected performance criteria, and characterization of product properties during and after use conditions.

1.2 *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 165 Test Method for Measuring Compressive Properties of Thermal Insulations²
- C 167 Test Methods for Thickness and Density of Blanket or Batt Thermal Insulations²
- C 168 Terminology Relating to Thermal Insulating Materials²
- C 177 Test Method for Steady-State Heat Flux Measurements and Thermal Transmission Properties by Means of the Guarded-Hot-Plate Apparatus²
- C 203 Test Methods for Breaking Load and Flexural Properties of Block-Type Thermal Insulation²
- C 302 Test Method for Density of Preformed Pipe-Covering-Type Thermal Insulation²
- C 303 Test Method for Density of Preformed Block-Type Thermal Insulation²
- C 335 Test Method for Steady-State Heat Transfer Properties of Horizontal Pipe Insulation²
- C 411 Test Method for Hot-Surface Performance of High-Temperature Thermal Insulation²
- C 421 Test Method for Tumbling Friability of Preformed Block-Type Thermal Insulation²
- C 446 Test Method for Breaking Load and Calculated

- Modulus of Rupture of Preformed Insulation for Pipes²
- C 518 Test Method for Steady-State Heat Flux Measurements and Thermal Transmission Properties by Means of the Heat Flow Meter Apparatus²
- C 569 Test Method for Indentation Hardness of Preformed Thermal Insulations³
- D 1621 Test Method for Compressive Properties of Rigid Cellular Plastics⁴
- D 1622 Test Method for Apparent Density of Rigid Cellular Plastics⁴

3. Terminology

3.1 Definitions C 168 shall apply to the terms used in this practice.

4. Summary of Practice

4.1 Dimensions, weight and other pertinent properties of the insulation are measured before, during, and after exposure to a hot surface.

4.2 Properties during and after exposure, and, in some cases, the degree of change in properties are reported for use in establishing the maximum service temperature of the insulation material.

5. Significance and Use

5.1 This practice is intended for use as a guide in evaluating the behavior of insulations at elevated temperatures, and in judging suitability for use under the conditions of an intended application. It is not intended for acceptance or certification testing on a lot basis.

5.2 No single test for estimating maximum use temperature can be used that will apply to all types of insulations, nor can any single maximum use temperature be applied to any insulation that will be applicable under all possible conditions of use. Maximum use temperature may depend on thickness, temperature gradient, heating rate, and other factors. When the various test methods listed herein are employed, the test results serve as guides and, as such, must be applied with good engineering judgment in arriving at an acceptable temperature limit for the products and applications being considered.

¹ This practice is under the jurisdiction of ASTM Committee C-16 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 Discontinued—See 1988 Annual Book of ASTM Standards, Vol 04.06.

⁴ Annual Book of ASTM Standards, Vol 08.01.