



Designation: C 591 – 00

Standard Specification for Unfaced Preformed Rigid Cellular Polyisocyanurate Thermal Insulation¹

This standard is issued under the fixed designation C 591; 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.

This standard has been approved for use by agencies of the Department of Defense.

1. Scope

1.1 This specification covers the types, physical properties, and dimensions of unfaced, preformed rigid cellular polyisocyanurate plastic material intended for use as thermal insulation on surfaces from – 70°F (–51°C) to 300°F (150°C). For specific applications, the actual temperature limits shall be agreed upon by the manufacturer and purchaser.

1.2 This specification only covers “polyurethane modified polyisocyanurate” thermal insulation which is commonly referred to as “polyisocyanurate” thermal insulation. This standard does not encompass all polyurethane modified materials. Polyurethane modified polyisocyanurate and other polyurethane materials are similar, but the materials will perform differently under some service conditions.

1.3 This standard is designed as a material specification, not a design document. Physical property requirements vary by application and temperature. Consult the manufacturer for specific recommendations and physical properties regarding applications, which include cryogenic service.

1.4 The use of thermal insulation material covered by this specification may be regulated by building codes that address fire performance.

1.5 The values stated in inch-pound units are to be regarded as the standard. The values given in parentheses are for information only and may be approximate.

1.6 Polyisocyanurate thermal insulation should be kept dry during storage, shipping, installation, start-up, and operation.

1.7 *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

¹ This specification is under the jurisdiction of ASTM Committee C16 on Thermal Insulation and is the direct responsibility of Subcommittee C16.22 on Inorganic and Nonhomogeneous Inorganic Thermal Insulation.

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² Annual Book of ASTM Standards, Vol 04.06.

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 Method for Breaking Load and Flexural Properties of Block-Type Thermal Insulation²

C 236 Test Method for Steady-State Thermal Performance of Building Assemblies by Means of a Guarded Hot Box²

C 272 Test Method for Water Absorption of Core Materials for Structural Sandwich Constructions²

C 303 Test Method for Density of Preformed Block-Type Thermal Insulation²

C 335 Test Method for Steady-State Heat Transfer Properties of Horizontal Pipe²

C 390 Criteria for Sampling and Acceptance of Preformed Thermal Insulation Lots²

C 411 Test Method for Hot Surface Performance of High Temperature Thermal Insulation²

C 518 Test Method for the Steady State Heat Flux Measurements and Thermal Transmission Properties by Means of the Heat Flow Meter Apparatus²

C 550 Practice for Measuring Trueness and Squareness of Rigid Block and Board Thermal Insulation²

C 585 Practice for Inner and Outer Diameters of Rigid Thermal Insulation for Nominal Sizes of Pipe and Tubing (NPS System)²

C 976 Test Method for Thermal Performance of Building Assemblies by Means of a Calibrated Hot Box²

C 1045 Practice for Calculating Thermal Transmission Properties from Steady-State Heat Flux Measurements²

C 1058 Practice for Selecting Temperatures for Evaluation and Reporting Thermal Properties of Thermal Insulation²

C 1114 Test Method for Steady-State Thermal Transmission Properties by Means of the Thin-Heater Apparatus²

C 1303 Test Method for Estimating the Long-Term Change in the Thermal Resistance of Unfaced Rigid Closed Cell Plastic Foams by Slicing and Sealing Under Controlled Laboratory Conditions³

D 883 Terminology Relating to Plastics⁴

³ Annual Book of ASTM Standards, Vol 15.03.

⁴ Annual Book of ASTM Standards, Vol 08.01.