



Standard Guide for Industrial Thermal Insulation Systems¹

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1. Scope

1.1 This guide covers information on selection of insulation materials, systems design, application methods, protective coverings, guarantees, inspection, testing, and maintenance of thermal insulation primarily for industrial applications in a temperature range of -320 to 1200°F (-195.5 to 648.8°C).

1.2 This guide is intended to provide practical guidelines, by applying acceptable current practice while indicating the basic principles by which new materials can be assessed and adapted for use under widely differing conditions. Design engineers, the general contractors, the fabricators, and the insulation contractors will find this guide helpful.

1.3 Although some insulation system designs can serve as fire protection, this guide does not address the criteria specific to that need. API 521 Guide for Pressure-Relieving and Depressuring Systems is recommended as a reference for fire protection. This guide will however address the fire properties of insulation materials.

1.4 This guide is not intended for commercial, architectural, acoustical, marine, vehicle transport, or military use.

1.5 This guide does not address insulation system design for refractory linings or cold boxes whereby these are typically package units and of a proprietary insulation design.

1.6 The values stated in inch-pound units are to be regarded as standard. The values given in parentheses are mathematical conversions to SI units that are provided for information only and are not considered standard.

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:²

A167 Specification for Stainless and Heat-Resisting Chromium-Nickel Steel Plate, Sheet, and Strip (Withdrawn 2014)³

A240/A240M Specification for Chromium and Chromium-Nickel Stainless Steel Plate, Sheet, and Strip for Pressure Vessels and for General Applications

A653/A653M Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process

A792/A792M Specification for Steel Sheet, 55 % Aluminum-Zinc Alloy-Coated by the Hot-Dip Process

B209 Specification for Aluminum and Aluminum-Alloy Sheet and Plate

C165 Test Method for Measuring Compressive Properties of Thermal Insulations

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

C195 Specification for Mineral Fiber Thermal Insulating Cement

C203 Test Methods for Breaking Load and Flexural Properties of Block-Type Thermal Insulation

C209 Test Methods for Cellulosic Fiber Insulating Board

C240 Test Methods of Testing Cellular Glass Insulation Block

C272/C272M Test Method for Water Absorption of Core Materials for Sandwich Constructions

C302 Test Method for Density and Dimensions of Pre-formed Pipe-Covering-Type Thermal Insulation

C303 Test Method for Dimensions and Density of Pre-formed Block and Board-Type Thermal Insulation

C335/C335M Test Method for Steady-State Heat Transfer

¹ This guide is under the jurisdiction of ASTM Committee C16 on Thermal Insulation and is the direct responsibility of Subcommittee C16.40 on Insulation Systems.

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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 The last approved version of this historical standard is referenced on www.astm.org.