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Standard Guide for Development of Standard Data Records for Computerization of Thermal Transmission Test Data for Thermal Insulation¹

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1. Scope

1.1 This guide provides recommended formats for the recording of thermal transmission test data for thermal insulation and similar materials for inclusion in computerized material property databases. From this information, the database designer is able to construct the database dictionary preparatory for development of a database schema.

1.2 This guide is applicable to thermal transmission test data obtained from standard test methods that cover planar and radial specimen geometries.

1.3 This guide is not intended for thermal transmission data obtained for thermal insulation assemblies or systems (that is, heat transmission coefficients for walls, roofs, ceilings, and floors).

1.4 *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, health, and environmental practices and determine the applicability of regulatory limitations prior to use.*

1.5 *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

C168 Terminology Relating to Thermal Insulation

¹ This guide 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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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.

- 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**
- C196 Specification for Expanded or Exfoliated Vermiculite Thermal Insulating Cement**
- C208 Specification for Cellulosic Fiber Insulating Board**
- C335 Test Method for Steady-State Heat Transfer Properties of Pipe Insulation**
- C449/C449M Specification for Mineral Fiber Hydraulic-Setting Thermal Insulating and Finishing Cement**
- C516 Specification for Vermiculite Loose Fill Thermal Insulation**
- C518 Test Method for Steady-State Thermal Transmission Properties by Means of the Heat Flow Meter Apparatus**
- C533 Specification for Calcium Silicate Block and Pipe Thermal Insulation**
- C534 Specification for Preformed Flexible Elastomeric Cellular Thermal Insulation in Sheet and Tubular Form**
- C547 Specification for Mineral Fiber Pipe Insulation**
- C549 Specification for Perlite Loose Fill Insulation**
- C552 Specification for Cellular Glass Thermal Insulation**
- C553 Specification for Mineral Fiber Blanket Thermal Insulation for Commercial and Industrial Applications**
- C578 Specification for Rigid, Cellular Polystyrene Thermal Insulation**
- C592 Specification for Mineral Fiber Blanket Insulation and Blanket-Type Pipe Insulation (Metal-Mesh Covered) (Industrial Type)**
- C610 Specification for Molded Expanded Perlite Block and Pipe Thermal Insulation**
- C612 Specification for Mineral Fiber Block and Board Thermal Insulation**
- C656 Specification for Structural Insulating Board, Calcium Silicate**
- C665 Specification for Mineral-Fiber Blanket Thermal Insulation for Light Frame Construction and Manufactured Housing**
- C726 Specification for Mineral Wool Roof Insulation Board**

C728 Specification for Perlite Thermal Insulation Board
C739 Specification for Cellulosic Fiber Loose-Fill Thermal Insulation
C745 Test Method for Heat Flux Through Evacuated Insulations Using a Guarded Flat Plate Boiloff Calorimeter (Withdrawn 2008)³
C764 Specification for Mineral Fiber Loose-Fill Thermal Insulation
C991 Specification for Flexible Fibrous Glass Insulation for Metal Buildings
C1014 Specification for Spray-Applied Mineral Fiber Thermal and Sound Absorbing Insulation
C1029 Specification for Spray-Applied Rigid Cellular Polyurethane Thermal Insulation
C1044 Practice for Using a Guarded-Hot-Plate Apparatus or Thin-Heater Apparatus in the Single-Sided Mode
C1045 Practice for Calculating Thermal Transmission Properties Under Steady-State Conditions
C1071 Specification for Fibrous Glass Duct Lining Insulation (Thermal and Sound Absorbing Material)
C1086 Specification for Glass Fiber Mechanically Bonded Felt Thermal Insulation
C1114 Test Method for Steady-State Thermal Transmission Properties by Means of the Thin-Heater Apparatus
C1126 Specification for Faced or Unfaced Rigid Cellular Phenolic Thermal Insulation
C1149 Specification for Self-Supported Spray Applied Cellulosic Thermal Insulation
C1289 Specification for Faced Rigid Cellular Polyisocyanurate Thermal Insulation Board
C1290 Specification for Flexible Fibrous Glass Blanket Insulation Used to Externally Insulate HVAC Ducts
C1363 Test Method for Thermal Performance of Building Materials and Envelope Assemblies by Means of a Hot Box Apparatus
C1410 Specification for Cellular Melamine Thermal and Sound-Absorbing Insulation
C1427 Specification for Extruded Preformed Flexible Cellular Polyolefin Thermal Insulation in Sheet and Tubular Form
C1482 Specification for Polyimide Flexible Cellular Thermal and Sound Absorbing Insulation
C1484 Specification for Vacuum Insulation Panels
C1534 Specification for Flexible Polymeric Foam Sheet Insulation Used as a Thermal and Sound Absorbing Liner for Duct Systems
C1594 Specification for Polyimide Rigid Cellular Thermal Insulation
C1631 Specification for Cellular Polypropylene Thermal Insulation (Withdrawn 2011)³
C1676 Specification for Microporous Thermal Insulation
C1685 Specification for Pneumatically Applied High-Temperature Fiber Thermal Insulation for Industrial Applications
C1728 Specification for Flexible Aerogel Insulation

C1902 Specification for Cellular Glass Insulation Used in Building and Roof Applications

2.2 ISO Standards:

ISO 8301 Thermal Insulation, Determination of Steady-State Thermal Resistance and Related Properties—Heat Flow Meter Apparatus⁴

ISO 8302 Thermal Insulation—Determination of Steady-State Thermal Resistance and Related Properties—Guarded Hot Plate Apparatus⁴

ISO 8497 Thermal Insulation—Determination of Steady-State Thermal Transmission Properties of Thermal Insulation for Circular Pipes⁴

ISO 8990 Thermal Insulation—Determination of Steady-State Thermal Transmission Properties—Calibrated and Guarded Hot Box⁴

3. Terminology

3.1 Definitions—For definitions of some terms applicable to this guide, see Terminology **C168**

3.2 Definitions of Terms Specific to This Standard:

3.2.1 class, *n*—a major material class, for example, ceramic, insulation, polymer, etc.

3.2.2 data element, *n*—an individual piece of information used to describe a material or to record test results; for example, a variable name or a test parameter.

3.2.2.1 Discussion—The term is synonymous with *data item*.

3.2.3 essential field, *n*—a field in a record that shall be completed in order to make the record meaningful in accordance with the pertinent guidelines or standard.

3.2.3.1 Discussion—Fields are considered essential if required to make a comparison of property data from different sources meaningful. A comparison of data from different sources where essential information is omitted reduces the value of the comparison.

3.2.4 field, *n*—an elementary unit of a record that contains a data item, a data aggregate, a pointer, or a link.

3.2.5 field name, *n*—a name or code associated with a field and used for identification.

3.2.6 form, *n*—the material form, for example, blanket, board, or roll.

3.2.7 value set, *n*—an open listing of representative acceptable text which is included in a particular field of a record.

4. Significance and Use

4.1 This guide defines the principal elements of information, which are considered important and worth recording and storing permanently in computerized databases. Sufficient information is provided in this guide to enable the user to construct a database structure suitable for the intended application involving thermal insulation. Guidance on the storage of (optional) digital images associated with test data is provided in **Appendix X1**.

³ The last approved version of this historical standard is referenced on www.astm.org.

⁴ Available from American National Standards Institute (ANSI), 25 W. 43rd St., 4th Floor, New York, NY 10036, <http://www.ansi.org>.