Guide to Insulation Product Specifications

Introduction
The Guide to Insulation Product Specifications was updated by the National Insulation Association Technical Information Committee. This guide lists ASTM, federal and military specifications that pertain to the thermal insulation industry. It encompasses both industrial and commercial mechanical insulations as well as building envelope and fire resistance insulations. Related application and finishing accessory materials also are included.

Some government construction agencies (General Services Administration, Department of Housing and Urban Development, Department of Defense, Corps of Engineers, etc.) issue specifications or standards that designate insulation materials. This guide is intended to serve the limited purpose of describing, in a general way, the specifications and standards so designated. It should be kept in mind that the materials listed in this guide are subject to change, as are the specifications and standards themselves. Users are encouraged to review the current version of the applicable specification and/or standard.

This guide organizes each specification by type (ASTM, federal, or military), number and title and describes its scope. NIA Associate Members that manufacture products that claim conformance to the referenced specification are listed below each specification.

Do not rely upon the guide to determine whether a product meets contract specifications or to obtain approvals under purchase orders or contracts. These determinations must be made by careful examination of the contract specifications, the manufacturer’s literature, and the provision of the government specification or standard referred to in the contract documents. For specific product information and specifications compliance, consult the particular manufacturer.

Ordering Information
To order a copy of an ASTM specification, contact the following:
Order Department
ASTM International
100 Barr Harbor Drive
West Conshohocken, PA 19428
Tel: (610) 832-9585; Fax (610) 832-9555
www.astm.org

Requests for copies of federal and military specifications should be made on company letterhead and sent to the following address:
700 Robbins Ave.
Philadelphia, PA 19111-5094
(Allow 8-10 working days for processing)

Hard copies of this guide can be downloaded from the NIA website at www.insulation.org:
NIA
516 Herndon Parkway., Suite D
Herndon, VA 20170
Tel: (703) 464-6422; Fax: (703) 464-5896
www.insulation.org

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Structural Insulating Board, Calcium Silicate
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Prefabricated Reflective Insulation Systems for Equipment and Pipe Operating at Temperatures Above Ambient Air
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Perlite Thermal Insulation Board
Mineral Fiber Loose-Fill Thermal Insulation
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High-Temperature Fiber Blanket Thermal Insulation
Adhesives for Duct Thermal Insulation
Flexible Glass Fiber Insulation for Pre-Engineered Metal Buildings
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Standard Specification for Polyimide Rigid Cellular Thermal Insulation
Standard Specification for Fabrication of Cellular Glass Pipe and Tubing Insulation
Standard Specification for Microporous Thermal Insulation
Standard Specification for Fabrication of Flexible Removable and Reusable Blanket Insulation for Hot Service
Standard Guide for Industrial Thermal Insulation Systems
Standard Guide for Installation of Flexible Closed Cell Preformed Insulation in Tube and Sheet Form
Standard Specification for Flexible Aerogel Insulation
Standard Specification for Aluminum Jacketing for Insulation
Standard Test Method for Water Absorption by Immersion of Thermal Insulation Materials
Standard Specification for Stainless Steel Jacketing for Use over Thermal Insulation
Standard Specification for Laminate Protective Jacket and Tape for Use over Thermal Insulation for Outdoor Applications
Standard Practice for Installation of Aluminum and Stainless Steel Jacketing over Thermal Insulation on Pipe and Rigid Tubing
Standard Specification for Cellular Glass Insulation Used in Building and Roof Applications
Standard Specification for Flexible Protective Jackets Made of Modified Asphalt/Butyl Rubber for Use over Thermal Insulation
Rigid Poly (Vinyl Chloride) (PVC) Compounds and Chlorinated Poly (Vinyl Chloride) (CPVC) Compounds

Federal Specifications

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Replacement Information for Canceled Federal Specifications

HH-B-100B  Canceled. Replaced by ASTM C1136.
Barrier Material, Vapor (for Pipe, Duct and Equipment Thermal Insulation)
Vapor barriers (jackets and facing) applied over thermal insulation for pipes, ducts, and equipment.
Type I—Low vapor transmission, high puncture resistance (for use on insulation for piping, ducts, and equipment)
Type II—Medium vapor transmission, moderate puncture resistance (for use on insulation for ducts and equipment)

HH-I-515E  Canceled. Replaced by ASTM C739.
Insulation, Thermal (Loose Fill For Pneumatic or Poured Application): Cellulosic or Wood Fiber
Covers chemically treated, recycled cellulosic fiber (wood base) loose-fill thermal insulation for use in attics or enclosed spaces in housing, and other framed buildings at ambient temperatures ranging from −50° to 180°F, by pneumatic or poured application. Last revised June 1992.
Type I—Pneumatic application
Type II—Poured application

Insulation Blankets, Thermal (Mineral Fiber, For Ambient Temperatures)

Insulation, Block and Pipe Covering, Thermal (Calcium Silicate for Temperatures to 1,200°F)

HH-I-524C  Canceled. Replaced by ASTM C578.
Insulation Board, Thermal (Polystyrene)

Insulation Board, Thermal (Cork)
Cork insulation board for thermal insulation.

HH-I-526C  Canceled. Replaced by ASTM C726.
Insulation Board, Thermal (Mineral Fiber)

HH-I-592B  Canceled. Replaced by ASTM C728.
Insulation Board, Thermal (Mineral Aggregate)

HH-I-530B  Canceled. Replaced by ASTM C591.
Insulation Board, Thermal, Unfaced (Polyurethane or Polyisocyanurate)

HH-I-545B  Canceled. Replaced by ASTM C1071.
Insulation, Thermal and Acoustical (Mineral Fiber, Duct Lining Material)

H-I-551E  Canceled. Replaced by ASTM C552.
Insulation, Block and Board, Thermal (Cellular Glass)

Insulation, Blankets, Thermal (Mineral Fiber, Industrial Type)
Covers industrial mineral fiber insulation.

HH-I-573B  Canceled. Replaced by ASTM C534.
Insulation, Thermal (Flexible Unicellular Sheet and Pipe Covering)
HH-I-574B  Canceled. Replaced by ASTM C549.
Insulation, Thermal (Perlite)

HH-I-585C  Canceled. Replaced by ASTM C516.
Insulation, Thermal (Vermiculite)

HH-I-1030B  Canceled. Replaced by ASTM C764.
Insulation, Thermal (Mineral Fiber, for Pneumatic or Poured Application)

HH-I-1252B  Canceled. No Replacement
Insulation, Thermal, Reflective (Aluminum Foil)
Aluminum foil insulation.
   Form 1-Materials providing a minimum 19 millimeters (3/4-inch) reflective air space having an effective emittance (E) of 0.05 maximum
   Form 2-Materials providing a minimum 10 millimeters (3/8-inch) reflective air space having an effective E of 0.05 maximum

L-P-535E  Inactive
Plastic Sheet (Sheeting); Plastic Strip; Poly (Vinyl Chloride) and Poly (Vinyl Chloride-Vinyl Acetate), Rigid
Covers rigid unsupported poly (vinyl chloride) and poly (vinyl chloride-vinyl acetate) sheets (sheeting) and strip.

LLL-I-535B  Canceled. Replaced by ASTM C208 and others.
Insulation Board, Thermal (Cellulosic Fiber)

SS-C-160A  Canceled. Replaced by ASTM C195 (Type III Grade U), ASTM C196 (Type IV), and ASTM C 449/C 449M (Type III Grade F).
Cements, Insulation Thermal
Heat-resisting cements.
   Type III—Mineral Wool
   Type IV—Vermiculite (100°–1,800°F)
   Type V—Diatomaceous Silica (100°–1,900°F)

Military Specifications

MIL-A-23054A  Acoustic Absorptive Board, Fibrous Glass Perforated Fibrous Glass Cloth Faced
MIL-A-24179A  Adhesive, Flexible Unicellular-Plastic Thermal Insulation
MIL-A-24699  Acoustical Transmission Loss Barrier Material
MIL-A-3316C  Adhesive, Fire-Resistant, Thermal Insulation
MIL-C-2861E  Cement, Insulation, High Temperature
MIL-C-19565C  Coating Compounds, Thermal Insulation, Fire- and Water-Resistant, Vapor-Barrier
MIL-C-20079H  Cloth, Glass; Tape, Textile Glass; and Thread, Glass and Wire-Reinforced Glass
MIL-C-24576A  Cloth, Silica Glass; Cloth, Coated, Glass, Silicone-Rubber Coated
MIL-I-742F  Insulation Board, Thermal, Fibrous Glass
MIL-I-2781F  Insulation, Pipe, Thermal
MIL-I-2818 C  Insulation Blanket, Thermal, Fibrous Mineral
MIL-I-2819F  Insulation Block, Thermal
MIL-I-13042A  Insulation Sleeving, Thermal, Tubular Flexible
MIL-I-15475C  Insulation Felt, Thermal, Fibrous Glass, Semi-rigid
MIL-I-16411F  Insulation Felt, Thermal, Glass Fiber
MIL-I-22023D  Insulation Felt, Thermal and Sound Absorbing Felt, Fibrous Glass, Flexible
MIL-I-22344D  Insulation, Pipe, Thermal, Fibrous Glass
MIL-I-23128B  Insulation Blanket, Thermal, Refractory Fiber, Flexible
MIL-DTL-24244D (SH)  Insulation Material, with Special Corrosion, Chloride, and Fluoride Requirements
MIL-PRF-32161  Performance Specification for Insulation Fire Protection, Thermal, and Acoustic
MIL-S-24149C  Studs, Welding, and Arc Shields (Ferrules)
MIL-T-23397B  Tapes, Pressure Sensitive Adhesive for Masking During Paint Stripping Operations
MIL-W-23680E  Stud Welding Systems, DC, Integral Power Source and Control Unit, Electric Arc and Capacitor Discharge

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MIL-W-80110C  Stud Welding Units, Independent DC Power Source with Separate Control Unit, Electric Arc
MIL-Y-1140H  Yarn, Cord, Sleeveing, Cloth, and Tape—Glass
ELECTRIC BOAT SPECIFICATION – EB 4013  Anti-Sweat and Refrigerant Insulation Systems (Sheet and Tubes)
DOD-I-24688 / MIL-DTL-24688A  Insulation; Polyimide, Sheet and Tube

Replacement Information for Canceled Military Specifications

MIL-P-15280J  Inactive. Plastic Material, Unicellular (Sheets and Tubes)

Acoustical Transmission Loss Barrier Material
Covers two types of acoustical transmission loss barriers.
  Type I—Barium sulfate-loaded vinyl with fibrous glass facing
  Type II—Wire-reinforced lead

MIL-B-5924B  Canceled. Replaced by ASTM C800.
Batting, Insulation, Glass Fibers

MIL-C-2861E  Canceled. Replacement is ASTM C195.
Cement, Insulation, High Temperature
Covers high temperature insulation cement for thermal control of irregular surfaces and for piping operating at temperatures between 100° and 1,800°F.

MIL-I-2818C  Canceled. No Replacement.
Insulation Blanket, Thermal, Fibrous Mineral
Covers wire-reinforced fibrous mineral wool insulation blanket.

MIL-I-13042A  Canceled. No Replacement.
Insulation Sleeveing, Thermal, Tubular Flexible
Flexible braided or woven tubular thermal insulation sleeving intended primarily for covering heater ducts, exhaust pipes, and other tubes in vehicles.

MIL-I-15475C  Canceled. No Replacement.
Insulation Felt, Thermal, Fibrous Glass, Semi-rigid
Covers fibrous glass felt sheets for thermal insulation.

Insulation Felt, Thermal and Sound Absorbing Felt, Fibrous Glass, Flexible
Covers lightweight, faced and unfaced flexible fibrous glass felt for thermal and sound absorbing insulation for use up to 400°F.

MIL-P-15280J  Inactive
Plastic Material, Unicellular (Sheets and Tubes)
Covers chemically expanded unicellular elastomeric plastic foam material for thermal insulation.

Miscellaneous Specifications and Standards

American Society of Heating, Refrigerating, and Air-Conditioning Engineers, Inc. (ASHRAE)
Corps of Engineers, Department of the Army
Energy Codes
Federal Construction Guide Specifications (FCGS)
Manufacturers Standardization Society of the Valve and Fitting Industry, Inc.

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A Listing of Guides, Practices and Test Methods Available Through ASTM

The following selected ASTM standards describe test methods and practices to determine specific characteristics of building and construction materials and shall not be used to specify materials. These methods may be referenced in ASTM standards or other specification and standards. ASTM standards must be reviewed every five years and, if not revised, either approved again or withdrawn.

Standards pertaining to thermal insulation generally are developed by ASTM Committee C-16 on Thermal Insulation and thus are identified with the prefix C followed by a three- or four-digit number. A two-digit number following the dash (omitted in this document) indicates the year that the standard was adopted or, if revised, the year of last revision.

Users are advised to refer to the current version of the standard in effect at the time of preparation of purchase documents and specifications.

C167  Test Methods for Thickness and Density of Blanket or Batt Thermal Insulations.
C168  Terminology Relating to Thermal Insulating Materials
C203  Test Methods for Breaking Load and Flexural Properties of Block-Type Thermal Insulation
C209  Test Methods for Cellulosic Fiber Insulation Board
C240  Test Methods of Testing Cellular Glass Insulation Block
C302  Test Method for Density and Dimensions of Preformed Pipe-Covering-Type Thermal Insulation
C303  Test Method for Density and Dimensions of Preformed Block-Type Thermal Insulation
C335  Test Method for Steady-State Heat Transfer Properties of Horizontal Pipe Insulation
C356  Test Method for Linear Shrinkage of Preformed High-Temperature Thermal Insulation Subjected to Soaking Heath
C390  Criteria for Sampling and Acceptance of Preformed Thermal Insulation Lots
C411  Test Method for Hot-Surface Performance of High-Temperature Thermal Insulation
C419  Practice for Making and Curing Test Specimens of Mastic Thermal Insulation Coatings
C423  Test Method for Sound Absorption and Sound Absorption Coefficiencies by the Reverberation Room Method
C447  Practice for Estimating the Maximum Use Temperature of Thermal Insulations
C450  Practice for Prefabrication and Field Fabrication of Thermal Insulating Fitting Cover for NPS Piping, Vessel Lagging, and Dished Head Segments
C461  Test Methods for Mastics and Coatings Used with Thermal Insulation
C488  Test Method for Conducting Exterior Exposure Tests of Finishes for Thermal Insulation
C585  Practice for Inner and Outer Diameters of Rigid Thermal Insulation for Nominal Sizes of Pipe and Tubing (NPS System)
C634  Terminology Relating to Environmental Acoustics
C647  Guide to Properties and Tests of Mastics and Coating Finishes for Thermal Insulation
C653  Guide for Determination of the Thermal Resistance of Low-Density Blanket-Type Mineral Fiber Insulation
C680  Practice for Determination of Heat Gain or Loss and the Surface Temperatures of Insulated Pipe and Equipment Systems by the Use of a Computer Program
C692  Test Method for Evaluating the Influence of Thermal Insulations on the External Stress Corrosion Cracking Tendency of Austenitic Stainless Steel
ASTM Specifications and Conforming Products from NIA members

This guide organizes each specification by type (ASTM, federal, or military), number, title, and describes its scope. NIA Associate Members that manufacture products that claim conformance to the referenced specification are listed below each specification.

A240/A240M
Heat-Resisting Chromium and Chromium-Nickel Stainless Steel Plate, Sheet, and Strip for Pressure Vessels
- Pabco-Childers Metals
- R.P.R. Products, Inc.

A653/A653M
Steel Sheet, Zinc Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process
- R.P.R. Products, Inc.
A792/A792M
Steel Sheet, 55% Aluminum-Zinc Alloy-Coated by the Hot-Dip Process
• Pabco-Childers Metals
• R.P.R. Products, Inc.

B209
Aluminum and Aluminum-Alloy Sheet and Plate [Metric]
Covers aluminum and aluminum alloy flat sheet, coiled sheet, and plate.
• Pabco-Childers Metals
• R.P.R. Products, Inc.

C195
Mineral Fiber Thermal Insulating Cement
Covers mineral fiber thermal insulating materials in the form of dry cement which, when mixed with a suitable proportion of water, applied as a plastic mass, and dried in place, affords resistance to heat transmission on surfaces operating at temperatures between 100° and 1,600°F. Replaces federal specification Ss-C-160A in part.

C196
Expanded or Exfoliated Vermiculite Thermal Insulating Cement
Covers expanded or exfoliated vermiculite thermal insulating material in the form of dry cement or plaster, intended to be mixed with a suitable proportion of water, applied as a plastic mass, and dried in place, for use as insulation on surfaces operating at temperatures between 100° and 1,800°F. The cement shall not be used where it will be exposed to combustion conditions, such as the hot face lining of a furnace. Replaces federal specification SS-C-160A in part.

C208
Cellulosic Fiber Insulation Board
Covers the principal types, grades, and sizes of insulating board.
  Type I—Sound deadening board
  Type II—Roof insulation board
  Type III—Ceiling tiles and panels
  Type IV—Wall sheathing
  Type V—Backer board
  Type VI—Roof deck

C449/C449M
Mineral Fiber Hydraulic-Setting Thermal Insulating and Finishing Cement
Covers mineral fiber insulating and finishing cement, shipped in dry mix form, including hydraulic-setting binder, which when mixed with water and applied in accordance with the manufacturer’s direction, affords a smooth surface as a final finish for heated surfaces between 100° and 1,200°F. Replaces federal specification SS-C-160A in part.
• Johns Manville

C516
Vermiculite Loose Fill Thermal Insulation
Covers expanded or exfoliated vermiculite loose fill insulation for use at temperatures ranging from -459° to 1,400°F. Replaces federal specification HH-I-585.
  Type I—Untreated
  Type II—Surface treated

C533
Calcium Silicate Block and Pipe Thermal Insulation
Covers calcium silicate block and pipe thermal insulation for use on surfaces with temperatures between 80 °F and 1700 °F. Replaces federal specification HH-I-523. Maximum density of less than 15 pcf.
  Type Ia—Up to 1,200°F Pipe and Block
    • Johns Manville
    • Rockfibras Do Brazil Ind Com
  Type II—Up to 1,700°F
    • Johns Manville
Preformed Flexible Elastomeric Cellular Thermal Insulation in Sheet and Tubular Form
Covers preformed flexible elastomeric cellular thermal insulation in sheet and tubular form for use on surfaces operating up to 350°F. Replaces federal specification HH-I-573.

Type I—Tubular
Grade 1—Regular
• Aeroflex USA, Inc.
• Armacell LLC
• K-Flex USA
Grade 2—High Temperature
• Armacell LLC
Grade 3—Non-halogen
• Aeroflex USA, Inc.
• Armacell LLC
• K-Flex USA

Type II—Sheet
Grade 1—Regular
• Aeroflex USA, Inc.
• Armacell LLC
• K-Flex USA
Grade 2—High Temperature
• Armacell LLC
Grade 3—Non-halogen
• Aeroflex USA, Inc.
• Armacell LLC
• K-Flex USA

Mineral Fiber Preformed Pipe Insulation
Covers mineral fiber preformed pipe insulation for use on surfaces up to 1,200°F. Within each type, there are also different grades available.

Type I—Up to 850°F (molded)
• CertainTeed, LLC
• Johns Manville
• Knauf Insulation
• Manson Insulation
• Owens Corning
• Rockfibras Do Brazil Ind Com
• ROCKWOOL Technical Insulation

Type II—Up to 1,200°F (molded)
• Johns Manville
• Rockfibras Do Brazil Ind Com
• ROCKWOOL Technical Insulation

Type III—Up to 1,200°F (V-groove)
• Johns Manville
• Rockfibras Do Brazil Ind Com

Type IV—Up to 1,000°F
• Johns Manville
• Knauf Insulation
• Rockfibras Do Brazil Ind Com
• ROCKWOOL Technical Insulation

Type V—Up to 1,400°F
• Rockfibras Do Brazil Ind Com
• ROCKWOOL Technical Insulation
Perlite Loose Fill Insulation
Covers expanded perlite loose fill insulation for use up to 1,400°F. Replaces federal specification HH-I-574.
- Type I—Untreated
  - Johns Manville
- Type II—Surface treated to produce water repellency
- Type III—Surface treated to limit dust generated during application
- Type IV—Surface treated to produce water repellency and limit dust generated during application.

C552
Cellular Glass Thermal Insulation
Covers cellular glass insulation for use at temperatures up to 800°F. Replaces federal specification HH-I-551.
- Type I—Flat Block
  - Owens Corning
- Type II—Pipe and tubing insulation
  - Owens Corning
- Type III—Special Shapes
  - Owens Corning
- Type IV—Board
  - Owens Corning

C553
Mineral Fiber Blanket Thermal Insulation for Commercial and Industrial Applications
Covers mineral fiber blanket intended for use at temperatures up to 1,200°F
- Type I—Maximum use 450°F
  - CertainTeed, LLC
  - Johns Manville
  - Knauf Insulation
  - Manson Insulation
  - Owens Corning
  - Rockfibras Do Brazil Ind Com
  - ROCKWOOL Technical Insulation
- Type II—Maximum use 450°F
  - CertainTeed, LLC
  - Johns Manville
  - Knauf Insulation
  - Manson Insulation
  - Owens Corning
  - Rockfibras Do Brazil Ind Com
  - ROCKWOOL Technical Insulation
- Type III—Maximum use 450°F
  - CertainTeed, LLC
  - Johns Manville
  - Knauf Insulation
  - Manson Insulation
  - Owens Corning
  - Rockfibras Do Brazil Ind Com
  - ROCKWOOL Technical Insulation
- Type IV—Maximum use 850°F
  - Johns Manville
  - Knauf Insulation
  - Manson Insulation
  - Owens Corning
  - Rockfibras Do Brazil Ind Com
  - ROCKWOOL Technical Insulation
- Type V—Maximum use 1,000°F
  - CertainTeed, LLC
• Johns Manville
• Knauf Insulation
• Owens Corning
• Rockfibras Do Brazil Ind Com
• ROCKWOOL Technical Insulation

Type VI—Maximum use 1,000°F
• CertainTeed, LLC
• Johns Manville
• Knauf Insulation
• Owens Corning
• Rockfibras Do Brazil Ind Com
• ROCKWOOL Technical Insulation

Type VII—Maximum use 1,200°F
• Johns Manville
• Owens Corning
• Rockfibras Do Brazil Ind Com
• ROCKWOOL Technical Insulation

C578

Rigid, Cellular Polystyrene Thermal Insulation
Covers cellular polystyrene for use at temperatures up to 165°F. Replace federal specification HH-I-524. Specification covers various types of rigid cellular polystyrenes that are commercially available. See specification for description of each type.

Type I-VII is EPS – Polystyrene for Pipe Insulation

Type IV
  • Kingspan, LLC

Type XIII is extruded polystyrene (XPS) billet available at various thicknesses of 7-10 inches
  • Johns Manville
  • Polyguard Products

Types XII, X, IV, VI, VII, and V are extruded polystyrene (XPS) boards available at various thicknesses up to 4 inches
  • Knauf Insulation
  • Owens Corning

C591

Unfaced Preformed Rigid Cellular Polyisocyanurate Thermal Insulation
Covers unfaced, preformed rigid cellular polyisocyanurate plastic material intended for use at temperatures up to 300°F. Replaces federal specification HH-I-530.

Type I—Minimum compressive resistance of 16 psi.
  • Kingspan, LLC
  • Johns Manville

Type II—Minimum compressive resistance of 35 psi.
  • Duna-USA
  • Kingspan, LLC
  • Johns Manville

Type III—Minimum compressive resistance of 45 psi.
  • Duna-USA
  • Kingspan, LLC
  • Johns Manville

Type IV—Minimum compressive resistance of 21 psi
  • Duna-USA
  • Kingspan, LLC
  • Johns Manville

Type V—Minimum compressive resistance of 80 psi.
  • Kingspan, LLC
  • Johns Manville

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Type VI—Minimum compressive resistance of 125 psi.
  • Kingspan, LLC
  • Johns Manville

C592
Mineral Fiber Blanket Insulation and Blanket-Type Pipe Insulation (Metal-Mesh Covered) (Industrial Type)
Covers metal-mesh covered mineral fiber blanket and blanket-type insulation for use at temperatures up to 1,200°F.
Type I—Maximum use 850°F
  • GLT Products
  • Johns Manville
  • Owens Corning
  • Rockfibras Do Brazil Ind Com
  • ROCKWOOL Technical Insulation
Type II—Maximum use 1,200°F
  • GLT Products
  • Johns Manville
  • Owens Corning
  • Rockfibras Do Brazil Ind Com
  • ROCKWOOL Technical Insulation
Type III—Maximum use 1,200°F
  • GLT Products
  • Johns Manville
  • Owens Corning
  • Rockfibras Do Brazil Ind Com
  • ROCKWOOL Technical Insulation

C610
Molded expanded Perlite Block and Pipe Thermal Insulation
Covers expanded perlite block and pipe insulation for use at temperatures up to 1,200°F.
  • Johns Manville

C612
Mineral Fiber Block and Board Thermal Insulation
Covers mineral fiber board insulation for use at temperatures up to 1,800°F.
Type IA, IB—Maximum use 450°F
  • CertainTeed, LLC
  • Johns Manville
  • Knauf Insulation
  • Manson Insulation
  • Owens Corning
  • Rockfibras Do Brazil Ind Com
  • ROCKWOOL Technical Insulation
Type II—Maximum use 850°F
  • CertainTeed, LLC
  • Johns Manville
  • Knauf Insulation
  • Owens Corning
  • Rockfibras Do Brazil Ind Com
  • ROCKWOOL Technical Insulation
Type III—Maximum use 1,000°F
  • Knauf Insulation
  • Johns Manville
  • Owens Corning
  • Rockfibras Do Brazil Ind Com
  • ROCKWOOL Technical Insulation
Type IV A, IV B—Maximum use 1,200°F
• Johns Manville
• Owens Corning
• Rockfibras Do Brazil Ind Com
• ROCKWOOL Technical Insulation

Type V—Maximum use 1,800°F
• Owens Corning

C656
Structural Insulating Board, Calcium Silicate
Covers structural insulating board for use in general insulation, fire-resistive, and marine-bulkhead applications at temperatures up to 1,700°F.

Type I—For use up to 1,400°F
Type II—For use up to 1,700°F
Grade 1—Typical density 36 lb./ft³
Grade 2—Typical density 46 lb./ft³
Grade 3—Typical density 60 lb./ft³
Grade 4—Typical density 14 lb./ft³
• Johns Manville
Grade 5—Typical density 18 lb./ft³
• Johns Manville
Grade 6—Typical density 28 lb./ft³
• Johns Manville
• Promat
Grade 7—Typical density 40 lb./ft³
• Johns Manville
Grade 8—Typical density 60 lb./ft³
• Johns Manville

C665
Mineral Fiber Blanket Thermal Insulation for Light Frame Construction and Manufactured Housing
Covers mineral fiber blanket insulation used to thermally or acoustically insulate ceilings, floors, and walls in light frame construction and manufactured housing. Replaces federal specification HH-I-521.

Type I—Blankets without membrane coverings
• CertainTeed, LLC
• Johns Manville
• Knauf Insulation
• Manson Insulation
• Owens Corning
• Rockfibras Do Brazil Ind Com
• ROCKWOOL Technical Insulation

Type II—Blankets with a nonreflective vapor-retarder membrane covering one principal face
• CertainTeed, LLC
• Johns Manville
• Knauf Insulation
• Manson Insulation
• Owens Corning
• Rockfibras Do Brazil Ind Com

Type III—Blankets with a reflective vapor-retarder covering on principal face
• CertainTeed, LLC
• Johns Manville
• Knauf Insulation
• Manson Insulation
• Owens Corning
• Rockfibras Do Brazil Ind Com

C667
Prefabricated Reflective Insulation Systems for Equipment and Pipe Operating at Temperatures Above Ambient Air
Covers metal prefabricated, reflective insulation systems for equipment and piping operating at temperatures above ambient in air.

C726
Mineral Wool Roof Insulation Board
Covers mineral wool insulation board used principally above structural roof decks as a base for built-up roofing. Replaces federal specification HH-I-526.
- Johns Manville
- Rockfibras Do Brazil Ind Com
- ROCKWOOL Technical Insulation

C728
Perlite Thermal Insulation Board
Covers perlite thermal insulation board used principally above structural roof decks and as a base for built up, modified, and elastomeric membrane roofing. Replaces federal specification HH-I-529.
- Johns Manville

C764
Mineral Fiber Loose-Fill Thermal Insulation
Covers nodulated mineral fiber thermal insulation for use in attics or enclosed spaces in housing and other framed buildings. Replaces federal specification HH-I-1030.
Type I—Pneumatic application
- CertainTeed, LLC
- Johns Manville
- Knauf Insulation
- Owens Corning
- Rockfibras Do Brazil Ind Com
Type II—Poured application
- Rockfibras Do Brazil Ind Com
- Owens Corning

C800
Glass Fiber Blanket Insulation (Aircraft Type)
Covers glass fiber blanket thermal and acoustical insulation for use up to 700°F in aircraft applications. Replaces MIL-B-59248.
Type I—For use to 450°F
- Johns Manville
Type II—For use to 700°F
- Johns Manville

C892
High-Temperature Fiber Blanket Thermal Insulation
Covers high-temperature fiber blanket thermal insulation for use at temperatures from 1,350°F up to 3,000°F.
Type I—Maximum temperature use 1,350°F
- Morgan Advanced Materials Thermal Ceramics
Type II—Maximum temperature use 1,600°F
- 3M
- Owens Corning
- Morgan Advanced Materials Thermal Ceramics
- Unifrax Corp.
Type III—Maximum temperature use 2,400°F
- 3M
- Morgan Advanced Materials Thermal Ceramics
- Unifrax Corp.
Type IV—Maximum temperature use 2,600°F
- 3M
- Morgan Advanced Materials Thermal Ceramics

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• Unifrax Corp.
  Type V—Maximum temperature use 3,000°F
  • 3M
  • Morgan Advanced Materials Thermal Ceramics
  • Unifrax Corp.

C916
Adhesives for Duct Thermal Insulation
Establishes minimum material requirements for adhesives to bond thermal insulation duct liner on the interior surfaces of sheet metal air conditioning ducts.
  Type I—Nonflammable in the liquid (wet) state and will pass edge-burning test
    • Foster Products (HB Fuller Construction Products)
    • Pabco-Childers Metals
  Type II—Nonflammable in the liquid (wet) state and will not pass edge-burning test
    • Foster Products (HB Fuller Construction Products)
    • Pabco-Childers Metals
  Type III—Flammable in the liquid (wet) state and will pass edge-burning test
  Type IV—Flammable in the liquid (wet) state and will not pass edge-burning test
    • Foster Products (HB Fuller Construction Products)
    • Pabco-Childers Metals

C991
Flexible Glass Fiber Insulation for Pre-Engineered Metal Buildings
Covers flexible glass fiber insulation for use as interior surface of walls and roofs of manufactured metal buildings.
  Type I—Without vapor-retarder facing
    • CertainTeed, LLC
    • Johns Manville
    • Knauf Insulation
    • Manson Insulation
    • Owens Corning
    • Rockfibras Do Brazil Ind Com
  Type II—with vapor-retarder facing
    • Johns Manville
    • Rockfibras Do Brazil Ind Com

C1014
Spray-Applied Mineral Fiber Thermal and Sound Absorbing Insulation
Covers spray-applied mineral fiber thermal or acoustical insulation.
  • Owens Corning

C1029
Spray-Applied Rigid Cellular Polyurethane Thermal Insulation
Covers spray-applied rigid cellular polyurethane for use as thermal insulation at temperatures between -22° and 225°F.
  Type I—Minimum compressive resistance 15 psi
  Type II—Minimum compressive resistance 25 psi
  Type III—Minimum compressive resistance 40 psi
  Type IV—Minimum compressive resistance 60 psi

C1071
Thermal and Acoustical Insulation (Glass Fiber, Duct Lining Material)
Covers fibrous glass insulation used as a thermal and acoustical liner for interior surfaces of ducts, plenums, and other air handling equipment. Replaces federal specification HH-I-545.
  Type I—Flat, in rolls
    • CertainTeed, LLC
    • Johns Manville
    • Knauf Insulation
• Manson Insulation
• Owens Corning
Type II—Flat, in sheet form
• CertainTeed, LLC
• Johns Manville
• Knauf Insulation
• Manson Insulation
• Owens Corning

C1086
Glass Fiber Felt Thermal Insulation
Covers glass fiber unsupported needled felt binder-free insulation used for thermal insulation of machinery and equipment at temperatures up to 1,200°F.
• Integrated Marketing Group
• Lewco Specialty Products, Inc.

C1126
Faced or Unfaced Rigid Cellular Phenolic Thermal Insulation
Covers faced or unfaced rigid cellular phenolic thermal insulation, in either board or tubular form, for use at temperatures between -40°F and 257°F.
- Type I—for use as roof insulation board
- Type II—for use as sheathing or rigid panel for non-load bearing applications
  • Johns Manville
  • Polyguard Products
- Type III—for use as pipe insulation
  • Johns Manville
  • Polyguard Products

C1136 Flexible, Low Permeance Vapor Retarders for Thermal Insulation
Covers vapor retarders for thermal insulation, specifically flexible materials with permeance of 0.10 perm or lower and surface burning characteristics of 25 flame spread/50 smoke or lower, for use indoors between temperatures of -20°F and 150°F. For use indoors or outdoors with weather protection. Replaces federal specification HH-B-100.
- Type I (0.02 perm max, high strength)
  • Lamtec Corp.
  • Johns Manville
- Type II (0.02 perm max, moderate strength)
  • Lamtec Corp.
  • Johns Manville
- Type II (0.10 perm max, high strength)
  • Lamtec Corp.
  • Johns Manville
- Type IV (0.10 perm max, moderate strength)
  • Lamtec Corp.
  • Johns Manville
- Type VII (0.01 perm max, high strength)
- Type VIII (0.02 perm max, moderate strength)
- Type IX (0.00 perm max)
  • K-Flex USA
  • Kingspan, LLC
  • Owens Corning
  • Polyguard Products
  • 3M
Type X (0.02 perm max)
- Lamtec

C1139
Fibrous Glass Thermal Insulation and Sound Absorbing Blanket and Board for Military Applications
Covers unfaced flexible fibrous glass blanket and faced board used as thermal and sound absorbing insulation at temperatures up to 450°F for military applications as a replacement for MIL-I-22023D.

Type I—Unfaced thermal blanket
- CertainTeed, LLC
- Johns Manville
- Knauf Insulation
- Manson Insulation
- Owens Corning

Type II—Unfaced sound absorbing blanket
- CertainTeed, LLC
- Johns Manville
- Knauf Insulation
- Manson Insulation
- Owens Corning

Type III—Faced, thermal and sound absorbing board
- CertainTeed, LLC
- Johns Manville
- Knauf Insulation

C1289
Faced Rigid Cellular Polyisocyanurate Thermal Insulation
Covers various types (I through VI) faced boards. Replaces ASTM C1013-94. See specifications for a more detailed description. The service temperature ranges from -40°F to +200°F.
- Johns Manville

C1290
Flexible Fibrous Glass Blanket Insulation Used to Externally Insulate HVAC Ducts
- CertainTeed, LLC
- Johns Manville
- Knauf Insulation
- Manson Insulation
- Owens Corning

C1393
Specification for Perpendicularly Oriented Mineral Fiber Roll and Sheet Thermal Insulation for Pipes and Tanks
- CertainTeed, LLC
- Knauf Insulation
- Johns Manville
- Owens Corning
- Rockfibras Do Brazil Ind Com

C1410
Specification for Melamine Thermal and Sound-Absorbing Insulation

C1427
Specification for Flexible Cellular Polyolefin Thermal Insulation in Sheet and Tubular form
- Aeroflex USA, Inc.
- Armacell, LLC
- K-FLEX USA

C1482

C1534
Specification for Flexible Polymeric Foam Sheet Insulation Used as a Thermal and Sound Absorbing Liner for Duct
Type I—Closed-Cell Flexible Foam
• Aeroflex USA, Inc.
• Armacell, LLC
• K-FLEX USA
• T-Fit

Type II—Open-Cell Flexible Foam

C1594
Standard Specification for Polyimide Rigid Cellular Thermal Insulation

C1676
Standard Specification for Microporous Thermal Insulation
Non-Hydrophobic, Type II, Grade 2A
• Morgan Advanced Materials Thermal Ceramics
• Promat

Hydrophobic, Type II, Grade 2B
• Johns Manville
• Morgan Advanced Materials Thermal Ceramics
• Promat

C1695
Standard Specification for Fabrication of Flexible Removable and Reusable Blanket Insulation for Hot Service

C1696
Standard Guide for Industrial Thermal Insulation Systems

C1710
Standard Guide for Installation of Flexible Closed Cell Preformed Insulation in Tube and Sheet Form

C1728
Standard Specification for Flexible Aerogel Insulation
Type I, Grade 1B
• Aspen Aerogels
Type III, Grade 1A
• Aspen Aerogels
• Armacell
Type III, Grade 1B
Type IV, Grade 1A
• Armacell

C1729
Standard Specification for Aluminum Jacketing for Insulation
• Pabco-Childers Metals
• RPR Products, Inc.

C1763
Standard Test Method for Water Absorption by Immersion of Thermal Insulation Materials

C1767
Standard Specification for Stainless Steel Jacketing for Use over Thermal Insulation
• Pabco-Childers Metals

C1775 Standard Specification for Laminate Protective Jacket and Tape for Use over Thermal Insulation for Outdoor Applications

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Type I
• Ideal Tape
• 3M

Type II
• 3M
• Foster Products (HB Fuller Construction Products)

Type III
• Foster Products (HB Fuller Construction Products)
• Ideal Tape

D1784
Rigid Poly (Vinyl Chloride) (PVC) Compounds and Chlorinated Poly (Vinyl Chloride) (CPVC) Compounds
Covers rigid PVC and CPVC compounds intended for general purpose use in extruded or molded form, including piping applications involving special chemical and acid resistance or heat resistance, composed of poly (vinyl chloride), chlorinated poly (vinyl chloride), or vinyl chloride copolymers containing at least 80 percent vinyl chloride, and the necessary compounding requirements.

- Johns Manville
- Proto Corp.
- Speedline Corp.

C1879
Standard Practice for Installation of Aluminum and Stainless Steel Jacketing over Thermal Insulation on Pipe and Rigid Tubing

C1902
Standard Specification for Cellular Glass Insulation Used in Building and Roof Applications
Type I—minimum R-3.6 per inch thermal resistance at 75°F mean temperature, minimum compressive strength 50 psi.
- Owens Corning

Type II—minimum R-3.1 per inch thermal resistance at 75°F mean temperature, minimum compressive strength 55 psi.
- Owens Corning

Type III—minimum R-2.9 per inch thermal resistance at 75°F mean temperature, minimum compressive strength 100 psi.
- Owens Corning

Type IV—minimum R-2.6 per inch thermal resistance at 75°F mean temperature, minimum compressive strength 160 psi.
- Owens Corning

Type V—minimum R-2.3 per inch thermal resistance at 75°F mean temperature, minimum compressive strength 240 psi.
- Owens Corning

C1916
Standard Specification for Flexible Protective Jackets Made of Modified Asphalt/Butyl Rubber for Use over Thermal Insulation
Type I, Grade 1, Class A
- Foster Products (HB Fuller Construction Products)
- Owens Corning
- Polyguard Products

Type I, Grade 1, Class B

Type I, Grade 2, Class A

Type I, Grade 3, Class A
- Polyguard Products

Type I, Grade 3, Class B
- Owens Corning

Type I, Grade 3, Class C
- Owens Corning

Type I, Grade 4, Class A
- Owens Corning

Type I, Grade 4, Class C
- Foster Products (HB Fuller Construction Products)
- Owens Corning
- Polyguard Products

Type II, Grade 1, Class B
- Owens Corning
Federal Specifications

Federal Law (Public Law 132) has mandated that Federal and Military Specifications shall be replaced with consensus or performance standards available in the public domain. To comply with this federal law, some of the following Federal or Military Specifications either have been made obsolete or soon will be obsolete. These obsolete specifications are included for reference only, and the new appropriate specifications are indicated.

**MIL-S-24149C**
Studs, Welding, and Arc Shields (Ferrules)
Covers studs for welding with stud welding equipment and arc shields (ferrules) for shielding studs where applicable.
- Midwest Fasteners, Inc.

**MIL-T-23397B**
Tapes, Pressure Sensitive Adhesive for Masking During Paint Stripping Operations. Covers tapes for masking during paint stripping operations.
- Type I—Three-hour protection
  - Ideal Tape Co.
- Type II—72-hour protection

**MIL-W-23680E**
Stud Welding Systems, DC, Integral Power Source and Control Unit, Electric Arc and Capacitor Discharge
Covers portable electric arc and capacitor discharge stud welding systems consisting of an integral direct current (DC) power source, timer controls, stud gun(s), and cables.
- Midwest Fasteners, Inc.

**MIL-W-80110C**
Stud Welding Units, Independent DC Power Source with Separate Control Unit, Electric Arc
Covers independent, direct current (DC) welding power sources and separate control units designed for electric arc stud welding with equipment and accessories.
- Midwest Fasteners, Inc.

**MIL-Y-1140H**
Yarn, Cord, Sleeving, Cloth, and Tape—Glass
Covers the basic forms of untreated glass fiber used by themselves or as components of other materials.
- Class C—Continuous filament
  - Integrated Marketing Group
  - Lewco Specialty Products, Inc.
- Class S—Staple fiber
- Form 1—Yarn
  - Lewco Specialty Products, Inc.
- Form 2—Cordage
  - Lewco Specialty Products, Inc.
- Form 3—Sleeving
  - Integrated Marketing Group
  - Lewco Specialty Products, Inc.
- Form 4—Cloth
  - Integrated Marketing Group
  - Lewco Specialty Products, Inc.
- Form 5—Tape
  - Ideal Tape Co.
  - Integrated Marketing Group
  - Lewco Specialty Products, Inc.

**ELECTRIC BOAT SPECIFICATION – EB 4013**
Anti-Sweat and Refrigerant Insulation Systems (Sheet and Tubes)

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Miscellaneous Specifications and Standards

American Society of Heating, Refrigerating, and Air-Conditioning Engineers, Inc. (ASHRAE)
- Terminology of Heating, Ventilation, Air Conditioning, and Refrigeration
  www.ashrae.org

Corps of Engineers, Department of the Army

Energy Codes
- International Code Council (ICC), www.iccsafe.org
- ASHRAE 90.1, www.ashrae.org

Federal Construction Guide Specifications (FCGS)
- FCGS—07250 Sprayed Fire Protection
- FCGS—07260 Firestopping Division 15-Mechanical
- FCGS—15180 Insulation of Mechanical Systems

Manufacturers Standardization Society of the Valve and Fitting Industry, Inc.
- MSS Publication SP-69, “Pipe Hangers and Supports-Selection and Application” (1983)

Midwest Insulation Contractors Association (MICA)
- National Commercial and Industrial Insulation Standards (2021, 9th Edition)

Model Building Codes
- NFPA 5000, www.nfpa.org
- International Code Council (ICC), www.iccsafe.org
- Council of American Building Officials (CABO)

National Insulation Association (NIA)
- Insulation Science Glossary
- Insulation Specifications Chart
- Mechanical Insulation Basics
- Mechanical Insulation Design Guide
- Certified Insulation Inspectors
- Certified Energy Appraisers

Naval Facilities Engineering Command (NAVFACENGCOM)
- Guide Specifications (NFGS) for Use in Regular Military Construction Projects
  - NFGS—07211 Loose Fill (Cellulosic and Mineral Fiber) Insulation
  - NFGS—07218 Spray Applied Cellulose Insulation
  - NFGS—07220 Roof Insulation
  - NFGS—07221 Masonry Wall Insulation
  - NFGS—07222 Tapered Roof Insulation

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• NFGS—07230 Perimeter and Under-Slab Insulation
• NFGS—07232 Ceiling, Wall, and Floor Insulation
• NFGS—07250 Spray-On Fireproofing
• NFGS—07250 Fireproofing
• NFGS—15250 Insulation of Mechanical Systems

Nuclear Regulatory Commission
  • Regulatory Guide 1.36, “Non-Metallic Insulation for Austenitic Stainless Steel”

National Fire Protection Association (NFPA)
  • NFPA 90A—Standard for the Installation of Air Conditioning and Ventilating Systems
  • NFPA 90B—Standard for the Installation of Warm Air Heating and Air Conditioning Systems
  • For the latest version, contact NFPA at 1 Batterymarch Park, P.O. Box 9101, Quincy, MA 02269-9109, (800) 344-3555, Fax (800) 593-6372, www.nfpa.org.

SCAQ MD
  • Regulation 1168-adhesives and coatings

Adhesives
  • Aeroflex USA
  • Armacell
  • Foster Products (HB Fuller Construction Products)
  • Johns Manville
  • K-Flex USA
  • Owens Corning

Type II—72-hour protection
  • Armacell
  • Foster Products (HB Fuller Construction Products)
  • K-Flex USA
  • Owens Corning

U.S. Coast Guard
  • 46 CFR 164.006 Deck Covering for Merchant Vessels
  • 46 CFR 164.007 Structural Insulations
  • 46 CFR 164.008 Bulkhead Panels
  • 46 CFR 164.009 Noncombustible Materials
  • Integrated Marketing Group
  • 46 CFR 164.010 Structural Ceiling
  • 46 CFR 164.012 Interior Finished

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