

SECTION 230719  
DUCT INSULATION

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section includes insulation, insulating cements, field-applied jackets, accessories and attachments, and sealing compounds.

1.2 SUBMITTALS

- A. Product Data: Thermal conductivity, thickness, and jackets (both factory and field applied, if any), for each type of product indicated.

1.3 QUALITY ASSURANCE

- A. Fire-Test-Response Characteristics: Provide products with flame-spread and smoke-developed indices of 25 and 50, respectively, according to ASTM E 84 by a testing agency acceptable to authorities having jurisdiction.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
- B. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
  - 1. Mineral-Fiber Insulation:
    - a. CertainTeed Manson.
    - b. Knauf Fiber Glass
    - c. Owens-Corning Fiberglas Corp.
  - 2. Flexible Elastomeric Thermal Insulation:
    - a. Armacell, LLC
    - b. Armstrong World Industries, Inc.
    - c. Rubatex Corp.
  - 3. Polyolefin Insulation:
    - a. LSP Products

- b. Armstrong World Industries, Inc.
  - c. IMCOA.
4. Closed-Cell Phenolic-Foam Insulation:
- a. Polyguard
  - b. Kooltherm Insulation Products, Ltd.
  - c. Casa Verde

## 2.2 INSULATION MATERIALS

- A. Mineral-Fiber Insulation: Glass fibers bonded with a thermosetting resin complying with the following:
- 1. Preformed Pipe Insulation: Comply with ASTM C 547, Type 1, with factory-applied, all-purpose, vapor-retarder jacket.
  - 2. Blanket Duct Insulation: Comply with ASTM C 553, Type II, with factory-applied FSK vapor-retarder jacket.
  - 3. Fire-Resistant Adhesive: Comply with MIL-A-3316C Class 1, Grade A for bonding glass cloth and tape to un-faced glass-fiber insulation, for sealing edges of glass-fiber insulation, and for bonding lagging cloth to un-faced glass-fiber insulation.
  - 4. Vapor-Retarder Mastics: Fire- and water-resistant, vapor-retarder mastic for indoor applications. Comply with MIL-C-19565C, Type II.
  - 5. Mineral-Fiber Insulating Cements: Comply with ASTM C 195.
  - 6. Expanded or Exfoliated Vermiculite Insulating Cements: Comply with ASTM C 196.
  - 7. Mineral-Fiber, Hydraulic-Setting Insulating and Finishing Cement: Comply with ASTM C 449/C 449M.
- B. Flexible Elastomeric Thermal Insulation: Closed-cell, sponge- or expanded-rubber materials. Comply with ASTM C 534, Type I for tubular materials and Type II for sheet materials.
- C. Polyolefin Insulation: Unicellular polyethylene thermal plastic, preformed pipe insulation. Comply with ASTM C 534, Type I, except for density.
- D. Field-Applied Jackets: ASTM C 921, Type 1, unless otherwise indicated.
- 1. Foil and Paper Jacket: Laminated, glass-fiber-reinforced, flame-retardant kraft paper and aluminum foil.
  - 2. PVC Jacket: High-impact, ultraviolet-resistant PVC; 20 mils thick; roll stock ready for shop or field cutting and forming.
  - 3. Standard PVC Fitting Covers: Factory-fabricated fitting covers manufactured from 20-mil thick, high-impact, ultraviolet-resistant PVC.

## PART 3 -

- A. Accessories and Attachments:
- 1. Glass Cloth and Tape: Comply with MIL-C-20079H, Type I for cloth and Type II for tape. Woven glass-fiber fabrics, plain weave, pre-sized a minimum of 8 oz./sq. yd.
  - 2. Bands: 3/4 inch wide aluminum.

3. Wire: 0.080-inch, nickel-copper alloy; 0.062-inch, soft-annealed, stainless steel; or 0.062-inch, soft-annealed, galvanized steel.

#### PART 4 - EXECUTION

##### 4.1 GENERAL APPLICATION REQUIREMENTS

- A. Surface Preparation: Clean and dry surfaces to receive insulation. Remove materials that will adversely affect insulation application.
- B. Apply insulation materials, accessories, and finishes according to the manufacturer's written instructions; with smooth, straight, and even surfaces; and free of voids throughout the length of ducts and fittings.
- C. Use accessories compatible with insulation materials and suitable for the service. Use accessories that do not corrode, soften, or otherwise attack insulation or jacket in either wet or dry state.
- D. Seal joints and seams with vapor-retarder mastic on insulation indicated to receive a vapor retarder.
- E. Apply insulation with tight longitudinal seams and end joints. Bond seams and joints with adhesive recommended by the insulation material manufacturer.
- F. Apply insulation with the least number of joints practical.
- G. Apply insulation over fittings and specialties, with continuous thermal and vapor-retarder integrity, unless otherwise indicated.
- H. Hangers and Anchors: Where vapor retarder is indicated, seal penetrations in insulation at hangers, supports, anchors, and other projections with vapor-retarder mastic. Apply insulation continuously through hangers and around anchor attachments.
- I. Insulation Terminations: For insulation application where vapor retarders are indicated, seal ends with a compound recommended by the insulation material manufacturer to maintain vapor retarder.
- J. Wall Penetrations: Apply insulation for interior applications to a point even with flashing.
- K. Interior Wall and Partition Penetrations: Apply insulation continuously through walls and partitions, except fire-rated walls and partitions.
- L. Floor Penetrations: Terminate insulation at underside of floor assembly and at floor support at top of floor.
- M. Blowers shall be operated and the duct system shall be leak tested prior to application of insulation. All leaks shall be sealed. Transverse joints to be repaired with welding or brazing. Longitudinal seams to be sealed.

- N. Duct Securement: Insulation to be secured per SMACNA standards with metal bands and weld type stickpins and zinc plated speed washers. All insulation joints, seams, pin penetrations, instrument penetrations, etc. shall be taped with 3" wide pressure sensitive FSK tape.

#### 4.2 INSULATION APPLICATION SCHEDULE

- A. Service: Domestic cold water.
  - 1. Operating Temperature: 35 to 60 deg F.
  - 2. Insulation Material: Flexible elastomeric.
  - 3. Insulation Thickness: 0.5" thickness, minimum.
  - 4. Vapor Retarder Required: Yes.
  
- B. Service: Domestic hot and recirculated hot water.
  - 1. Operating Temperature: 60 to 140 deg F
  - 2. Insulation Material: Mineral fiber
  - 3. Insulation Thickness: 1" thickness, minimum.
  - 4. Field-Applied Jacket: PVC.
  
- C. Service: Heating hot-, chilled-, and condenser- water supply and return.
  - 1. Operating Temperature: 40 to 200 deg F.
  - 2. Insulation Material: Mineral fiber.
  - 3. Insulation Thickness: 1.5" thickness, minimum
  - 4. Field-Applied Jacket: PVC.
  - 5. Vapor Retarder Required: Yes.
  
- D. Service: Supply and Return Air Ducts
  - 1. Operating Temperature: 50 to 110 deg F.
  - 2. Insulation Material: Mineral fiber
  - 3. Insulation Thickness: 1.5" thickness, minimum
  - 4. Field-Applied Jacket: FSK.
  - 5. Vapor Retarder Required: Yes

END OF SECTION 230719