SECTION 230700 - HVAC INSULATION

PART 1 - GENERAL

1.1 SECTION REQUIREMENTS

A. Submittals:

1. Product Data: For each type of product indicated.
2. For adhesives and sealants, documentation including printed statement of VOC content.

B. Quality Assurance: Labeled with maximum flame-spread index of 25 and maximum smoke-developed index of 50 according to ASTM E 84.

C. Samples: Provided by distributor

PART 2 - PRODUCTS

2.1 DISTRIBUTOR OF INSULATION PRODUCTS

A. General Insulation, which is located at: 278 Mystic Avenue, Medford, MA, 02155; Toll Free Tel: 800-241-4402; Tel: 781-391-2070; Fax: 781-391-3094; Email: request info (info@generalinsulation.com); Web: www.generalinsulation.com

B. Requests for substitutions will be considered in accordance with provisions of Section 01 60 00 - Product Requirements.

2.2 PERFORMANCE REQUIREMENTS

A. Surface-Burning Characteristics:

1. Indoor Insulation and Related Materials: To be factory-labeled designating maximum flame-spread index of 25 or less and smoke-developed index of 50 or less according to ASTM E 84.
2. Outdoor Insulation and Related Materials: To be factory labeled designating maximum flame-spread index of 75 or less and smoke-developed index of 150 or less according to ASTM E 84.

2.3 INSULATION MATERIALS

A. Foam insulation materials shall not use CFC or HCFC blowing agents in the manufacturing process.

B. Flexible Elastomeric: Closed-cell, sponge- or expanded-rubber materials. Comply with ASTM C 534, Type I for tubular materials and Type II for sheet materials.

1. Basis-of-Design Product: Subject to compliance with requirements, provide **K-Flex USA** or comparable product by one of the following:

    a. Aeroflex USA, Inc.
    b. Armacell LLC.

C. Mineral-Fiber Blanket Insulation: Comply with ASTM C 553, Type II and ASTM C 1290, Type I.

1. Basis-of-Design Product: Subject to compliance with requirements, provide **Manson Insulation Inc.; an Knauf Insulation Company** or comparable product by one of the following:

    a. CertainTeed Corporation.
    b. Knauf Insulation.;

D. Mineral-Fiber Board Insulation: Comply with ASTM C 612, Type IA or Type IB. For duct and plenum applications, provide insulation [**without factory-applied jacket**] [**with factory-applied ASJ**] [**with factory-applied FSK jacket**].

1. Basis-of-Design Product: Subject to compliance with requirements, provide **Manson Insulation Inc.; an Knauf Insulation Company** or comparable product by one of the following:

    a. CertainTeed Corporation.
    b. Knauf Insulation.

E. Mineral-Fiber, Preformed Pipe Insulation: Comply with ASTM C 547, Type I, Grade A, with factory-applied ASJ.

1. Basis-of-Design Product: Subject to compliance with requirements, provide **Manson Insulation Inc.; an Knauf Insulation Company** or comparable product by one of the following:

    a. Knauf Insulation.
    b. Owens Corning.

F. Mineral-Fiber Pipe and Tank Insulation: Complying with ASTM C 1393, Type II or Type IIIA, Category 2, or with properties similar to ASTM C 612, Type IB; having factory-applied [**ASJ**] [**FSK jacket**]. Nominal density is 2.5 lb/cu. ft. (40 kg/cu. m) or more. Thermal conductivity (k-value) at 100 deg F (55 deg C) is 0.29 Btu x in./h x sq. ft. x deg F (0.042 W/m x K) or less.

1. Basis-of-Design Product: Subject to compliance with requirements, provide **Manson Insulation Inc.; an Knauf Insulation Company** or comparable product by one of the following:

    a. CertainTeed Corporation.
    b. Knauf Insulation.

G. Polyolefin Insulation: Unicellular, polyethylene thermal plastic insulation. Comply with ASTM C 534 or ASTM C 1427, Type I, Grade 1 for tubular materials and Type II, Grade 1 for sheet materials.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

    a. Armacell LLC.
    b. Nomaco Insulation.

H. Flexible Elastomeric and Polyolefin Adhesive: Comply with MIL-A-24179A, Type II, Class I.

1. Basis-of-Design Product: Subject to compliance with requirements, provide **MK-Flex USA** or comparable product by one of the following:

    a. Armacell LLC.
    b. Foster Brand; H. B. Fuller Construction Products.

2. For indoor applications, adhesive shall have a VOC content of 50 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).

I. Mineral-Fiber Adhesive: Comply with MIL-A-3316C, Class 2, Grade A.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

    a. Childers Brand; H. B. Fuller Construction Products.
    b. Eagle Bridges - Marathon Industries.
    c. Foster Brand; H. B. Fuller Construction Products.
    d. Mon-Eco Industries, Inc.

2. For indoor applications, adhesive shall have a VOC content of 80 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).

J. Vapor-Barrier Mastic: Water based; suitable for indoor and outdoor use on below ambient services.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

    a. Foster Brand; H. B. Fuller Construction Products.
    b. Vimasco Corporation.

2. Water-Vapor Permeance: ASTM E 96/E 96M, Procedure B, 0.013 perm (0.009 metric perm) at 43-mil (1.09-mm) dry film thickness.

3. Solids Content: ASTM D 1644, 58 percent by volume and 70 percent by weight.

K. Factory-Applied Jackets: When factory-applied jackets are indicated, comply with the following:

1. ASJ: White, kraft-paper, fiberglass-reinforced scrim with aluminum-foil backing; complying with ASTM C 1136, Type I.
2. FSK Jacket: Aluminum-foil, fiberglass-reinforced scrim with kraft-paper backing; complying with ASTM C 1136, Type II.

L. ASJ Tape: White vapor-retarder tape matching factory-applied jacket with acrylic adhesive, complying with ASTM C 1136.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. Avery Dennison Corporation, Specialty Tapes Division.
b. Compac Corporation.
c. Ideal Tape Co., Inc., an American Biltrite Company.
d. Venture Tape.

M. FSK Tape: Foil-face, vapor-retarder tape matching factory-applied jacket with acrylic adhesive; complying with ASTM C 1136.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. Avery Dennison Corporation, Specialty Tapes Division.
b. Compac Corporation.
c. Ideal Tape Co., Inc., an American Biltrite Company.
d. Venture Tape.

PART 3 - EXECUTION

3.1 INSULATION INSTALLATION

A. Comply with requirements of the Midwest Insulation Contractors Association's "National Commercial & Industrial Insulation Standards" for insulation installation on pipes and equipment.

B. Insulation Installation at Interior Wall and Partition Penetrations (That Are Not Fire Rated): Install insulation continuously through walls and partitions.

C. Insulation Installation at Fire-Rated Wall, Partition, and Floor Penetrations: Install insulation continuously through penetrations. Seal penetrations. Comply with requirements in Section 078413 "Penetration Firestopping."

D. Flexible Elastomeric Insulation Installation:

1. Seal longitudinal seams and end joints with adhesive to eliminate openings in insulation that allow passage of air to surface being insulated.
2. Insulation Installation on Pipe Fittings and Elbows: Install mitered sections of pipe insulation. Secure insulation materials and seal seams with adhesive to eliminate openings in insulation that allow passage of air to surface being insulated.

E. Mineral-Fiber Insulation Installation:

1. Insulation Installation on Straight Pipes and Tubes: Where vapor barriers are indicated, seal longitudinal seams, end joints, and protrusions with vapor-barrier mastic and joint sealant.
2. For insulation with factory-applied jackets on above ambient surfaces, secure laps with outward clinched staples at 6 inches (150 mm) o.c.
3. For insulation with factory-applied jackets on below ambient surfaces, do not staple longitudinal tabs but secure tabs with additional adhesive as recommended by insulation material manufacturer and seal with vapor-barrier mastic and flashing sealant.
4. Blanket and Board Insulation Installation on Ducts and Plenums: Secure with adhesive and insulation pins.
5. For ducts and plenums with surface temperatures below ambient, install a continuous, unbroken vapor barrier.

F. Polyolefin Insulation Installation:

1. Seal split-tube longitudinal seams and end joints with adhesive to eliminate openings in insulation that allow passage of air to surface being insulated.
2. Insulation Installation on Pipe Fittings and Elbows: Install mitered sections of polyolefin pipe insulation. Secure insulation materials and seal seams with adhesive to eliminate openings in insulation that allow passage of air to surface being insulated.

G. Plenums and Ducts Requiring Insulation:

1. Concealed and exposed supply and outdoor air.
2. Concealed and exposed return air located in nonconditioned space.
3. Concealed and exposed exhaust between isolation damper and penetration of building exterior.

H. Plenums and Ducts Not Insulated:

1. Metal ducts with duct liner.
2. Factory-insulated plenums and casings.
3. Flexible connectors.
4. Vibration-control devices.
5. Factory-insulated access panels and doors.

I. Piping Not Insulated: Unless otherwise indicated, do not install insulation on the following:

1. Drainage piping located in crawlspaces.
2. Underground piping.
3. Chrome-plated pipes and fittings unless there is a potential for personnel injury.

3.2 DUCT AND PLENUM INSULATION SCHEDULE

A. Concealed duct insulation shall be[**one of**] the following:

1. Flexible Elastomeric: [**1 inch (25 mm)**] <**Insert dimension**> thick.

2. Mineral-Fiber Blanket: [**1-1/2 inches (38 mm)**] [**2 inches (50 mm)**] [**3 inches (75 mm)**] <**Insert dimension**> thick and [**0.75-lb/cu. ft. (12-kg/cu. m)**] [**1.5-lb/cu. ft. (24-kg/cu. m)**] [**3-lb/cu. ft. (48-kg/cu. m)**] nominal density.
3. Mineral-Fiber Board: [**1-1/2 inches (38 mm)**] [**2 inches (50 mm)**] [**3 inches (75 mm)**] <**Insert dimension**> thick and [**2-lb/cu. ft. (32-kg/cu. m)**] [**3-lb/cu. ft. (48-kg/cu. m)**] [**6-lb/cu. ft. (96-kg/cu. m)**] nominal density.
4. Polyolefin: [**1 inch (25 mm)**] <**Insert dimension**> thick.

B. Exposed duct insulation shall be[**one of**] the following:

1. Flexible Elastomeric: [**1 inch (25 mm)**] <**Insert dimension**> thick.
2. Mineral-Fiber Blanket: [**1-1/2 inches (38 mm)**] [**2 inches (50 mm)**] [**3 inches (75 mm)**] <**Insert dimension**> thick and [**0.75-lb/cu. ft. (12-kg/cu. m)**] [**1.5-lb/cu. ft. (24-kg/cu. m)**] [**3-lb/cu. ft. (48-kg/cu. m)**] nominal density.
3. Mineral-Fiber Board: [**1-1/2 inches (38 mm)**] [**2 inches (50 mm)**] [**3 inches (75 mm)**] <**Insert dimension**> thick and [**2-lb/cu. ft. (32-kg/cu. m)**] [**3-lb/cu. ft. (48-kg/cu. m)**] [**6-lb/cu. ft. (96-kg/cu. m)**] nominal density.
4. Polyolefin: [**1 inch (25 mm)**] <**Insert dimension**> thick.

3.3 HVAC PIPING INSULATION SCHEDULE

A. Chilled Water: Insulation shall be[**one of**] the following:

1. Flexible Elastomeric: [**1 inch (25 mm)**] <**Insert dimension**> thick.
2. Mineral-Fiber, Preformed Pipe, [**Type I**] [**Type I or Pipe Insulation Wicking System**]: [**1 inch (25 mm)**] [**1-1/2 inches (38 mm)**] [**2 inches (50 mm)**] <**Insert dimension**> thick.
3. Polyolefin: [**1 inch (25 mm)**] <**Insert dimension**> thick.

B. Heating-Hot-Water Supply and Return: Insulation shall be the following:

1. Mineral-Fiber, Preformed Pipe, Type I: [**1 inch (25 mm)**] [**2 inches (50 mm)**] <**Insert dimension**> thick.

C. Refrigerant Suction and Hot-Gas Piping: Insulation shall be[**one of**] the following:

1. Flexible Elastomeric: [**1 inch (25 mm)**] <**Insert dimension**> thick.
2. Mineral-Fiber, Preformed Pipe Insulation, Type I: [**1 inch (25 mm)**] <**Insert dimension**> thick.
3. Polyolefin: [**1 inch (25 mm)**] <**Insert dimension**> thick.

D. Refrigerant Suction and Hot-Gas Flexible Tubing: Insulation shall be[**one of**] the following:

1. Flexible Elastomeric: [**1 inch (25 mm)**] <**Insert dimension**> thick.
2. Polyolefin: [**1 inch (25 mm)**] <**Insert dimension**> thick.

E. Dual-Service Heating and Cooling: Mineral-Fiber, Preformed Pipe, Type I: [**1 inch (25 mm)**] [**1-1/2 inches (38 mm)**] [**2 inches (50 mm)**] <**Insert dimension**> thick.

END OF SECTION 230700