SECTION 220700 - PLUMBING INSULATION

PART 1 - GENERAL

1.1 SECTION REQUIREMENTS

A. Submittals:

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

B. Samples: Provided by distributor

PART 2 - PRODUCTS

2.1 DISTRIBUTOR OF INSULATION MATERIALS

A. General Insulation Company, Inc, 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. Insulation Installed Indoors: Flame-spread index of 25 or less, and smoke-developed index of 50 or less according to ASTM E 84.

B. Insulation Installed Outdoors: 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 Insulation: 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: Mineral or glass fibers bonded with a thermosetting resin. Comply with ASTM C 553, Type II and ASTM C 1290, Type I. Factory-applied jacket requirements are specified in "Factory-Applied Jackets" Article.

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

a. CertainTeed Corporation.
b. Knauf Insulation.

D. Mineral-Fiber, Preformed Pipe Insulation:

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

a. Owens Corning
b. Knauf Insulation.

E. Mineral-Fiber, Pipe and Tank Insulation: Mineral or glass fibers bonded with a thermosetting resin. Semirigid board material with factory-applied [**ASJ**] [**FSK jacket**] complying with ASTM C 1393, Type II or Type IIIA Category 2, or with properties similar to ASTM C 612, Type IB. 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. Factory-applied jacket requirements are specified in "Factory-Applied Jackets" Article.

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

a. CertainTeed Corporation.
b. Knauf Insulation.

F. Polyolefin: 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.

2.4 ADHESIVES

A. 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 **K-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.

B. 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.

C. ASJ Adhesive, and FSK Jacket Adhesive: Comply with MIL-A-3316C, Class 2, Grade A for bonding insulation jacket lap seams and joints.

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 50 g/L or less.

2.5 MASTICS

A. Vapor-Barrier Mastic: Water based; suitable for indoor 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. For indoor applications, use mastics that have a VOC content of 50 g/L or less.
3. 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.
4. Service Temperature Range: Minus 20 to plus 180 deg F (Minus 29 to plus 82 deg C).
5. Solids Content: ASTM D 1644, 58 percent by volume and 70 percent by weight.
6. Color: White.

B. Breather Mastic: Water based; suitable for indoor and outdoor use on above ambient services.

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.
e. Vimasco Corporation.

2. Water-Vapor Permeance: ASTM F 1249, 1.8 perms (1.2 metric perms) at 0.0625-inch (1.6-mm) dry film thickness.

3. Service Temperature Range: Minus 20 to plus 180 deg F (Minus 29 to plus 82 deg C).
4. Solids Content: 60 percent by volume and 66 percent by weight.
5. Color: White.

2.6 SEALANTS

A. Joint Sealants for Cellular-Glass Products:

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.
e. Pittsburgh Corning Corporation.

2. Materials shall be compatible with insulation materials, jackets, and substrates.

3. Permanently flexible, elastomeric sealant.
4. Service Temperature Range: Minus 100 to plus 300 deg F (Minus 73 to plus 149 deg C).
5. Color: White or gray.
6. For indoor applications, sealants shall have a VOC content of 420 g/L or less.

B. ASJ Flashing Sealants, and Vinyl, PVDC, and PVC Jacket Flashing:

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

a. Childers Brand; H. B. Fuller Construction Products.

2. Materials shall be compatible with insulation materials, jackets, and substrates.

3. Fire- and water-resistant, flexible, elastomeric sealant.
4. Service Temperature Range: Minus 40 to plus 250 deg F (Minus 40 to plus 121 deg C).
5. Color: White.
6. For indoor applications, sealants shall have a VOC content of 420 g/L or less.

2.7 FACTORY-APPLIED JACKETS

A. Insulation system schedules indicate factory-applied jackets on various applications. 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. ASJ-SSL: ASJ with self-sealing, pressure-sensitive, acrylic-based adhesive covered by a removable protective strip; complying with ASTM C 1136, Type I.
3. FSK Jacket: Aluminum-foil, fiberglass-reinforced scrim with kraft-paper backing; complying with ASTM C 1136, Type II.

2.8 TAPES

A. 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.

2. Width: 3 inches (75 mm).

3. Thickness: 11.5 mils (0.29 mm).
4. Adhesion: 90 ounces force/inch (1.0 N/mm) in width.
5. Elongation: 2 percent.
6. Tensile Strength: 40 lbf/inch (7.2 N/mm) in width.
7. ASJ Tape Disks and Squares: Precut disks or squares of ASJ tape.

B. 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 the following**] [**provide products by one of the following**] [**available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following**]:

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

2. Width: 3 inches (75 mm).

3. Thickness: 6.5 mils (0.16 mm).
4. Adhesion: 90 ounces force/inch (1.0 N/mm) in width.

5. Elongation: 2 percent.
6. Tensile Strength: 40 lbf/inch (7.2 N/mm) in width.
7. FSK Tape Disks and Squares: Precut disks or squares of FSK tape.

PART 3 - EXECUTION

3.1 PIPE 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.

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. Interior Piping System Applications: Insulate the following piping systems:

1. Domestic hot water.

2. Recirculated domestic hot water.
3. Roof drain bodies and horizontal rainwater leaders of storm water piping.
4. Exposed water supplies and sanitary drains of fixtures for people with disabilities.

H. Do not apply insulation to the following systems, materials, and equipment:

1. Flexible connectors.
2. Sanitary drainage and vent piping.
3. Drainage piping located in crawlspaces unless otherwise indicated.
4. Chrome-plated pipes and fittings, except for plumbing fixtures for people with disabilities.
5. Piping specialties, including air chambers, unions, strainers, check valves, plug valves, and flow regulators.

3.2 EQUIPMENT INSULATION SCHEDULE

A. Domestic water and domestic hot-water hydropneumatic tank insulation shall be[**one of**] the following:

1. Flexible Elastomeric: [**1 inch (25 mm)**] <**Insert dimension**> thick.
2. Mineral-Fiber Blanket: [**1 inch (25 mm)**] <**Insert dimension**> thick and **2-lb/cu. ft.** (**32-kg/cu. m**) nominal density.
3. Mineral-Fiber Pipe and Tank: [**1 inch (25 mm)**] <**Insert dimension**> thick.
4. Polyolefin: [**1 inch (25 mm)**] <**Insert dimension**> thick.

B. Domestic hot-water storage tank insulation shall be[**one of**] the following:

1. Mineral-Fiber Pipe and Tank: [**4 inches (100 mm)**] <**Insert dimension**> thick.

C. Domestic water storage tank insulation shall be[**one of**] the following:

1. Flexible Elastomeric: [**1 inch (25 mm)**] <**Insert dimension**> thick.
2. Mineral-Fiber Pipe and Tank: [**1 inch (25 mm)**] <**Insert dimension**> thick.
3. Polyolefin: [**1 inch (25 mm)**] <**Insert dimension**> thick.

3.3 INDOOR PIPING INSULATION SCHEDULE

A. 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.

B. Domestic Cold Water:

1. [**NPS 1 (DN 25)**] <**Insert pipe size**> and Smaller: Insulation shall be[**one of**] the following:

a. Flexible Elastomeric: [**1/2 inch (13 mm)**] [**3/4 inch (19 mm)**] [**1 inch (25 mm)**] <**Insert dimension**> thick.

b. Mineral-Fiber, Preformed Pipe Insulation, Type I: [**1/2 inch (13 mm)**] [**1 inch (25 mm)**] <**Insert dimension**> thick.
c. Polyolefin: [**1/2 inch (13 mm)**] [**3/4 inch (19 mm)**] [**1 inch (25 mm)**] <**Insert dimension**> thick.

2. [**NPS 1-1/4 (DN 32)**] <**Insert pipe size**> and Larger: Insulation shall be[**one of**] the following:

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

C. Domestic Hot and Recirculated Hot Water:

1. [**NPS 1-1/4 (DN 32)**] <**Insert pipe size**> and Smaller: Insulation shall be[**one of**] the following:

a. Flexible Elastomeric: [**3/4 inch (19 mm)**] [**1 inch (25 mm)**] <**Insert dimension**> thick.
b. Mineral-Fiber, Preformed Pipe Insulation, Type I: [**1/2 inch (13 mm)**] [**1 inch (25 mm)**] <**Insert dimension**> thick.
c. Polyolefin: [**3/4 inch (19 mm)**] [**1 inch (25 mm)**] <**Insert dimension**> thick.

2. [**NPS 1-1/2 (DN 40)**] <**Insert pipe size**> and Larger: Insulation shall be[**one of**] the following:

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

D. Roof Drain and Overflow Drain Bodies:

1. All Pipe Sizes: Insulation shall be[**one of**] the following:

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

E. Exposed Sanitary Drains, Domestic Water, Domestic Hot Water, and Stops for Plumbing Fixtures for People with Disabilities:

1. All Pipe Sizes: Insulation shall be[**one of**] the following:

a. Flexible Elastomeric: [**1/2 inch (13 mm)**] [**3/4 inch (19 mm)**] [**1 inch (25 mm)**] <**Insert dimension**> thick.
b. Mineral-Fiber, Preformed Pipe Insulation, Type I: [**1/2 inch (13 mm)**] [**1 inch (25 mm)**] <**Insert dimension**> thick.

c. Polyolefin: [**1/2 inch (13 mm)**] [**3/4 inch (19 mm)**] [**1 inch (25 mm)**] <**Insert dimension**> thick.

END OF SECTION 220700