

SECTION 23 0719
HVAC PIPING INSULATION

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Piping insulation.

1.02 REFERENCE STANDARDS

- A. ASTM C534/C534M - Standard Specification for Preformed Flexible Elastomeric Cellular Thermal Insulation in Sheet and Tubular Form; 2014.
- B. ASTM C 1126 - Standard Specification for Faced or Unfaced Rigid Cellular Phenolic Thermal Insulation; 2009.
- C. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2015a.
- D. NFPA 255 - Standard Method of Test of Surface Burning Characteristics of Building Materials; National Fire Protection Association 2007.
- E. UL 723 - Standard for Test for Surface Burning Characteristics of Building Materials; Current Edition, Including All Revisions.

1.03 SUBMITTALS

- A. See Section 23 0510 - General HVAC Requirements for submittal procedures.
- B. Product Data: Provide product description, thermal characteristics, list of materials and thickness for each service, and locations.
- C. Manufacturer's Instructions: Indicate installation procedures that ensure acceptable workmanship and installation standards will be achieved.

1.04 QUALITY ASSURANCE

- A. All insulation, mastics, coatings, sealants, and adhesives shall be certified by the manufacturer to be Asbestos-free.
- B. Applicator Qualifications: Company specializing in performing the type of work specified in this section with minimum Three years of experience.

1.05 DELIVERY, STORAGE, AND HANDLING

- A. Accept materials on site, labeled with manufacturer's identification, product density, and thickness.

PART 2 PRODUCTS

2.01 REGULATORY REQUIREMENTS

- A. Surface Burning Characteristics: Flame spread/Smoke developed index of 25/50, maximum, when tested in accordance with ASTM E 84, NFPA 255, or UL 723.

2.02 FLEXIBLE ELASTOMERIC CELLULAR INSULATION

- A. Manufacturer:
 - 1. Aeroflex USA, Inc; Aerocel: www.aeroflexusa.com/#sle.
 - 2. Armacell LLC: www.armacell.us/#sle.
 - 3. K-Flex USA LLC; Insul-Tube: www.kflexusa.com/#sle.
- B. Insulation: Preformed flexible closed-cell elastomeric rubber insulation complying with ASTM C 534 Grade 1; use molded tubular material. Split tube installation is prohibited.
 - 1. 'K' ('Ksi') value: 0.25 at 75 degrees F (0.04 at 24 degrees C).
 - 2. Maximum Moisture Absorption: < 1.0 percent (pipe) by volume, when tested in accordance with ASTM C 209.
 - 3. Water Vapor Permeability: 0.05 perm-inches, when tested in accordance with ASTM E 96.
 - 4. Minimum Service Temperature: Minus 40 degrees F.

5. Maximum Service Temperature: 220 degrees F.
 6. Connection: Waterproof vapor barrier adhesive.
- C. Elastomeric Foam Adhesive: Air dried, contact adhesive, compatible with insulation.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that piping has been tested before applying insulation materials.
- B. Verify that surfaces are clean and dry, with foreign material removed.

3.02 INSTALLATION

- A. Install in accordance with manufacturer's instructions.
- B. Install in accordance with NAIMA National Insulation Standards.
- C. Exposed Piping: Locate insulation and cover seams in least visible locations. Exterior of insulation shall be uniform in appearance.
- D. Insulation jacket shall fit snug to insulation.
- E. Valves and fittings:
 1. Insulate pipe and all valves and fittings including valve bonnets on A.C. condensate drain , chilled water, and refrigerant suction piping. Leave only valve stems, open ends of wells and gauge cocks exposed.
 2. Insulate pipe and all valves and fittings including valve bonnets on Heating Water piping within five feet of terminal unit heating coils. Leave only valve stems, open ends of wells and gauge cocks exposed.
 3. All Other Piping: Insulate pipe and fittings, but omit insulation on unions and valves. Taper insulation ends and cover with jacket material.
- F. Insulation at Hangers: Hangers for horizontal, A.C. condensate drain, chilled water, refrigerant suction, and trapeze supports shall be outside of insulation with saddles as specified herein.
- G. Saddles:
 1. Provide galvanized steel saddles at each point where pipe insulation passes through a hanger or rests on a support.
 2. Saddles shall be 180 arc for horizontal piping, 360 arch for vertical piping.
 3. Center saddle on pipe hanger.
 4. Length and gauge of saddle shall be as follows:
 - a. 2 inch pipe size and smaller: 18 Gauge saddle, 8 inch long, minimum.
 - b. 2-1/2 & 3 inch pipe size: 18 Gauge saddle, 12 inch long, minimum.
 - c. 4 inch pipe size: 16 Gauge saddle, 16 inch long, minimum.
 - d. 6 inch pipe size and larger: 16 Gauge saddle, 24 inch long, minimum.
- H. Flexible elastomeric cellular rubber insulation: Install without splitting and under compression during pipe fabrication. Seal Joints with adhesive. Paint exposed insulation with two coats of vinyl insulation paint after adhesive has dried for twelve hours, minimum. Allow two hours, minimum, between coats.
- I. Continue insulation through walls, sleeves, pipe hangers, and other pipe penetrations. Finish at supports, protrusions, and interruptions. At fire separations, refer to Section 15010.

3.03 CLEANING

- A. Clean adjacent surfaces, valves, valve handles, etc. of jacketing materials.

3.04 SCHEDULES

- A. Heating Hot Water Systems:
 1. Material and jacket:
 - a. Heating Water Runouts to Terminal units Coils: 3/4 inch thick preformed flexible elastomeric cellular rubber insulation.
 2. Minimum Pipe Insulation Thickness - Heating and Hot Water Systems:
 - a. Fluid Operating Temperature Range (°F) and Usage: 141 °F - 200 °F

- 1) Insulation Conductivity:
 - (a) Conductivity BTU•in. (h•ft²•°F): 0.25 -0.29.
 - (b) Mean Rating Temperature, °F: 125
- 2) Nominal Pipe or Tube Size (in) - Insulation Thickness:
 - (a) <1 inch - 1.5 in.
 - (b) 1 to <1-1/2 inches - 1.5 in.
 - (c) 1 1/2 to <4 inches - 2.0 in.
 - (d) 4 to <8 inches - 2.0 in.

END OF SECTION