

SECTION 230719 - HVAC PIPING INSULATION

PART 1 GENERAL

1.1 WORK INCLUDED

- A. Piping insulation.
- B. Jackets and accessories.

1.2 RELATED WORK

- A. Section 230529 - Hangers and Supports for HVAC Piping and Equipment
- B. Section 230553 - Identification for HVAC Piping and Equipment

1.3 REFERENCES

- A. ANSI/ASTM C195 - Mineral Fiber Thermal Insulation Cement.
- B. ANSI/ASTM C547 - Mineral Fiber Preformed Pipe Insulation.
- C. ANSI/ASTM C552 - Cellular Glass Block and Pipe Thermal Insulation.
- D. ASTM C449 - Mineral Fiber Hydraulic-setting Thermal Insulating and Finishing Cement.
- E. ASTM E84 - Surface Burning Characteristics of Building Materials.
- F. NFPA 255 - Surface Burning Characteristics of Building Materials.
- G. ASTM B209 - Aluminum and Aluminum-Alloy Sheet and Plate.
- H. UL723 - Surface Burning Characteristics of Building Materials.
- I. Factory Mutual Research Corporation - Simulated Pipe Chase Test.

1.4 QUALITY ASSURANCE

- A. Applicator: Company specializing in piping insulation application with three years minimum experience.
- B. Materials: Flame spread/fuel contributed/smoke developed rating of 25/50/50 in accordance with ASTM E84, latest revision. In addition, the product when tested will not melt or drip flaming particles, and the flame shall not be progressive. All materials shall pass simulated end-use fire tests.
- C. The materials shall be manufactured under an independent third party supervision testing program covering the properties of fire performance, thermal conductivity, and water vapor transmission (WVT).

1.5 SUBMITTALS

- A. Submit product data under provisions of Section 013300.

- B. Include product description, list of materials and thickness for each service, and locations
- C. Submit manufacturer's installation instructions under provisions of Section 013300.

PART 2 PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS

- A. Pittsburg-Corning.
- B. Johns Manville / Schuller.
- C. Knauf.
- D. Armacell.
- E. Certainteed.
- F. Dow.
- G. Substitutions: Under provisions of Section 012500.

2.2 INSULATION

- A. Type A: Glass Fiber insulation; ANSI/ASTM C547; 'k' value of 0.24 at 75 degrees F; noncombustible
- B. Type D: Cellular foam; flexible, plastic; 'k' value of 0.27 at 75 degrees F. Armacell AP/ Armaflex white insulation. Insulation shall have a maximum WVT coefficient of 0.08 perm-inches when tested in accordance with ASTM E96, Procedure A.

2.3 JACKETS

- A. Interior Applications:
 - 1. Vapor Barrier Jackets: Kraft reinforced foil vapor barrier with self-sealing adhesive joints.
 - 2. PVC Jackets: Service pipe sizes 2" and smaller, one piece, pre-molded type for fittings.
- B. Exterior Applications:
 - 1. Weather resistant protective finish compatible with insulation system, Armstrong Armaflex Finish or equal. Finish shall include 10 X 10 Leno weave glass mesh adhered with Armstrong 520 adhesive and two coats of WB Armstrong Finish, color as selected by Owner.

2.4 ACCESSORIES

- A. Insulating Cement: ANSI/ASTM C195; hydraulic setting mineral wool.
- B. Finishing Cement: ASTM C449.
- C. Adhesives: Compatible with insulation, Armstrong 520, Benjamin Foster 85-75, Childers Chil-Seal CP-50A MV1 coating and adhesive or approved equal.
- D. Insulation Bands: 3/4 inches wide 0.020 inches thick ASTM B-209 aluminum.

- E. Metal Jacket Bands: 3/4 inches wide, 0.020 inches thick ASTM B-209 aluminum.
- F. Cellular foam joint sealant: Pittsburgh Corning Pittseal 444.

PART 3 EXECUTION

3.1 PREPARATION

- A. Install materials after piping has been tested and approved.
- B. Coordinate with other trades so that valve stems, operators, thermometer and control sensor wells, etc. are installed with proper mounting brackets and extensions are provided to allow insulation to run continuously and so that all penetrations can be sealed to protect the integrity of the vapor barrier.

3.2 INSTALLATION

- A. Install materials in accordance with manufacturer's instructions. Keep insulation dry and protected from damage.
- B. Continue insulation with vapor barrier through penetrations, sleeves and inside hangers. Stagger longitudinal joints on all insulation.
- C. In exposed piping, locate insulation and over seams in least visible location.
- D. On insulated piping with operating temperatures below 60 degrees or above 140 degrees, insulate fittings, valves, unions, flanges, strainers, flexible connections, and expansion joints.
- E. On insulated piping conveying fluids between 60 and 140 degrees F, do not insulate valves, flanges and unions at equipment, but bevel and seal ends of insulation at such locations with vapor barrier cement.
- F. Provide an insert, not less than 12 inches long, of same thickness and contour as adjoining insulation between support shield and piping, but under the finish jacket, on all piping 2 inches diameter or larger, to prevent insulation from sagging at support points. Inserts shall be type B or Type C heavy density insulating material suitable for the planned temperature range. Factory fabricated inserts may be used.
- G. Neatly finish insulation at supports, protrusions, and interruptions.
- H. Jackets:
 - 1. Indoor, concealed Applications: Insulated pipes with type A insulation shall have standard jackets with vapor barrier, factory-applied. Insulate fittings, joints and valves, with operating temperature above 140 degrees or below 60 degrees with insulation of like material and thickness as adjoining pipe, and finish with preformed PVC or aluminum fitting covers. Pipe valves and fittings insulated with type D insulation need no additional vapor barrier jacket.
 - 2. Outdoor, Exposed Applications: Outdoor piping with type "D" insulation shall receive 10 X 10 Leno weave glass mesh and two coats of weatherproof coating.
- I. Type A Insulation - Operating Temperature Above 60 Degrees:
 - 1. Pipe Insulation: Insulate all piping in a neat, workmanlike fashion in accordance with thicknesses listed in schedule. Jackets and butt strips.

2. Fittings: Where the factory-premolded one-piece PVC or two piece aluminum fitting covers are to be used, the proper factory precut insulation of like material and thickness as adjoining pipe shall be applied to the fitting. The ends of the insulation shall be tucked snugly into the throat of the fitting and the edges adjacent to the pipe covering tufted and tucked in, fully insulating the pipe fitting. The fitting cover is then secured by stapling, tack fastening, banding or taping the ends of the adjacent pipe covering.
- J. Type 'D' Insulation:
1. Where possible, insulation shall be slipped over the tubing as a full cylinder. Where necessary to cut, and at all butt joints and fittings, insulation shall be joined by sealing with a waterproof vapor-barrier adhesive, Armstrong 520 or approved equal.
 2. On refrigeration piping, insulation shall be slipped over the tubing as a full cylinder. Longitudinal slitting of the insulation is not allowed except on mitered sections at traps, tees, and bends over ninety degrees. Where necessary to cut, and at all butt joints and fittings, insulation shall be joined by sealing with a waterproof vapor-barrier adhesive, Armstrong 520 or approved equal.

3.3 SCHEDULE

PIPING	INSULATION TYPE	PIPE SIZE Inch	THICKNESS Inch
Condensate Drain	A	1/2" 3/4"	1/2" 3/4"
Refrigerant Liquid	D	All	3/4"
Refrigerant Suction and Hot Gas	D	All	3/4"

END OF SECTION 230719