

SECTION 220700 - PLUMBING PIPING INSULATION

PART 1 GENERAL

1.1 WORK INCLUDED

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

1.2 RELATED WORK

- A. Section 220529 - Hanger and Supports for Plumbing Piping and Equipment
- B. Section 220553 - Identification for Plumbing Piping and Equipment

1.3 REFERENCES

- A. ANSI/ASTM C195 - Mineral Fiber Thermal Insulation Cement.
- B. ANSI/ASTM C533 - Calcium Silicate Block and Pipe Thermal Insulation.
- C. ANSI/ASTM C547 - Mineral Fiber Preformed Pipe Insulation.
- D. ANSI/ASTM C552 - Cellular Glass Block and Pipe Thermal Insulation.
- E. ASTM C449 - Mineral Fiber Hydraulic-setting Thermal Insulating and Finishing Cement.
- F. ASTM E84 - Surface Burning Characteristics of Building Materials.
- G. NFPA 255 - Surface Burning Characteristics of Building Materials.
- H. ASTM B209 - Aluminum and Aluminum-Alloy Sheet and Plate.
- I. UL723 - Surface Burning Characteristics of Building Materials.
- J. 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 Sections 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 B: Cellular glass; ANSI/ASTM C552; maximum water vapor transmission rating of 0.2 perms; 'k' value of 27 at 75 degrees F.
- C. Type C: Hydrous calcium silicate; ANSI/ASTM C533; rigid white in preformed piping sections; asbestos free; 'k' value of 0.44 at 300 degrees F, suitable for 1200 degrees F operation.

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.

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. Fibrous Glass Cloth: Untreated; 8 ounces per square yard weight.
- G. 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 and exposed 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.
- I. Type A Insulation - Operating Temperature Below 60 Degrees:

1. Pipe Insulation: Insulate all piping in a neat, workmanlike fashion in accordance with thickness listed in schedule. Longitudinal laps of jackets shall be sealed and butt joints shall be wrapped with a 3" minimum wide strip of the jacketing material securely sealed in place. Adhesive to be Johns-Manville U-Glue, Epolux "Catalog" 400, Benjamin Foster 85-75, or approved equal.
2. Type B Insulation shall be applied in a single layer application with all joints tightly butted and sealed with joint sealant specified. Poorly fitting or broken insulation shall be replaced or re-cut to form a completely vapor sealed insulation system.
3. Fittings: Where the factory-premolded, one-piece PVC or two piece aluminum fitting covers are to be used, the proper factory pre-cut 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 cover is then secured by stapling, tack fastening, banding or taping the ends to the adjacent pipe covering. All seam edges of the cover shall be sealed with vapor-barrier adhesive. The circumferential edges of cover shall be wrapped with vapor-barrier pressure sensitive color matching tape. The tape shall extend over the adjacent pipe insulation, and have an overlap on itself at least 2 inches on the downward side.

J. 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 pre-cut 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.

3.3 SCHEDULE

INSULATION PIPING	TYPE	PIPE SIZE INCH	THICKNESS INCH
Domestic Hot and Recirculating Water	A	1/2"	1/2"
		3/4"	3/4"
		1"	1"
Domestic Cold Water	A	1/2"	1/2"
		3/4"	1/2"
		1"	1/2"
		1-1/4"	1/2"
		1-1/2"	1"
		2"	1"

END OF SECTION 220700