

SECTION 15260
PIPING INSULATION

PART 1 GENERAL

1.1 REFERENCES

- A. ASTM B209: Aluminum and Aluminum-Alloy Sheet and Plate.
- B. ASTM C534: Preformed Flexible Elastomeric Cellular Thermal Insulation in Sheet and Tubular Form.
- C. ASTM C547: Mineral Fiber Preformed Pipe Insulation.
- D. ASTM C552: Cellular Glass Block and Pipe Thermal Insulation.
- E. ASTM C553: Mineral Fiber Blanket and Felt Insulation.
- F. ASTM C921: Properties of Jacketing Materials for Thermal Insulation.
- G. ASTM E84: Surface Burning Characteristics of Building Materials.

1.2 SUBMITTALS

- A. Submit under provisions of Section 15000.
- B. Product Data: For each product used in this project, provide catalog data for insulation, jackets and accessories, and installation instructions.
- C. Samples: Not required.

1.3 QUALITY ASSURANCE

- A. Materials: Flame spread/smoke developed rating of 25/50 or less in accordance with ASTM E84.
- B. Applicator: Company specializing in performing the work of this section with minimum three years experience.

1.4 DELIVERY, STORAGE AND HANDLING

- A. Deliver materials to site in original factory packaging, labeled with manufacturer's identification, including product density and thickness.
- B. Store insulation in original wrapping, and protect from weather and construction traffic.
- C. Protect insulation against dirt, water, chemical and mechanical damage.

PART 2 PRODUCTS

2.1 RIGID FIBER GLASS INSULATION

- A. Provide molded, heavy density, noncombustible, one-piece pipe insulation made from inorganic glass fibers bonded with a thermosetting resin. K-value shall be 0.24 at 75°F. ASTM C547
- B. Provide factory applied, all service jacket of white kraft paper bonded to aluminum foil and reinforced with glass fibers. Provide self-sealing lap for longitudinal seam and butt strips for circumferential joints. ASTM C921
- C. Provide 18-ga, Type 304 stainless steel tie wire with twisted ends on 24" centers but not less than two tie wires per insulation section.

- D. For fittings and valves, provide one-piece, molded, 20-mil thick, PVC covers with fiberglass inserts. Use pressure sensitive, color matching vinyl tape to seal PVC fitting covers to jacket of insulation. ASTM C921

2.2 FLEXIBLE FIBER GLASS INSULATION

- A. Provide flexible, noncombustible, blanket insulation made from highly resilient, inorganic glass fibers bonded by a thermosetting resin. Density shall be 1.0 lb/cu ft. K-value shall be 0.28 at 75°F. ASTM C553
- B. Provide factory applied, foil-scrim-kraft vapor barrier with 2" wide stapling flange. Secure seams with outward clinching staples on 6" centers. Seal seams with two coats of vapor barrier mastic reinforced with 4" wide, open weave glass fabric. ASTM C921

2.3 CELLULAR GLASS INSULATION

- A. Provide molded, impermeable, noncombustible, cellular glass pipe insulation. K-value shall be 0.35 at 75°F. ASTM C552
- B. Interior Applications in Concealed Locations
 - 1. Pipe: All service jacket with self-sealing lap.
 - 2. Fittings: Vapor barrier mastic and reinforcing membrane.
- C. Interior Applications in Exposed Locations
 - 1. Pipe: Vapor barrier mastic and reinforcing membrane.
 - 2. Fittings: Same as pipe.
- D. Exterior Applications
 - 1. Pipe: Vapor barrier mastic, reinforcing membrane and aluminum jacket.
 - 2. Fittings: Same as pipe.
- E. Buried Applications
 - 1. Pipe: Prefabricated material, 120 mil thick, consisting of bituminous resin reinforced with a woven glass fiber, an integral aluminum foil layer and a protective plastic film coating.
 - 2. Fittings: Same as pipe.
- F. Provide open mesh, synthetic membrane to reinforce mastic finishes. Thread count shall be 6 strands by 6 strands per square inch. Thickness shall be 27 mils.
- G. Provide 18-ga, Type 304 stainless steel tie wire with twisted ends on maximum 12" centers but not less than two tie wires per insulation section.
- H. Provide flexible, acrylic latex coating for use with cellular glass insulation to provide a vapor barrier finish.

2.4 CELLULAR FOAM INSULATION

- A. Provide flexible, closed-cell, slit tubing form, elastomeric pipe insulation. For large diameter pipe, provide sheet form. K-value shall be 0.27 at 75°F. Use contact adhesive to seal longitudinal seams and circumferential joints. ASTM C534.
- B. For fittings and valves, fabricate insulation from mitered-cut tubular form. Use contact adhesive to seal joints.
- C. If necessary, provide two layers of insulation to obtain specified thickness. Stagger longitudinal and circumferential joints.

2.5 ALUMINUM JACKET

- A. For pipes, provide 16 mil thick, stucco embossed pattern finish, Type 1100 aluminum jacket, ASTM B209. For horizontal pipe, locate longitudinal lap on bottom.
- B. For fittings, provide 24-mil thick, die shaped, smooth finish, Type 1100 aluminum jacket, ASTM B209.
- C. Provide 0.5" wide, 20-mil thick, Type 3003 aluminum bands on maximum 24" centers but not less than two bands per jacket section.

2.6 SHIELDS AND INSERTS

- A. At all pipe hangers or pipe supports, provide 12" long, 180° arc, galvanized sheet metal shields. The shields shall match the insulation outside dimension.
- B. For pipes larger than 2" diameter, provide 12" long, 180° arc, cellular glass insulation inserts.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Before applying insulation, verify that piping has been inspected, tested and approved.
- B. Before applying insulation, verify that surfaces are clean (foreign material removed) and dry.
- C. Before applying insulation, verify that brass thermowells with 2.5" lagging extensions have been installed.
- D. Before applying insulation, verify that 4" long brass nipples for gage cocks have been installed.

3.2 INSTALLATION

- A. Install materials in accordance with manufacturer's instructions.
- B. On exposed insulation provide jacket or finish, and locate longitudinal seams in least visible locations. Where insulated piping extends to weather exposed areas, provide specified aluminum sheet metal jacket.
- C. Piping, ductwork and equipment insulation or covering shall not penetrate fire-rated assembly unless the specific material has been tested and approved as part of the fire-rated assembly. (FBC, 705.4.3)
- D. Insulate fittings, joints, and valves with insulation of like material and thickness as adjoining pipe.
- E. For above grade applications, maintain 0.5" air space on all sides of the insulation. The air space provides a significant R-value.
- F. Finish insulation at supports, protrusions, and interruptions.
- G. Chilled Water Pipe
 - 1. Provide cellular glass insulation with vapor barrier jacket for pipe, fittings, valves, strainers, unions, flanges, etc. No Armaflex permitted.
 - 2. Apply insulation with all joints tightly fitted and buttered with joint sealer. Eliminate voids by refitting or replacing insulation. Do NOT fill voids with joint sealer.
 - 3. Interior Applications: For pipes 3" diameter and smaller, provide 1.5" thick insulation. For pipes larger than 3" diameter, provide 2" thick insulation.
 - 4. Exterior and Buried Applications: For all pipe sizes, provide 2" thick insulation.
 - 5. For expansion joints, flexible connections and mechanical couplings for grooved pipe provide two layers of 1" thick cellular foam insulation. The longitudinal seam for each layer shall be staggered 180°. The cellular foam insulation shall overlap the cellular glass insulation a minimum of 3".
 - 6. Provide cellular glass insulation with vapor barrier jacket for the pipe to the expansion tank. For all applications, provide 1.5" thick insulation.

7. Provide cellular glass insulation with vapor barrier jacket for the pipe to the chilled water make-up system and chilled water chemical treatment system for a minimum length of 6' from the chilled water pipe. For all applications, provide 1.5" thick insulation.
- H. Storm Water Pipe (Interior and Above Grade Applications)
1. For roof drain bodies, provide 2" thick, flexible fiberglass insulation.
 2. For horizontal drains, provide 1" thick, rigid fiberglass insulation.
 3. For vertical leaders, insulation is not required.
 4. Seal all seams with vapor barrier mastic.
 5. Insulate all fittings per Article 2.1.D.
- I. Domestic Hot Water Pipe (Interior and Above Grade Applications): For hot water supply and return pipes, provide 1" thick, rigid fiberglass insulation.
- J. Domestic Cold Water Pipe: Insulation is not required.
- K. Condensate Pipe (Interior and Above Grade Applications): Provide ¾" thick, cellular foam insulation.
- L. Refrigerant Pipe (Interior and Above Grade Applications)
1. For suction lines, provide 1" thick, cellular foam insulation.
 2. For liquid lines, insulation is not required.
 3. For hot gas lines, provide ¾" thick, cellular foam insulation.
 4. Jacket is not required.
- M. Refrigerant Pipe (Exterior Applications)
1. For suction lines, provide 1" thick, cellular foam insulation.
 2. For liquid lines, insulation is not required.
 3. For hot gas lines, provide ¾" thick, cellular foam insulation.
 4. For pipe and fittings insulation, provide 2 coats of UV protection paint.
- N. Refrigerant Pipe (Buried Applications)
1. For suction lines, provide 1" thick, cellular foam insulation.
 2. For liquid lines, insulation is not required.
 3. For hot gas lines, provide ¾" thick, cellular foam insulation.
 4. Route pipe within schedule 40 PVC sleeve with ends sealed watertight.

END OF SECTION