

**Preformed Fiber Glass Pipe
Insulation Specification**

SECTION 15086 –PIPING INSULATION

PART 1.00-GENERAL

1.01 SCOPE

- A. The work covered by this specification consists of furnishing all labor, equipment, materials and accessories, and performing all operations required, for the correct installation of insulation on all piping, fittings, valves, controls and all other necessary items connected into the system subject to condensation or loss of heat.

1.02 SUBMITTALS

- A. Product Data: Provide product description, list of materials and thickness for each service or equipment scheduled, locations, and manufacturer's installation instructions.
- B. Shop Drawings: Submit list of insulation to be used for each service. Include installation details for valves, fittings, pipe and all other items to be insulated.
- C. Samples: Included with the above submittals, shall be samples of each insulation to be used.

1.03 ENVIRONMENTAL REQUIREMENTS

- A. Maintain ambient temperatures and conditions required by manufacturers of adhesives, mastics and insulating cements.

1.04 QUALITY ASSURANCE

- A. Insulation Materials: Insulation materials must be manufactured at facilities certified and registered with an approved registrar to conform to ISO 9001 Quality Standard.
1. Pipe insulation shall be preformed and furnished in standard lengths with ends cut square, conforming with the dimensional requirements of ASTM C 585.
 2. Insulation materials shall be asbestos free.
 3. All insulating products shall have a 25/50 flame spread/smoke developed rating as tested in accordance with ASTM E 84.

- B. Workmanship: All insulation to be installed by a licensed applicator and applied in accordance with the manufacturer's recommendations.

1. All work shall comply with all applicable federal, state and local codes and laws. This shall include, but shall not be limited to, the Occupational Safety and Health Act.
2. All work shall conform with accepted industry and trade standards for commercial and industrial insulations.
3. Surfaces to be insulated shall be clean and free of dirt, scale, moisture, oil and grease.

1.05 DELIVERY AND STORAGE OF MATERIALS

- A. Deliver all materials to the jobsite and protect the insulation against dirt, water, chemical and mechanical damage before, during and after installation. Do not install damaged insulation and remove it from the project site.
- B. Deliver insulation, coverings, cements, adhesives coatings etc. to the site in factory-fabricated containers with the manufacturer's stamp or label affixed showing fire hazard ratings of the products.
- C. Installed insulation which has not been weather-proofed shall be protected from inclement weather by an approved waterproof sheeting installed by the contractor. Any wet or damaged insulation shall be removed and replaced by the contractor at no additional cost.

PART 2.00 - PRODUCTS

2.01 PIPE INSULATION

- A. All piping shall be insulated with a preformed fiber glass pipe insulation, complying with ASTM C 547, Class 3 (to 850°F [454°C]), rigid, molded pipe insulation, noncombustible.
1. Thermal Conductivity ("k"): 0.23 Btu•in/(hr•ft²•°F) at 75°F mean temperature (0.033 W/m•°C at 24°C) per ASTM C 518.
 2. Maximum Service Temperature: 850°F (454°C).
 3. Rated 25/50 per ASTM E 84, UL 723 and NFPA 255.
 4. When being used over stainless steel, product must comply with the requirements of ASTM C 795.



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5. All-Service (ASJ) Vapor-Retarder Jacket: A white, kraft paper, reinforced with a glass fiber yarn and bonded to an aluminum foil, with self-sealing longitudinal closure laps (SSL) and butt strips.
- B. Field-Applied Jackets:
1. PVC Plastic: Zeston® 2000 Series. One piece, molded type fitting covers and jacketing material, gloss white.
 - a. Connections: Tacks, pressure sensitive, color matching, vinyl tape.
 2. Aluminum Jacket: 0.016" (0.41 mm) thick sheet, (smooth/ embossed) finish, with longitudinal slip joints and 2" (51 mm) laps, die-shaped fitting covers with factory-attached protective liner.
 3. Stainless Steel Jacket: Type 304 stainless steel, 0.10" (2.54 mm), (smooth/ corrugated) finish.

2.02 FITTINGS, VALVES, TEES, ETC.

- A. All fittings, valves, tees, flanges, connections, etc. shall be insulated and covered with the appropriate Zeston 2000 PVC insulated fitting cover.
1. Fittings shall be manufactured from ultraviolet-resistant PVC.
 2. Connections: Tacks, pressure sensitive, color matching, vinyl tape, Perma-Weld® Adhesive.

PART 3.00 - EXECUTION

3.01 PREPARATION

- A. Verify that the fiber glass pipe insulation may be installed in accordance with project drawings, operation performance parameters and limitations of the specification.
- B. Tests of the piping system shall be completed prior to insulation application.
- C. All piping shall be cleaned of foreign substances and free of surface moisture prior to insulation application.

3.02 INSTALLATION

- A. General:
1. All pipe insulation shall be continuous through wall and ceiling openings and sleeves, except where fire stop materials are required.
 2. Insulation on all cold surfaces must be applied with a continuous, unbroken vapor seal. Hangers, supports, anchors, etc., that are secured directly to cold surfaces must be adequately

insulated and vapor sealed to prevent condensation. In brine or chilled water piping systems, seal pipe terminations every four pipe sections.

3. All surface finishes are to be extended to protect all surfaces, ends and raw edges of insulation.
4. Rigid insulation inserts shall be installed on pipe sizes 1½" (38 mm) or larger under outside hangers. Inserts shall be of equal thickness to the adjoining insulation and shall be provided with vapor retarder seals where required.
5. Insulation inserts shall not be less than the following lengths:

Pipe Size		Length	
in.	mm	in.	mm
1½ – 2½	40 – 65	10	254
3 – 6	80 – 150	12	305
8 – 10	200 – 250	16	406
12 & up	300 & up	22	559

6. Galvanized metal shields shall be applied between hangers or supports and the pipe insulation. Shields shall be formed to fit the insulation and shall extend up to the centerline of the pipe and the length specified for the insulation hanger inserts less 4" (102 mm) to allow for vapor retarding butt joints on each side of the shields.
 7. Specified adhesives, mastics and coatings shall be applied at the manufacturer's recommended minimum coverage per gallon.
- B. Indoor piping: This portion of the installation procedure is applicable for piping in all indoor areas, including concealed spaces, mechanical rooms and inhabited areas.
1. Preformed fiber glass pipe insulation with all-service jacket shall be applied to piping with all joints tightly fitted to eliminate voids.
 2. Longitudinal jacket laps and butt strips shall be smoothly secured according to manufacturer's recommendations.
 3. When adhered, the lap and butt strips must be pressurized by rubbing firmly with a plastic squeegee or the back of a knife blade to ensure positive closure.
 4. The installed thickness shall be enough that the surface temperature shall be kept below 150°F (66°C).



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5. For pipe exposed in mechanical equipment rooms or in finished spaces less than 10' (3 m) above finished floor, finish with Zeston 2000 Cut & Curled™ PVC or aluminum jacket.
 6. Fittings, valves and flanges shall be insulated with Zeston 2000 PVC insulated fitting covers and Hi-Lo® Temp insulation inserts per manufacturer's recommendations.
- C. Outdoor piping systems operating up to 850°F (454°C):
1. Plain pipe insulation shall be wired or taped in place over clean, dry pipe with all joints firmly butted together. If a vapor retarder is required, jacket shall be used.
 2. The insulation shall be finished using a metal jacketing with a laminated moisture retarder or with Zeston 2000 PVC jacketing in 20 or 30 mil (0.5 or 0.8 mm) thickness. Metal jacketing shall be overlapped 2" to 3" (51 mm to 76 mm) and held in place with sheet metal screws or metal bands. The Zeston 2000 PVC jacketing shall be secured by overlapping and sealing all joints with Zeston Perma-Weld solvent welding adhesive, per manufacturer's recommended installation procedures.
 3. Elbows and tees for metal-jacketed systems shall be finished with matching metal fitting covers. Other fittings in metal-jacketed systems shall be finished using conventional weather-resistant insulation materials with painted aluminum finish.
 4. When Zeston 2000 PVC Insulated Fitting Covers are used, care shall be taken to ensure that the surface temperature of the fitting will be kept below 150°F (66°C) by the use of a proper thickness of insulation and by keeping the PVC cover away from contact with, or exposure to, sources of direct or radiant heat.



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