

SECTION 15413
INSULATION (P&D)

PART 1 - GENERAL

1.01 DESCRIPTION OF WORK

- A. Provide non-conducting insulation, including accessories, on the following piping and apparatus.
1. All concealed and exposed horizontal runs and off-sets of storm water piping, except when laid in the ground or when located in non-occupied spaces in the basement. All fittings and vertical off-sets associated with the foregoing pipe shall also be insulated.

1.02 SUBMITTALS

- A. Product Data
- Submit manufacturer's product data for insulation materials, adhesives, mastics and cements. Include installation details for valves, fittings, pipes and all other item to be insulated. No material shall be delivered to the site prior to being approved.
- B. Schedule listing items to be insulated, description of insulation and finishing procedures.
- C. Certificates from the manufacturer stating compliance with the following:
- Insulation, finishing facings or jackets, adhesives, mastics and cements are asbestos free and all materials installed have composite fire and smoke hazard ratings, 25 & 50 respectively, to meet the requirements of the Building Code of the City of New York.
- D. Contractor Qualifications

1.03 QUALITY ASSURANCE

- A. Installer's Qualifications: Firm with at least three years of successful installation experience on projects with the piping and equipment insulation similar to that required for this Project.
- B. Regulatory Requirements
1. Comply with the 2014 NYC Plumbing Code, 2016 New York City Energy Conservation Code (NYCECC) and ASHRAE 90.1-2013 as amended by the 2016 NYCECC for materials and installation.

2. All insulation, vapor barriers, as well as the adhesives and finishing facings or jackets used herewith shall have a flame spread rating not over 25 without evidence of continued progressive combustion, and shall have a smoke developed rating not higher than 50. Flame spread rating and smoke developed rating shall be as defined in the N.Y.C. Building Code. All materials installed shall have composite fire and smoke hazard ratings to meet requirements of that Code. Whenever the NYC Construction Codes or the Rules of the Department of Buildings requires that material be listed or labeled and material proposed to be used is not so listed or labeled, the use of such material shall be subject to prior approval by the Commissioner (Office of Technical Certification and Research OTCR) and such material shall be used only to the extent set forth in such approval. Materials that were previously approved by the Board of Standards and Appeal (BSA) or by the Department (MEA) before the effective date of the NYC Construction Codes may continue to be used, but only to the extent set forth in such approval, and only if such approval is not specifically amended or repealed by the Commissioner.

C. Asbestos Prohibition

All products provided under this Section shall be asbestos, lead and mercury free.

1.04 DELIVERY, STORAGE AND HANDLING

- A. Deliver insulation, coverings, cements, adhesives and coatings to the site in factory-fabricated containers with the manufacturer's stamp, or label, affixed showing fire hazard ratings of the products and brand.
- B. Store insulation in original wrappings and protect from any damage.

1.05 TEMPERATURE REQUIREMENT

- A. Apply adhesive, sealers, coating, and all other items and accessories at the proper temperature as recommended by the manufacturer. If ambient conditions are not acceptable, provide temporary heat as required for proper installation without any delay to the Project completion.

1.06 COORDINATION

- A. Coordinate size and location of supports, hangers, and insulation shields
- B. Coordinate clearance requirements with piping installer for piping insulation application and equipment installer for equipment insulation application. Establish and maintain clearance requirements for installation of insulation and field-applied jackets and finishes and for space required for maintenance.
- C. Coordinate installation and testing of heat tracing.

PART 2 - PRODUCTS**2.01 MANUFACTURERS**

- A. Insulation, fiberglass fitting cloth, bands and casings (predicated on meeting the specification requirements)
 - 1. Certain-Teed Corp.
 - 2. Johns Manville, Owens-Corning Fiberglass Corp.
 - 3. Knauf Insulation.
 - 4. Armacell LLC; AP Armaflex.
 - 5. Pittsburgh Corning Corp.
- B. Adhesives (predicated on meeting the specification requirements)
 - 1. Benjamin Foster Co.
 - 2. Epolux Manufacturing Corp.
 - 3. Armacell LLC
 - 4. Insul-Coustic (Division of Birma Products Corp.)
- C. Pre-molded fiberglass fittings (predicated on meeting the specification requirements)
 - 1. Hamfab Inc
- D. Vapor barrier and weatherproofing jacket (predicated on meeting the specification requirements)
 - 1. Venture Tape Corp.
 - 2. Polyguard Products Inc.

2.02 MATERIALS

- A. Adhesives and Sealants for Insulation: All adhesives and sealants used on interior building insulation shall comply with the South Coast Air Quality Management District (SCAQMD) Rule #1168; VOC limits shall comply with the limits indicated in Table 1 of LEED Version 3.0, Indoor Environmental Quality Section, Credit IEQ-4.1. Those limits correspond to an effective date of the SCAQMD Rule #1168 of July 1, 2005, and Rule Amendment date of January 7, 2005.
- B. Products shall not contain asbestos, lead, mercury, or mercury compounds.
- C. Foam insulation materials shall not use CFC or HCFC agents in the manufacturing process.
- D. Piping Insulation
1. One-piece molded sectional fiberglass: Nominal 4-pound density. Its thermal conductivity shall have a range between 0.25 - 0.29 BTU per inch/h x ft² x °F per Section C404.4 of the 2016 NYCECC. Insulations shall have factory-applied all-service jacket (ASJ) and adhesive used to adhere the jacket to the insulation. It shall be suitable for use on piping up to 200°F.
 2. Fiber Free Elastomeric Foam: Shall be closed-cell material with a thermal conductivity that ranges between 0.25-0.29 BTU per inch/h x ft² x °F per Section C404.4 of the 2016 NYCECC and suitable for use on piping up to 200°F; the equal of AP Armaflex.
 3. Fiberglass Paper-Free ASJ Pipe Insulation: Molded fibrous glass pipe insulation with factory applied paper free all service jacket and double adhesive lap seal closure system, rated for a maximum service temperature of 850°F. Thermal conductivity for paper-free fiberglass shall range between 0.25-0.29 per Section C404.4 of the 2016 NYCECC. Circumferential joints shall be sealed with paper free butt strips that are compatible with the required facing. Stapling shall not be required to complete the closure. Manufacturer's data regarding thickness constraints in relation to operating temperature shall be followed. On cold systems, vapor barrier shall be provided. All penetrations and exposed ends of insulation shall be sealed with mold resistant vapor barrier mastic.

E. Insulation and accessories

1. For valves, fittings, etc. for hot water piping, cold water piping, drainage and vent piping shall include the following:
 - a. One-pound density fiberglass blanket.
 - b. Segments of pipe insulation.
 - c. Pre-molded fiberglass fittings.
 - d. No. 20 gage galvanized steel annealed wire.
 - e. Insulating cement.
 - f. In lieu of the cement coat, and fiberglass blanket material or segment of pipe insulation on valves and fittings; the use of Zeston product, an ultra violet resistant, 20-mil thick, one-piece PVC fitting cover with pre-cut insulation inserts, HI-Lo-Temp, as manufactured by Manville, shall be accepted.

F. Jacket and accessories

1. Over insulation for cold water piping, drainage and vent piping, install the following:
 - a. White kraft paper outer surface bonded to aluminum foil and reinforced with fiberglass yarn.
 - b. Insulation adhesive.
 - c. Aluminum casing, .016" thick.
 - e. Elastomeric closed cell fiber free foam with no vapor barrier is also acceptable.
 - d. Vapor barrier and weatherproofing jacket shall be a laminated five-ply self-adhesive material; weather resistant, high puncture and tear resistant. The product shall be used both indoors and outdoors, shall have zero permeability, and shall be manufactured with mold inhibitors: VentureClad 1577CW-All Grade or Alumaguard Lite or Alumaguard "All Weather" LT.
4. Over insulation on valves and fittings for drainage and vent piping and over valves,

fittings, water meters for cold water, the following shall be included:

- a. Glass cloth.
 - b. Vapor barrier coating shall be Foster 30-80.
- G. Special protection: At all points of support the following shall be included:
1. Rigid calcium silicate pipe insulation having a minimum twelve (12) pound density. Blocks shall be 1½" thick.
 2. Galvanized metal shields as manufactured by Carpenter & Paterson, Fig. 265 P or Anvil International Fig. 167. Shields shall be 18 gage for pipe sizes up to and including 5" and 16 gage for larger sizes.

PART 3 - EXECUTION

3.01 GENERAL REQUIREMENTS

- A. Insulation shall be installed only after tests of the piping systems as specified in Section 15414 have been successfully completed.
- B. Fire Seal Application: Where pipes pass through fire walls, fire partitions, fire rated pipe chase walls or floors above grade, insulation shall pass through and a UL classified assembly shall be provided. Refer to Section 07270 - Firestopping.
- C. All necessary insulating material not specified shall be as recommended by the manufacturer of the insulation.

3.02 INSTALLATION

- A. Thermal Insulation for Piping
 1. Cold Water Piping
 - a. 1½" thick insulation for pipe sizes larger than 2" in diameter.
 2. Insulation for horizontal runs and off-sets including fittings and vertical off-sets of storm water piping shall be of the thickness specified for cold water piping.

B. Facing or Jackets

1. Cold Water Piping

- a. Insulation on piping shall have a vapor barrier jacket of white kraft paper outer surface bonded to aluminum foil and reinforced with fiberglass yarn or of self-adhesive material. Longitudinal laps and butt strips shall be smoothly secured with insulation adhesive. Vapor barrier jackets on insulation must be applied with a continuous unbroken vapor seal. The use of staples on vapor barrier jacketed insulation is not permitted. The use of Elastomeric closed cell fiber free foam with no vapor barrier is acceptable.
- b. Insulation on valves, fittings, water meter, etc., shall be vapor sealed by applying glass cloth embedded between two 1/16" thick coats of vapor barrier coating. Lap seal glass cloth at least 2" on itself and the adjoining insulation.
- c. The ends of cold water pipe insulation shall be sealed off at all flanges, fittings, valves and interval of 21' on continuous runs of pipe with Foster fire resistant vapor barrier coating BF 30-80.

2. Horizontal Drainage Lines

- a. Insulation on horizontal runs and off-sets including fittings, vertical off-sets of storm water piping shall have a vapor barrier jacket as described for cold water piping in subparagraph 1 above. The use of Elastomeric closed cell fiber free foam with no vapor barrier is acceptable.
- b. The ends of drainage pipe insulation shall be sealed off at all fittings and at intervals of 21 feet on continuous run of pipe with Foster fire resistant vapor barrier coating BF 30-80.

C. Insulation and Protection at Points of Support

1. Install inserts made from rigid calcium silicate pipe insulation, in lieu of pipe insulation specified in Paragraph A above, at all points of support. Inserts shall be not less than 12" long

and of thickness equal to adjoining insulation. A jacket shall be installed over the insert with longitudinal laps and butt strips for circumferential joints smoothly secured with insulation adhesive. Jacket shall provide vapor barrier where required.

2. Install galvanized steel shields between supports and inserts. Shields shall be formed to fit the insulation and shall extend up to the center line of the pipe and of the length specified for the inserts. Supports shall not pierce the insulation and all vapor barriers shall be unbroken and continuous.

3.03 PROTECTION AND REPLACEMENT

- A. Replace insulation damaged during construction which cannot be repaired satisfactorily, including units with vapor barrier damage and moisture saturated units.
- B. Protection

Insulation worker shall advise Contractor of required protection for insulation work during remainder of construction period, to avoid damage and deterioration.

3.04 PAINTING

- A. Insulation on all piping and fittings, exposed in Boiler Room, Mechanical Spaces and Fan Rooms, shall be given two (2) coats paint. Color of paint shall be as per the schedule in Section 15431, Article 2.03, Par. D.
- B. Insulation on all piping and fittings, exposed in finished spaces shall be given two (2) coats of paint, the color of which shall match the adjacent surroundings.
- C. For additional materials and method of painting, refer to Section 09900 - Painting.

3.05 LABELING

- A. After the finished coat of paint has been applied to the insulation, this contractor shall do all pipeline identification labeling as specified in Section 15431 - "Tags, Charts and Identification."

END OF SECTION

LIST OF SUBMITTALS

<u>SUBMITTAL</u>	<u>DATE SUBMITTED</u>	<u>DATE APPROVED</u>
Product Data:	_____	_____
1. Materials, adhesives mastics, cements etc.		
2. Installation Inst.		
Schedule:	_____	_____
1. List of items to be insulated		
Quality Control Submittals:	_____	_____
1. Manufacturer's certificate indicating compliance with fire/smoke rating, asbestos free products & NYC building code		
2. Contractor qualifications		

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