

SECTION 22 25 00 – INSULATION

PART 1 - GENERAL

1.1 WORK INCLUDED

- A. Provide labor, materials, equipment and services to perform operations required for the complete installation and related Work as required in Contract Documents.

1.2 SUBMITTALS

- A. Manufacturer data. Schedule of insulation applications.

PART 2 - PRODUCTS

2.1 GENERAL

- A. Insulation, Jackets, Adhesives, And Coatings, Shall Comply With The Following:
 - 1. Treatment of jackets or facings for flame and smoke safety must be permanent. Water soluble treatments not permitted.
 - 2. Insulation, including finishes and adhesives on the exterior surfaces of ducts, pipes, and equipment, shall have a flame spread rating of 25 or less and a smoke developed rating of 50.
 - 3. Asbestos or asbestos bearing materials not permitted.

2.2 PIPE INSULATION (RIGID TYPE)

- A. Preformed rigid sectional pipe covering, 4 lb. nominal density fiberglass. Maximum thermal conductivity (k), on a flat surface, shall be 0.25 Btu/sq. ft. hr. °F/in. at 75°F mean temperature. White Kraft outer surface bonded to aluminum foil and reinforced with fiberglass yarn.

2.3 PIPE INSULATION (FLEXIBLE TYPE)

- A. Flexible, unicellular elastomeric foam type, fire retardant insulation.

2.4 CALCIUM SILICATE

- A. Asbestos free, hydrous calcium silicate. 12 lbs/cu.ft. density minimum.

2.5 CELLULAR GLASS

- A. Rigid, impermeable, noncombustible, without fillers or binders. 100 psi compressive strength. Conforms to ASTM C 552.

2.6 EQUIPMENT INSULATION

- A. Segmented board, sheets, blocks, size, shape, and material as called for.

2.7 METAL JACKETING

- A. Aluminum, .016 in. thick, Z-joint longitudinal joint. Transverse closure strip with weatherproof sealing method.

2.8 PLASTIC JACKETING

- A. PVC jacket, UV resistant, 20 mill thickness. Solvent adhesive welded joints.

2.9 MAKE

- A. Fiberglass: Certainteed, Knauf, Manville, Owens-Corning, or approved equal.
- B. Calcium Silicate: Knauf, Manville, Owens-Corning, or approved equal.
- C. Flexible Elastomeric: Armstrong, Manville, Rubatex, or approved equal.
- D. Cellular Polyisocyanurate: Celotex, NRG, R-Max, or approved equal.
- E. Adhesives: Benjamin Foster (BF), Mono-Eco, Tremco; numbers designate quality of adhesive.

2.10 MATERIALS AND SCHEDULES

- A. See Exhibits at the end of this section.

PART 3 - EXECUTION

3.1 GENERAL REQUIREMENTS

- A. Provide Thermal Insulation:
 - 1. Insulation is required on piping and equipment unless otherwise called for.
 - 2. Only on clean, dry surfaces and after work has been tested.
 - 3. On cold surfaces with continuous unbroken vapor seal.
 - 4. Exposed surfaces shall be white.
 - 5. Pipes individually insulated.
- B. Do not cover inspection stampings, openings, petcocks, handholes, manholes, access doors, plugged outlets, air vents, plugged openings or petcocks.

3.2 PIPE INSULATION

- A. Insulate piping systems including fittings, valves, flanges, unions, strainers, and other attachments installed in piping system, whether exposed or concealed.

- B. Piping In Exterior Walls, Spaces, Overhangs, Attics, Or Where Subject To Freezing: Insulate pipe with double the thickness called for. Piping In Wall Chases: In addition to the above, pack chase with loose glass fiber insulation.
- C. Plumbing Equipment:
 - 1. Install insulation on exposed hot and cold plumbing piping to within 18 in. of fixture or equipment connection.
 - 2. Insulate exposed domestic hot water and waste piping for plumbing fixtures designated for use by the handicapped.
- D. Joints In Section Pipe Covering Made As Follows:
 - 1. Standard: Longitudinal laps and butt joint sealing strips cemented with BF 85-20 or factory applied pressure sensitive adhesive lap seal. Stapled with outward clinching staples.
 - 2. Vapor barrier: For cold services, Longitudinal laps and 4 in. vapor barrier strip at butt joints shall be sealed with white BF 85-20. Seal ends of pipe insulation at valves, flanges, and fittings with white BF 85-20.
- E. Fittings, Valves And Flanges:
 - 1. Hot and cold water:
 - a) Concealed: Insulating cement of the same thickness as adjacent pipe insulation. Cold water to be vapor sealed with BF 30-36 "Seal-Fas".
 - b) Exposed: Premolded fitting covers of the same material and thickness as the adjacent pipe insulation and finished with glass cloth applied and coated with BF 30-36 "Seal-Fas."
 - 2. Optional: In lieu of the standard method above, the Contractor has the option of using Zeston, Ceel-Tite System, or Proto. Tape all joints at covers.
- F. Flexible Pipe Insulation:
 - 1. Split longitudinal joint and seal with adhesive.
 - 2. Fittings made from miter-cut pieces properly sealed with adhesive, or ells may be continuous.
 - 3. Where exposed, apply white paint as recommended by manufacturer.

3.3 EQUIPMENT INSULATION

- A. Equipment insulation surfaces shall be a hard, smooth, uniform finish. Install Work ready for painting.

3.4 RECOVERING

- A. Field apply 6 oz. white glass cloth, cemented and applied over standard jacket. Properly cut at fittings to avoid wrinkles and coat with BF 30-36. Leave ready for painting. Provide as called for.

EXHIBIT "I" - PIPE INSULATION MATERIALS (Notes are at end of Exhibit I)

<u>SERVICE</u>	<u>INSULATION MATERIAL</u>	<u>THICKNESS</u>	<u>REMARKS</u>
Domestic cold water	Glass fiber or Flexible	1-1/2" and larger 1" 1-1/4" and smaller ... 1/2"	SEE NOTE 2
Domestic hot and circulation water (up to 140°)	Glass fiber or Flexible	1-1/2" to 8" 1-1/2" 1-1/4" and smaller 1" Runouts 1"	SEE NOTE 3
Domestic hot and circulation water (over 140°)	Glass fiber	1-1/2" to 8"..... 2" 1-1/4" and smaller 1-1/2" Runouts 1-1/2"	
AC unit drains and overflows (IW)	Glass fiber or Flexible	All sizes 1/2"	SEE NOTE 2
Roof conductor lines	Glass fiber	All sizes 1"	Insulate body of drain and conductor piping, horizontal (and vertical), down to connection below ground floor slab or in crawl space
Sanitary/Waste	Glass fiber	All sizes 1"	Insulate in parking garages

NOTES FOR EXHIBIT I

NOTE 1: Exposed insulation shall be covered with PVC jacket.

NOTE 2: Flexible allowed in 1/2 in. thickness only.

NOTE 3: PEX domestic branch piping less than 1-1/4" within dwelling units do not require insulation. All branch piping and mains external to dwelling units must be insulated per the schedule above.

EXHIBIT "II" - EQUIPMENT INSULATION MATERIALS
(Notes are at end of Exhibit II)

<u>SERVICE</u>	<u>INSULATION MATERIAL</u>	<u>THICKNESS</u>	<u>REMARKS</u>
Domestic hot water tanks	Calcium silicate or 6 lb. fiberglass suitable for 450° service	1-1/2" segmented blocks or molded sections	Secure blocks with galvanized steel bands, 12" O.C. Secure fiberglass with pins, studs, or clips, then apply 2" galvanized hexagon mesh wire. Cover with 1/4" layer insulating cement. Recover - SEE NOTE 1
Domestic water pumps	Flexible sheets	1/2"	Install on "box" framing per manufacturer's construction specifications. Arrange for easy removal and replacement. Coat with white finish

NOTES FOR EXHIBIT II

NOTE 1: Where required, provide welded studs, clips or angles as anchors for bands, wires and mesh.

END OF SECTION