

SECTION 23 07 00.00 22

MECHANICAL INSULATION  
11/15

PART 1 GENERAL

1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to within the text by the basic designation only.

ASTM INTERNATIONAL (ASTM)

ASTM C547	(2015) Standard Specification for Mineral Fiber Pipe Insulation
ASTM C552	(2015) Standard Specification for Cellular Glass Thermal Insulation
ASTM D1784	(2011) Standard Specification for Rigid Poly(Vinyl Chloride) (PVC) Compounds and Chlorinated Poly(Vinyl Chloride) (CPVC) Compounds
ASTM E84	(2015a) Standard Test Method for Surface Burning Characteristics of Building Materials

1.2 SYSTEM DESCRIPTION

Provide field-applied mechanical insulation for mechanical systems. Mechanical systems include plumbing systems and condensate drains. Obtain Contracting Officer's written approval of each system before applying field-applied insulation. Provide new asbestos-free insulation materials.

1.3 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for Contractor Quality Control approval. Submit the following in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

SD-03 Product Data

Piping insulation and jacket; G

SD-08 Manufacturer's Instructions

Piping insulation/jacket installation

PART 2 PRODUCTS

2.1 PIPING INSULATION AND JACKET

2.1.1 Mineral Fiber Preformed Pipe Insulation

ASTM C547. Provide piping insulation jacket.

2.1.2 Cellular Glass Preformed Pipe Insulation

ASTM C552, Type II. Supply the insulation from the fabricator with ASJ vapor retarder and installed with all longitudinal overlaps sealed and all circumferential joints ASJ taped or supply the insulation unfaced from the fabricator and install with all longitudinal and circumferential joints sealed with vapor barrier mastic. Furnish cellular glass adhesive for longitudinal tab connections consisting of two-component, thermo-setting urethane adhesive containing no flammable solvents, with a service temperature range of minus 100 to plus 200 deg F.

2.1.3 Piping Insulation Jacket

Provide manufacturer's standard fire-retardant vapor barrier jacket. Jacket shall be suitable for painting. Provide factory prefabricated one-piece PVC insulation covers and cellular glass insulation inserts of the same thickness as piping insulation for fittings and valves.

2.1.4 PVC Jacket

ASTM D1784, PVC jacketing, pre-cut and curled, 20 mil thick, white UV-resistant, and flame/smoke rating of 25/50 in accordance with ASTM E84. All joints and seams shall be solvent welded in accordance with manufacturer's recommendations. Tacks and staples will not be allowed.

PART 3 EXECUTION

3.1 INSTALLATION OF MECHANICAL INSULATION

Clean exterior of mechanical systems prior to the application of field-applied insulation. Install field-applied insulation in accordance with the manufacturer's recommendations and as specified herein.

The completed installation shall have a fire hazard rating in accordance with ASTM E84; flame-spread rating shall not exceed 25 and smoke developed rating shall not exceed 50 except as specified herein; smoke developed rating shall not exceed 150 for polyurethane insulations.

Insulation shall be clean and dry when installed and prior to the application of jackets and coatings. Do not use short pieces of insulation materials where a full length section will fit. Provide insulation materials and jackets with smooth and even surfaces, with jackets drawn tight, and smoothly secured on longitudinal laps and end laps. Insulate fittings and piping accessories with premolded, precut, or field fabricated insulation of the same material and thickness as the adjoining pipe insulation.

Provide unions and piping accessories with readily removable sections of insulation and jacket. Provide insulation continuous through pipe hangers, pipe supports, pipe sleeves and wall openings.

Provide a complete moisture and vapor seal wherever insulation terminates against hangers, anchors, and other projections through insulation on cold surfaces; fill joints, breaks, punctures, and voids with vapor barrier compound and cover with vapor sealed material. Do not conceal equipment nameplates. Cover ends of exposed insulation with waterproof mastic.

### 3.2 PIPING INSULATION

Install field-applied insulation in accordance with the manufacturer's standard published instructions for [piping insulation/jacket installation](#). Instructions shall apply to the particular piping system insulated. Generic generalized instructions shall not be acceptable. Comply with additional requirements specified herein.

Provide factory preformed pipe insulation. For insulation protection shields; provide rigid pipe insulation of the same thickness as adjacent pipe insulation and having a minimum compressive strength of [35 psi](#) For piping [2 inches](#) and smaller, insulation having a minimum density of [7 pcf](#) may be provided between the insulation protection shields and the pipe.

Install insulation with joints tightly butted. Overlap longitudinal jacket laps not less than [1.5 inches](#). Wrap butt joints with butt strips not less than [3 inches](#) wide of identical materials as jacket. Cement jacket laps and butt strips on both surfaces with fire-resistant, waterproof bonding adhesive or with factory-applied self-sealing system.

If vapor barrier jacket is pierced or punctured, brush coat with vapor barrier coating to provide a vapor-tight covering. If molded or mitered fitting covers are used, join with fire-resistant, waterproof bonding adhesive or wire in place and provide with a smooth coat of finishing cement. For copper tubing sizes one inch and less, pipe insulation for elbows, tees, and valves may be mitered.

#### 3.2.1 Insulation for Water Piping

Provide mineral fiber preformed pipe insulation for hot domestic water piping. Provide cellular glass for cold domestic water and cold drain piping. Rigid cellular phenolic preformed pipe insulation having an insulating efficiency not less than that of the specified thickness of mineral fiber pipe insulation may be provided in lieu of mineral fiber pipe insulation.

##### 3.2.1.1 Hot and Cold Domestic Water Piping

Provide hot domestic water piping sizes less than [3 inches](#) with minimum of [1 inch](#) thick mineral fiber pipe insulation. Provide cold domestic water piping sizes less than [3 inches](#) with minimum of [1.5 inch](#) cellular glass pipe insulation. [Density shall be 7.5 lb/ft<sup>3</sup> minimum.](#)

##### 3.2.1.2 Cold Drain Piping

Provide minimum of [1.5 inch](#) thick cellular glass pipe insulation. [Density shall be 7.5 lb/ft<sup>3</sup> minimum.](#)

#### 3.2.2 Piping Insulation Covering

Provide piping insulation with piping insulation jacket.

### 3.2.2.1 Pipes in High Abuse Areas

In high abuse areas such as janitor closets and traffic areas in plumbing accesses, PVC jackets shall be utilized. Pipe insulation to the 6 foot level shall be protected.

### 3.3 FIELD INSPECTIONS

Visually inspect the insulation installation of all mechanical systems to ensure that materials conform to requirements specified herein.

-- End of Section --