

SECTION 15250

MECHANICAL INSULATION

PART 1 - GENERAL

1.01 SUMMARY

A. Section Includes:

1. Mechanical insulation for piping, ductwork, and equipment.

B. Related Sections:

1. Section 15900 - Ductwork and Accessories: Duct lining.
2. Section 15050 - Basic Mechanical Materials and Methods: Insulation protection saddles and shields.

1.02 SYSTEM DESCRIPTION

A. Design Requirements:

1. Insulation thickness in agreement with the minimum thickness recommended in ASHRAE Standard 90A.
2. If more than one type of insulation material is available for satisfying technical requirements, then price-performance should be evaluated and maximized in actual selection.
3. Weigh need to insulate unions, flanges, valves, control devices and similar items where maintenance access is needed. Give consideration to:
 - a. Energy conservation.
 - b. Where heat gain to space or ductwork is objectionable.
 - c. Where condensation must be prevented.
 - d. Equipment maintainability.
4. Review conclusions with University's Department of Facilities Management project representative for final design approval.
5. Specify removable insulation for chilled water pumps.
6. Specify teflon-coated, Velcro closure, removable insulation jackets for steam and condensate equipment applications including high-pressure valves, expansion joints, high-pressure strainers, condensate pumps, and regulators.

1.03 QUALITY ASSURANCE

- A. Installer qualifications: Three years minimum successful installation experience on projects with mechanical insulation similar in scope and nature to that required for the project.
- B. Requirements for energy conservation: All insulation shall be in accordance with ASHRAE Standard 90A.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

- A. Armaflex
- B. Armstrong
- C. Certain-Teed
- D. Knauf
- E. Manson
- F. NOMACO
- G. Owens-Corning
- H. Schuller (Johns-Manville)

2.02 MATERIALS

- A. Insulation:
 - 1. Fiberglass.
 - 2. Calcium Silicate.
 - 3. Flexible Closed-Cell.
- B. Adhesives, Sealers, Facings and Vapor Barrier Coatings:
 - 1. Specify that materials must be paintable where painting is required.

LEED EQc4: Low-Emitting Materials:

All interior adhesives and sealants must meet or exceed VOC limit requirements of South Coast Air Quality Management District Rule #1168 and sealants used as fillers must meet requirements of the Bay Area Air Quality Management District Regulation 8, Rule 51.

2.03 PERFORMANCE CRITERIA

- A. Insulation and accessory materials to meet the following criteria:

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1. Insulation Materials: Non-combustible as defined in National Fire Protection Association Pamphlet 220 and Underwriters' Laboratory Listed or Labeled.
2. Flame/Smoke Ratings: Composite mechanical insulation (insulation, jackets, coverings, sealers, mastics and adhesives) flame-spread rating 25 or less, smoke-developed rating 50 or less, as tested by ANSI/ASTM E-84 (NFPA 255) method.

PART 3 - EXECUTION

3.01 GENERAL INSTALLATION REQUIREMENTS

- A. Do not insulate cleanouts, access openings or identification plates. Neatly bevel insulation and finishes up to edges of such openings and seal edges as required.

3.02 SPECIFIC INSTALLATION REQUIREMENTS

A. General:

1. Prepare from following list (expand per job requirements) a schedule of mechanical insulation showing systems insulated, types, thickness for various sizes, temperatures and special conditions and schedule on Drawings or include in Specifications.
2. Detail on Drawings special removable insulation covers for equipment. For example, enclose chilled water pump bodies in insulated sheet metal split case housings to provide easy maintenance of pumps without damage to insulation.
3. Where pipe insulation has the hanger on the outside of the insulation jacket supply 180 degree cal-sil with metal shield or wood blocks with 180 degree metal shield.

B. Plumbing System:

1. Domestic cold water.
2. Roof drains (horizontal only but including drain bowls and initial vertical drop to horizontal). All roof drain lines are considered cold pipe. Refer to spec 15050-5 7c.
3. Domestic hot and tempered supply and circulating water.
4. Domestic water heaters, storage tanks and Accumulators (not factory insulated).
5. Under lavatories: pre-molded insulation to meet ADA requirements.
6. Chilled Drinking Water.
7. Fittings.
8. Valves.

C. Heating System:

1. Heating Water Supply and Return
2. Heat Exchangers, Converters, Air Separators, Storage Tanks and Receivers.
3. Low Pressure Steam Piping.
4. Medium Pressure Steam Piping.
5. High Pressure Steam Piping.
6. Steam Condensate and Boiler Feed Water.
7. Fittings.
8. Valves. (Specify factory-made removable insulation covers on high and medium pressure steam applications on all valves, strainers, and bucket traps.)

D. Chilling Systems:

1. Chilled, Dual Temperature and Heat Recovery Water Supply and Return.
2. Heat Reclaim Coil Header.
3. Fittings.
4. Valves.
5. Cold Condensate Drain Piping (first 10 feet).
6. Chiller Water Boxes.
7. Refrigerant and Brine Piping below 40 degree F.
8. Refrigerant Hot Gas Piping (Only within buildings or where exposure is likely to cause accidental burn injury).
9. Cold Water Thermal Storage Tanks.
10. Direct buried chilled water lines below frost line need not be insulated.

E. Air Distribution Systems:

1. buried distribution is not preferred.
2. Exterior surfaces of Outside Air, Combustion Air, Mixed Air, and Recovery Coil Discharge.
3. Exterior surfaces of Supply and Return Air Plenums not indicated to be lined.

4. Exterior surfaces of exposed Supply Ductwork not lined.
 5. Concealed Supply Ductwork not lined.
 6. Rigid Spiral Supply Air Ductwork.
 7. Kitchen Exhaust Ductwork or Chase, whichever is more viable.
- F. Other Systems:
1. Engine Exhaust and Muffler inside building.
 2. Piping with heat tracer exposed to freezing.
- G. Protective jacket
1. Piping Insulation exposed to weather and where abrasion is likely. Review type of jacket with University.

END OF SECTION