

## **PART 1: GENERAL**

### 1.01 Purpose:

- A. This standard is intended to provide useful information to the Professional Service Provider (PSP) to establish a basis of design. The responsibility of the engineer is to apply the principles of this section such that the University may achieve a level of quality and consistency in the design and construction of their facilities. Deviations from these guidelines must be justified through LCC analysis and submitted to the University for approval.

### 1.02 Requirements:

- A. Provide insulation and associated accessories with flame-spread index of 25 or less, and smoke-developed index of 50 or less, as tested by ASTM E 84 (NFPA 255) method.
- B. Provide piping insulation thickness and thermal conductivity in conformance with the latest edition of ASHRAE 90.1.
- C. Provide pipe insulation continuous through walls, partitions, ceiling openings and sleeves. For penetrations that require link seal insulation no insulation shall be installed in the seal area.
- D. Provide UL-approved assemblies for pipes passing through fire-rated floors, walls, or partitions as required.
- E. Provide a continuous, unbroken, vapor seal on all cold pipe surfaces. Guides and anchors secured directly to cold surfaces shall be adequately insulated and vapor sealed to prevent condensation
- F. Provide aluminum or PVC jackets for exterior pipe and equipment insulation covers, as well as for exposed piping in mechanical rooms subject to wear or abuse. Locate seams on bottom side of horizontal pipe
- G. Jackets for piping insulation shall conform to requirements of ASTM C 921, Type II for piping with temperatures above ambient.
- H. Provide insulation protection shields fabricated from galvanized steel at all pipe hangers. All insulation at the shields shall be high density appropriate for the load.
- I. Provide staples, bands, wires, cement, adhesives, sealers, and protective finishes as recommended by insulation manufacturer for applications indicated.
- J. Insulate valves, fittings and similar items in each piping system with equivalent thickness and composition of insulation as applied to adjoining pipe run. Install factory molded, precut units.
- K. All equipment requiring insulation, the insulation jacket shall be designed to be removable and reused.

**PART 2 - PRODUCTS**

2.01 Piping Insulation Materials:

- A. Calcium Silicate: Shall meet or exceed the requirements of ASTM C533, Type I. Provide insulation with manufacturer’s recommended jacket.
- B. Flexible Elastomeric Closed Cell: Shall meet or exceed requirements of ASTM C 534, Type I, tubular grade.

2.02 Equipment Insulation Materials:

- A. Mineral Fiber: Shall meet or exceed requirements of ASTM C 547, Types I, II or III. Provide with factory-applied jacket.
- B. Calcium Silicate: Shall meet or exceed the requirements of ASTM C 533, Type I or II. Provide insulation with manufacturer’s recommended jacket.
- C. Flexible Elastomeric Cellular: Shall meet or exceed the requirements of ASTM C 534, Grade 1, Type I or II. Provide type II with vapor retarder skin on one or both sides of insulation.

**PART 3: EXECUTION**

3.01 Piping System Insulation:

3.02 Equipment Insulation:

EQUIPMENT HANDLING MEDIA AT INDICATED TEMPERATURE	INSULATION MATERIAL		THICKNESS	
1 to 34 degrees F	Flexible Elastomeric Cellular		1.5 inches	
35 to 60 degrees F	Flexible Elastomeric Cellular		1.0 inches	
61 to 250 degrees F	Mineral Fiber	Calcium Silicate	2.0 inches	2.0 inches
251 to 400 degrees F	Mineral Fiber	Calcium Silicate	3.0 inches	4.0 inches
401 to 600 degrees F	Mineral Fiber	Calcium Silicate	4.0 inches	6.0 inches
> 600 degrees F	Thickness necessary to limit external insulation temperature to 120 degrees F.			

- A. Do not insulate over nameplate or ASME stamps. Bevel and seal insulation around nameplates.

END OF STANDARD