SECTION 22 07 00

PLUMBING INSULATION

PART 1 - GENERAL

1.1 Purpose:

A. This guideline is intended to provide useful information to the Professional Service Provider (PSP) to establish a basis of design. PSP is to apply the principles of this section such that the University of Texas at Arlington (UTA) may achieve a level of quality and consistency in the design and construction of their facilities. Deviations from these guidelines must be approved by UTA and may require justification through Life Cycle Cost (LCC) analysis and submitted to UTA for approval.

1.2 LESSONS LEARNED AND DESIGN CONSIDERATIONS

A. Waterless urinals are not allowed.

B. Coordinate how to adjust shower to achieve design temperatures and confirm what design temperatures are required.

1.3 References:

A. ASTM E 84 - Standard Test Method for Surface Burning Characteristics of Building Materials

B. ASTM C 533 – Calcium Silicate Block and Pipe Thermal Insulation

C. ASTM C 534 – Preformed Flexible Elastomeric Cellular Thermal Insulation

D. ASTM C 547 – Mineral Fiber Preformed Insulation

E. ASTM C 921 – Standard Practice for Determining the Properties of Jacketing Materials for Thermal Insulation

F. MSS SP-69 - Pipe Hangers and Supports – Selection and Application

1.4 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.

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 jackets, 0.016” thick, 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 saddles fabricated from galvanized steel at all pipe hangers in accordance with MSS SP-69. All galvanized saddles shall be installed simultaneously to preserve insulation integrity and vapor barrier.

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.

PART 2 - PRODUCTS

2.1 This product section is intended to inform the PSP on the minimum standard of quality that should be incorporated in new designs. The PSP should evaluate these standards and incorporate or make additional requirements per project specific requirements. Where the PSP considers any requirement listed not to be applicable or incompatible with the project design intent should be discussed with UTA Office of Facilities Management.

2.2 Piping Insulation Materials:

B. Calcium Silicate: Shall meet or exceed the requirements of ASTM C533, Type I. Provide insulation with manufacturer's recommended jacket.

D. Flexible Elastomeric Closed Cell: Shall meet or exceed requirements of ASTM C 534, Type I, tubular grade.

2.3 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

3.1 Piping System Insulation:

A. Plumbing System Omissions: Omit insulation on chrome-plated exposed piping (except for handicapped fixtures), air chambers, unions, strainers, check valves, balance cocks, flow regulators, drain lines from water coolers, drainage piping located in crawl spaces or tunnels, buried piping, fire protection piping, and pre-insulated equipment.

B. Insulate piping systems per table 22.07.1, and in accordance with latest edition of International Energy Conservation Code (ICCC) and ASHRAE standard 90.1

Table 22.07.1 1

SERVICE	MATERIAL	VAPOR BARRIER
Potable Cold Water, makeup water, drinking fountain drain	Flexible Elastomeric Closed Cell, Urethane or Phenolic Foam	No
Potable Hot Water supply/recirculating (max 200° F)	Calcium Silicate, Fiberglass, or Phenolic Foam	No

3.2 Equipment Insulation:

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

B. Insulate the following equipment per Table 22.07.2: Cold refrigeration equipment not factory insulated, drip pans under chilled equipment, cold and hot water storage tanks, water softeners, cold water pumps, roof drain bodies, expansion and air separator tanks, heat exchangers, hot water generators, water heaters, and pumps handling media above 130° F.

Table 22.07.2

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.	

END OF 22 07 00