

1. GENERAL

1.1 Scope

- .1 Piping insulation.
- .2 Adhesives, tie wires, tapes.
- .3 Recovering.

1.2 Quality Assurance

- .1 Insulation shall be installed by skilled workmen regularly engaged in this type of work.
- .2 Materials shall meet or exceed fire and smoke hazard ratings as stated in this section and defined in applicable building codes.

1.3 Submittals

- .1 Submit shop drawings which indicate complete material data, "K" value temperature rating, density, finish, recovery jacket of materials proposed for this project and indicate thickness of material for individual services.
- .2 Submit samples of proposed insulating and recovering materials.

1.4 Job Conditions

- .1 Deliver material to job site in original non-broken factory packaging, labelled with manufacturer's density and thickness.
- .2 Perform work at ambient and equipment temperatures as recommended by the adhesive manufacturer. Make good separation of joints or cracking of insulation due to thermal movement or poor workmanship.

1.5 Alternatives

- .1 Alternative insulations are subject to review and acceptance by the Contract Administrator. Alternatives shall provide the same or better thermal resistance at normal conditions as material specified.

2. PRODUCTS

2.1 General

- .1 Insulation Materials, Recovery Jackets, Vapour Barrier Facings, Tapes and Adhesives: Composite fire and smoke hazard ratings shall not exceed 25 for flame spread and 50 for smoke developed.

- .2 All insulation materials shall meet current Building Code Standards, and packages or containers of such materials shall be appropriately labelled.
- .3 Insulate fittings and valve bodies with preformed removable insulated fittings.

2.2 Materials

- .1 Cold Piping: Formed fine fibrous glass or formed mineral fibre pipe insulation, with factory applied vapour barrier jacket, factory moulded to conform with piping, "K" value at 24°C (75°F) maximum 0.035 W/m.°C (0.25 Btu-in/(hr-ft²-°F)). Service temperature -14°C (7°F) to 100°C (212°F).
- .2 Refrigerant Piping: Foamed plastic of closed cell structure or closed cell elastomer, "K" value maximum 0.04 W/m.°C (0.28 Btu-in/(hr-ft²-°F)) at 24°C (75°F). Maximum water vapour transmission rating of 0.1 perms.
- .3 Recovery Jackets:
 - .1 0.4 mm (30 ga) embossed aluminum sheet for piping.
 - .2 Canvas Jacket
 - .1 Fabric: ASTM C921, Plain weave cotton treated with dilute fire retardant lagging adhesive.
 - .2 Lagging Adhesive: compatible with insulation.

3. EXECUTION

3.1 Preparation

- .1 Do not install covering before piping and equipment has been tested and approved.
- .2 Ensure surface is clean and dry prior to installation. Ensure insulation is dry before and during application. Finish with systems at operating conditions.

3.2 Installation

- .1 Ensure insulation is continuous through inside walls. Pack around pipes with fire proof self-supporting insulation material, properly sealed.
- .2 Insulate complete system including fittings, valves, unions, flanges, strainers. Do not insulate flexible connections and expansion joints. Terminate insulation neatly with plastic material travelled on a bevel.
- .3 Insulate piping, fittings and valves. Do not insulate unions, flanges (except on flanged valves), "victaulic" couplings, strainers, (except on chilled water lines), flexible connections and expansion joints. Terminate insulation neatly with plastic material trowelled on a bevel.

- .4 Finish insulation neatly on hangers, supports and other protrusions.
- .5 Locate insulation or cover seams in least visible locations. Locate seams on piping in ceiling spaces on the underside of the pipe.
- .6 Provide recovering jackets on exposed insulation throughout, including equipment rooms. Insulation located in crawl spaces, pipe shafts and suspended ceiling spaces is not considered exposed. Make smooth uneven insulated surfaces before recovering.
- .7 Cover insulation exposed to outdoors with aluminum jacket secured with aluminum bands on 200 mm (8 in) centres or screws on 150 mm (6 in) centres. Lap joints 75 mm (3 in) minimum and seal with compatible waterproof lap cement.
- .8 Cold Piping: Seal lap joints with 100% coverage of vapour barrier adhesive. Seal butt joints with 50 mm (2 in) wide strips of vapour barrier sealed with vapour barrier adhesive. For fittings and valves, apply hydraulic insulating cement; or apply factory fabricated insulation half shells, seal all laps and joints.
- .9 Refrigerant Piping: Cover fittings and valves with equivalent thickness of pipe insulation material. Apply with edges tightly butted. Seal joints with sealer.

3.3 Insulation Installation Thickness Schedule

Piping or Equipment	Pipe Sizes mm (in)	Insulation Thickness mm (in)	Recovery Jacket
.1 Refrigerant Suction Piping	All sizes	25 (1)	Aluminum
.2 Chilled Water Piping	All sizes	25 (1)	Canvas

END OF SECTION