

HVAC EQUIPMENT INSULATION

1. GENERAL

1.1 References

- .1 American Society of Heating, Refrigeration and Air Conditioning Engineers (ASHRAE)
 - .1 ASHRAE Standard 90.1-10(R2011), Energy Standard for Buildings Except Low-Rise Residential Buildings (IESNA co-sponsored; ANSI approved; Continuous Maintenance Standard).
- .2 ASTM International (ASTM)
 - .1 ASTM C 117-10, Standard Test Method for Steady-State Heat Flux Measurements and Thermal Transmission Properties by Means of the Guarded-Hot-Plate Apparatus.
 - .2 ASTM C 335-10(E2011), Standard Test Method for Steady State Heat Transfer Properties of Horizontal Pipe Insulation.
 - .3 ASTM C 411-11, Standard Test Method for Hot-Surface Performance of High-Temperature Thermal Insulation.
 - .4 ASTM C 534-08, Standard Specification for Preformed Flexible Elastomeric Cellular Thermal Insulation in Sheet and Tubular Form
 - .5 ASTM C 547-11, Mineral Fiber Pipe Insulation.
 - .6 ASTM C 553-11, Specification for Mineral Fiber Blanket Thermal Insulation for Commercial and Industrial Applications.
 - .7 ASTM C 921-10, Standard Practice for Determining the Properties of Jacketing Materials for Thermal Insulation.
 - .8 ASTM D 1056-07, Standard Specification for Flexible Cellular Materials - Sponge or Expanded Rubber
- .3 Canadian General Standards Board (CGSB)
 - .1 CGSB 51-GP-52Ma-89, Vapour Barrier, Jacket and Facing Material for Pipe, Duct and Equipment Thermal Insulation.
 - .2 CAN/CGSB-51.53-95, Poly (Vinyl Chloride) Jacketing Sheet, for Insulated Pipes, Vessels and Round Ducts
- .4 Thermal Insulation Association of Canada (TIAC)
 - .1 Best Practices Guide.
- .5 Underwriters' Laboratories of Canada (ULC)
 - .1 CAN/ULC-S102-10, Standard Method of Test for Surface Burning Characteristics of Building Materials and Assemblies.

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- .2 CAN/ULC-S702-09, Standard for Mineral Fibre Thermal Insulation for Buildings

1.2 Product Data

- .1 Submit Product Data in accordance with Section 01 33 00 - Submittal Procedures.

1.3 Qualifications

- .1 Installer: specialist in performing work of this Section, and have at least 5 years successful experience in this size and type of project, and being a member of TIAC.

1.4 Delivery, Storage and Handling

- .1 Deliver materials to site in original factory packaging, labelled with manufacturer's name, address.
- .2 Protect from weather and construction traffic.
- .3 Protect against damage from any source.
- .4 Store at temperatures and conditions recommended by manufacturer.

2. PRODUCTS

2.1 Fire and Smoke Rating

- .1 In accordance with CAN/ULC-S102:
 - .1 Maximum flame spread rating: 25.
 - .2 Maximum smoke developed rating: 50.

2.2 Insulation

- .1 Mineral fibre specified includes glass fibre.
- .2 Thermal conductivity ("k" factor) not to exceed specified values at 24° C mean temperature when tested in accordance with ASTM C 335.
- .3 TIAC Code A-6: Preformed flexible elastomeric cellular sheet insulation.
 - .1 Insulation: ABS/PVC flexible foam with a skin.
 - .2 Maximum "k" factor: 0.28 @ 23.9°C (75°F)
 - .3 The insulation complies to or has been tested in accordance with the following:
 - .1 ASTM C 177
 - .2 ASTM C 534 Type 2
 - .3 ASTM D 1056-07-2C1

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.4 CAN/ULC S102

2.3 Insulation Securement

.1 Tape: self-adhesive, aluminium, plain, 50 mm wide minimum.

2.4 Jackets

.1 Polyvinyl Chloride (PVC):

.1 One-piece moulded type to CAN/CGSB-51.53 with pre-formed shapes as required.

.2 Colours: White, gloss finish.

.3 Minimum service temperatures: -20 degrees C.

.4 Maximum service temperature: 65 degrees C.

.5 Moisture vapour transmission: 0.02 perm.

.6 Thickness: 0.8 mm.

.7 Fastenings:

.1 Use solvent weld adhesive compatible with insulation to seal laps and joints.

.2 Aluminium:

.1 To ASTM B 209.

.2 Thickness: 0.9 mm sheet.

.3 Finish: stucco embossed.

.4 Joining: longitudinal and circumferential slip joints with 50 mm laps.

.5 Fittings: 0.9 mm thick die-shaped fitting covers with factory-attached protective liner.

.6 Metal jacket banding and mechanical seals: stainless steel, 19 mm wide, 0.5 mm thick at 300 mm spacing.

2.5 Insulation Securements

.1 Tape: Self-adhesive, aluminum, reinforced, 50 mm wide minimum.

.2 Contact adhesive: Quick setting.

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3. EXECUTION

3.1 Manufacturer's Instructions

- .1 Compliance: comply with manufacturer's written recommendations or specifications, including product technical bulletins, handling, storage and installation instructions, and datasheet.

3.2 Pre- Installation Requirements

- .1 Pressure testing of equipment and adjacent piping systems complete, witnessed and certified.
- .2 Surfaces clean, dry, free from foreign material.

3.3 Installation

- .1 Install in accordance with TIAC Best Practices Guide.
- .2 Apply materials in accordance with manufacturer's instructions and this specification.
- .3 Use two layers with staggered joints when required nominal wall thickness exceeds 75 mm.
- .4 Maintain uninterrupted continuity and integrity of vapour retarder jacket and finishes.
 - .1 Install hangers, supports outside vapour retarder jacket.
- .5 Supports, Hangers:
 - .1 Apply high compressive strength insulation, suitable for service, at oversized saddles and shoes where insulation saddles have not been provided.
- .6 Elastomeric Insulation: to remain dry. Overlaps to manufacturer's instructions. Joints tight and sealed properly.

3.4 Removable, Pre-Fabricated, Insulation and Enclosures

- .1 Application: at expansion joints, valves, primary flow measuring elements flanges and unions at equipment.
- .2 Design: to permit movement of expansion joint and to permit periodic removal and replacement without damage to adjacent insulation.
- .3 Insulation:
 - .1 Insulation, fastenings and finishes: same as system.
 - .2 Jacket: aluminium and PVC .

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3.5 Equipment Insulation Schedules

- .1 Includes valves, valve bonnets, strainers, air separators, flanges and fittings unless otherwise specified.
- .2 Chillers
 - .1 TIAC A-6 cemented in place forming vapour barrier.
 - .2 Thicknesses: 20 mm.
 - .3 Finishes: Painted in resilient epoxy finish that resists cracking matching chiller colour.
- .3 Air Separators
 - .1 TIAC A-6 cemented in place forming vapour barrier.
 - .2 Thicknesses: 20 mm.
 - .3 Finishes: Painted in resilient epoxy finish that resists cracking matching adjacent pipe finish colour.
- .4 Finishes:
 - .1 Equipment in mechanical rooms: TIAC code CEF/1 with aluminium jacket.

END OF SECTION