

## **PART 1 GENERAL**

### **1.1 REFERENCE STANDARDS**

- .1 Definitions
  - .1 For purposes of this section:
    - .1 “CONCEALED”: insulated mechanical services and equipment in suspended ceilings and non-accessible chases and furred-in spaces.
    - .2 “EXPOSED”: means “not concealed”, as previously defined.
  - .2 TIAC Codes:
    - .1 CRD: Code Round Ductwork,
    - .2 CRF: Code Rectangular Finish.
- .2 References
  - .1 American Society of Heating, Refrigeration and Air Conditioning Engineers (ASHRAE).
    - .1 ANSI/ASHRAE/IESNA 90.1, SI; Energy Standard for Buildings Except Low-Rise Residential Buildings.
  - .2 ASTM International Inc.
    - .1 ASTM B209M, Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate (Metric).
    - .2 ASTM C335, Standard Test Method for Steady State Heat Transfer Properties of Pipe Insulation.
    - .3 ASTM C411, Standard Test Method for Hot-Surface Performance of High-Temperature Thermal Insulation.
    - .4 ASTM C449/C449M, Standard Specification for Mineral Fiber-Hydraulic-Setting Thermal Insulating and Finishing Cement.
    - .5 ASTM C547, Standard Specification for Mineral Fiber Pipe Insulation.
    - .6 ASTM C553, Standard Specification for Mineral Fiber Blanket Thermal Insulation for Commercial and Industrial Applications.
    - .7 ASTM C612, Standard Specification for Mineral Fiber Block and Board Thermal Insulation.
    - .8 ASTM C795, Standard Specification for Thermal Insulation for Use in Contact with Austenitic Stainless Steel.
    - .9 ASTM C921, Standard Practice for Determining the Properties of Jacketing Materials for Thermal Insulation.
  - .3 Canadian General Standards Board (CGSB).
    - .1 CGSB 51-GP-52Ma, Vapour Barrier, Jacket and Facing Material for Pipe, Duct and Equipment Thermal Insulation.
  - .4 Green Seal Environmental Standards (GSES).
    - .1 Standard GS-36, Commercial Adhesives.

- .5 South Coast Air Quality Management District (SCAQMD), California State.
  - .1 SCAQMD Rule 1168, Adhesive and Sealant Applications.
- .6 Thermal Insulation Association of Canada (TIAC): National Insulation Standards (2005).
- .7 Underwriters Laboratories of Canada (ULC).
  - .1 CAN/ULC-S102, Method of Test for Surface Burning Characteristics of Building Materials and Assemblies.
  - .2 CAN/ULC-S701, Standard for Thermal Insulation, Polystyrene, Boards and Pipe Covering.

## **1.2 QUALITY ASSURANCE**

- .1 Qualifications:
  - .1 Installer: must be a specialist in performing work of this field, have at least 3 years of successful experience in this size and type of project, and be a member of TIAC.

## **PART 2 PRODUCT**

### **2.1 FIRE AND SMOKE RATING**

- .1 Conform to CAN/ULC-S102:
  - .1 Maximum flame spread rating: 25.
  - .2 Maximum smoke developed rating: 50.

### **2.2 INSULATION**

- .1 Mineral fibre: as specified includes glass fibre, rock wool, and slag wool.
- .2 Thermal conductivity ("k" factor) must not exceed specified mean temperature values of 24°C, when tested in accordance with ASTM C335.
- .3 TIAC Code C-1: Rigid mineral fibre board conform to ASTM C612, with factory applied vapour retarder jacket conform to CGSB 51-GP-52Ma (as scheduled in PART 3 of this Section).
- .4 TIAC Code C-2: Mineral fibre blanket conform to ASTM C553 faced with factory applied vapour retarder jacket conform to CGSB 51-GP-52Ma (as scheduled in PART 3 of this section).
  - .1 Mineral fibre: conform to ASTM C553.
  - .2 Jacket: conform to CGSB 51-GP-52Ma.
  - .3 Maximum "k" factor: conform to ASTM C553.

## **2.3 JACKETS**

- .1 Canvas:
  - .1 220 gm/m<sup>2</sup> cotton, plain weave, treated with dilute fire retardant lagging adhesive conform to ASTM C921.
- .2 Lagging adhesive: compatible with insulation.

## **2.4 ACCESSORIES**

- .1 Vapour retarder lap adhesive:
  - .1 Water-based, fire-retardant type, compatible with insulation.
- .2 Indoor Vapour Retarder Finish:
  - .1 Vinyl emulsion type acrylic, compatible with insulation.
- .3 Insulating Cement: setting on mineral wool, conform to ASTM C449.
- .4 ULC Listed Canvas Jacket:
  - .1 220 gm/m<sup>2</sup> cotton, plain weave.
- .5 Outdoor Vapour Retarder Mastic:
  - .1 Vinyl emulsion type acrylic, compatible with insulation.
  - .2 Reinforcing fabric: fiber-glass, untreated 305 g/m<sup>2</sup>.
- .6 Tape: self-adhesive, aluminum, reinforced, 75 mm wide minimum.
- .7 Contact adhesive: quick-setting.
- .8 Canvas adhesive: washable.
- .9 Tie wire: 1.5 mm stainless steel.
- .10 Banding: 19 mm wide, 0.5 mm thick stainless steel.
- .11 Facing: 25 mm stainless or galvanized steel, hexagonal wire mesh stitched on both faces of insulation.
- .12 Fasteners: 4 mm diameter pins with 35 mm square clips, length to suit thickness of insulation.

## **PART 3 EXECUTION**

### **3.1 APPLICATION**

- .1 Manufacturer's instructions: comply with manufacturer's written recommendations, including product technical bulletins, handling, storage and installation instructions, as well as datasheets.

**3.2 PRE-INSTALLATION REQUIREMENTS**

- .1 Only after pressure test ductwork systems completed, with witness and certification.
- .2 Make sure that surfaces are clean, dry, and free from foreign material.

**3.3 INSTALLATION**

- .1 Install in accordance with TIAC National Standards.
- .2 Apply materials in accordance with manufacturer’s instructions and as indicated.
- .3 Use 2 layers with staggered joints when required nominal thickness exceeds 50 mm.
- .4 Maintain uninterrupted continuity and integrity of vapour retarder jacket and finishes.
  - .1 Make sure that hangers and supports are outside vapour retarder jacket.
- .5 Fasteners: install at 300 mm on centre in horizontal and vertical directions, minimum 2 rows on each side.

**3.4 DUCTWORK INSULATION SCHEDULE**

- .1 Insulation types and thicknesses: conform to the following table:

	TIAC Code	Vapour Retarder	Thickness (mm)
Rectangular	C-1	yes	50
Round	C-2	yes	50

- .2 Finishes: conform to the following table:

	TIAC Code	TIAC Code
	Rectangular	Round
Indoor, concealed	N/A	N/A
Indoor, exposed within mechanical room	CRF/1	CRD/2
Indoor, exposed elsewhere	CRF/2	CRD/3
Outdoor, exposed to precipitation	CRF/3	CRD/4
Outdoor, elsewhere	CRF/4	CRD/5

**END OF SECTION**