

## **PART 1 - GENERAL**

### **1.1 RELATED SECTIONS**

- .1 Section 07 92 00: Joint Sealing.

### **1.2 REFERENCES**

- .1 American Society for Testing and Materials (ASTM)
  - .1 ASTM B209M-14, Specification for Aluminum and Aluminum Alloy Sheet and Plate Metric.
  - .2 ASTM C335-10e1, Test Method for Steady State Heat Transfer Properties of Horizontal Pipe Insulation
  - .3 ASTM C449/C449M-07(R2013), Standard Specification for Mineral Fibre Hydraulic Setting Thermal Insulating and Finishing Cement.
  - .4 ASTM C533-13 Standard specification for Calcium Silicate Insulation Block and Pipe.
  - .5 ASTM C534-14 Standard Specification for Preformed Elastomeric Cellular Thermal Insulation in Sheet And Tubular Form.
  - .6 ASTM C547-15 Standard Specification for Mineral Fibre Pipe Insulation.
  - .7 ASTM C921-10(R2015), Practice for Determining the Properties of Jacketing Materials for Thermal Insulation.
- .2 Canadian General Standards Board (CGSB)
  - .1 CGSB 51GP52Ma-1989, Vapour Barrier, Jacket and Facing Material for Pipe, Duct and Equipment Thermal Insulation.
  - .2 CAN/CGSB 51.53, Poly (Vinyl Chloride) Jacketing Sheet, for Insulated Pipes, Vessels and Round Ducts.
- .3 Manufacturer's Trade Associations
  - .1 Thermal Insulation Association of Canada (TIAC): National Insulation Standards.
- .4 Underwriters' Laboratories of Canada (ULC)
  - .1 CAN/ULC S102-07, Surface Burning Characteristics of Building Materials and Assemblies.
  - .2 CAN/ULC S701-11 Thermal Insulation, Polystyrene, Boards and Pipe Covering.
  - .3 CAN/ULC S702-09AMI, Thermal Insulation, Mineral Fibre, for Buildings

### **1.3 DEFINITIONS**

- .1 For purposes of this section:
  - .1 "CONCEALED" - insulated mechanical services in suspended ceilings and non-accessible chases and furred-in spaces.
  - .2 "EXPOSED" - will mean "not concealed" as specified.
- .2 TIAC ss:
  - .1 CPF: Commercial Piping Finish.

### **1.4 SHOP DRAWINGS**

- .1 Shop drawings in accordance with Section 01 33 00 – Submittal Procedures.
- .2 Submit for approval manufacturer's catalogue literature related to installation, fabrication for pipe, fittings, valves and jointing recommendations.

### **1.5 SAMPLES**

- .1 Submit samples in accordance with Section 01 33 00 – Submittal Procedures.

### **1.6 MANUFACTURER'S INSTRUCTIONS**

- .1 Submit manufacturers' installation instructions in accordance with Section 01 78 00– Closeout Procedures.
- .2 Installation instructions to include procedures to be used, installation standards to be achieved.

## **PART 2 - PRODUCTS**

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

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

## **2.2 INSULATION**

- .1 Mineral fibre specified includes glass fibre, rock wool, slag wool.
- .2 Thermal conductivity ("k" factor) not to exceed specified values at 24°C mean temperature when tested in accordance with ASTM C335.
- .3 TIAC Code A3: Rigid moulded mineral fibre with factory applied vapour retarder jacket.
  - .1 Mineral fibre: to CAN/ULCS702 and ASTM C547.
  - .2 Jacket: to CGSB 51GP52Ma.
  - .3 Maximum "k" factor: to CAN/ULCS702.
- .4 TIAC Code C2: Mineral fibre blanket faced with factory applied vapour retarder jacket (as scheduled in PART 3 of this section).
  - .1 Mineral fibre: to CAN/ULCS702.
  - .2 Jacket: to CGSB 51GP52Ma.
  - .3 Maximum "k" factor: to CAN/ULCS702.

## **2.3 INSULATION SECRETMENT**

- .1 Tape: Self-adhesive, aluminum, plain reinforced, 50mm wide minimum.
- .2 Contact adhesive: Quick setting.
- .3 Canvas adhesive: Washable.
- .4 Tie wire: 1.5mm diameter stainless steel.
- .5 Bands: Stainless steel, 19mm wide, 0.5 mm thick.

## **2.4 CEMENT**

- .1 Thermal insulating and finishing cement:
  - .1 Hydraulic setting or air drying on mineral wool, to ASTM C449/C449M.

## **2.5 VAPOUR RETARDER LAP ADHESIVE**

- .1 Water based, fire retardant type, compatible with insulation.

## **2.6 INDOOR VAPOUR RETARDER FINISH**

- .1 Vinyl emulsion type acrylic, compatible with insulation.

## **2.7 JACKETS**

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

## **PART 3 - EXECUTION**

### **3.1 PRE-INSTALLATION REQUIREMENTS**

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

### **3.2 INSTALLATION**

- .1 Install in accordance with TIAC National Standards.
- .2 Apply materials in accordance with manufacturer's instructions and this specification.
- .3 Use two (2) layers with staggered joints when required nominal wall thickness exceeds 75mm.
- .4 Maintain uninterrupted continuity and integrity of vapour retarder jacket and finishes.
  - .1 Hangers, supports to be 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.

### **3.3 REMOVABLE PRE-FABRICATED, INSULATION AND ENCLOSURES**

- .1 Application: At valves and unions at equipment.
- .2 Design: To permit periodic removal and replacement without damage to adjacent insulation.
- .3 Insulation:

- .1 Insulation, fastenings and finishes: same as system.
- .2 Jacket: Aluminum, SS, PVC high temperature fabric.

### 3.4 PIPING INSTALLATION SCHEDULES

- .1 Includes valves, valve bonnets, strainers, flanges and fittings unless otherwise specified.
- .2 TIAC Code: A3.
  - .1 Securements: Tape at 300mm oc.
  - .2 Seals: VR lap seal adhesive, VR lagging adhesive.
  - .3 Installation: TIAC Code: 1501C.
- .3 TIAC Code: C2 with vapour retarder jacket.
  - .1 Insulation securements: 18 ga SS wire or 12mm x 0.5 mm ss bands at 300mm oc.
  - .2 Seals: lap seal adhesive, lagging adhesive.
  - .3 Installation: TIAC Code: 1501C.
- .4 Provide thickness of insulation as listed in following table:
  - .1 Do not insulate exposed run outs to plumbing fixtures, chrome plated piping, valves, and fittings.

Application (°C)	Temp code	TIAC	Pipe sizes (NPS) and insulation thickness (mm)					
			Run out	to 1	1-1/4 to 2	2-1/2 to 4	5 to 6	8 & over
Domestic Cold Water (DCW)		A-3	25	25	25	25	25	25

- .5 Finishes:
  - .1 Exposed indoors: canvas.
  - .2 Concealed, indoors: canvas on valves, fittings. All service jacket elsewhere.
  - .3 Use vapour retarder jacket on TIAC code A3 insulation compatible with insulation.
  - .4 Finish attachments: SS screws or bands, at 150 mm oc. or to manufacturer's recommendations.
  - .5 Seals: wing or closed.
- .6 Installation: To appropriate TIAC code CPF/1 through CPF/5.

**END OF SECTION**