PART 1 GENERAL

1.1 RELATED SECTIONS

.1 Section 15061 - Bases, Hangers and Supports.

1.2 REFERENCES

.1 American Society of Heating, Refrigeration and Air Conditioning Engineers (ASHRAE)

.1 ASHRAE Standard 90.1.

.2 American Society for Testing and Materials (ASTM).

.1 ASTM B 209M, Specification for Aluminum and Aluminum Alloy Sheet and Plate.


.3 ASTM C 411, Test Method for Hot-Surface Performance of High-Temperature Thermal Insulation.


.5 ASTM C 795, Specification for Thermal Insulation for Use with Austenitic Stainless Steel.

.6 ASTM C 921, Practice for Determining the Properties of Jacketing Materials for Thermal Insulation.

.3 Canadian General Standards Board (CGSB)

.1 CAN/CGSB-51.2, Thermal Insulation, Calcium Silicate, for Piping, Machinery and Boilers.

.2 CAN/CGSB-51.9, Mineral Fibre Thermal Insulation for Piping and Round Ducting.

.3 CAN/CGSB-51.10, Mineral Fibre Board Thermal Insulation.

.4 CAN/CGSB-51.11, Mineral Fibre Thermal Insulation Blanket.

.5 CAN/CGSB-51.12, Cement, Thermal Insulating and Finishing.

.6 CAN/CGSB-51.40, Thermal Insulation, Flexible, Elastomeric, Unicellular, Sheet and Pipe Covering.

.7 CGSB 51-GP-52Ma, Vapour Barrier, Jacket and Facing Material for Pipe, Duct and Equipment Thermal Insulation.
.4 Manufacturer's Trade Associations.

.1 Thermal Insulation Association of Canada (TIAC): National Insulation Standards.

.5 Underwriters Laboratories of Canada (ULC)

.1 CAN/ULC-S102, Surface Burning Characteristics of Building Materials and Assemblies.

1.3 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" - will mean "not concealed" as defined herein.

.3 Insulation systems - insulation material, fasteners, jackets, and other accessories.

.2 TIAC Codes:

.1 CRD: Code Round Ductwork,

.2 CRF: Code Rectangular Finish.

1.4 SHOP DRAWINGS

.1 Submit shop drawings in accordance with Section 01000 – General Provisions.

.2 Submit for approval manufacturer's catalogue literature related to installation, fabrication for duct jointing recommendations.

1.5 MANUFACTURER'S INSTRUCTIONS

.1 Submit manufacturer's installation instructions in accordance with Section 01000 – General Provisions.

.2 Installation instructions to include procedures to be used, installation standards to be achieved.

1.6 QUALIFICATIONS

.1 Installer to be specialist in performing work of this section, and have at least 3 years successful experience in this size and type of project, qualified to standards of TIAC.

1.7 1.8 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 required by manufacturer.

PART 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 as specified herein includes glass fibre, rock wool, slag wool.
.2 Thermal conductivity ("k" factor) not to exceed specified values at 24C mean temperature when tested in accordance with ASTM C 335.
.3 TIAC Code C-1: Rigid mineral fibre board to CAN/CGSB 51.10, with without factory applied vapour retarder jacket to CGSB 51-GP-52Ma (as scheduled in PART 3 of this Section).
.4 TIAC Code C-2: Mineral fibre blanket to CAN/CGSB-51.11 faced without factory applied vapour retarder jacket to CGSB 51-GP-52Ma (as scheduled in PART 3 of this section).
   .1 Mineral fibre: to CAN/CGSB-51.11.
   .2 Jacket: to CGSB 51-GP-52Ma.
   .3 Maximum "k" factor: to CAN/CGSB-51.11.

2.3 JACKETS

.1 Canvas:
   .1 220 gm/m cotton, plain weave, treated with dilute fire retardant lagging adhesive to ASTM C 921.
   .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.

4. ULC Listed Canvas Jacket:
   .1  220 gm/m² cotton, plain weave, treated with dilute fire retardant lagging adhesive to ASTM C 921.

5. Tape: self-adhesive, aluminum, reinforced, 75 mm wide minimum.

6. Contact adhesive: quick-setting


8. Tie wire: 1.5 mm stainless steel.

9. Banding: 19 mm wide, 0.5 mm thick stainless steel.

10. Facing: 25 mm stainless steel hexagonal wire mesh stitched on one face of insulation.

11. Fasteners: 4 mm diameter pins with 35 mm diameter or square clips, length to suit thickness of insulation.

PART 3  EXECUTION

3.1  PREINSTALLATION REQUIREMENTS

.1  Pressure testing of ductwork systems to be complete, witnessed and certified.

.2  Surfaces to be clean, dry, 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 layers with staggered joints when required nominal thickness exceeds 75 mm.

.4  Maintain uninterrupted continuity and integrity of vapour retarder jacket and finishes.

   .1  Hangers, supports to be outside vapour retarder jacket.

.5  Supports, Hangers in accordance with Section 15061 - Bases, Hangers and Supports

   .1  Apply high compressive strength insulation where insulation may be compressed by weight of ductwork.

.6  Fasteners: At 300 mm oc in horizontal and vertical directions, minimum two rows each side.
3.3 **DUCTWORK INSULATION SCHEDULE**

.1 Insulation types and thicknesses: Conform to following table:

<table>
<thead>
<tr>
<th>Type</th>
<th>TIAC Code</th>
<th>Vapour Retarder</th>
<th>Thickness (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rectangular air ducts</td>
<td>C-1</td>
<td>yes</td>
<td>25</td>
</tr>
<tr>
<td>Round air ducts</td>
<td>C-2</td>
<td>yes</td>
<td>25</td>
</tr>
<tr>
<td>Outside air ducts to mixing plenum</td>
<td>C-1</td>
<td>yes</td>
<td>50</td>
</tr>
<tr>
<td>Mixing plenums</td>
<td>C-1</td>
<td>yes</td>
<td>50</td>
</tr>
<tr>
<td>Exhaust duct between dampers and louvres</td>
<td>C-1</td>
<td>yes</td>
<td>50</td>
</tr>
</tbody>
</table>

.2 Exposed round ducts 600 mm and larger, smaller sizes where subject to abuse:

.1 Use TIAC code C-1 insulation, scored to suit diameter of duct.

.1 Finishes: Conform to following table:

<table>
<thead>
<tr>
<th>Location</th>
<th>TIAC Code</th>
<th>Rectangular</th>
<th>Round</th>
</tr>
</thead>
<tbody>
<tr>
<td>Indoor, concealed</td>
<td>none</td>
<td>none</td>
<td></td>
</tr>
<tr>
<td>Indoor, exposed within mechanical room</td>
<td>CRF/1</td>
<td>CRD/2</td>
<td></td>
</tr>
<tr>
<td>Indoor, exposed elsewhere</td>
<td>CRF/2</td>
<td>CRD/3</td>
<td></td>
</tr>
</tbody>
</table>

END OF SECTION