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**PART 1 - GENERAL****1.1 CODES AND REFERENCES**

- .1 American Society of Heating, Refrigeration and Air Conditioning Engineers (ASHRAE).
  - .1 ANSI/ASHRAE/IESNA 90.1-01, SI; Energy Standard for Buildings Except Low-Rise Residential Buildings.
- .2 American Society for Testing and Materials International (ASTM).
  - .1 ASTM C335-95, Test Method for Steady State Heat Transfer Properties of Horizontal Pipe Insulation.
  - .2 ASTM C449/C449M-00, Standard Specification for Mineral Fiber-Hydraulic-Setting Thermal Insulating and Finishing Cement.
  - .3 ASTM C547-00, Specification for Mineral Fiber Pipe Insulation.
  - .4 ASTM C553-11, Specification for Mineral Fiber Blanket Thermal Insulation for Commercial and Industrial Applications.
- .3 Canadian General Standards Board (CGSB).
  - .1 CGSB 51-GP-52Ma-89, Vapor Barrier, Jacket and Facing Material for Pipe, Duct and Equipment Thermal Insulation.
- .4 Thermal Insulation Association of Canada (TIAC), National Insulation Standards (C1999).
- .5 Underwriters Laboratories of Canada.
  - .1 CAN/ULC-S102-10, Method of Test for Surface Burning Characteristics of Building Materials and Assemblies.

**1.2 DEFINITIONS**

- .1 For the present section the following definitions apply:
  - .1 Concealed elements: Insulated piping, ductwork and mechanical equipment located above suspended ceilings or in inaccessible construction spaces.
  - .2 Visible elements: Elements that are not concealed (as per the definition above).
  - .3 Insulation: Includes the insulating material, accessories for fixing and jackets.

## DUCT INSULATION

- .4 Ductwork: Overall duct network including the ducts, the joints and all related accessories.
- .2 Insulation thickness is the thickness needed to cover every component of the insulated element, including reinforcements, angles, T-joints, flanges, etc.

**1.3 ACTION AND INFORMATIONAL SUBMITTALS**

- .1 Provide submittals in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Product Data.
  - .1 Provide manufacturer's printed product literature and datasheets for duct insulation, and include product characteristics, performance criteria, physical size, finish and limitations.
- .3 Manufacturers' Instructions.
  - .1 Provide manufacture's written duct insulation jointing recommendations and special handling criteria, installation sequence, and cleaning procedures.

**1.4 QUALITY ASSURANCE**

- .1 The mechanical quality insulation standards manual of the Thermal Insulation Association of Canada (TIAC), as well as its authorized amendments, must be used as the standard reference and is part of the specifications of this project.
- .2 The Contractor responsible for the thermal insulation installation must keep a copy of this quality standard manual as a reference on the jobsite.

**PART 2 - PRODUCTS****2.1 FIRE AND SMOKE RATING**

- .1 To CAN/ULC-S102-10 Standard.
  - .1 Maximum flame spread rating: 25.
  - .2 Maximum smoke developed rating: 50.

**2.2 INSULATION**

- .1 Thermal conductivity coefficient (coefficient "K") must not exceed the prescribed value at mean temperatures of 24°C, in accordance with ASTM C335 Standard.

## DUCT INSULATION

- .2 Type **D-2 insulation**: Bat made of mineral fibres in accordance with ASTM C553-11 Standard, with factory installed vapour barrier envelop in accordance with CGSB 51-GP-52Ma Standard.
  - .1 Mineral fibers: In accordance with ASTM-C553-11 Standard.
  - .2 Vapour barrier: In accordance with CGSB 51-GP-52Ma Standard.
  - .3 Thermal conductivity coefficient "K" no greater than 0,035 W/m•°C at mean temperature of 24°C.
  - .4 Temperature limit: 120°C.
  - .5 Density: 24 kg/m<sup>3</sup>.
  - .6 Acceptable product: Manson Alley Wrap FSK; Knauf; Dispro.

### 2.3 GLUES, TAPES AND ATTACHMENTS

- .1 Tapes: Self-adhesive aluminum, of 100 mm in width, approved by the ULC for the following characteristics: Flame spread index inferior to 25 and a fumigant property index of at most 50.
- .2 Quick set contact glue.
- .3 Sealing Glue for Overlaps: Quick set glue used to seal the joints and the overlaps of the vapour barriers.
- .4 Pegs.
  - .1 Pegs to weld to the duct once the insulation is set, of a 4 mm diameter, with a 35 mm head diameter, of an appropriate length to the thickness of the insulator.
  - .2 Pegs to weld on the duct before the insulation is set, of a 2 mm diameter, of an appropriate length to the thickness of the insulator, equipped with a nylon square holding small plate of 32 mm side.

## PART 3 - EXECUTION

### 3.1 PRE-INSTALLATION REQUIREMENTS

- .1 Pressure test ductwork systems completed, witnessed, and certified.
- .2 Ensure surfaces are clean, dry, and free from foreign material.

## DUCT INSULATION

**3.2 INSTALLATION**

- .1 Install in accordance with TIAC National Standards.
- .2 Apply materials in accordance with manufacturers' instructions and as indicated.
- .3 Use two layers with staggered joints when required nominal thickness exceeds 75 mm.
- .4 If there are elevated joints, cover them by overlapping sections or with a flexible insulating material with an integrated vapour barrier.
- .5 Maintain uninterrupted continuity and integrity of vapour retarder jacket and finishes.
  - .1 Ensure hangers, and supports are outside vapour retarder jacket.
- .6 Fasteners: Install at 300 mm on centre in horizontal and vertical directions, minimum two rows each side.

**3.3 DUCTWORK INSULATION SCHEDULE**

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

NETWORKS AND EQUIPMENTS	THICKNESS OF INSULATION mm	TYPE OF INSULATION
.1 The networks of conditioning supply air ducts. Insulate new pipes and rectify existing insulation at the connection points of new pipes in the works area.	25	D-2

**END OF SECTION**