

## SECTION 11 : INDUSTRIAL EQUIPMENT

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## SECTION 11

### INDUSTRIAL EQUIPMENT

#### 11.1 APPLICATION

##### A. HOT EQUIPMENT

###### Specification Code No.

**1701-H** - Apply insulation to sidewalls, breechings, etc. in block form applied to equipment with wire, stud, or strap fastening. The insulation shall be fabricated using bevelled lags or curved pre-formed segments and shall be installed in such a manner as to closely fit the equipment contours without voids. Equipment operating below 300 C shall have single layer construction and equipment operating at 300 C or greater or when insulation thickness is greater than 75 mm it shall be insulated in double layer construction with all joints staggered.

**1702-H** - Apply insulation to heads, transitions, tapers, etc. in block form applied to equipment with wire, stud, or strap attached to float rings or anchor rings. The spacing of wire, stud or strap at rings shall not exceed 300 mm on centres. The insulation shall be cut to fit snugly with all joints butted together and bevelled to prevent "V" shaped voids between pieces. Equipment operating below 300 C shall have single layer construction and equipment operating at 300 C or greater or when insulation thickness is greater than 75 mm it shall be insulated in double layer construction with all joints staggered.

##### B. COLD EQUIPMENT

###### Specification Code No.

**1703-C** - Apply insulation to sidewalls in block form to equipment with wire or strap fastenings. The insulation shall be fabricated using bevelled lags or curved preformed segments and shall be installed in such a manner as to closely fit the equipment contours without voids. Equipment operating below +2 C shall have single layer construction and equipment operating below -20 C or when insulation thickness is greater than 50 mm, it shall be insulated in double layer construction with all joints staggered. The entire surface shall be given a coating of vapour retarder coating at the rate of coverage as recommended by the manufacturer, embed a layer of reinforcing membrane and then apply a second coat of vapour retarder coating at the rate of coverage as recommended by the manufacturer.

Equipment operating below -30 C shall have all support saddles, skirts, etc. insulated for a distance of four (4) times the insulation thickness from the equipment.

**1704-C** - Apply insulation to heads, transitions, tapers, etc. in block form applied to equipment with wire, stud or strap attached to float rings or anchor rings. The spacing of wire or strap at rings shall not exceed 300 mm on centres. The insulation shall be cut to fit snugly with all joints butted together and bevelled to prevent "V" shaped voids between pieces. Equipment operating below +2 C shall have single layer construction and equipment operating below -20 C or when insulation thickness is greater than 50mm, it shall be insulated in double layer construction with all joints staggered. The entire surface shall be given a coat of vapour retarder coating at the rate of coverage as recommended by the manufacturer, embed a layer of reinforcing membrane and then apply a second coat of vapour retarder coating at the rate of coverage as recommended by the manufacturer.

**Note 1: Insulated tanks or vessels that are set on a concrete slab, the first 300mm of insulation shall be closed cell imbedded in mastic.**

## 11.2 FINISHES

### Specification Code No.

**IEF-1** - Where corrugated metal is specified in the equipment finish format, all vertical seams shall be lapped a minimum of 75 mm and shall be secured with specified bands. All horizontal seams shall be lapped a minimum of 50 mm. Two "S" clips per sheet to be installed to support sheets on the circumferential laps. (Do not install "S" clips at corners of sheets where they overlap.) Equipment over 2 m in diameter shall have an expansion spring in each securing band for equipment operating at over 200 C and two expansion springs spaced at 180 degrees apart if operating at over 400 C. All metal shall be cut to fit snugly around nozzles, man-ways, platform supports, etc. and shall be flashed with an approved sealing compound.

**IEF-2** - Where smooth metal is specified in the equipment finish format for horizontal vessels, and equipment heads the metal shall be lapped a minimum of 75 mm on all joints for horizontal equipment and secured with specified bands. Orange peel sections shall be applied to heads with overlaps placed to shed water and shall be secured with sheet metal screws or pop rivets 100 mm on centres. The orange peel sections shall overlap shell jacket approximately 100 mm. Metal jackets are not required on bottom heads of vertical vessels inside skirts.

**IEF-3** - Irregular surfaced equipment such as pumps and compressors shall be finished with insulating cement embedded on a layer of reinforcing mesh followed by a second layer of insulating cement trowelled smooth. Over the cement apply a brush coat of mastic weather coating at the rate of 1.2 L/ m<sup>2</sup>, embed a layer of reinforcing membrane and then apply another brush coat of mastic weather coat at the rate of 1.0 L/ m<sup>2</sup>.

## 11.3 EQUIPMENT FORMAT

### A. EQUIPMENT INSULATION

- Rigid Mineral Fibre - Low & Medium Temperature
- Flexible Mineral Fibre - Low & Medium Temperature
- Calcium Silicate - High Temperature
- Rigid Mineral Fibre - High Temperature
- Flexible Mineral Fibre - High Temperature
- Polyisocyanurate
- Cellular Glass
- Perlite

### B. EQUIPMENT INSULATION

The following equipment shall be insulated.

	<u>Equipment</u>	<u>Material</u>	<u>Thickness</u>
1.			
2.			
3.			

**C. INSULATION ATTACHMENT**

<u>Material</u>	<u>Size</u>	<u>Spacing</u>
<input type="checkbox"/> Galvanized Wire	<input type="checkbox"/> 18 gauge	<input type="checkbox"/> 300 mm on centre
<input type="checkbox"/> Stainless Steel Wire	<input type="checkbox"/> 16 gauge	<input type="checkbox"/> 450 mm on centre
<input type="checkbox"/> Stainless Steel Band	<input type="checkbox"/> 14 gauge	<input type="checkbox"/> 600 mm on centre
<input type="checkbox"/> Wing Seals	<input type="checkbox"/> 12 mm x 0.38 mm	
<input type="checkbox"/> Closed Seals	<input type="checkbox"/> 18 mm x 0.50 mm	

**D. INSULATION FINISH**

<u>Material</u>	<u>Thickness</u>	<u>Form</u>
<input type="checkbox"/> Aluminum	<input type="checkbox"/> 0.250 mm	<input type="checkbox"/> Smooth
<input type="checkbox"/> Plain	<input type="checkbox"/> 0.400 mm	<input type="checkbox"/> Corrugated
<input type="checkbox"/> Acrylic	<input type="checkbox"/> 0.500 mm	<input type="checkbox"/> Stucco Embossed
<input type="checkbox"/> Stainless Steel	<input type="checkbox"/> 0.600 mm	
<input type="checkbox"/> Type 304		
<input type="checkbox"/> Type 316		
<input type="checkbox"/> Glass fabric and Mastic		

**E. INSULATION FINISH ATTACHMENT**

<u>Material</u>	<u>Size</u>	<u>Spacing</u>
<input type="checkbox"/> Stainless Steel Screws	<input type="checkbox"/> 12mm x #8	<input type="checkbox"/> 300mm centres
<input type="checkbox"/> Stainless Steel Bands	<input type="checkbox"/> 12 mm x 0.38mm	<input type="checkbox"/> 450 mm centres
<input type="checkbox"/> Wing Seals	<input type="checkbox"/> 19 mm x 0.50mm	<input type="checkbox"/> 600 mm centres
<input type="checkbox"/> Closed Seals		