

SECTION 6: COMMERCIAL DUCTWORK AND PLENUM

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Note: The contents of the Section include the application and finishes of duct and plenum insulation under Specification Code Numbers CER, CEF, CIR, CIF, CIU, CRF and CRD. These code numbers are cross-referenced in TIAC specification sections 15250 (23 07 00) - Mechanical Insulation and 15270 (23 07 13) - Ductwork Insulation.

SECTION 6

COMMERCIAL DUCTWORK AND PLENUM

6.1 APPLICATION

A. RIGID INSULATION EXTERNAL APPLICATION

Specification Code No.

CER/1 Hot Duct and Plenum (20° to 65°C)

- Preparation: Fix mechanical fasteners to both horizontal and vertical surfaces at approximately 300 mm centers, each direction.
- Application: Cut insulation without integral vapour retarder to required size and apply to exterior of duct and/or plenum, with horizontal surfaces overlapping vertical surfaces and edges tightly butted together. Secure insulation by impaling on mechanical fasteners. **(See Note 1)**

CER/2 Cold or Dual Temp Duct and Plenum (Sub-ambient to 65°C)

- Preparation: Fix mechanical fasteners to both horizontal and vertical surfaces at approximately 300 mm centers, each direction.
- Application: Cut insulation with integral vapour retarder to required size and apply to exterior of duct and/or plenum with vapour retarder to the warm side with horizontal surfaces overlapping vertical surfaces. Butt edges together tightly. Secure insulation by impaling on mechanical fasteners. Where mechanical fasteners penetrate vapour retarder, and at all corners and joints, apply self adhesive vapour retarder tape or vapour retarder strips adhered with vapour retarder adhesive. Where raised seams are encountered, add a strip of insulation above seam termination on each side of the seam, secure to the seams an overlapping strip of insulating material of equal thickness to the one required with integral vapour retarder to provide a continuous vapour retarder and seal all joints and edges with self adhesive vapour retarder tape. **(See Note 1)**

CER/3 Outside Air Duct and Plenum (-40°C to Ambient)

- As CER/2 above but firstly apply a layer of rigid insulation without vapour retarder before applying layer of rigid insulation with vapour retarder. All joints shall be staggered.

Note 1: For external applications of rigid insulation (CER/1 and CER/2) where the use of mechanical fasteners is unsuitable due to space limitations, wire fastenings, insulation adhesive or other suitable method of attachment may be substituted.

Note 2: Except where specifically called for in the Insulation section of the project specifications, where an interior duct liner is used, external insulation shall not be applied.

B. FLEXIBLE INSULATION EXTERNAL APPLICATION

Specification Code No.

CEF/1 Hot Duct and Plenum (20°C to 65°C)

- Preparation: On round ducts and on rectangular ducts 740mm or less in width, no preparation is necessary. On rectangular ducts 600mm or more in width, apply to bottom surface, either mechanical fasteners at approximately 300 mm centres, or insulation adhesive applied in strips 100mm wide on approximately 300 mm centres.
- Application: Cut insulation without integral vapour retarder to required size allowing for 50 mm overlap at each joint and apply to exterior of duct. Secure insulation with either twine or wire fastening on approximately 300 mm centres, or by stapling laps; or by 100% insulation adhesive coverage.

CEF/2 Cold or Dual Temp Duct and Plenum (Sub-ambient to 65°C)

- Preparation: On rectangular ducts 600 mm or more in width, apply to bottom surface, either mechanical fasteners at approximately 300 mm centers or insulation adhesive in strips 100 mm wide on approximately 300 mm centers.
- Application: Cut insulation with integral vapour retarder to required size and apply to exterior of duct with vapour retarder to the outside. Where mechanical fasteners or staples penetrate the vapour retarder and at all joints apply vapour retarder tape or vapour retarder strips adhered with vapour retarder adhesive. All joints shall be overlapped a minimum of 50 mm and stapled on approximately 100 mm centers. Secure insulation with wire fastening on approximately 300 mm centers. **(See Notes 1 and 2)**

Note 1: Except where specifically called for in the Insulation section of the project specifications, where an interior duct liner is used, external insulation shall not be applied.

Note 2: All Outside Air Ducts shall be insulated as specified under CER/3, Page CD-1.

C. LINER INTERNAL APPLICATION

Specification Code No.

CIR/1 Rigid Duct Liner

- Preparation: Fix mechanical fasteners to both horizontal and vertical surfaces at approximately 300 mm centers each direction.
- Application: Cut insulation material to required size and apply to interior of duct and/or plenum with horizontal surfaces overlapping vertical surfaces and with edges tightly butted together. Insulation shall be applied to the ductwork with a minimum 90% coverage of adhesive and mechanical fasteners. Where mechanical fasteners penetrate factory finish and at all joints, apply a heavy layer of seal coating. On high velocity duct systems 20.32 m/s to 30.48 m/s apply reinforcing membrane over the entire insulation joint surface. Seal off leading edge of insulation to duct surface with reinforced seal coating. **(See Note 1)**

CIF/1 Flexible Duct Liner

- Preparation: Fix mechanical fasteners to both horizontal and vertical surfaces at approximately 300 mm centers each way.
- Application: Cut insulation material to required size and apply to interior of duct, edges tightly butted together. Insulation shall be applied to the ductwork with a minimum 90% coverage of adhesive and mechanical fasteners. Where mechanical fasteners penetrate factory finish and at all joints, apply a heavy layer of seal coating. On duct systems having a 10.16 m/s to 20.32 m/s velocity, reinforce the joints with seal coating and reinforcing membrane. Seal off leading edge of insulation to duct surface with reinforced seal coating. **(See Note 1)**

Note 1: Except where specifically called for in the Insulation section of the project specifications, where an interior duct liner is used, external insulation shall not be applied.

Note 2: Internal insulation shall not be applied to duct work that is below ambient temperature.

D. UNDERGROUND INSULATION

Specification Code No.

CUI/1 Buried Underground Insulation

- Patented encasement type based on the particular characteristics of the insulation materials shall be used.
- Install the underground insulation in accordance with the manufacturer's recommendations and specifications.

6.2 FINISHES

A. RECTANGULAR DUCTS

INSULATION ON CONCEALED DUCTWORK WILL BE LEFT AS FACTORY FINISHED WITH NO FURTHER FINISH REQUIRED. The following finishes apply to exposed ductwork and plenums only.

Specification Code No.

CRF/1 Indoor

- Use over rigid insulation with an integral vapour retarder. vapour Apply continuous metal corner bead to all corners. Adhere vapour retarder tape over all joints and breaks in vapour retarder, and at all corners.
- Secure canvas jacket over insulation using fire resistive lagging coating and adhesive, and finish with one (1) coat of fire resistive lagging coating adhesive.

CRF/2 Indoor

- Use over rigid insulation with an integral vapour retarder. Apply continuous metal corner bead to all corners. Adhere vapour retarder tape over all joints and breaks in vapour retarder, and at all corners.

CRF/3 Outdoor

- Adhere vapour retarder tape over all joints and breaks in vapour retarder and at all corners on cold or dual temp ductwork.
- Apply over the insulation surface a stucco embossed aluminum jacket secured with pop rivets or stainless steel self tapping screws. All joints sealed or flashed to prevent water infiltration.

CRF/4 Outdoor

- Apply to the insulation surface a coat (minimum 1 litre per 1.5 m) of weather coating. While still wet, embed a layer of reinforcing membrane and finish with a final coat (minimum 1 litre per 1.5 m) of weather coating. (Insulation having factory applied vapour retarder is not 2 required with this finish).

CRF/5 Outdoor

- Install a modified bitumen membrane in accordance to manufacturer's instructions.

B. ROUND DUCTS

INSULATION ON CONCEALED DUCT WORK WILL BE LEFT AS FACTORY FINISHED WITH NO FURTHER FINISH REQUIRED. The following finishes apply to exposed duct work only.

Specification Code No.

CRD/1 Indoor

- Use with flexible insulation or pipe and tank wrap with integral vapour retarder. At all joints and breaks, apply self-adhesive vapour retarder tape.
- Apply canvas jacket over insulation using fire resistive lagging coating and finish with one (1) coat of fire resistive lagging coating.

CRD/2 Indoor

- Use flexible insulation with integral vapour retarder.
- At all joints and breaks, apply vapour retarder tape.

CRD/3 Outdoor

- Adhere vapour retarder tape over all joints and breaks in vapour retarder on cold or dual temp ductwork.

- Apply over the insulation surface a stucco embossed aluminum jacket secured with pop rivets or stainless steel self-tapping screws. All joints sealed or flashed to prevent water infiltration.

CRD/4 Outdoor

- Install an aluminized modified bitumen membrane in accordance to manufacturer's instructions.

CRD/5 Outdoor

- Apply to the insulation surface a coat (minimum 1 litre per 1.5 m) of weather coating. While still wet, embed a layer of reinforcing membrane and finish with a final coat (minimum 1 litre per 1.5 m) of weather coating. (Insulation having factory applied vapour retarder is not required with this finish).

C. OVAL DUCTS

Please refer to the specifications for RECTANGULAR DUCTS in Section 6.2.A