

SECTION: 2.13

ACOUSTIC INSULATION

1.0 **Scope**

1.1 The scope of work covers Acoustic insulation of

- i) sheet metal ducting
- ii) return air boxes
- iii) equipment rooms

1.2 The work also covers acoustic doors for equipment rooms.

2.0 **Material**

2.1 The materials for acoustic insulation shall be as follows:

Application	Material	Sound Absorption Coefficient at Octave Mid band frequency HZ				
		250	500	1000	2000	4000
Ducts	Open Cell Nitrile Rubber 150 Kg/Cum 25mm thick	0.32	0.82	0.95	0.96	0.94
Walls & Ceiling.	Open Cell Nitrile Rubber 150 Kg/Cum 25mm thick	0.76	1.04	0.75	1.15	0.83

2.2 All nitrile rubber shall be specially selected shot-free non-corrosive, non-settling variety.

3.0 **Duct Liners**

3.1 All discharge and return ducts connected to Air handling units and fan coil units shall be acoustically insulated for distance as shown:

AH Units 4.5 m or as shown on drawings or as directed by the Engineer-in-charge.

Fan coil units Entire discharge duct

3.2 The duct surface shall be cleaned and hot bitumen applied in patches stick self adhesive insulation holding pins to all ducts. The resin bonded fibre glass cut to appropriate size and stuck to the duct wall. The insulation face shall be covered with perforated aluminium sheet 0.45 mm thick with 3 mm perforations at 5.0 mm staggered centres and held in position with rivets or galvanised steel bolts with counter sunk heads & 50 x 50 x 2 mm plate washers at not more than 600 mm centres. All duct lining shall be done by the sheet metal contractor according to these specifications.

3.3 In the case of fan coil units the discharge duct may be perforated with 3 mm perforations dia @ 5mm centre to centre staggered and make an outer wrapping of insulation. The insulation shall be covered with Fibre glass tissue & PVC strapping.

4.0 **Wall & Ceiling Acoustic**

4.1 Walls and ceilings shall be acoustically insulated wherever shown on drawings or as required by the Engineer-in-charge. The wall/ceiling surface shall be cleaned and a grid work of 600 x 600 shall be made using 50 x 50 x 0.8 G.I pressed steel forms. 50mm resin bonded fibre glass shall be cut to size and positioned within the grid work and held with 1.0 mm galvanized steel wire at 300 mm intervals. Entire insulation shall be covered with 0.8 mm thick aluminium sheets having 3 mm perforations at 5 mm staggered centres. The sheet shall be neatly cut and the edges reinforced with a 20 mm sheet fold and made into neat looking panels. The panels shall be fixed on the frame work using cheese headed No. 8-20 mm sheet metal CP brass screws at 300 mm centres.

4.2 Where the insulation thickness is 100 mm the channels shall be 50 x 100 and the remaining work shall be as specified above.

5.0 **Return Air Acoustic Boxes**

5.1 The return air acoustic boxes wherever required shall be generally as shown on drawings and the acoustic insulation shall be applied as for duct lining.

6.0 **Air tight doors**

6.1 Air tight doors for AHU rooms shall be double leaf hollow steel doors of 2” (50 mm) thick filled with honey comb fill. The doors shall be fixed with 3 point heavy duty hinges, mounted on a steel frame. The door shall have double acoustic seals at the hinges and a single seal at the centre point. Doors shall have positive pressure latch with adjustable strike and push rod release. The door and frame shall be fabricated from combination of 14/16 SWG mild steel sheets and given two coats of grey oil paint over two coats of primer. The door performance shall be such that the leakage is not more than 10 cfm/100 sqft face area.

7.0 **Mode of measurement**

7.1 Acoustic insulation shall be calculated on the basis of the prime duct size and paid for per unit area.

7.2 Room acoustic insulation shall be calculated on the basis of the prime unfinished area and paid for per unit area.

7.3 Air tight doors shall be measured per unit including the door, frame etc. as specified.