

# BCA 2009 Specification 3.12.5 Ductwork Insulation and Sealing Applies to Class 1 & 10a buildings

## 3.12.5 Application

This Part applies to—

- (a) a Class 1 building; and
- (b) a Class 10a building.

<b>A. Acceptable construction manual</b>
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### 3.12.5.3

#### Heating and cooling ductwork

- (a) Heating and cooling ductwork and fittings must—
  - (i) achieve the *Total R-Value* in [Table 3.12.5.2](#) ; and
  - (ii) use thermal insulation material in accordance with AS/NZS 4859.1; and
  - (iii) be sealed against air loss—
    - (A) by closing all openings in the surface, joints and seams of ductwork with adhesives, mastics, sealants or gaskets in accordance with AS 4254 for a Class C seal; or
    - (B) for flexible ductwork, with a draw band in conjunction with a sealant or adhesive tape.
- (b) Duct insulation located under a suspended floor, in an attached Class 10a building and in a roof space must—
  - (i) be protected by an outer sleeve of protective sheeting to prevent the insulation becoming damp; and
  - (ii) have the outer protective sleeve sealed with adhesive tape not less than 48 mm wide creating an airtight and waterproof seal.
- (c) The requirements of [\(a\)](#) do not apply to heating and cooling ductwork and fittings located within the insulated building *envelope* including a service riser within the *conditioned space*, internal floors between storeys and the like.

Explanatory information:

Ductwork within a fully insulated building may still benefit from insulation particularly when the system is only operating for short periods.

In some *climate zones* condensation may create problems with uninsulated ductwork and insulation should still be considered.

**Table 3.12.5.2 HEATING AND COOLING DUCTWORK AND FITTINGS—MINIMUM TOTAL R-VALUE**

Ductwork element	Minimum <i>Total R-Value</i> for ductwork and fittings in each <i>climate zone</i>					
	Evaporative cooling system	Heating-only system or refrigerated cooling-only system		Combined heating and refrigerated cooling system		
	All <i>climate zones</i>	1, 2, 3, 4, 5, 6 and 7	8	1, 3, 4, 6 and 7	2 and 5	8
Ductwork	0.6	1.0	1.5	1.5 (see note)	1.0	1.5
Fittings	0.4					

Note:

The minimum *Total R-Value required* for ductwork may be reduced by 0.5 for combined heating and refrigerated cooling systems in *climate zones* 1, 3, 4, 6 and 7 if the ducts are—

- (a) under a suspended floor with an enclosed perimeter; or
- (b) in a roof space that has insulation of not less than R0.5 directly beneath the roofing.

Explanatory information:

1. For information on an enclosed perimeter, refer to the explanatory information following [Table 3.12.1.4](#).
2. Insulation for refrigerated cooling ductwork should have a vapour barrier to prevent possible damage by condensation.
3. The insulation levels in the following table are typical examples of materials that can be used to insulate ductwork and fittings and the *R-Values* they contribute. Other methods are available for meeting the *Total R-Values required* by [Table 3.12.5.2](#).

<b>Insulation</b>	<b><u>R-Value</u></b>
8 mm polyurethane spray	R0.3
40 mm polyester fibre insulation (250 g/m <sup>2</sup> )	R0.6
70 mm polyester fibre insulation (450 g/m <sup>2</sup> )	R1.0
90 mm polyester fibre insulation (800 g/m <sup>2</sup> )	R1.5
25 mm mineral wool or fibreglass insulation (480 g/m <sup>2</sup> )	R0.6
38 mm mineral wool or fibreglass insulation (560 g/m <sup>2</sup> )	R1.0
50 mm mineral wool or fibreglass insulation (840 g/m <sup>2</sup> )	R1.5

4. The air films and surfaces of the ductwork and fittings are considered to contribute an R-Value of not more than R0.15 to the Total R-Values. A greater value, such as for the addition of foil backing to the insulation or a plastic protective sheet, would need to be supported by appropriate documentary evidence.

5. Any flexible ductwork used for the transfer of products, initiating from a heat source that contains a flame, must also have the fire hazard properties required by 3.7.1.9.