

### 3.12.5.3 Heating and cooling ductwork

- (a) Heating and cooling ductwork and fittings must—
  - (i) achieve the material *R-Value* in 3.12.5.3(d); and
  - (ii) 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 4254.1 and AS 4254.2 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 must—
  - (i) abut adjoining duct insulation to form a continuous barrier; and
  - (ii) be installed so that it maintains its position and thickness, other than at flanges and supports; and
  - (iii) where located outside the building, under a suspended floor, in an attached Class 10a building or in a roof space—
    - (A) be protected by an outer sleeve of protective sheeting to prevent the insulation becoming damp; and
    - (B) 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.

## Energy Efficiency

In some *climate zones* condensation may create problems with uninsulated ductwork, in which case insulation should still be considered.

- (d) The material *R-Value required* by (a)(i) must be determined in accordance with the following:
- (i) In a heating-only system or cooling-only system including an evaporative cooling system—
    - (A) ductwork must have a minimum material *R-Value* of—
      - (aa) in *climate zones* 1 to 7 — 1.0; and
      - (bb) in *climate zone* 8 — 1.5; and
    - (B) fittings must have a minimum material *R-Value* of 0.4.
  - (ii) In a combined heating and refrigerated cooling system—
    - (A) ductwork must have a minimum material *R-Value* of—
      - (aa) in *climate zones* 1, 3, 4, 6 and 7 — 1.5; and
      - (bb) in *climate zones* 2 and 5 — 1.0; and
      - (cc) in *climate zone* 8 — 1.5; and
    - (B) fittings must have a minimum material *R-Value* of 0.4.
  - (iii) For the purposes of (d)(ii)(A), the minimum material *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 an insulation of greater than or equal to 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 tables are typical examples of materials that can be used to insulate ductwork and the *R-Values* they contribute. Other methods are available for meeting the minimum material *R-Value* required by [3.12.5.3\(d\)](#). These values do not take into account all issues that may reduce the effectiveness of insulation. AS/NZS 4859.1 should be used to confirm in-situ values.
4. For fittings, 11 mm polyurethane typically provides an *R-Value* of 0.4.

### R-Values for typical ductwork insulation materials — flexible ductwork

Insulating material and thickness	<i>R-Value</i>
45 mm glasswool (11 kg/m <sup>3</sup> )	1.0
70 mm polyester (6.4 kg/m <sup>3</sup> )	1.0
63 mm glasswool (11 kg/m <sup>3</sup> )	1.5
90 mm polyester (8.9 kg/m <sup>3</sup> )	1.5
85 mm glasswool (11 kg/m <sup>2</sup> )	2.0

### R-Values for typical ductwork insulation materials — sheetmetal ductwork — external insulation

Insulating material and thickness	<i>R-Value</i>
38 mm glasswool (22 kg/m <sup>3</sup> )	1.0
50 mm polyester (20kg/m <sup>3</sup> )	1.1
50 mm glasswool (22 kg/m <sup>3</sup> )	1.5
75 mm polyester (20kg/m <sup>3</sup> )	1.7

### R-Values for typical ductwork insulation materials — sheetmetal ductwork — internal insulation

Insulating material and thickness	<i>R-Value</i>
38 mm glasswool (32 kg/m <sup>3</sup> )	1.0

## Energy Efficiency

Insulating material and thickness	<i>R-Value</i>
50 mm polyester (32 kg/m <sup>3</sup> )	1.3
50 mm glasswool (32 kg/m <sup>3</sup> )	1.5

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 3.7.1.2.