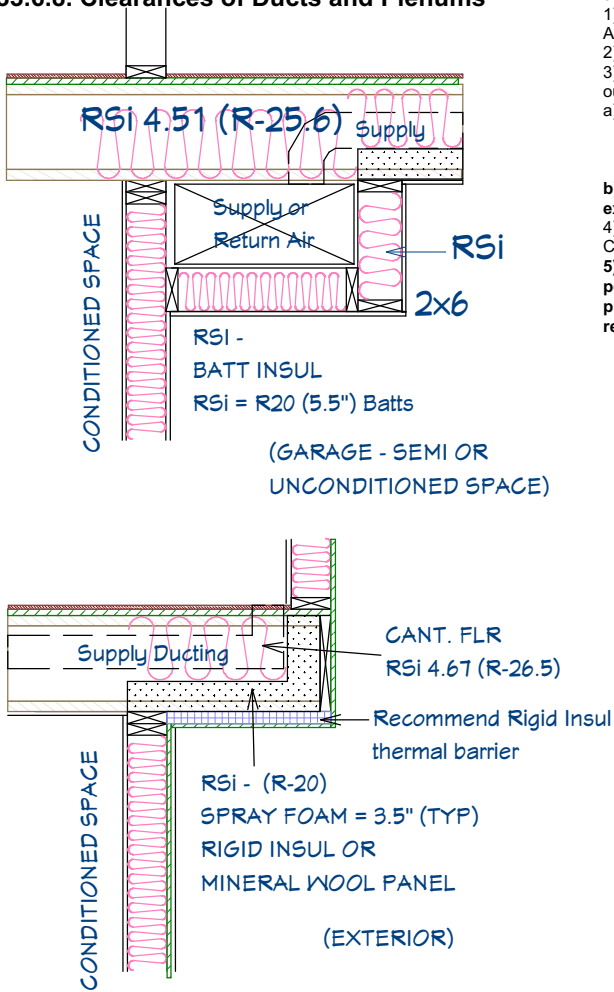


**NOTE:**  
**9.33.6.8. Clearances of Ducts and Plenums**



**9.36.3.2. Equipment and Ducts**

- 1) HVAC systems shall be sized in accordance with good practice as described in Sections 9.32. and 9.33. (See Note A-9.36.3.2.(1).)
- 2) Ducts shall be designed and installed in accordance with Sections 9.32. and 9.33. (See Note A-9.36.3.2.(2).)
- 3) Except for exhaust ducts leading directly to the exterior, ducts and plenums carrying conditioned air and located outside the plane of insulation shall
  - a) except as provided in Sentence (4), have all joints sealed against air infiltration and exfiltration with
    - i) sealants or gaskets made from liquids, mastics or heat-applied materials,
    - ii) mastic with embedded fabric, or
    - iii) foil-faced butyl tape, and
  - b) except as provided in Sentence (5), be insulated to the same level as required in Subsection 9.36.2. for exterior above-ground walls. RSi = 3.08
- 4) Fabric-backed tape with rubber adhesives shall not be used as a primary sealant to meet the requirements of Clause (3)(a).
- 5) The underside of rectangular ducts installed under an insulated floor over an unconditioned space is permitted to be insulated to a lower level than required in Sentence (3) but not to less than 2.11 (m<sup>2</sup>·K)/W, provided both sides of such ducts are insulated to a compensating higher thermal resistance so that the resulting heat loss does not exceed that of ducts complying with Sentence (3). (See Note A-9.36.3.2.(5).)

**A-9.36.3.2.(5) Increasing the Insulation on Sides of Ducts.** Table A-9.36.3.2.(5) can be used to determine the level of insulation needed on the sides of ducts that are 127 mm deep to compensate for a reduced level of insulation on their underside.

**Table A-9.36.3.2.(5)**  
RSI Required on Sides of Ducts where RSi on Underside is Reduced

RSI Required for Exterior Walls, <sup>(1)</sup> (m <sup>2</sup> ·K)/W	RSI <sup>(2)</sup> on Underside of 127 mm Deep Duct, (m <sup>2</sup> ·K)/W	Width of Duct, mm						
		304	356	406	457	483	508	533
2.78	2.11	4.47	4.98	5.61	6.43	6.94	n/a	n/a
	2.29	3.74	3.97	4.23	4.52	4.69	4.86	5.05
	2.64	2.97	3.00	3.03	3.07	3.09	3.10	3.12
2.96	2.11	5.70	6.75	8.25	n/a	n/a	n/a	n/a
	2.29	4.56	5.02	5.58	6.27	6.68	n/a	n/a
	2.64	3.46	3.57	3.67	3.78	3.84	3.90	3.97
3.08	2.29	5.26	5.96	6.88	n/a	n/a	n/a	n/a
	2.64	3.85	4.02	4.20	4.40	4.50	4.62	4.73
3.85	3.43	4.67	4.84	5.03	5.23	5.34	5.45	5.56

Notes to Table A-9.36.3.2.(5):

- (1) See Article 9.36.2.6.
- (2) See Note A-9.36.1.2.(3) for the formula to convert metric RSI values to imperial R values.

1 RSI = 5.678 R-value    RSI 2.29 = R13    RSI 2.64 = R15  
 127mm = 5 inches

**9.33.6.4. Coverings, Linings, Adhesives and Insulation**

- 6) Foamed plastic insulation conforming to Article 9.25.2.2. is permitted to be used to insulate a galvanized steel, stainless steel or aluminum air duct, provided
  - a) the foamed plastic insulation applied to supply ductwork is not less than 3 m from the furnace bonnet,
  - b) the temperature within the ductwork where the insulation is installed is not greater than 50°C,
  - c) duct joints are taped with a product conforming to Sentence 9.33.6.3.(1),
  - d) return air plenums are separated from the foamed plastic insulation, and e) the foamed plastic insulation is protected
    - i) by one of the interior finishes described in Subsections 9.29.4. to 9.29.9.,
    - ii) provided the building does not contain a Group C major occupancy, by sheet metal that is mechanically fastened to the supporting assembly independent of the insulation, is not less than 0.38 mm thick and has a melting point of 650°C or more, or
    - iii) by any thermal barrier that meets the requirements of Clause 3.1.5.15.(2)(e).
- 7) Foamed plastic insulation is permitted to be used in a ceiling space that acts as a return air plenum provided the foamed plastic insulation is protected from exposure to the plenum in accordance with Sentence 3.1.5.14.(4).

**Equipment and Ducts (9.36.3.2.)**

HVAC systems and ducts are required to be sized in accordance with "good practice," such as described in the Thermal Environmental Comfort Association (TECA) reference material, CSA 280, and Sections 9.32. and 9.33. In addition, 9.36. requires that:

- transverse and longitudinal joints in duct work must be sealed using an approved tape and sealant when outside the plane of insulation
- ducts must be insulated to the same level as required for walls if they are outside of the envelope and carrying conditioned air (Figure 6).

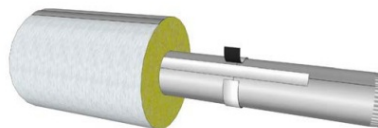


Figure 6:  
Sealing and Insulation Requirements for Ducts Outside Plane of Insulation

*Illustration from BC Housing Guide - Energy Efficiency - Zone 5*

Type	R-value Per Inch	Minimum Thickness	Minimum Thickness R-Value	Maximum Thickness	Maximum Thickness R-Value
Open-Cell	3.8	1.5"	5.7	3.5"	13.3
Closed-Cell	7	3.5"	24.5	5.5"	38.5

Rigid Insulation Material:	Insulation R-Value Per Inch:
High-Density EPS	R-4.2 Per Inch
Low-Density EPS	R-3.85 Per Inch
High-Density XPS	R-5.2 Per Inch
Low-Density XPS	R-4.15 Per Inch
ISO (Pentane Expanded, New Polyiso)	R-6.8 Per Inch
ISO (Pentane Expanded, 5-10 Years Old Polyiso)	R-5.5 Per Inch

**PLEASE NOTE - These drawings examples have been created for the specific topic noted and should not be considered as a completed detail meeting all BCBC requirements.**

<b>PURPOSE:</b> INSULATION DETAILS FOR DUCTS LOCATED IN NON OR SEMI CONDITIONED SPACES	<b>APP/REV</b>	<b>PAGE</b>
<b>CODE REFERENCE (S):</b> 9.36.3.2 (2018) BCBC	23-07-25	01