

## BC Building Code 2012

### Proposed revision to accompany Section 9.36 Energy package

Blue text is new content.

## Section 9.32. Ventilation

### 9.32.1. General

#### 9.32.1.1. Application

1) This Section applies to the ventilation of rooms and spaces in *residential occupancies* by natural ventilation and to self-contained mechanical ventilation systems serving only one *dwelling unit*.

2) Mechanical ventilation systems other than self-contained systems serving single *dwelling units* shall conform to Part 6.

3) A *storage garage* for more than 5 motor vehicles shall be ventilated in accordance with Part 6.

#### 9.32.1.2. Required Ventilation Provisions

1) Every *dwelling unit* shall incorporate

a) provisions for non-heating-season ventilation in accordance with Subsection 9.32.2., and

b) if supplied with electrical power, provisions for heating season ventilation in accordance with Subsection 9.32.3.

### 9.32.2. Non-Heating-Season Ventilation

#### 9.32.2.1. Required Ventilation

1) Rooms or spaces in *dwelling units* shall be ventilated during the non-heating season by

a) natural ventilation in accordance with Article 9.32.2.2., or

b) a mechanical ventilation system conforming to

i) Part 6, or

ii) [Subsection 9.32.3.](#)

2) Where a habitable room or space is not provided with natural ventilation as described in Sentence (1), mechanical ventilation shall be provided to exhaust inside air from or to introduce outside air to that room or space at the rate of

a) one-half air change per hour if the room or space is mechanically cooled during the non-heating season, or

b) one air change per hour if it is not mechanically cooled during the non-heating season.

#### 9.32.2.2. Natural Ventilation

1) The unobstructed openable ventilation area to the outdoors for rooms and spaces in *residential buildings* ventilated by natural means shall conform to Table 9.32.2.2.

**Table 9.32.2.2.**  
**Natural Ventilation Area**  
Forming Part of Sentence 9.32.2.2.(1)

Location		Minimum Unobstructed Area
Within <i>dwelling</i>	Bathrooms or water closet rooms	0.09 m <sup>2</sup>

<i>unit</i>	Unfinished bathroom space	0.2% of the floor area
	Dining rooms, living rooms, bedrooms, kitchens, combined rooms, dens, recreation rooms and all other finished rooms	0.28 m <sup>2</sup> per room or combination room
Other than within <i>dwelling unit</i>	Bathrooms or water closet rooms	0.09 m <sup>2</sup> per water-closet
	Sleeping rooms	0.14 m <sup>2</sup> per occupant
	Laundry rooms, kitchens, recreation rooms	4% of the floor area
	Corridors, storage rooms and other similar public rooms or spaces	2% of the floor area
	Unfinished basement space not used on a shared basis	0.2% of the floor area

2) Where a vestibule opens directly off a living or dining room within a *dwelling unit*, ventilation to the outdoors for such rooms may be through the vestibule.

3) Openings for natural ventilation other than windows shall be constructed to provide protection from the weather and insects.

4) Screening shall be of corrosion-resistant material.

### 9.32.3. Heating Season (Mechanical) Ventilation

(See Appendix A.)

#### 9.32.3.1. Required Ventilation

1) Every *dwelling unit* that is supplied with electrical power shall be provided with a mechanical ventilation system complying with

- a) this Subsection, or
- b) CAN/CSA-F326, "Residential Mechanical Ventilation Systems."

*(order reversed, Part 6 deleted)*

#### 9.32.3.2. Design and Installation

1) Aspects of mechanical ventilation systems not specifically described in this Subsection shall be designed, constructed and installed in accordance with good practice such as described in the ASHRAE Handbooks and Standards, TECA Ventilation Guideline, Hydronics Institute Manuals and the SMACNA manuals. *(HRAI Digests deleted)*

#### 9.32.3.3. Required Ventilation Capacity

1) Every *dwelling unit* shall be equipped with

- a) a principal ventilation system [conforming to Article 9.32.3.14.](#) providing a minimum ventilation rate complying with Table 9.32.3.3.A, and
- b) an exhaust fan with a ventilation rate complying with Table 9.32.3.3.B in
  - i) every kitchen, and
  - ii) [every bathroom or water-closet room, unless the bathroom or water-closet room is served by a principle ventilation exhaust fan or ducted central ventilation system providing a minimum ventilation rate complying with Table 9.32.3.3.B.](#)

*(order reversed, Part 6 deleted)*

2) Where make-up air is required by Article 9.32.3.8. for the principal ventilation exhaust fan, the maximum ventilation rate shall not exceed 55 l/s.

**Table 9.32.3.3.A**  
**Principal Exhaust Fan Ventilation Rate (l/s)**  
 Forming Part of Clause 9.32.3.3.(1)(a)

Floor Area, m <sup>2</sup>	Number of Bedrooms <sup>(1)</sup>				
	0-1	2-3	4-5	6-7	>7
<140	14	21	28	35	42
140-280	21	28	35	42	49
281-420	28	35	42	49	56
421-560	35	42	49	56	64
561-700	42	49	56	64	71
>700	49	56	64	71	78

<sup>(1)</sup> A bedroom is considered as a room with a window conforming to Article 9.9.10.1. and an interior closing door.

**Table 9.32.3.3.B**  
**Bathroom/Kitchen Exhaust Ventilation Rate**  
 Forming Part of Clause 9.32.3.3.(1)(b)

Room	Exhaust Rate l/s	
	Intermittent	Continuous
Kitchen	47	N/A
Bathroom	23	9

**9.32.3.4. Principal Exhaust Fan Control**

1) The principal ventilation fan shall be designed to run continuously and be provided only with service disconnect. *(timer option deleted)*

**9.32.3.5. Principal Ventilation Exhaust Fan Capacity Rating**

1) The principal ventilation exhaust fan capacity rating shall be based on air flow performance at 50 pa external static pressure as determined in accordance with

- a) HVI 916 "Airflow Test Standard," or
- b) CAN/CSA-C260-M, "Rating the Performance of Residential Mechanical Ventilating Equipment."

**9.32.3.6. Principal Ventilation Exhaust Fan Sound Rating**

1) Wall and ceiling fans used as a principal ventilation exhaust fan shall not have a sound rating exceeding 1.0 Sone at 2.5 mm water column. *(1.5 Sone when controlled by timer deleted)*

- 2) The principal ventilation exhaust fan sound rating shall be determined in accordance with
  - a) HVI 915, "Procedure for Loudness Rating of Residential Fan Products," or

b) CAN/CSA-C260-M, "Rating the Performance of Residential Mechanical Ventilating Equipment."

**9.32.3.7. Kitchen/Bathroom Ventilation Exhaust Fan Capacity Ratings**

- 1) Kitchen and bathroom ventilation exhaust fan capacity rating shall be based on air flow performance at 50 pa external static pressure as determined in accordance with
  - a) HVI 916 "Airflow Test Standard," or
  - b) CAN/CSA-C260-M, "Rating the Performance of Residential Mechanical Ventilating Equipment."

**9.32.3.8. Required Make-up Air for Principal Ventilation Exhaust Fan**

- 1) Make-up ventilation air shall be provided from the outdoors to all dwelling units actively or passively and distributed in conformance with Article 9.32.3.14.  
(Point 2 deleted)

**9.32.3.9. Exhaust and Make-up Air Ducts**

- 1) Exhaust ducts serving wall or ceiling exhaust fans shall be sized in accordance with Table 9.32.3.9.
- 2) Exhaust ducts shall discharge directly to the outdoors.
- 3) Where an exhaust duct passes through or is located adjacent to an unheated space, the duct shall be insulated to not less than RSI 0.75. and conform to Article 9.36.3.2.
- 4) Where a ventilation air supply duct passes through a heated space the duct shall be insulated to not less than RSI 0.75 and provided with an effective vapour barrier.
- 5) Where an exhaust duct exceeds 30 m in total equivalent length, using an equivalent length of 10 m for the exterior hood and 3 m for each 90 degree elbow, the duct shall be increased to the next diameter.
- 6) Ductwork for cooktop overhead exhaust hoods and down-draft exhaust fans shall
  - a) be of noncombustible, corrosion-resistant and cleanable material,
  - b) lead directly to the outdoors with no connections to other exhaust fans or ducts, and
  - c) be equipped with a grease filter at the intake end.
- 7) Where exhaust ducts are installed in an exterior insulated wall, they shall maintain the continuity of insulation as described in 9.36.2.5.

**Table 9.32.3.9.**

**Maximum Equivalent Duct Length, m**  
Forming part of Sentence 9.42.3.9.(1)

**Smooth Duct**

Diameter, mm	Fan capacity, l/s					
	25	40	50	60	70	80
100	32	15	-	-	-	-
125	46	40	28	18	13	-
150	46	46	46	42	34	24
175	46	46	46	46	46	46

### Flexible Duct

Diameter, mm	Fan Capacity, l/s					
	25	40	50	60	70	80
125	32	15	-	-	-	-
150	46	40	28	18	13	-
175	46	46	46	46	46	24
200	46	46	46	46	46	46

#### 9.32.3.10. Protection from Weather

1) Outdoor air intakes and exhaust outlets shall be shielded from the weather, birds and rodents with hoods incorporating a screen of corrosion-resistant material with openings of 6 mm to 12 mm.

#### 9.32.3.11. Exhaust Fan Installation

1) Installation of exhaust fans shall be in accordance with manufacturer's instructions for minimizing noise and vibration transmission and achieving the required sound rating.

#### 9.32.3.12. Accessibility

1) Ventilation equipment shall be accessible for inspection, maintenance, repair and cleaning.

2) Except where the kitchen exhaust grille is located at least 1.2 m horizontally from the [cooktop](#), or [equipped with an intake filter](#), kitchen exhaust ducts shall be designed and installed so the entire duct can be cleaned .

#### 9.32.3.13. Ventilation Ducts

1) Except as required by Sentence 9.32.3.9.(6), ventilation air ducts serving general exhaust and supply ventilation air are permitted to be of combustible material.

#### 9.32.3.14. Interior Distribution

1) Ventilation air must be distributed to each bedroom and living level without a bedroom in accordance with Sentences (2), (3), (4), (5) or (6).

2) A principle exhaust fan sized in accordance with Article 9.32.3.3. may be employed in combination with outdoor ventilation air introduced passively through inlets with a clear open area not less than 100 mm<sup>2</sup> located at least 1 800 mm above the floor in each bedroom and one common area where the *dwelling unit*

a) is located where the winter design temperature is greater than -10°C,

b) has only 1 *storey* including *storeys* below grade,

c) has an occupied area less than 168 m<sup>2</sup>, and

d) the heating system is not forced-air.

(See Appendix A)

3) Outdoor ventilation air may be supplied by a central forced-air heating system where

- a) the outdoor ventilation air supply duct is connected not more than 4.5 m and, unless a flow control device is used, not less than 3 m upstream of the return-air connection to the furnace cabinet,
- b) the outdoor ventilation air supply duct is
  - i) 100 mm in diameter if smooth duct, or
  - ii) 125 mm diameter for flexible duct, and
- c) the furnace air circulating fan is set to run continuously.

(See Appendix A)

**4)** A heat recovery ventilator may be used in combination with the ventilation system described in Sentence (3) where

- a) the heat recovery ventilator supply air is connected to the furnace return air plenum, and
- b) the heat recovery ventilator exhaust air is ducted from one or more inlets sized to the full capacity of the heat recovery ventilator and located not less than 2 m above the floor of the uppermost floor level independent of the return air system used for the forced air furnace, or
- c) the heat recovery ventilator supply air may be ducted independently to
  - i) each bedroom,
  - ii) each floor level without a bedroom, and
  - iii) each heated crawlspace.

(See Appendix A)

**5)** Where there is a principal exhaust fan conforming to Clause 9.32.3.3.(1)(a) outdoor ventilation air may be supplied by a ducted central re-circulation ventilation system that

- a) has the outdoor air intake connected upstream of the fan, and
- b) draws air from each bedroom and delivers it to a common area, or
- c) draws air from a common area and delivers it to each bedroom.

(See Appendix A)

**6)** When outdoor ventilation air is delivered to a dwelling unit from a central ventilation system within a multi-suite residential building, it shall

- a) be ducted to each bedroom and each floor level without a bedroom ,
- b) conform to 9.10.9.6., where the ducting penetrates a fire separation, and
- c) conform to 9.10.9.7. for combustible ducting.

(See Appendix A)

**7)** Supply and exhaust air duct sizes not specified by the equipment manufacturer shall be sized not less than the minimums in Table 9.32.3.9

**8)** Systems or ducts designed to provide combustion and/or dilution air for fuel burning appliances shall not be used to supply make-up air for ventilation systems.

**9)** To facilitate ventilation air transfer, interior doors shall be undercut a minimum of 12 mm above finished floor or the rooms shall be provided with a transfer grille of no less than 100 cm<sup>2</sup>.

**10)** The requirements for ventilation of a heated crawlspace shall be deemed to be met when

- a) the crawlspace is heated by the dwelling unit's forced-air heating, or
- b) the crawlspace is heated by other means and
  - i) a supply air or exhaust duct is provided from the central ventilation system, or
  - ii) not less than 2 transfer grilles are installed connecting each crawlspace compartment to the ventilated living space above with each transfer grille having a clear opening area of 25 mm<sup>2</sup> for every 30 m<sup>2</sup> of crawlspace compartment area.

(See Appendix A)

## **9.32.4. Additional Protection Against Depressurization**

### **9.32.4.1. Protection Requirements**

- 1) Additional make-up air for the actual appliance exhaust rate shall be provided for any appliance that discharges air to the exterior at an installed rate exceeding 0.5 air change per hour when it is located within a *dwelling unit* that
- a) contains a vented appliance that is subject to back drafting (Naturally Aspirating Fuel Fired Vented Appliance) (See A-9.32.3.8.(1)(a) in Appendix A), or
  - b) is located in an area where soil gas is deemed to be a problem and incorporates no soil gas mitigation system.
- 2) Where additional make-up air is required for appliances described in Sentence (1), it shall be provided by
- a) supply ducts sized in conformance with Table 9.32.3.8. for requirements of 60 l/s or less, or
  - b) a supply fan rated to deliver outdoor air at the rate of the installed exhaust appliance.
- 3) The supply fan as required in Clause (2)(b) shall be interconnected with the exhaust fan for which make-up air is required.
- 4) The outdoor air required by Sentence (3) shall be
- a) tempered to at least 1°C before being introduced to a normally unoccupied area of the *dwelling unit*, or
  - b) tempered to at least 12°C before being introduced to occupied areas either by passive transfer grille or directly from outside.

**9.32.4.2. Carbon Monoxide Alarms - No Changes**  
(See Appendix A.)