

(a) CAN/CSA-B214, “Installation Code for Hydronic Heating Systems”, or

(b) good engineering practice appropriate to the circumstances such as described in Article 6.2.1.1.

6.2.1.5. Fireplaces

(1) Fireplaces shall conform to the requirements of Section 9.22.

6.2.1.6. Heat Recovery Ventilators

(1) Except as provided in Sentence (2), heat recovery ventilators with rated capacities of not less than 25 L/s and not more than 200 L/s shall be installed in accordance with Article 9.32.3.11.

(2) Where *electric space heating*, other than forced-air electric heating system, is provided in *buildings of residential occupancy* within the scope of Part 9, the mechanical ventilation system shall include heat recovery ventilators designed to provide the greater of,

(a) the minimum rated efficiency required by the *Green Energy Act, 2009*, or

(b) a minimum 55% sensible heat recovery efficiency when tested to the low temperature thermal and ventilation performance test method set out in CAN/CSA-C439, “Rating the Performance of Heat/Energy-Recovery Ventilators”, at a Station 1 test temperature of -25°C at an air flow not less than 30 L/s.

6.2.1.7. Outside Design Conditions

(1) The outside conditions to be used in designing heating, ventilating and *air-conditioning* systems shall be determined in conformance with MMAH Supplementary Standard SB-1, “Climatic and Seismic Data”.

6.2.1.8. Installation – General

(1) Equipment requiring periodic maintenance and forming part of a heating, ventilating or *air-conditioning* system shall be installed with provision for access for inspection, maintenance, repair and cleaning.

(2) Mechanical equipment shall be provided with guards to prevent injury.

(3) Heating, ventilating or *air-conditioning* systems shall be protected from freezing if they may be adversely affected by freezing temperatures.

6.2.1.9. Expansion, Contraction and System Pressure

(1) Heating and cooling systems shall be designed to allow for expansion and contraction of the heat transfer fluid and to maintain the system pressure within the rated working pressure limits of all components of the system.

6.2.1.10. Asbestos

(1) Asbestos shall not be used in air distribution systems or equipment in a form or in a location where asbestos fibres could enter the air supply or return systems.

6.2.1.11. Access Openings

(1) Any covering of an access opening through which a person could enter shall be openable from the inside without the use of keys where there is a possibility of the opening being accidentally closed while the system or equipment is being serviced.

6.2.1.12. Combustible Tubing

(1) *Combustible* tubing for pneumatic controls may be used in *buildings* required to be of *noncombustible construction* provided it has an outside diameter not exceeding 10 mm.

6.2.2. Ventilation

6.2.2.1. Required Ventilation

(1) Except as provided in Sentence (3), all *buildings* shall be ventilated in accordance with this Part.

(2) Except in *storage garages* and *repair garages* covered by Article 6.2.2.3., the rates at which outdoor air is supplied in *buildings* by ventilation systems shall be not less than the rates required by ANSI/ASHRAE 62.1, “Ventilation for Acceptable Indoor Air Quality”.

(3) Self-contained mechanical ventilation systems that serve only one *dwelling unit* and that conform to the requirements of Subsection 9.32.3. shall be considered to satisfy the requirements of this Article.

(4) *Live/work units* shall be mechanically ventilated in accordance with the requirements of Sentence (1).

6.2.2.2. Natural Ventilation

(1) Except as permitted by Sentence (2), the ventilation required by Article 6.2.2.1. shall be provided by mechanical ventilation except that it can be provided by natural ventilation or a combination of natural and mechanical ventilation in,

(a) *buildings* of other than *residential occupancy* having an *occupant load* of not more than one person per 40 m² during normal use,

(b) *buildings* of *industrial occupancy* where the nature of the process contained in them permits or requires the use of large openings in the *building* envelope even during the winter, or

(c) seasonal *buildings* not intended to be occupied during the winter.

(2) Where climatic conditions permit, *buildings* containing *occupancies* other than *residential occupancies*, may be ventilated by natural ventilation methods in lieu of mechanical ventilation where engineering data demonstrates that such a method will provide the required ventilation for the type of *occupancy*.

6.2.2.3. Ventilation of Storage and Repair Garages

(1) Except as provided in Sentences (4) and (6), an enclosed *storage garage* shall have a mechanical ventilation system designed to,

- (a) limit the concentration of carbon monoxide to not more than 100 parts per million of air when measured between 900 mm and 1 800 mm from the floor, where the majority of the vehicles stored are powered by gasoline fuelled engines,
- (b) limit the concentration of nitrogen dioxide to not more than 3 parts per million parts of air when installed in accordance with manufacturer's instructions, where the majority of the vehicles stored are powered by diesel fuelled engines, or
- (c) provide, during operating hours, a continuous supply of outdoor air at a rate of not less than 3.9 L/s for each square metre of floor area.
- (2) Mechanical ventilation systems provided in accordance with Clause (1)(a) shall be controlled automatically by carbon monoxide monitoring devices and systems provided in accordance with Clause (1)(b) shall be controlled automatically by nitrogen dioxide or other acceptable monitoring devices, located so as to provide full protection throughout the *storage garage*.
- (3) Mechanical ventilation systems provided in accordance with Sentence (1) shall be designed such that the pressure in the *storage garage* is less than the pressure in adjoining *buildings* of other *occupancy*, or in adjacent portions of the same *building* having a different *occupancy*.
- (4) In *storage garages* subject to the requirements of Sentence (1), where motor vehicles are parked by mechanical means, the ventilation requirements may be reduced by one half.
- (5) Except as provided in Sentence (6), ticket and attendant booths of *storage garages* shall be pressurized with a supply of outdoor air.
- (6) The requirements of Sentences (1) to (5) shall not apply to *open-air storeys* in a *storage garage*.
- (7) A *repair garage* shall have a mechanical ventilation system designed to limit the exposure of workers to,
- (a) carbon monoxide to below the time weighted average concentration of 25 parts per million for a normal 8 hour workday or 40 hour work week, and
- (b) nitrogen dioxide from diesel powered vehicles to below 0.72 parts per million for a normal 8 hour workday or 40 hour work week.
- (8) In a *repair garage*, when a repair bay is not immediately adjacent to an outside garage door opening, a system capable of providing continuous general ventilation of not less than 700 L/s per internal bay shall be provided.
- (9) The general ventilation system described in Sentence (8) shall be designed to,
- (a) operate continuously, or
- (b) be controlled automatically by carbon monoxide monitoring devices, located so as to provide full protection throughout the *repair garage*.
- (10) The general ventilation system described in Sentence (8) is not required when tail pipes of vehicles are directly connected to local mechanical exhaust systems that terminate outdoors.

6.2.2.4. Air Contaminants

- (1) Air contaminants released within *buildings* shall be removed insofar as possible at their points of origin and shall not be permitted to accumulate in concentrations greater than permitted in the ACGIH, "Industrial Ventilation Manual".
- (2) Systems serving spaces that contain sources of contamination and systems serving other occupied parts of the *building* but located in or running through spaces that contain sources of contamination shall be designed in such a manner as to prevent spreading of such contamination to other occupied parts of the *building*.
- (3) Heating, ventilating and *air-conditioning* systems shall be designed to minimize growth of micro-organisms according to good engineering practice as described in 6.2.1.1.(1).
- (4) Mechanical rooms containing refrigeration equipment shall be ventilated in accordance with CSA-B52, "Mechanical Refrigeration Code".

6.2.2.5. Hazardous Gases, Dusts or Liquids

- (1) Systems serving spaces that contain hazardous gases, dusts or liquids shall be designed, constructed and installed in conformance with the provisions of the Fire Code made under the *Fire Protection and Prevention Act, 1997*, or in the absence of requirements pertinent to such systems in the Fire Code, to good engineering practice such as is described in the publications of the National Fire Protection Association and in the CCBFC NRCC 53303, "National Fire Code of Canada".
- (2) When indoor piping for Class I *flammable liquids* is installed in a trench, the trench shall be,
- (a) provided with positive ventilation to the outdoors, or
- (b) designed to prevent the accumulation of flammable vapours.

6.2.2.6. Commercial Cooking Equipment

- (1) All commercial cooking equipment shall be provided with ventilation systems designed, constructed and installed to conform to NFPA 96, "Ventilation Control and Fire Protection of Commercial Cooking Operations", except as required by Sentence 3.6.3.1.(1) and Article 3.6.4.2.
- (2) Fire protection systems for high efficiency, high temperature commercial cooking equipment using vegetable oil or animal fat shall conform to,
- (a) UL 300, "Fire Extinguishing Systems for Protection of Restaurant Cooking Areas", or
- (b) ULC/ORD-C1254.6, "Fire Testing of Restaurant Cooking Area Fire Extinguishing System Units".

6.2.2.7. Crawl Spaces and Attic or Roof Spaces

- (1) Every crawl space and every *attic or roof space* shall be ventilated by natural or mechanical means.