Carbon Monoxide Alarm Questions And Answers

Please be advised that the Chief Fire Official has the authority to enforce the Fire Code within his or her jurisdiction and should be contacted prior to implementing any opinion expressed in the following information.

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Carbon Monoxide (CO) Properties

1. **How is CO generated in the home?**

CO is a by-product of incomplete combustion of fuel such as natural gas, propane, heating oil, kerosene, coal, charcoal, gasoline, wood, or other bio-fuels. This incomplete combustion can occur in any device that depends on burning a fuel for energy or heat.

Examples of fuel burning devices:

Home furnace
Space heater
Decorative fireplace
Wood stove
Kitchen stove or grill
Gas/charcoal barbeque
Hot water heater
Automobile
Lawnmower

Automobiles left running in an attached garage, a portable generator operating near an open window or in the garage, an outdoor gas barbecue operated inside the house, a grill or kerosene heater that is not properly vented, or a fireplace chimney that is dirty or plugged may create unsafe levels of CO.

When these devices are properly installed, maintained and vented, the CO produced can be prevented from reaching unsafe levels in the home.

2. **What are the symptoms of CO poisoning?**

Exposure to CO can cause flu-like symptoms such as headaches, nausea, dizziness, burning eyes, confusion, drowsiness and even loss of consciousness, without the elevated temperature associated with the flu. In severe cases, CO poisoning can cause brain damage and death. The elderly, children and people with heart or respiratory conditions may be particularly sensitive to CO.

It can poison the body quickly in high concentrations, or slowly over long periods of time.

3. **How do CO alarms work?**

CO alarms monitor airborne concentration levels (parts per million) of CO over time, and sound an alarm when harmful levels are present. They are designed to sense low CO concentrations over a long period of time as well as high concentrations over a short period of time.

4. **How expensive are CO alarms?**

CO alarms range in price from approximately $26 to over $100 depending on whether they are hard-wired, battery operated or plug-in and whether they have additional features (i.e. battery back-up, digital display, etc.). The average mid-range plug-in/battery back-up model is between $35 and $40 per unit.

5. **Why are CO alarms required to be installed adjacent to sleeping areas in the home?**

Proper placement of a CO alarm is important. The CO alarm must be located adjacent to all sleeping areas of the home to increase the likelihood that sleeping occupants will hear the alarm if it goes off.

6. **At what height should CO alarms be installed?**

Unlike smoke, which rises to the ceiling, CO mixes with air. Hence CO alarms may be installed at any height. However, if a combination smoke/CO alarm is used, it must be installed on or near the ceiling as per manufacturer's instructions, to ensure that it can detect smoke effectively.

7. **Do CO alarms sound different from smoke alarms?**

Yes. CO alarms sound different from smoke alarms when they activate. By introducing a new emergency device into the home, it is important that everyone in the household knows the difference between an alarming smoke alarm and an alarming CO alarm.

As well, everyone needs to know the difference between an actual alarm sound versus the low battery or end of life warnings for both their smoke and CO alarms.

Owners should consult their instruction manual to obtain further information on the characteristics of the audible signals for each device.

8. **How does a CO alarm signal differ from a smoke alarm signal when it alarms?**

According to the CO alarm standard, CSA 6.19-01, a CO alarm signal consists of 4 very quick beeps followed by a 5 s pause and the pattern is repeated. This contrasts with a smoke alarm's signal as defined by the smoke alarm standard ULC S531, which consists of 3 beeps followed by a 1.5 s pause and then this pattern is repeated.

9. **If your CO alarm sounds, and you or other occupants suffer from symptoms of CO poisoning, what should you do?**

Immediately have everyone in the home move outdoors and then call 911 or your local emergency services number from outside the building.

10. **If your CO alarm sounds, and no one is suffering from symptoms of CO poisoning, what should you do?**

Check to see if the battery needs replacing, or the alarm has reached its "end of life" before calling 911.

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General Ontario Fire Code (OFC) and Ontario Building Code (OBC)

11. **Why is the Ontario Fire Code (OFC) being amended?**

OFC changes relating to CO alarms are part of the implementation of the Hawkins Gignac Act, 2013, which received Royal Assent in December 2013. This Act amended the Fire Protection and Prevention Act, 1997 (FPPA) to allow the regulation of CO alarms through amendments to the OFC. The Act also proclaims the week beginning November 1 as Carbon Monoxide Awareness Week.

12. **What is the relationship between the OFC and OBC (Ontario Building Code) with respect to CO alarm requirements?**

The OBC and OFC are companion regulations adopted by Ontario as uniform minimum mandatory standards for building construction and fire/life safety. New construction, renovations and building change of use are regulated by the OBC. Existing buildings are regulated by the OFC, to maintain OBC provisions and/or for retrofit requirements. The CO alarm requirements in the OFC were developed to not exceed existing OBC requirements.

13. **Do all newly constructed residential buildings require the installation of a CO alarm?**

Yes. Under the OBC, CO alarms have been mandatory in new residential buildings containing a fuel-burning appliance (e.g. a gas furnace/stove) or a storage garage (for motor vehicles) since 2001. Until these OFC amendments, there were no provincial requirements for CO alarms in properties built before 2001. However, many municipalities have required these devices through municipal by-laws.

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Compliance Schedule

14. **When did the CO alarm requirements come into force?**

The CO alarm requirements came into force on October 15, 2014. Buildings that contain no more than six suites of residential occupancy are required to comply with the installation and replacement requirements within 6 months of the in-force date (April 15, 2015, at the latest).

Buildings that contain more than six suites of residential occupancy are required to comply with the installation and replacement requirements within 12 months of the in-force date (October 15, 2015, at the latest).

The maintenance and testing requirements for existing CO alarms (e.g. those devices previously installed to comply with the OBC or a municipal by-law) take effect on the in-force date (October 15, 2014).

[Div. B, 2.16.1.1.(2), 6.3.4.7.(2)]

15. **Why are there 6 and 12 month phase-in periods for CO alarm installation and replacement?**

The two phase-in periods for the installation and replacement of CO alarms recognizes the impact of the requirement on different size buildings.

The 6 month phase-in period for smaller residential properties considers the incidental cost and time associated with owners purchasing and installing CO alarms.

The 12 month phase-in period provides building owners, property managers and landlords of larger residential properties additional time to plan for, procure and install CO alarms.

16. **Do the 6 and 12 month phase-in periods apply to CO alarm maintenance and testing?**

No. The maintenance and testing requirements take effect on October 15, 2014, the effective date of the CO alarm requirements.

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Application

17. **Do all existing residential buildings require CO alarms?**

Existing residential occupancies that contain at least one fuel-burning appliance (e.g., gas water heater or gas furnace), fireplace or an attached garage, require the installation of a CO alarm.

[Div. B, 2.16.1.1.(1)]

18. **Are CO alarms required in non-residential buildings (i.e. care, care and treatment facilities, daycare centres, etc.)?**

The OBC and the OFC currently require CO alarms in residential occupancies only. Other regulations, such as those under the Occupational Health and Safety Act, may require CO concentrations to not exceed specified levels so as to ensure a safe work place. In these circumstances, it is advisable to consult with the Ministry of Labour on specific requirements.

[Div. B, 2.16.1.1.(1)]

19. **What are examples of residential buildings to which the CO alarm requirements apply?**

The following are examples of residential buildings:

- Houses (detached, semi-detached, attached)
- Rental Apartments/Condominiums
- Residential Group Homes (adults, youth, children)
- Hostels/Domiciliary Hostels
- Social Housing
- Student Residences/Dormitories
- Retirement Homes (classified as residential occupancies)
- Camps for Housing Workers
- Boarding, Lodging, Rooming and Halfway Houses
- Convents/Monasteries
- Clubs (residential)
- Hotels/Motels
- Open and semi-secure detention for Youth
- Recreational Camps
- Residential Schools
- Shelters (homeless/women)

20. **Are the CO alarm installation requirements applicable to a house that has an electric fireplace only and no attached garage?**

No. Since there are no fuel-fired appliances in the house or an attached garage, a CO alarm is not required. However, homeowners are still encouraged to install a CO alarm adjacent all sleeping areas for enhanced safety to address unanticipated CO sources that may originate from outside the home.

[Div. B, 2.16.1.1.(1)]

21. **Is a carport considered a garage?**

No, a carport is not considered a garage. It is an open-sided shelter for vehicles that will allow any CO generated to safely dissipate.

22. **Are gas powered lawn tractors considered to be motor vehicles for the purposes of the definition of "storage garage"?**

Yes. Gas powered lawn tractors have an internal combustion engine that can generate high levels of CO if left running in an attached garage.

23. **Do the CO alarm requirements apply to a trailer or other similar transportable structures such as recreational vehicles (RVs), campers or motor homes?**

Possibly. The CO alarm requirements are applicable to 'buildings' that contain a residential occupancy and fuel-burning appliance, fireplace or storage garage.

A trailer or other similar transportable structure could be considered a 'building' provided it satisfies the definition provided in the Fire Code. Article 1.4.1.2. of Division A defines 'building' as "any structure used or intended for supporting or sheltering any use or occupancy". In assessing whether a trailer or other similar transportable structure meets this 'building' definition, the following factors should be considered:

- degree of permanence
- signs of anchorage (e.g. masonry blocks)
- presence and condition of wheels
- presence and currency of license plates
- roadworthiness (i.e. is it capable of immediate transport) and
- treatment under other regulations (e.g. Park Model Trailers constructed in conformance with CAN/CSA Z241 are considered buildings for the purposes of the Building Code)

Hence, if a trailer or other similar transportable structure is used as a 'building' to house a residential occupancy and contains a fuel-burning appliance, the CO alarm requirements apply.

The CO alarm requirements in the Fire Code do not apply to trailers or other similar transportable structures that are used as vehicles. However, CAN/CSA-Z240 RV Series-08, which is the CSA standard applicable to RV's, requires the installation of a CO alarm that is approved for use in RV's and complies with CAN/CSA 6.19.

24. **Does the OFC require CO visual alarms for people who are deaf or hearing impaired?**

No. This maintains consistency with OBC requirements.

Although CO visual alarms are not mandatory, people who are deaf or hearing impaired are encouraged to install supplemental warning devices that can be connected to their CO alarm(s). Supplemental devices available on the market include strobe lights and motorized bed shakers.

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Responsibilities

25. **Who is responsible for installing CO alarms in rental dwelling units?**

The landlord of the building is responsible for the installation of the CO alarms.

[Div. B, 2.16.1.2.]

26. **Who is responsible for maintaining CO alarms in rental dwelling units?**

The landlord is responsible for the maintenance of CO alarms. The landlord is also responsible for providing the tenant with CO alarm maintenance instructions.

[Div. B, 6.3.4.2., 6.3.4.4.]

27. **Who is responsible for testing CO alarms in rental dwelling units?**

Landlords are responsible for testing CO alarms. Although homeowners are not required to test their alarms, it is recommended that they do this on a monthly basis for enhanced safety.

[Div. B, 6.3.4.8.]

28. **Who is responsible for installing CO alarms in boarding, lodging and rooming houses?**

The landlord is responsible for the installation of the CO alarms.

[Div. B, 2.16.1.2.]

29. **Who is responsible for maintaining CO alarms in boarding, lodging and rooming houses?**

The landlord is responsible for the maintenance of CO alarms. The landlord is also responsible for providing the tenant with CO alarm maintenance instructions.

30. **Who is responsible for the installation and maintenance of CO alarms in residential condominium suites?**

The owner of the condominium suite is responsible for the installation and maintenance of CO alarms in the suite. Often, there are agreements between the owner and the condominium corporation in which the corporation takes on this responsibility on behalf of the owner.

In a situation where the condominium owner rents out the suite to a tenant, the owner takes on the role of the landlord and is responsible for the installation and maintenance of the CO alarms. Again, there are often agreements between the owner/landlord and the condominium corporation, in which the corporation takes on this responsibility on behalf of the owner/landlord.

[Div. B, 2.16.1.2., 6.3.4.2]

31. **What responsibilities do tenants have under the CO alarm requirements?**

Tenants are responsible for notifying the landlord as soon as they become aware that a CO alarm in their unit is disconnected, not operating, or its operation is impaired. Also, tenants may not disable their CO alarms.

[Div. B, 6.3.4.5., 6.3.4.6]

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Installation

32. **When are CO alarms required to be installed within a house?**

If the house contains a fuel burning appliance, fireplace or an attached garage, a CO alarm is required to be installed adjacent to each sleeping area in the house.

For optimum protection, it is recommended that additional CO alarm(s) be installed in other levels and/or areas of the home that are in proximity to a CO source, subject to the distance limits provided in the product's instruction manual.

[Div. B, 2.16.2.1.]

33. **Are CO alarms required to be installed in the basement furnace room of a single family house?**

No. Furnace rooms within the same suite of residential occupancy are not required to have a CO alarm.

[Div. B, 2.16.2.1.(2)(b)]

34. **What does "adjacent to each sleeping area" mean in terms of installation location?**

In general, this phrase means the hallway serving or area outside the sleeping area. For instance, a CO alarm must be installed in the hallway adjacent to multiple bedrooms in a house or apartment.

However, there may be situations where "adjacent to each sleeping area" refers to the area around the bed, within the bedroom or sleeping area itself.

[Div. B, 2.16.2.1.]

35. **When are CO alarms required to be installed within an apartment building?**

If a fuel-burning appliance or a fireplace is installed in the apartment suite, a CO alarm is required to be installed adjacent to each sleeping area within the suite.

If an apartment suite shares a common wall or floor/ceiling assembly with a garage, a CO alarm is required to be installed adjacent to each sleeping area within the suite.

If an apartment suite shares a common wall or floor/ceiling assembly with a service room containing a fuel-burning appliance, a CO alarm is required to be installed adjacent to each sleeping area within the suite.

If the apartment building's service room contains a fuel-burning appliance associated with building services, a CO alarm is required to be installed in the service room.

[Div. B, 2.16.2.1.]

36. **What is meant by a "fuel-burning appliance associated with building services" under Sentence 2.16.2.1.(2)?**

This phrase is intended to address fuel-burning appliances and equipment that service the building (i.e. furnaces, water heaters, boilers, etc). These are typically required to be located in a service room, but may also be located in open areas within smaller buildings as permitted under the OBC (i.e. OBC 9.10.10.4.(2)). This phrase is not intended to address non-building service related fuel-burning appliances (i.e. gas stoves, gas dryers, etc.)

[Div. B, 2.16.2.1.(2)]

37. **Do service rooms containing fuel-burning appliances associated with building services that are located on building rooftops require the installation of a CO alarm?**

Yes. Further, CO alarms are required to be installed in all residential suites located immediately below and beside the rooftop service room.

[Div. B, 2.16.2.1.(2)(b)]

38. **If an apartment suite has a fuel burning appliance, do neighbouring suites that share either a common wall or floor/ceiling assembly require a CO alarm?**

No. This maintains consistency with OBC requirements.

39. **Does an apartment suite that is located across the corridor from a service room containing a fuel-burning appliance associated with building services require a CO alarm?**

No. This maintains consistency with OBC requirements.

40. **If an apartment suite has no fuel burning appliance, but has concealed spaces that contain ducts servicing fuel fire appliances located outside of the suite, does the suite require a CO alarm?**

No. This maintains consistency with OBC requirements.

41. **What is the intent of the installation requirements in Clauses 2.16.2.1.(2)(c) and (3)(b)?**

These requirements are intended to address situations with sleeping rooms in boarding, lodging and rooming houses (BLR) that are located such that they do not share a common wall or common floor/ceiling assembly with either a service room/open area or garage. Essentially these two clauses require CO alarms to be installed adjacent to all BLR sleeping rooms located in a building that contains either a service room/open area with fuel-burning appliance or an attached garage.

[Div. B, 2.16.2.1.(2)(c), (3)(b)]

42. **Where within hotels/motels are CO alarms required to be installed?**

If a guest suite contains a fuel-burning appliance, a CO alarm is required to be installed within the guest suite. Also if a guest suite is located above/below/beside a garage or service room containing a fuel-fired appliance associated with building services, a CO alarm is required to be installed within the guest suite. The service room itself would also require a CO alarm.

[Div. B, 2.16.2.1.]

43. **Where within BLR's are CO alarms required to be installed?**

If the building contains a fuel-burning appliance associated with building services or an attached garage, CO alarms are required adjacent to all sleeping rooms. Service rooms/areas that contain a fuel-burning appliance associated with building services also require a CO alarm.

[Div. B, 2.16.2.1.]

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CO Alarm Standards

44. **What standards apply to CO alarms?**

There are two industry standards referenced under the OFC and OBC, namely CSA-6.19-01, “Residential Carbon Monoxide Alarming Devices” and UL 2034-2008, “Single and Multiple Station Carbon Monoxide Detectors”.

[Div. B, 2.16.2.1.(5)]

45. **Are CO alarms required to have a secondary power source (i.e. battery) in the event of a power failure?**

No. This maintains consistency with the OBC.

However, for optimum protection, it is recommended that consumers choosing to install hard wired or plug-in type CO alarms, purchase units that include a secondary power source.

[Div. B, 2.16.2.1.(5)]

46. **Can CO alarms that are designed to be placed (i.e. not permanently secured) on a surface permitted?**

Yes. Battery operated CO alarms that can be placed on a surface are acceptable as long as they are in compliance with CSA-6.19-01, “Residential Carbon Monoxide Alarming Devices” or UL 2034-2008, “Single and Multiple Station Carbon Monoxide Detectors”.

[Div. B, 2.16.2.1.(5)]

47. **Can combination smoke/CO alarms be installed?**

Yes. Combination smoke/CO alarms that are in compliance with the appropriate smoke alarm and CO alarm standards referenced in the OFC can be installed.

[Div. B, 2.16.2.1.(5)]

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Replacement

48. **How often are CO alarms required to be replaced?**

CO alarms are required to be replaced within the timeframe indicated in the manufacturer's instructions and/or on the label on the unit.

CO alarm sensors can deteriorate and lose sensitivity over time due to environmental conditions.

[Div. B, 6.3.4.7.(3)]

49. **What is the significance of the August 6, 2001 construction date referenced in the replacement requirements under OFC Division B, Sentences 6.3.4.7.(4) and (5)?**

August 6, 2001 is the date when current CO alarm installation requirements were introduced in the OBC for the construction of new residential buildings.

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Testing

50. **How often are CO alarms required to be tested?**

In a rental dwelling unit, the landlord must test CO alarms annually, after the battery is replaced and after every change in tenancy.

The landlord must also test CO alarms that are connected to an electrical circuit after any change is made to the electrical circuit.

[Div. B, 6.3.4.8]

51. **How is a CO alarm tested?**

A CO alarm is tested by activating the test feature as described in the manufacturer's maintenance instructions.

[Div. B, 6.3.4.8.(5)]

52. **Are landlord records of CO alarm testing required?**

Yes. As per the requirement of Sentence 1.1.2.1.(1) of Division B, records of tests are to be retained at the building premises for examination by the Chief Fire Official.

[Div. B, 6.3.4.2, 1.1.2.1.(1)]

53. **Are CO alarms that are installed in hotels, motels and similar short term accommodations for the travelling public required to be tested?**

Owners/operators of hotels, motels and similar short term accommodations are required to maintain their CO alarms and alarm power supplies in operating condition at all times.

Although there are no specific testing requirements, it is recommended that CO alarms installed in these properties be tested:

- annually
- after the battery is replaced or
- after any change is made to the electric circuit the alarm is connected to

It is not necessary to test the CO alarms every time a new guest arrives.

[Div. B, 6.3.4.3]

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Enforcement

54. **What is the impact of the CO alarm requirements on existing municipal CO alarm by-laws?**

Section 79 of the Fire Protection and Prevention Act, 1997, states that the OFC supersedes all municipal by-laws related to the presence of unsafe levels of CO.

CO alarms that were installed to meet a municipal by-law must be maintained in accordance with the OFC effective October 15, 2014.

55. **If I don't comply with the OFC, can I be charged?**

Yes. Once the compliance dates for CO alarms have passed, anyone found to be in contravention of these requirement can be charged and if convicted would be subject to penalties.

56. **Is there a Part I ticketable offence for CO alarm violations?**

Yes. The ministry has developed new short form wording to increase the number of ticketable offences under the Provincial Offences Act for a number of OFC violations, including those relating to CO alarms.

57. **What are the set fines and total payable for Part I OFC offences related to CO alarms?**

The set fines for Part I OFC offences have recently increased. Those relating to CO alarm offences are set at either $195 or $295 depending on the violation. The victim fine surcharge has also increased to $60 while court costs have remained the same at $5. Hence, total payable for CO alarm ticketable offences are now $260 or $360 depending on the violation.

58. **With the new set fines, does that mean individuals cannot be charged for CO alarm violations under Part III of the Provincial Offences Act?**

No. The new set fines do not preclude prosecution under Part III of the Provincial Offences Act for more serious CO alarm related offences under the OFC. The process for prosecuting the CO alarm violations would require the issuance of a Part III Information pursuant to the Provincial Offences Act. This process requires the defendant to be served with a summons.

59. **If convicted under Part III of the Provincial Offences Act, would the penalty be the same as a Part I offence?**

No. Conviction under Part III of the Provincial Offences Act for failure to comply with the OFC could result in a fine of up to $50,000 and/or imprisonment for up to one year for individuals or $100,000 for corporations.

60. **Can a fire department serve an Inspection Order under Subsection 21(1) of the FPPA to address a CO alarm related Fire Code violation in the building?**

Yes. Since the definition of "fire safety" under the FPPA has been revised to address "unsafe levels of carbon monoxide", CO alarm related OFC violations can be addressed through an Inspection Order.

61. **Can a fire department close a building under Subsection 21.(2)of the FPPA to address a CO related hazard?**

Yes. Since Section 18 of the FPPA has a revised meaning for "fire safety", applicable to Part VI Inspection requirements, that includes "unsafe levels of carbon monoxide", CO related risks can be addressed through an Order to Close.

62. **Can a fire department use the Immediate Threat to Life provisions under Section 15 of the FPPA to alleviate a CO alarm related hazard in the building?**

No. The wording in Section 15 of the FPPA specifically states that this Section addresses an immediate threat to life situation due to "risk of fire", which excludes CO related hazards .

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Other

63. **Do CO alarms need to be addressed in a fire safety plan?**

Although CO alarms do not specifically fall within the scope of Subsection 2.8.2., it would be a good practice to include in the fire safety plan their maintenance requirements and any special procedures to follow should the CO alarm sound.