



## Carbon Monoxide The Silent Killer You Can't Ignore

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Carbon monoxide, or CO (not to be confused with carbon dioxide, or CO<sub>2</sub>), is a colorless, odorless, tasteless gas that is a natural product of incomplete combustion. Because it can accumulate in a building without being noticed, it can kill occupants without their ever knowing they were in grave danger. For this reason, CO has earned the dubious appellation 'The Silent Killer'. U.S. fire departments responded to an average of 72,000 CO incidents per year between 2006 and 2010, with 94% of these incidents occurring in residential properties. According to the Centers for Disease Control, 676 people died in 2008 of unintentional non-fire exposure to gases in the U.S.; most of these deaths were due to CO. While only 4% of the incidents occurred in residential properties other than one- or two- family dwellings or apartment buildings, student housing facilities are not immune to the dangers of CO. In 1998, a South Carolina State University student died when CO from a water

heater leaked into his dorm room.

Several other colleges and universities have experienced CO scares in recent years. In February 2013, four students from the University at Buffalo, Amherst, NY were hospitalized, and a fifth was treated on-scene, when they were sickened by CO from a faulty boiler. Other higher learning institutions, including the Art Institute of Philadelphia and Harvard University, have had similar, recent scares. Off-campus housing also poses a CO risk. A fraternity house experienced a CO event in 2011 in which 42 University of Nebraska-Lincoln students were hospitalized, and in 2007, a CO leak in an off-campus apartment building resulted in the hospitalization of 23 Virginia Tech students.

Numerous potential sources for CO leaks exist in buildings. They include: gas, wood, coal, and oil heating equipment; gas and solid-fuel cooking equipment; wood-burning and gas fireplaces; portable generators and other

portable power equipment; and vehicles in attached garages or parking structures. Anything that involves combustion is a potential CO source where the combustion gases are not properly vented to the outside where they can safely dissipate. Since the presence of CO is undetectable by sight or smell, the only way to mitigate the risk of CO poisoning, other than eliminating all potential CO sources, is to install CO detection and warning equipment.

The National Fire Protection Association (NFPA) develops and maintains some 300 consensus codes and standards for protection against fire and similar hazards. Among them is NFPA 720, *Standard for the Installation of Carbon Monoxide (CO) Detection and Warning Equipment*. Work on NFPA 720 started in 1993 in response to the increased concern over CO hazards in residential properties; the first edition of NFPA 720 was published in 1998. While NFPA 720 specifies the detailed requirements for the installation of CO detection sys-



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tems and CO alarms, it does not mandate their installation in any occupancy. Such a mandate is typically found in a state or local building code or fire prevention code.

As a developer of model fire and safety codes and standards, NFPA recognized the need for mandatory CO detection and warning equipment installations in residential occupancies with the publication of the 2012 editions of NFPA 1, *Fire Code*, NFPA 101, *Life Safety Code*, and NFPA 5000, *Building Construction and Safety Code*. Although NFPA 1 and NFPA 101 apply to both new and existing buildings (the scope of NFPA 5000 is limited to new construction and existing building rehabilitation), these codes require the installation of CO detection and warning equipment only in new one- and two-family dwellings, new lodging or rooming houses (e.g., student housing such as a fraternity or sorority house with sleeping accommodations for not more than 16 persons), new hotels and dormitories, and new apartment buildings, and only where those occupancies contain potential CO sources. It is important to note that these codes specify *minimum* requirements for

safety from fire and other hazards. Because the codes strive to provide a *minimum* level of safety while not overly burdening building owners, they do not currently require existing residential buildings to be retrofitted with CO detection and warning equipment. It is anticipated that the upcoming 2015 editions will contain similar requirements.

In those jurisdictions where the installation of CO detection and warning equipment in existing buildings is not mandated by state or local law, it is up to the owners and operators of student housing facilities to evaluate the risk of CO poisoning to their students and their potential liability in the event of a CO incident, which could easily end in tragedy. Those responsible for existing student housing - buildings that might contain hundreds of young people - might consider the risk too great, and conclude that meeting the *minimum* requirements is insufficient. The expense incurred to install CO detection and warning equipment in existing student housing would be well justified if even one accidental death is prevented. The tools to protect the nation's student population from acci-

dental CO poisoning are available. It's up to those responsible for providing that population with safe places to live to implement those tools.

NFPA 1, NFPA 101, and NFPA 5000 are available to review for free online at [www.nfpa.org/1](http://www.nfpa.org/1), [www.nfpa.org/101](http://www.nfpa.org/101), and [www.nfpa.org/5000](http://www.nfpa.org/5000), respectively.

For additional resources on carbon monoxide, please visit NFPA's website at [www.nfpa.org/CO](http://www.nfpa.org/CO).

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