Carbon Monoxide Detection:

A Summary of National Codes, Standards, and Legislation

Product standards

- UL 2034 *Standard for Single and Multiple Station Smoke Alarms describes product requirements for products* that are not designed or listed to be connected to a control unit. They are powered either from the building's AC electrical system or from an integral battery.
- UL 2075 *Standard for Gas and Vapor Detectors and Sensors* **describes requirements for products that** are designed and listed to be connected to an approved control panel via conductors or by a low-power RF communication signal.
- Devices must ignore carbon monoxide levels below 30 ppm to prevent nuisance alarms.
- An audible and visual signal is required before the level of carbon monoxide in the blood reaches 10%.

Installation/building codes

- NFPA 720 *Standard for the Installation of Carbon Monoxide Detection and Warning Equipment* contains installation requirements for alarms and detectors.
  - Current or previous version adopted (directly or by reference) into law in almost every state
  - Alarms and detectors required to be listed to the appropriate standards (above)
  - This standard is in the process of being folded into NFPA 72 *National Fire Alarm and Signaling Code for the 2019 edition*
- *International Residential Code* applies to one- and two-family dwellings and detached townhomes not more than three stories
  - Hardwired carbon monoxide detection required in new homes since 2009 that have a fuel-burning appliance or an attached garages
  - Carbon monoxide alarms or detectors shall be installed outside and in the immediate vicinity of each separate sleeping area
  - 49 states and DC have adopted an edition of the IRC since 2009 or later

Cont;

- *International Building Code and International Fire Code* apply to larger buildings such as apartment buildings, schools, hotels, and other non-residential buildings
  - 2015 edition requires hardwired carbon monoxide detection (alarms or detectors) in new buildings
  - Carbon monoxide alarms or detectors are required in dwelling units, sleeping units, and classrooms containing a fuel-burning appliance (FBA) or served by a fuel-burning HVAC system. If the FBA is located outside a dwelling unit, sleeping unit, or classroom, carbon monoxide detection is then required to be installed on the ceiling of a room containing an FBA or in an approved location between the room containing the FBA and the dwelling unit, sleeping unit, or classroom.
  - 11 states have adopted the 2015 edition statewide; 6 more states have local jurisdictions that have adopted the 2015 edition

Power requirements

- Both standards allow a device to receive its primary power from the building's electrical system or from a battery.
- Secondary power supply requirements are as follows:
  - For a detection system, NFPA 720 requires that devices have a secondary power supply capable of powering the alarm notification for 12 hours of alarm. The 12 hours of alarm is allowed to be reduced to 5 minutes when monitored by a remote monitoring station.
  - For an alarm (UL 2034) there is no current requirement for a secondary power supply (though one is recommended by various industry and life safety groups); if a secondary power supply is present, it must be capable of providing power for 8 hours in standby, followed by 12 hours of alarm. After the initial alarm, the signal may repeat once every 5 minutes during the 12 hours.

Legislative landscape

- 44 states and Washington, D.C., have laws (either by statute of code adoption) that require carbon monoxide detection in residential dwellings
- 16 states have laws that require carbon monoxide detection in hotels/motels
- 7 states have laws that require carbon monoxide detection in schools
- For an overview of requirement by state, please visit www.lifefiresafety.org

NEMA recommendations for state laws and regulatory requirements

- State laws should require that detection devices comply with the relevant codes and standards.
- States should not mandate specific product requirements beyond the applicable codes and standards.
- Installation standards do not require carbon monoxide detection in buildings that existed before the code is published; this is an opportunity for state laws to fill life safety gaps, particularly in schools and hotels/motels.
- No national consensus code requirements are in place for carbon monoxide detection in public assemblies (theaters, museums, restaurants, ice rinks); this is another opportunity for state legislation.