



**Boulder County
Land Use Department
Publications**

Smoke Alarms and Carbon Monoxide Alarms

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Building Permits can be applied for
and issued until 4 p.m.

Smoke Alarms and Carbon Monoxide Alarms

As per Sections R314 and R315 of the 2015 International Residential Code In the event of a fire, properly installed and maintained smoke alarms can provide an early warning alarm for your household. Household smoke detection and notification devices are required to be **listed** and **labeled** in accordance with UL217. Smoke and toxic heated gases produced by combustion are the major cause of death and injury associated with fires in dwellings.

Carbon monoxide, also known as CO, is called the "Invisible Killer" because it's a colorless, odorless, poisonous gas. More than 150 people in the United States die every year from accidental non-fire related CO poisoning associated with consumer products, including generators. Other products include faulty, improperly-used or incorrectly-vented fuel-burning appliances such as furnaces, stoves, water heaters and fireplaces. *Source: Consumer Product Safety Commission*

Smoke Alarms

Almost two-thirds of home fire deaths in 2005-2009 resulted from fires in homes with no smoke alarms or no working smoke alarms. When smoke alarms fail to operate, it is usually because batteries are missing, disconnected or dead. Almost one-quarter of the smoke alarm failures were due to dead batteries. *Source: U.S. Fire Administration.* Smoke can flow and spread through doors, windows and other openings, and through spaces above false ceilings.

Smoke Alarms requirements from the 2015 IRC Section R314:

- Location - Smoke alarms shall be installed in the following locations:
 1. In each sleeping room.
 2. Outside each sleeping area in the immediate vicinity of the bedrooms.
 3. On each additional story of the building including basements and habitable attics.
- Alterations, repairs and additions - When alterations, repairs or additions requiring a permit occur, or when one or more sleeping rooms are added or created in existing dwellings, the individual dwelling unit shall be equipped with smoke alarms located as required for new dwellings.

Exceptions:

1. Work involving the exterior surfaces of dwellings, such as the replacement of roofing or siding, or the addition or replacement of windows or doors, or the addition of a porch or deck, are exempt from the requirements of this section.
 2. Installation, alteration or repairs of plumbing or mechanical systems are exempt from the requirements of this section.
- Power source - Smoke alarms shall receive their primary power from the building wiring when such wiring is served from a commercial source, and when primary power is interrupted, shall receive power from a battery. Wiring shall be permanent and without a disconnecting switch other than those required for overcurrent protection.

Exceptions:

1. Smoke alarms shall be permitted to be battery operated when installed in buildings without commercial power.

2. Hard wiring of smoke alarms in existing areas shall not be required where the alterations or repairs do not result in the removal of interior wall or ceiling finishes exposing the structure, unless there is an attic, crawl space or basement available which could provide access for hard wiring without the removal of interior finishes.

- ☐ Interconnection - Where more than one smoke alarm is required to be installed within an individual dwelling unit in accordance with Section R314.3, the alarm devices shall be interconnected in such a manner that the actuation of one alarm will activate all of the alarms in the individual unit. Physical interconnection of smoke alarms shall not be required where listed wireless alarms are installed and all alarms sound upon activation of one alarm.

Exception:

Interconnection of smoke alarms in existing areas shall not be required where alterations or repairs do not result in removal of interior wall or ceiling finishes exposing the structure, unless there is an attic, crawl space or basement available which could provide access for interconnection without the removal of interior finishes.

Check the batteries in your smoke alarms every six months. Examine each device. If the device is more than 10 years old it should be replaced.

Listed wireless interconnected smoke alarms are allowed in both new and existing construction covered under the International Residential Code.

Larger homes with more than 12 interconnected smoke alarms require a commercial-type supervised and monitored fire alarm system to comply with the NFPA 72 Standard.

Carbon monoxide alarms

- Install and maintain CO alarms inside your home to provide early warning of carbon monoxide.
- Choose a CO alarm that has the label of a recognized testing laboratory.
- CO alarms are not substitutes for smoke alarms. Know the difference between the sound of smoke alarms and the sound of CO alarms.

Because CO is odorless, colorless, and otherwise undetectable to the human senses, people may not know that they are being exposed. The initial symptoms of low to moderate CO poisoning are similar to the flu (but without the fever). They include:

- Headache
- Fatigue
- Shortness of breath
- Nausea
- Dizziness

High level CO poisoning results in progressively more severe symptoms, including:

- Mental confusion
- Vomiting
- Loss of muscular coordination
- Loss of consciousness
- Ultimately death

Source: NFPA

Carbon monoxide alarm requirements from the 2015 IRC Section R315

- Carbon Monoxide Alarms - For new construction, an approved carbon monoxide alarm shall be installed outside of each separate sleeping area in the immediate vicinity of the bedrooms in dwelling units within which fuel-fired appliances are installed and in dwelling units that have attached garages.
- Carbon monoxide detection systems - Carbon monoxide detection systems that include carbon monoxide detectors and audible notification appliances, installed and maintained in accordance with this section for carbon monoxide alarms and NFPA 720, shall be permitted. The carbon monoxide detectors shall be listed as complying with UL 2075. Where a household carbon monoxide detection system is installed, it shall become a permanent fixture of the occupancy, owned by the homeowner and shall be monitored by an approved supervising station.

Exception: Where carbon monoxide alarms are installed meeting the requirements of Section R315.1, compliance with Section 315.2 is not required.

- Where required in existing buildings - Where work requiring a permit occurs in existing dwellings that have attached garages or in existing dwellings within which fuel fired appliances exist, carbon monoxide alarms shall be provided in accordance with Section R315.1.

(The State of Colorado requires that listed carbon monoxide alarms be installed within 15 feet of the entrance to each sleeping room when the dwelling is equipped with fuel-fired appliances, fireplaces, or has an attached garage).

- Alarm Requirements - Single-station carbon monoxide alarms shall be listed as complying with UL 2034 and shall be installed in accordance with this code and the manufacturer's installation instructions.
 - Carbon Monoxide alarms are not required to be hard wired or interconnected unless connected to a listed carbon monoxide detection system.
 - Listed combination Smoke and CO alarms are available that do satisfy minimum life safety code requirements when installed per code.
 - Verify manufacturers installation instructions for separation distance between device and HVAC supply or return air registers, and distance below ceiling for wall-mounted applications.

1. National estimates are based on National Fire Incident Reporting System (NFIRS) data (1996–1998) and the National Fire Protection Association's (NFPA) annual survey, Fire Loss in the United States.