

# Residential Fire Safety

## *Maintaining and Using Single- and Multiple-station Smoke Alarms, Carbon Monoxide Alarms, Combination Carbon Monoxide and Smoke Alarms, and Fire Extinguishers*

*In 2009, the State of Colorado and City and County of Denver passed ordinances requiring Carbon Monoxide (CO) alarms in residences—a new facet added to governmental requirements for home safety.*

*This document will tell you how to make sure you're in compliance with existing requirements for smoke alarms and fire extinguishers, what you need to do to comply with the new CO detector requirements, and best practices for home fire safety.*

## Background

In 2018 there were 1,318,500 fires reported in the States. These fires caused 3,655 civilian deaths, 15,200 civilian injuries, and \$25.6 billion in property damage. (NFPA) Kitchens are the leading area of origin for these fires.

Functioning smoke alarms and portable fire extinguishers have proven effective in reducing the risk of death in home fires. Denver's Fire Code has specific requirements for the inspection and testing of this equipment.

According to the NFPA, 24 of every 25 households surveyed in 2008 had at least one smoke alarm—but households with smoke alarms that **don't work** outnumber the households with no alarms by a substantial margin. Almost two-thirds of home fire deaths resulted from fires in properties that lacked a functioning smoke alarm. When a smoke alarm fails to operate, it is usually because its batteries are missing, disconnected, or dead.

Any home maintenance program must include smoke alarm, portable fire extinguisher, and carbon monoxide alarm maintenance.

## Smoke Alarms/Detectors

There is a difference between alarms and detectors. A Smoke detector is connected to a fire alarm panel. It is hardwired and may have a battery backup. The life expectancy on a smoke detector depends on whether or not the detector passes the monthly required test. Once a detector fails the monthly test it must be replaced. Smoke alarms only notify the occupants in the individual unit in which they are installed. They may be powered by a ten-year lithium ion battery which is sealed inside the unit or hardwired with a battery backup. Batteries must be a 10-year lithium ion battery. Hardwired smoke alarms are interconnected so that when one goes off, they will all activate. Hardwired smoke alarms may remain in service for as long as they continue to pass their monthly test. Battery operated smoke alarms must be replaced every ten years or when the end of life signal activates whichever comes first.

Although most homes, apartments, condominiums, and townhomes have at least one smoke alarm, many do not have a smoke alarm on every floor. Smoke alarms are required, as

described below. It's easy to forget that a smoke alarm's sole function is to sound the warning. Develop and practice an escape plan so that if the alarm sounds, your family can get out quickly.

### Requirements and Positioning:

- Smoke alarms are required in every residential dwelling or sleeping unit, including single-family homes. Every multi-family residential facility is required to have smoke alarms, whether battery-operated or hard-wired with battery backup.
- Smoke alarms are required in every bedroom, outside each sleeping area, and on every level of the home including the basement.

### Maintenance – Smoke Alarms:

- Required: Denver Fire Code requires that you have your smoke alarms inspected and tested at least monthly and at intervals not less than that required by the manufacturer's published instructions. You may hire someone to do this, you may do it yourself or, if you live in a multi-family residential facility, your management may take care of this. It is required that the batteries (primary and back up be changed) to a 10-year lithium-ion battery.
- Required: As the homeowner, you must fill out a residential **Fire Safety Equipment Report** and submit it to the property management or homeowner's association annually unless the management is providing the maintenance for you. You may download the form at [www.denvergov.org/fire](http://www.denvergov.org/fire).
- Smoke alarms that are hardwired shall be replaced as required by the manufacturer and NFPA 72. Those that have an alkaline battery backup should replace the battery with a 10-year battery. Stand-alone smoke detectors shall not remain in service longer than 10 years from the date of manufacturer. It is recommended that detectors manufactured prior to and including the model year of 2013 should be replaced, since they may not have the ability to use a 10-year battery.
- Beginning January 1, 2019 all newly installed smoke detectors must have a 10-year lithium ion battery. These batteries if not sealed may look like a typical 9 Volt alkaline battery but are good for 10 years.

## Portable Fire Extinguishers

Portable fire extinguishers are a first line of defense against fires of limited size. They are needed even if the property is equipped with automatic fire sprinklers.

### Requirements and Placement:

## Maintenance – Portable Fire Extinguishers:

- Recommended: Give your portable fire extinguisher(s) a quick check every 30 days. This is a task you can easily do by answering three questions:
  - Is the extinguisher in the right location?
  - Is the extinguisher visible and accessible?
  - Does the gauge or pressure indicator show the correct pressure?
- Required: Denver Fire Code requires that you have your portable fire extinguishers inspected and maintained annually. This is a thorough examination of the extinguisher's mechanical parts, fire extinguishing agent and expellant gas. A fire extinguisher professional licensed by the Denver Fire Department is the ideal person to perform this annual maintenance because this person has the appropriate servicing manuals, tools, recharge materials, parts, and lubricants as well as the necessary training and experience.

## If you discover a fire in your home . . .

**ACTIVATE** the building fire alarm system or notify the Fire Department (call 911 or have someone else do this for you).

**ASSIST** any person in immediate danger, or those incapable of exiting the building on their own, without risk to yourself.

Only after these two steps have been completed should you attempt to extinguish the fire.

- Only fight a fire with a portable fire extinguisher: If the fire is small and contained
- If you are safe from toxic smoke
- If you have a means of escape
- If your instincts tell you it is okay to do this

It is a good idea to practice picking up and holding a portable fire extinguisher to get an idea of its weight and feel.

Take time to read the operating instructions and warnings on the fire extinguisher's label.

Practice releasing the discharge hose or horn and aiming it at the base of an imagined fire. Do not pull the pin or squeeze the lever—this will break the extinguisher seal and cause it to lose pressure.

Like any mechanical device, a portable fire extinguisher must be maintained on a regular basis to insure proper operation. The owner or occupant where the extinguisher(s) is/are located is responsible for the fire extinguisher's maintenance.

## Carbon Monoxide (CO) Alarms

Carbon monoxide (CO) is produced when any fuel is incompletely burned because of insufficient oxygen. Wood fires and charcoal grills produce large amounts of carbon monoxide, as do malfunctioning heating systems.

Carbon monoxide combines with hemoglobin, the oxygen-carrying agent in red blood cells. When oxygen is robbed from the brain and other organs, death can result. In addition, up to 40% of survivors of severe CO poisoning develop memory impairment and other serious illnesses. Many cases of

reported CO poisoning indicate that victims are aware that they are not well but become so disoriented that they are unable to save themselves. Carbon monoxide is colorless and odorless. There is only one safe and reliable way to detect carbon monoxide in your

home—**install a carbon monoxide alarm.**

### Requirements:

- **State of Colorado and City and County of Denver requirement:** Every residence with fuel-burning appliances or an attached garage must be equipped with at least one UL-listed carbon monoxide alarm or combination CO/smoke alarm.

### Placement:

- State of Colorado and City and County of Denver laws require carbon monoxide alarms or combination CO/smoke alarms in the following locations:
  - One CO alarm or combination CO/smoke alarm within 15 feet of each bedroom entry door
  - One CO alarm or combination CO/smoke alarm on each level of a multi-level dwelling unit including the basement.
  - One CO alarm or combination CO/smoke alarm within each bedroom containing a fuel-burning appliance
  - Where a fuel-burning appliance(s) serve(s) multiple residences, one CO alarm or combination CO/smoke alarm within the enclosure housing the appliance(s), placed within 25 feet of the appliance(s). The CO alarm or combination CO/smoke alarm must be integrated with the base building fire alarm system. (Requires a City and County of Denver permit.)
- For existing properties where a fuel-burning appliance does not serve multiple residences, the installation of a battery-powered, 115-volt plug-in or 115-volt hard-wired CO alarm or combination CO/smoke alarm or combination 115-volt and battery-powered CO alarm or combination CO/smoke alarm may be installed. For new construction, a 115-volt hard-wired CO alarm or combination CO/smoke alarm with battery backup must be installed under City and County of Denver permit. **Note: Smoke alarms are required in all residential occupancies.**
- Do not install CO alarms or combination CO/smoke alarms directly above or beside fuel-burning appliances, as these appliances may emit a small amount of CO upon startup.
- Do not install CO alarms or combination CO/smoke alarms within 15 feet of heating or cooking appliances or in or near very humid areas such as bathrooms. Carbon monoxide will rise with the warmer air, so the CO alarm or combination CO/smoke alarm may be mounted on the ceiling.
- Recommended installation locations may vary by manufacturer based on research conducted and the listing obtained for the device, so be sure to read the installation manual for each CO alarm or combination CO/smoke alarm before installing it.

- Required: Every home must have one or more portable fire extinguishers.
- Required: Every multi-family residential facility must have one or more portable fire extinguishers, regardless of any other type of fire protection provided.
- For multi-family residential properties, portable fire extinguishers must be mounted within the interior egress corridors when the facility has such corridors and mounted on the exterior of the building adjacent to exit stairways.
- In both situations, the portable fire extinguishers must be located within 75 feet line of travel of all areas of the living unit; or one 2A:10BC portable fire extinguisher located within each living unit.

**Maintenance – CO Alarms or Combination CO/Smoke Alarms:**

- Required: Denver Fire Code requires that you have your CO alarms or combination CO/smoke alarms inspected and tested monthly and not less than that required by the manufacturer’s published instructions. You may hire someone to do this, you may do it yourself or, if you live in a multi-family residential facility, your management may take care of this. As of January 1, 2019 batteries should be replaced with a 10 year lithium battery.
- CO alarms and combination CO/smoke alarms shall be replaced when the end of life signal activates, or as required by the manufacturer, or 10 years from the date of manufacture, whichever comes first.

**Requirements and Positioning.**

- CO detectors shall be placed on each level of the home including the basement if there is one.

**Disposal**

CO detectors may be placed in your regular trash. Smoke detectors carry a small amount of a radioactive isotope called Americum 241. The best option for disposal is to return the detector back to the manufacturer. The Manufacturer address can be found in the owner’s manual, the back of the detector or on the manufacturer’s website. Contact the manufacturer for shipping instructions. You may elect to have your old smoke detectors picked up by Denver Trash. You may schedule an appointment at [www.denvergov.org/trash](http://www.denvergov.org/trash). There is a \$14.00 charge for each smoke alarm.