



OREGON

Theodore R. Kulongoski, Governor

Oregon State Police
Office of State Fire Marshal
4760 Portland Road NE
Salem, OR 97305-1760
(503) 378-3473
Fax (503) 373-1825 fax
TTY (503) 390-4661
E-mail: Oregon.sfm@state.or.us
www.Oregon.gov/OSP/SFM

CARBON MONOXIDE QUESTIONS & ANSWERS

What is carbon monoxide?

- It is an invisible, odorless, colorless gas created when fuels, such as gasoline, wood, charcoal, coal, natural gas, propane, oil, kerosene and methane burn incompletely

Where does carbon monoxide come from?

- Heaters, fireplaces, furnaces, appliances and cooking sources using coal, wood, petroleum products, and other fuels producing carbon monoxide
- Products and equipment powered by an internal combustion engine, such as portable generators, cars, lawn mowers, and power washers produce carbon monoxide
- Operating equipment inside an attached garage increases the risk of introduction of carbon monoxide into a living space

What are the risk factors of carbon monoxide?

- Carbon monoxide fumes are dangerous and may be deadly. Especially at risk are:
 - Unborn babies
 - Infants
 - Older adults
 - People who smoke
 - People with chronic heart disease, anemia or respiratory problems

Why should my home have carbon monoxide alarms?

- According to the *Journal of the American Medical Association*, approximately 2,100 people die from carbon monoxide poisoning every year in the United States
- There are more than 10,000 injuries annually from carbon monoxide
- Fuel burning home heating and cooking equipment are sources of carbon monoxide
- Car exhaust in an attached garage may leak carbon monoxide into the house even with the main garage door open

Why is carbon monoxide harmful?

- It displaces oxygen in the blood and deprives the heart, brain, and other vital organs of oxygen
 - The molecules attach to your red blood cells more easily than oxygen molecules, depriving oxygen from getting into the body. This may damage tissues and result in death

What are symptoms of carbon monoxide poisoning?

- Initial symptoms are similar to the flu but without the fever:
 - Headache
 - Fatigue
 - Shortness of breath
 - Nausea
 - Dizziness
 - Skin may turn bright red
- Severe symptoms include:
 - Mental confusion
 - Vomiting
 - Loss of muscular coordination
 - Loss of consciousness
 - Ultimately death

Who does what, when?

- Oregon law requires carbon monoxide alarms to be installed following specific **House Bill 3450** implementation dates:
 - **JULY 1, 2010** – Office of State Fire Marshal (OSFM) Administrative Rules effective date
 - **JULY 1, 2010** – For all new rental agreements, landlords must provide properly functioning carbon monoxide alarms for rental dwelling units with, or within a structure containing, a carbon monoxide source
 - **APRIL 1, 2011** – Landlords must provide properly functioning carbon monoxide alarms for all rental dwelling units with, or within a structure containing a carbon monoxide source
 - **APRIL 1, 2011** – Home sellers of one-and two family dwellings, manufactured dwellings, or multifamily housing units containing a carbon monoxide source must have one or more properly functioning carbon monoxide alarms before conveying fee title or transferring possession of a dwelling
 - **APRIL 1, 2011** – Carbon monoxide alarms are required in new construction or a structure that undergoes reconstruction, alteration or repair for which a building permit is required, and is identified in the structural specialty code as a residential Group R structure.(for new construction and reconstruction go to Oregon Buildings Codes <http://www.cbs.state.or.us/bcd/committees/11orsc.html>)
- Temporary Administrative Rules are in effect **July 1, 2010 – December 28, 2010**.
- Permanent carbon monoxide Administrative Rules go into effect **December 28, 2010**.

What is a carbon monoxide alarm?

- Detects carbon monoxide
- Produces a distinctive audible alert when carbon monoxide is detected

- Must comply with ANSI/UL 2034 or 2075 or other nationally recognized testing laboratory
- May be a separate stand alone unit or part of a detection and alarm system

What types of carbon monoxide alarms are available?

- **Carbon monoxide only alarms:** Activated by carbon monoxide
 - May be battery-operated, plug-in, or hard-wired
 - Battery back-up is recommended for plug-in and hardwired alarms
- **Combination smoke/carbon monoxide alarms:** Activated by smoke or carbon monoxide
 - Combination smoke/carbon monoxide alarms must comply with ANSI/UL 217 and ANSI/UL 2034
 - Combination smoke/carbon monoxide detectors must comply with ANSI/UL 268 and ANSI/UL 2075
- **Ionization smoke/carbon monoxide alarms:** Activated by smoke or carbon monoxide
These alarms are labeled on either the front or back of the alarm with:
 - ‘Smoke and carbon monoxide alarm’
 - A lower case letter ‘i’ for ionization and the word ‘ionization’
 - The phrase ‘contains radioactive material’

NOTE: These alarms do not require a 10-year battery

- **Photoelectric smoke/carbon monoxide alarm:** Activated by smoke or carbon monoxide.
These alarms are labeled on either the front or back of the alarm with:
 - ‘smoke and carbon monoxide alarm’
 - a capital letter ‘P’ for photoelectric and the word ‘photoelectric’
- **Photoelectric smoke/carbon monoxide with voice alarm:** Activated by smoke or carbon monoxide. An audible voice tone speaks the type and location of danger in your home, when programmed. These alarms are labeled on either the front or back of the alarm with:
 - A capital letter ‘P’ and the word ‘photoelectric’
 - ‘Smoke and carbon monoxide alarm’
- **Explosive gas & carbon monoxide alarm:** Activated by carbon monoxide, propane or natural/methane gas. These alarms are labeled on either the front or back of the alarm with:
 - ‘Explosive gas and carbon monoxide alarm’ on the front of the alarm

What is the difference between ionized and photoelectric?

- Ionization smoke detectors feature a radioactive source within a dual detection chamber. Ionization alarms sense an unseen change in the electrical conductivity
- Ionization detectors sense smoke invisible to the human eye
- Photoelectric detectors respond to visible by-products of combustion

- When enough visible combustibles are present, the detector sounds an alarm

May I modify my hard-wired smoke alarm system for a combination carbon monoxide and smoke alarm?

- You may replace a hardwired smoke alarm for a hardwired battery back-up smoke/carbon monoxide combination alarm
- Switching from one manufacturer's unit to another requires a power adapter plug
- Manufacturers advise adapter plugs may be changed using wire nuts and may require a qualified electrician

Where do I install carbon monoxide alarms?

- On each level of your home with sleeping areas
- In each bedroom or within 15 feet outside each sleeping area
- Install alarms according to the manufacturer's instructions

Do the current rules require a carbon monoxide alarm in each sleeping area?

- No, but it is still a recommended best practice to have them in both the bedroom and within 15 feet outside the bedroom
- The law requires a carbon monoxide alarm on each level of your home with sleeping areas and within 15 feet of each sleeping area
 - However, ductwork from sources often goes directly to bedrooms, bypassing hallways outside of sleeping areas

I understand the rules provide minimum requirements. What other recommendations are there for placement of carbon monoxide alarms?

- Securely fasten plug in devices to the structure.
- Install a CO alarm in every room containing a carbon monoxide source, except a garage intended for parking vehicles.
- Install a carbon monoxide alarm system in multi-family dwellings in any enclosed common area within the building if the common area is connected to:
 - Carbon monoxide source located or attached to the structure; and
 - A dwelling unit.

Where should carbon monoxide alarms NOT be installed?

- Garages and kitchens
- Extremely dusty, dirty, humid, or greasy areas
- Direct sunlight or areas prone to temperature extremes. These include unconditioned crawl spaces such as ventilated attics, basement, and crawl spaces, unfinished attics, uninsulated or poorly insulated ceilings, and porches
- In electrical outlets covered by curtains or other obstructions

- In turbulent air such as near ceiling fans, heat vents, air conditioners, fresh air returns, or open windows. Blowing air may prevent carbon monoxide from reaching the sensors
- Directly above or beside fuel-burning appliances, as appliances may emit a trace amount of carbon monoxide only upon start-up
- Within 15 feet of heating and cooking appliances, or in or near, very humid areas such as bathrooms

How often do I replace my carbon monoxide alarm?

- Most carbon monoxide alarms have a five year limited warranty
- Manufacturers recommend replacing alarms five years from date of production

How do I keep my carbon monoxide alarm working?

- Test alarms monthly
- Vacuum alarms regularly to remove dust and cobwebs
- Never disconnect or remove alarm batteries for other use
- For battery operated, replace the 9-volt or AA batteries at least once per year
- Carbon monoxide alarms are not required to have a 10-year battery
- Carbon monoxide/smoke combination alarms are not required to have a 10-year battery

What should I do when the carbon monoxide alarm sounds?

- Don't ignore the alarm! It is intended to warn household members before they experience symptoms
- Silence the alarm
- Move everyone outside to fresh air and call for help from a fresh air location:
 - If anyone is experiencing symptoms of carbon monoxide poisoning, call 9-1-1
 - If no one has symptoms, ventilate the building and contact a qualified service technician
- Have all home equipment powered by fuels such as gas, wood, coal, natural gas, propane, oil, or methane inspected by a qualified technician
- Have fuel-burning heating equipment and chimneys inspected by a professional every year before cold weather sets in

For more information on Oregon's carbon monoxide law, visit:

http://www.oregon.gov/OSP/SFM/CommEd_CO_Program.shtml or call 503-934-8228

Additional references:

CARBON MONOXIDE in Oregon Statutes at <http://www.oregon.gov/OSP/SFM/docs/Codes/COStatutes.pdf>

For Landlords:

Metro Multifamily Housing Association
 921 SW Washington Suite 772
 Portland, OR 97205
 503-226-4533

For Homebuilders:

Oregon Home Builders Association
 375 Taylor Street NE
 Salem, OR 97301
 503-378-9066

For Realtors:

Oregon Association. of Realtors
2110 Mission Street SE, Suite 310
Salem, OR 97308
503-362-3645

Building Codes Division:

P.O. Box 14470
Salem, OR 97309-0404
503-378-4133

For Adult Foster Home Program:

Connie Rush
DHS-Seniors and People with Disabilities
500 Summer St. NE E12
Salem, OR 97301-1073
800-232-3020

**SECTION R326
CARBON MONOXIDE ALARMS**

R326.1 Carbon monoxide alarms. For new construction, approved single station carbon monoxide alarms or a household carbon monoxide detection system shall be installed.

R326.2 Installation Location. Carbon monoxide alarms shall be located in each bedroom or within 15 feet outside of each bedroom door. Bedrooms on separate floor levels in a structure consisting of two or more stories shall have separate carbon monoxide alarms serving each story.

R326.3 Alarm requirements.

R326.3.1 Single station 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.

R326.3.2 Household carbon monoxide detection systems. Household carbon monoxide detection systems, that include carbon monoxide detectors and audible notification appliances, installed 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.

R326.3.3 Combination smoke/carbon monoxide alarm/detectors requirements. Combination smoke/carbon monoxide alarms shall be listed as complying with ANSI/UL 2034 and ANSI/UL 217. Combination smoke/carbon monoxide detectors shall be listed as complying with ANSI/UL 2075 and ANSI/UL 268. See Section R313 for additional requirements specific to the installation of smoke alarms.

R326.4 Power Source.

R326.4.1 Carbon Monoxide Alarms. Single station carbon monoxide alarms shall be battery operated, or may receive their primary power from the building wiring system. Plug in devices securely fastened to the structure and installed in accordance with the manufacturer’s installation instructions are deemed to satisfy this requirement. Hard wired and plug-in carbon monoxide alarms shall be equipped with battery back up.

R326.4.2 Household carbon monoxide detection systems. Required power supply sources for household carbon monoxide detection systems shall be in accordance with NFPA 720.

R326.4.3 Combination smoke/carbon monoxide alarms/detectors. Combination smoke/carbon monoxide alarm/detectors 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. Smoke alarm features of combination smoke/carbon monoxide alarms /detectors shall be interconnected.

Exceptions: Interconnection and hard-wiring of combination smoke/carbon monoxide alarms /detectors 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.

R326.5 Where required in existing dwellings. Where a new carbon monoxide source is introduced or work requiring a structural permit occurs in existing dwellings, carbon monoxide alarms shall be provided in accordance with Section R326.1.

Exception: 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.

Add the following Standards to Chapter 43

NFPA 720-09 Standard for the Installation of Carbon Monoxide (CO) Detection and Warning EquipmentR326.3.2, R326.4.2

ANSI/UL 268-06 Standard for Smoke Detectors for Fire Protective Signaling Systems.....R326.3.3

ANSI/UL 2075-04 First Edition of the Standard for Gas and Vapor Detectors and Sensors, with revisions through September 28, 07.....R326.3.2, R326.3.3