

## Carbon Monoxide (CO)

Carbon monoxide or “CO” is an odorless, colorless gas produced by incomplete combustion that can cause sudden illness and death in humans and animals.

### Introduction

Carbon monoxide, abbreviated “CO,” is an invisible, odorless, gas produced by incomplete combustion or burning of natural gas, propane, gasoline, charcoal or other materials.

Carbon monoxide poisoning occurs when carbon monoxide molecules attach to your red blood cells preventing oxygen distribution in your bloodstream. This can result in tissue and vital organs being starved of oxygen leading to serious tissue damage or even death.

Each year more Americans die of carbon monoxide poisoning than all other types of poisoning combined.

### Common sources of CO

CO is found in combustion gases, such as those produced by cars and trucks, lawn mowers and weed whips, gas stoves and lanterns, burning charcoal and wood, and gas ranges and heating systems. CO from these sources can build up in enclosed or semi-enclosed spaces.

### What are the symptoms of CO poisoning?

CO poisoning can be difficult to diagnose because the symptoms mimic other illnesses. The most common symptoms of CO poisoning are headache, dizziness, weakness, nausea, vomiting, chest pain, and confusion.

High levels of CO inhalation can cause loss of consciousness and death. People who are sleeping or intoxicated

can die from CO poisoning before ever experiencing symptoms.

### Who is at risk of CO poisoning?

All people and animals are at risk of CO poisoning. Fetuses, infants, and people with chronic heart disease, anemia, or respiratory problems are more susceptible to CO’s effects.

### Preventing CO poisoning at work and at home

These are three key ways to prevent CO poisoning.

- Use only gas appliances & equipment designed and vented for indoor use.
- Use CO detectors. Check or replace the battery when you change the time on your clocks each spring and fall.
- During a power outage, don’t bring gas or charcoal grills into your home. Keep generators outside.

### Gas appliances as a source of CO

Common sources of CO problems are gas appliances such as water heaters and furnaces.

- Have all gas appliances serviced by a qualified technician every year.
- Do not use portable flameless chemical heaters (catalytic) indoors. These heaters burn gas and can cause CO to build up inside homes, cabins or campers.
- Odor from the cooling unit of your gas refrigerator may indicate a defect in the cooling unit. It could also be giving off CO.

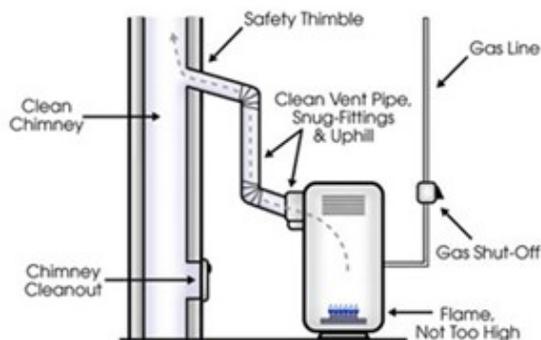
Buy only gas powered equipment carrying the seal of a national testing agency, such as the American Gas Association or Underwriters’ Laboratories.

## Proper venting of gas appliances

All gas appliances must be vented to the exterior of the building so CO will not build up indoors. Never burn anything in a stove or fireplace that isn't vented.

Indoor horizontal vent pipes should go up slightly as they go outdoors. This helps prevent CO or other gases from leaking if the joints or pipes aren't fitted tightly.

Here's the Safe Way to Connect Heating Equipment to the Chimney



Check the vents. Animals may build nests inside vent pipes to keep warm and may block CO from venting to the outside. Have your chimney checked or cleaned every year. Chimneys can be blocked by debris and can cause CO to build up inside your home or cabin.

## When the power is out

Never use a gas range or oven for heating. Never burn charcoal indoors. Never use a gas grill or camp stove indoors. Never use a generator inside your home, basement, garage or near a window, door, or vent. All of these actions will produce hazardous CO levels.

## Gas-powered equipment

Never run gas-powered equipment indoors or where there might be limited ventilation. This includes lawnmowers, weed-whips, and pressure washers.

## CO exposure from vehicles

Never run a car or truck in the garage with the garage door shut.

A small leak in your car's exhaust system can lead to a buildup of CO inside the car.

If you drive a vehicle with a tailgate down CO from the exhaust can be pulled into the passenger compartment car, so open the window for ventilation.

## Minnesota OSHA regulations

Carbon monoxide is a hazardous substance and is covered by the Federal Hazard Communication Standard.

MN OSHA requires that when internal-combustion engine powered industrial trucks (ex. forklifts) are operated indoors, employees' exposures to CO must be monitored, on at least a quarterly basis. Additional information may be found at MN Rule 5205.0116.

MN OSHA enforces an 8 hour Time-Weighted Average (TWA) of 35 parts per million. This is lower than the Federal Permissible Exposure Limit (PEL) of 50 parts per million, which is enforced in other states such as Wisconsin.

## Questions

If you have questions on this topic, please contact Health, Safety, and Risk Management at (612) 626-6002.