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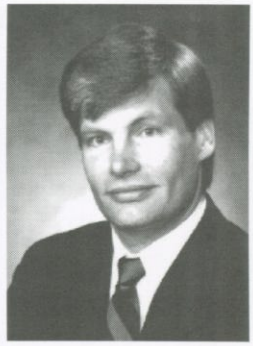
AN ENGINEER'S OPINION

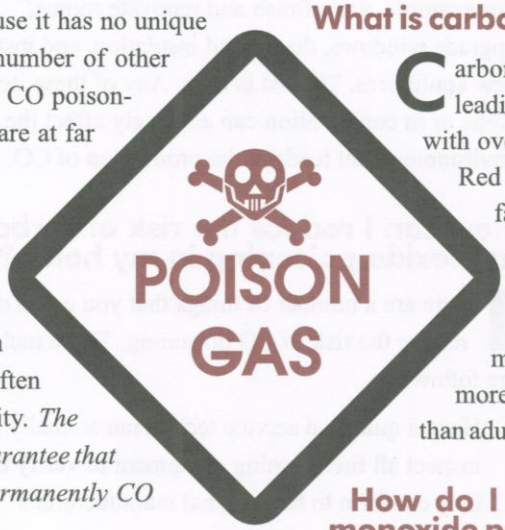


Special Issue

Carbon Monoxide: Clear and Present Danger

This issue of *An Engineer's Opinion* is dedicated to one subject only and that is carbon monoxide, or CO for short. In my opinion, this is the number one safety issue in the home today. CO is often called the silent killer. You can't see it, smell it, or taste it, but it kills over 100 people each year in Canada. CO poisoning has been called the great mimicker because it has no unique set of symptoms. It mimics a number of other systemic diseases which makes CO poisoning hard to diagnose. Children are at far greater risk than adults.

Nothing has been talked about more and understood less. There are a number of confusing myths about carbon monoxide, some of which often result in a false sense of security. *The bottom line is that there is no guarantee that can ensure that any home is permanently CO free.*



The purpose of this newsletter is to clarify the subject, provide answers to a number of commonly asked questions about CO, and give helpful advice on what a reasonable person can do to minimize the exposure of their family to CO and CO poisoning.

What is carbon monoxide?

Carbon monoxide is a flammable, odourless, colourless, tasteless, and nonirritating gas. Combustion requires a proper mix of fuel and oxygen. In normal combustion, one atom of carbon joins with two atoms of oxygen to form carbon dioxide (CO_2). When there is a lack of oxygen, each carbon atom links up with only one oxygen atom to form carbon monoxide (CO). Thus, the production of CO is inextricably linked to the supply of fresh air (oxygen) in a home. This is affected by the way air moves about the house, which is usually a function of air pressure. CO is about the same weight as air and, depending on air currents in the home, will usually distribute itself evenly from floor to ceiling.

What is carbon monoxide poisoning?

Carbon monoxide poisoning is the leading cause of death by poisoning, with over 100 deaths per year in Canada. Red blood cells absorb CO 200 times faster than they absorb oxygen. Thus, the body becomes asphyxiated from a lack of oxygen. Infants and children are more vulnerable because they need more oxygen and breathe more rapidly than adults.

How do I know if I have carbon monoxide poisoning?

Because its symptoms are very similar to the symptoms of many common illnesses (such as the flu), carbon monoxide poisoning is often misdiagnosed. Symptoms of CO poisoning include fatigue, drowsiness, headaches, dizziness, weakness, nausea, confusion, disorientation, impaired vision, and lack of coordination. Be especially concerned if these symptoms persist or seem to clear up when you leave the house.

(Continued on the reverse side)

An Engineer's Opinion

An Engineer's Opinion is published to assist homeowners in creating the healthiest, most comfortable environment in their homes at the most reasonable cost. If you have questions, criticism or input, we want to hear them. Please write or call me personally.

Roger Grochmal, P.Eng., President

New City of Toronto Bylaw

The City of Toronto has passed a bylaw that requires every home to have a carbon monoxide (CO) detector. Beware of the cheapie models that will be flooding into the market. See our recommendations at the right on detector selection.

How can I tell if my home is susceptible to carbon monoxide?

Every house is susceptible to CO build-up. If your home has combustion appliances, a fireplace, or an attached garage, you could experience CO at some point in time. There are no exceptions. Your house could be new or old, loose or tight. It doesn't matter. A change in the environment that alters air movement or internal air pressure in the house could occur for any number of reasons and immediately change the level of CO from high to low, or vice versa.

How does the level of CO in the house change?

The house must be considered as a tightly integrated system. All the parts work together. A change in one area affects other areas. As homeowners, we are always making changes to our home to maximize our enjoyment and retain its value. For example, we refinish and renovate rooms, upgrade windows, doors, and insulation, and install new appliances. The list is long. Any of these items alone or in combination can adversely affect the environment that leads to the production of CO.

How can I reduce the risk of carbon monoxide poisoning in my home?

There are a number of things that you could do to reduce the risk of CO poisoning. These include the following:

- Have a qualified service technician annually inspect all fuel-burning equipment to verify that they conform to the original manufacturer's specifications.
- Have a certified chimney contractor annually inspect your masonry chimney for moisture stains, cracks, white chalky deposits, or loose mortar.
- Keep the area around the furnace and water heater clear so that the air supply to the appliance is not blocked off. Also consult a qualified heating contractor before making any changes to enclose or partition off your combustion appliances.
- Always remember to back your car out of the garage as you let it warm up. Never leave it running in the garage, especially if the garage is attached to the house.

Should I consider installing a carbon monoxide detector?

A CO detector is a good investment for your family's well being. They are easy to install and very affordable. You can install them yourself or have your heating contractor do it for you. You should have at least one detector in your home, with the prime unit in the sleeping area since most deaths occur while occupants are asleep. A CO detector can provide added protection, but is no substitute for the proper use and upkeep of potential CO sources. No detector is 100% reliable. Get a unit with a digital readout so that you can observe changes in levels as some individuals may experience health problems at levels of CO below the amou it takes to set off the alarm.

Where should I install the detector(s)?

Ideally you should have one detector on every level of your home, but most importantly, near the sleeping area. Each manufacturer has instructions in the box as to how their detector should be installed. However, there are some general rules that can be followed:

- Mount the detectors on the wall, preferably midway between floor and ceiling.
- In the bedroom area, place the detector in the hall close to a return air grille if possible.
- In the living area, place the detector at least five feet away from a fireplace.
- In the basement or furnace area, place the detector at least five feet away from any combustion appliance.

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