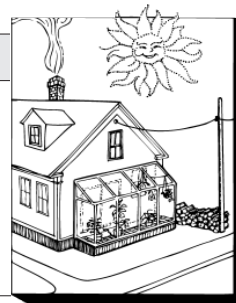


Carbon Monoxide Detectors: Cheap Insurance

by Bruce Sullivan



In September 1993, the City of Chicago passed an ordinance requiring carbon monoxide (CO) detectors, detectors in all new homes with oil- or gas-fired furnaces. In a similar move, Ohio Edison now requires CO detectors in all homes with fireplaces or combustion appliances that are built under its Good Cents residential construction program; other utility-sponsored programs have promised to follow suit.

These rules are probably just the beginning of a trend. Carbon monoxide is an odorless, tasteless, invisible, yet potentially deadly gas that's produced wherever there's incomplete combustion. Since combustion is never 100% efficient, any combustion appliance can pose a threat (see "Common Sources of Carbon Monoxide," below). Dangerous CO concentrations could come from a woodstove, a fireplace, a gas range —

even a car in an attached garage. Although the risk posed by a properly functioning appliance is minimal, poor maintenance, sloppy installation, damaged equipment, or improper construction practices can allow flue gases containing CO to spill into the building. In fact, the U.S. Consumer Product Safety Commission estimates that between 200 and 300 people per year die from CO poisoning in their own homes, so it's likely that more codes will begin requiring CO detectors. But codes or no codes, the danger posed by combustion appliances make CO detectors — which look like smoke detectors and sound a piercing alarm when CO concentrations reach dangerous levels — a wise choice for all new homes.

Concentration Standards

CO does its damage by binding to the hemoglobin in red blood cells, thus

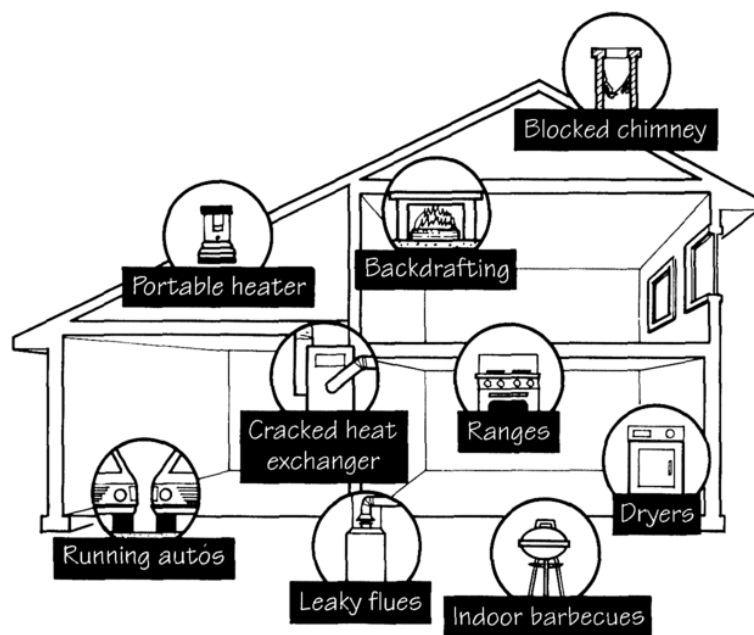
reducing the blood's ability to transport oxygen. The percentage of CO in the blood (called COHb) is a function of its concentration in the air, in parts per million (ppm), and the length of time a person is exposed to it. Although concentrations of 15,000 ppm could kill you in minutes, longer exposures to smaller concentrations are also dangerous, because CO builds up in the bloodstream. Exposure to concentrations of 350 ppm for one hour (a COHb of 30%) can cause slight headache, nausea, vomiting, and fatigue (these symptoms are easily mistaken for the flu, so some health experts believe that CO poisoning has been under-reported). Exposure to 350 ppm for a period of four hours (a COHb of 50%) can cause brain damage or even death.

The Occupational Health and Safety Administration (OSHA) limits workplace CO concentrations to an average of 50 ppm over any eight-hour period. (OSHA plans to lower the maximum exposure to 35 ppm soon.) According to a booklet published by the Bonneville Power Administration in Portland, Ore., the typical concentration in a home without combustion appliances is the same as the outdoor air: 0.5 to 5 ppm. Cooking over a gas range adds 5 to 10 ppm, while unvented space heaters have been shown to raise average concentrations to as high as 39 ppm. Even vented appliances can release CO into the home if they malfunction, are improperly installed, or are inadequately maintained. The only ways to avoid problems are not to install combustion devices (including gas ranges and woodstoves) or to isolate them in a garage that's sealed off from living spaces.

CO Detectors

Given that people will continue to use combustion appliances, a CO detector is cheap insurance against health risks. A properly working detector can provide an early warning to occupants before gas concentrations reach a dangerous level.

Common Sources of Carbon Monoxide in the Home



Every combustion appliance in a home is a potential source of carbon monoxide. In the U.S., more than 200 people die annually in their homes from CO poisoning.



Carbon monoxide detectors resemble ordinary smoke detectors. They cost from \$40 to \$80 and are available in 110-volt, 12-volt, or battery-powered versions.

If a home has even one combustion appliance it should also have a detector.

Detector prices range from \$40 to \$80. (An \$80 model will give you a digital display and sensitivity to lower CO levels.) Be sure to select one with a label that says it meets Underwriters Laboratories Standard 2034. To meet UL Standard 2034, a detector must sound the alarm when CO concentrations reach 100 ppm for 90 minutes, 200 ppm for 35 minutes, or 400 ppm for 15 minutes. Models are also available that sense lower CO concentrations than the UL standard. For example, Nighthawk Industries makes one with a numeric display that shows CO concentration down to about 5 ppm (the \$80 model), and that sounds the alarm when concentrations reach 30 ppm for two hours.

Like smoke alarms, CO detectors should be mounted on hallway ceilings outside of a home's bedrooms. For added safety, it's also wise to place additional detectors near any combustion equipment. Models currently on the market are powered either by 110-volt house current or batteries (one manufacturer makes a detector that runs on 12-volt line current). The drawback to batteries is that homeowners forget to change them when they run down. First Alert's CO detector addresses this by giving off an intermittent beep when the battery is low (as does a battery-powered smoke detector). Line-powered units never need new batteries, but they also never work during power outages. This can be dangerous because CO concentrations are likely to be higher during power outages, as people turn to fireplaces, unvented portable heaters, or even gas ranges to keep warm while the furnace is off. Until someone makes a hard-wired detector with battery backup, you'll have to choose which of the above types makes you feel safer. Or, you could install two: a hard-wired model near the combustion device and a battery-powered model near the bedrooms. ■

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Sources of Supply

The following manufacturers all make CO detectors that satisfy UL Standard 2034.

American Sensors
60 Bentley St.
Markham, ON L3R 3L2
800/387-4219 (U.S. only)
905/477-3320
(Line units only)

First Alert
780 McClure Rd.
Aurora, IL 60504
800/323-9005
(Battery units only)

M.T.I. Industries Inc.
1000 Brown St., Suite 109
Wauconda, IL 60084
800/383-0269
(Line units only)

Nighthawk Industries
4835 Centennial Blvd.
Colorado Springs, CO 80919
800/880-6788
(Line and battery units)

Quantum
11211 Sorrento Valley Rd.
San Diego, CA 92121
800/432-5599
(Battery units only)