Are You Checking for Carbon Monoxide Alarms?

BY RICK BUNZEL

THE FACTS ON CARBON monoxide (CO) poisoning in American households are staggering. Recent National Fire Protection Association studies claim an estimated 80,000 carbon monoxide incidents occurred in 2010 in the United States. That is equal to one every 6½ minutes. More than 200 people die in their homes each year from carbon-monoxide poisoning, and thousands more are hospitalized. Unfortunately, only 25 states have any laws requiring CO alarms' in homes. As home inspectors, we have an opportunity to have a positive impact on this by informing clients about the risks of CO poisoning and recommending CO alarms.

As a firefighter with nearly 40 years' experience, I have seen firsthand the effects of CO poisoning. When I first became a home inspector, I was only recommending CO alarms where I felt there was high risk. In my third year of business I got a call on a home I had inspected months earlier. The call was from an official-sounding man who said he was representing my client and their family who were in the hospital due to issues from my inspection. He wanted the name of my insurer. I told him I don't carry that with me, and I would call him back. Five minutes later I got a panicky call from the Realtor who told me that we were going to get sued due to a bad furnace that I didn't call out, etc. The whole family almost died from CO poisoning, and kids may have brain damage, etc. Fortunately, I was on my way home and able to pull the report within the hour. This home had an old Rheem furnace with a rusty heat exchanger. I called to have it evaluated for replacement and in the interior section of my report I recommended that they install new smoke alarms and a CO alarm. When

CAKb0N **MONOXIDE ALARM**

$_4t$

I spoke to the official-sounding man, I patiently explained my findings, the recommendation to have the furnace evaluated and have a CO alarm installed. I asked if any of this happened, and the man said that he would have to check to see if the recommendations were followed. I never heard from him again and later found out that my clients had spent most of their time and money renovating the kitchen. After this experience I made it a practice to recommend CO alarms in all homes I inspected.

Carbon monoxide poisoning can occur several ways: when flues or chimneys become blocked; when a furnace has a cracked or rusted heat exchanger; when fuel-burning space heaters, gas fireplaces, ovens, ranges or grills are operated in the home without adequate ventilation; when generators are run in garages, near a door or window; when car exhaust from an attached garage enters the home and when there's a negative pressure balance between the inside and outside of the home, prevent-

ing adequate venting of combustion gases. Most occupants will never know when the CO levels rise in their homes. Some will get headaches; other will just feel lethargic. In my client's case, the heat exchanger on the furnace was the most-likely culprit. The burners were rusted and probably the heat exchanger had holes in it. When they ran the furnace, the CO was being sucked into the airstream and spread throughout the house.

According to the National Conference of State Legislatures, only 25 states have requirements for CO alarms in residential buildings. This is pretty amazing considering the number of people who are poisoned each year. In Washington State it has taken years to get a law passed. As of 2012, it is a requirement for homes being sold to have CO alarms on each habitable level. Fortunately, the law doesn't discriminate whether the home has gas appliances or not. ibis was due in a part to a severe winter storm in 2006 during which more than 300 people were sickened, and eight were killed by carbon monoxide as families without electricity turned to alternate sources of heat and power. Many of these homes had all electric heating and no f ossil fuel appliances.

When I bought my first CO alarm in 1990, I spent about $85 for a Kidde AC/DC model with a digital display. That same CO alarm can now be found on Amazon for about $40. If you are on a budget, there are CO alarms from First Alert and Kidde for under $20.

p

E-PERM® Radon Detectors
The Standard by which Others are Judged

"A Radon Tester Intent on Quality Would be Well Advised to Look into the E-Perm® System to See how it Fits Their Needs"
Samuel Poppell Jr. US EPA

- Designed with the Home Inspector in mind
- Ideally suited for real estate transactions
- Easy-to-use
- Same day results
- Tamper Indicating devices available
- Low cost per measurement
- Short-term and long-term options
- Test for radon in water
- Low cost rental program for large scale surveys
- Training Video and QA/QC Plan available
- In-house financing

Rad Elec Inc.
1-800-526-5482
www.radelec.com
5716-A Industry Lane, Frederick, Maryland 21704 USA
info@radelec.com fx:301-694-0013

ASHI Council of Representatives and Group Leaders

Speaker:
Tony Smith
319-533-4565
inspectthathouse@
netscape.net

Alternate Speaker:
Bruce LaBell
602-765-2140
inspectOcox.net

Secretary:
Larry Cerro
850-545-8448
larrycerro comcast.net

GROUP LEADERS

New England/Canada:
Mike Atwell, 617-285-8554
mikeOjmhi.com

New York/New Jersey:
Jerry Sanangini
856-232-6607
jsantangini@comcast.net

Mid-Atlantic:
Jim Funkhouser
571-214-4039
jfunkhouser@aol.com

Midwest:
Mike Wagner, 317-867-7688
mwagner@ralis.com

South Atlantic:
Richard Hart, 770-827-2200
ashi 1 comcast.net

Gulf:
Larry Cerro, 850-545-8448
larrycerroCcomcast.net

South Midwest:
Paul MacNeill
314-392-9313
paul appleinspections.com

North Central:
Brendan Ryan
724-898-1414
brendancsahomeinspection.com

Mountain:
Marcus Richter
520-271-8582
i nfoOha ndsonhome
inspection.com

Pacific:
Scott Swickard
949-454-1389
scottGinspectoc.com

Most CO Alarms have a life expectancy of three-to-seven years and should be replaced once they have passed that age. You should check the manufacturer's instructions for any existing CO alarms to see if they have exceeded their useful life and need to be replaced. Most CO alarms have a date on them and if the unit is more than seven years old, / will call it out for replacement.

CO alarms use several types of sensors. Commonly they are biomimetic, metal oxide and electrochemical. Biomimetic sensor technology reproduces CO's effects on hemoglobin in the blood. In a biomimetic sensor, a gel changes color as it absorbs CO. A separate sensor detects the color change and alerts the alarm's processor to sound the alarm. Metal oxide semiconductor sensors use circuits applied to a silica chip. When CO comes into contact with the circuitry, it lowers the electrical resistance. The processor detects the change and causes the alarm to sound. These sensors require lots of electricity, so they generally plug into wall outlets rather than using batteries. Electrochemical sensors also use changes in electrical current to detect CO. But instead of using an integrated chip, electrochemical sensors use electrodes immersed in a chemical solution.

The sensor identifies and measures CO gas concentration in the atmosphere in parts per million (ppm). In the United States, sensors for home use are calibrated to detect CO concentrations according to Underwriters Laboratories (UL) safety standards. When the sensor detects dangerous levels of the gas, it sends an electronic pulse to the alarm. The higher the concentration, the faster the alarm will respond. For example, the alarm will respond to concentrations of about 70 ppm in as little as an hour but will respond to concentrations of 400 ppm in as little as four minutes.

The Consumer Product Safety Commission (CPSC) and NFPA recommend CO alarms be located near the sleeping area(s), where the alarm can wake the occupants if they are asleep. Additional alarms should be installed on each habitable level. When considering where to place a carbon monoxide alarm, keep in mind that carbon monoxide is roughly the same weight as air and will move with the air currents in a home. For this reason, some manufacturer's recommend installing the CO alarms above eye level. However, many models are plugin alarms, and they will reside at the lower level. If small children are present, this type is not the best choice as they will play with the buttons. When in doubt about where to mount, follow the manufacturer's installation recommendations.

Homeowners should not install CO alarms directly above or beside fuel-burning appliances, as appliances may emit a small amount of CO upon start-up. An alarm should not be placed within 15 feet of heating or cooking appliances or in or near very humid areas such as bathrooms. These locations can cause the sensors to become contaminated.

Most CO alarms have a life expectancy of three-to-seven years and should be replaced once they have passed that age. You should check the manufacturer's instructions for any existing CO alarms to see if they have exceeded their useful life and need to be replaced. Most CO alarms have a date on them and if the unit is more than seven years old, I will call it out for replacement.

As home inspectors, we all should recommend that homeowners install CO alarms in their houses. If the family with the faulty furnace had spent the money for a CO alarm, they could have been alerted to the issue and avoided spending several days in the hospital. They eventually did recover. I am sure that they now have CO alarms throughout their home. •

Rick Bunzel is the principle inspector with Pacific Crest Inspections and an ASH! Certified Inspector. He holds a BA in business marketing and has chaired the marketing and public relations committees for a national home inspection organization. Locally, he chairs the North Puget Sound Board of Realtor's Communications Committee and is a Lieutenant firefighter/EMT with the Mt. Erie Fire Department in Anacortes, Wash.

References

I. In the late 1990s *Underwriters Laboratories (UL)* **changed their definition of single station CO detector** with a sound device in it to a carbon **monoxide (CO)** alarm. This applies to all CO safety alarms that meet UL 2034

National Conference of State Legislatures *hrrp:// wwu..ncsl. orglresearcb/environn:enr-and-natural-resources/carbon-rnonoxide-derrsrors-sta:e-sratu:es.aspx*

Underwriters Laboratories, *Protect Your Family from the S,Irn: Killer'*

Underwriters Laboratories 2034 Standard *hr:p:l/ uboandardsinJimet. uLcom/scopes/scopes.asp?Jn..2034. hrml*

hrtp://www.uL corn/globe lleng/pagt.s/oftirings/perspectiveu/consumer/producrsafety/co/

NFPA 720: Standard for the Installation of Household Carbon Monoxide (CO) Warning Equipment

Aidd, hup.//u.wu'. kida',. corn/Produc:(.'aralog/Pages/ (.arbonAfonoxideAlarrns.aspx