

Types of Carbon Monoxide Detector Sensing Technologies

Biomimetic (Chem-Optical or Gel Cell)

"These sensors attempt to mimic chemically the effect that CO has on hemoglobin. A gel coated disc will change color and darken in the presence of CO. A sensor then recognizes the color changes and sets off an audible alarm. Such detectors are inexpensive, and require very little electricity and therefore can be battery powered. They do not alarm incorrectly in the presence of common household gases, but high and low temperature or humidity can trip the alarm. Low levels of CO can be detected, but a problem with some of these devices is the sensor's low reset capability." ¹

"Biomimetic sensors can take up to 48 hours to reset after exposure to carbon monoxide, during which time the occupants are unprotected. Because the sensor constantly absorbs carbon monoxide, they cannot reset themselves to '0' properly, causing false alarms. Chicago in 1995 reported thousands of false alarms due to this type of sensor." ²

"For these (biomimetic) sensors to function properly, they must be allowed to reset after an alarm by removing the unit and placing it in a clean air environment for several hours." ³

"Types of detectors to avoid: Biomimetic sensors." ⁴

Semiconductor (Metal-Oxide)

"Uses an electrically powered sensing element monitored by an integrated circuit or computer chip. The sensing element is a thin layer of tin dioxide placed over a ceramic base. Wires on the same conduit are embedded into the ceramic base, forming an open circuit because the ceramic base does not conduct electricity. The surface of the electrical charged tin dioxide attracts both oxygen and carbon monoxide. Oxygen restricts the flow of electrons, increasing the resistance between the wires. Carbon monoxide increases the flow of electrons; resistance between the wires is decreased. This detector works in 2.5-minute cycles, monitoring air quality and burning off the last cycle's sample. The microchip records each sampling and will cause the detector to sound alarm when levels of CO are continually above the allowed threshold." ³

"Solid-state semiconductor sensors are highly accurate, dependable and virtually free of false alarms... Can be checked or reset after an alarm with a simple push of a button, and sensors last up to ten years." ⁴

Semiconductor sensors are "more accurate than biomimetic sensors." ² Must connect to house power. No need to remember to check batteries.

Electrochemical

"Electrochemical devices have been used in industrial detectors for 20 years. They are being used with increasing frequency in domestic detectors. Three platinum electrodes are immersed in electrolyte solution and reaction with CO induces a small electric current. The devices are battery powered or have built in power supplies, and have audible alarms and LCD displays with a memory feature." ¹

"This type of sensing element also contains a memory for peak carbon monoxide levels, further aiding responders in the detection of carbon monoxide." ³

"Electrochemical sensing technology is the most accurate and dependable CO detection technology available to the consumer. Used as an industry standard sensor for professional carbon monoxide detection equipment. Instantly detects the presence of carbon monoxide. Will not react with other gases. Accurate to within +-3%." ⁵

"A significant amount of information in the form of periodicals, videos, reports from various watchdog groups, scientists etc. have been collected. This information has been reviewed and it indicates that the electrochemical sensor technology used in some CO Alarms has proven to be the most reliable and accurate." ⁶

¹ Newcastle General Hospital, Accident and Emergency Department

² U.S. Marine Corps Air Ground Combat Center, California

³ City of Kirksville, Missouri

⁴ Township of Delta, Michigan

⁵ Oklahoma Natural Gas

⁶ City of Windsor Fire and Rescue