

Hazard Alert



Carbon Monoxide

Hazard Summary

A worker was exposed to high levels of carbon monoxide while repairing a refrigeration unit in a small walk-in freezer. The refrigeration coil was completely encased in ice and the worker used an acetylene torch to melt the ice before the repairs could begin. The worker began exhibiting signs of acute carbon monoxide exposure such as headache, nausea, confusion and a period of unconsciousness. Fortunately, when it was reported that the worker wasn't feeling well, 911 was called and he received immediate assistance. When the physician determined that the level of carboxyhemoglobin (COHb) was greatly elevated, the exposed worker was transported to the Victoria General Hospital in Halifax to be treated in a hyperbaric chamber. The attending physician reported that the oxygen levels in the worker's blood were so low that this incident was very close to being a fatality. After six hours of hyperbaric oxygen therapy, however, the worker recovered from the carbon monoxide poisoning.



Hazard Location

Carbon monoxide can be dangerous in areas where the incomplete burning of carbon-containing materials, such as gasoline, oil, propane, acetylene, coal or wood has occurred. The risk becomes much greater in an area where there is poor or no ventilation. Occupations where carbon monoxide poisoning is a serious risk include those that have sources of any of the following emissions:

- Vehicles
- Portable generators
- Gas-powered tools
- Propane space heaters
- Furnaces and boilers
- Welding



Contributing Factors

The incomplete combustion of the acetylene gas caused carbon monoxide to be released. This was directly inhaled by the worker. Carbon monoxide is known as a silent killer because it is a colourless, odourless, tasteless poisonous gas. It is harmful when breathed because it displaces oxygen in the blood and deprives the heart, brain and other vital organs of oxygen.

Legislated Requirements

Section 11.3 of the *Occupational Health and Safety Act* (OHS) General Regulations states that where the air of working areas is contaminated by vapours, fumes, gases, mists or other impurities which constitute a hazard to the health or safety of employees, suitable means of ventilation shall be provided by the employer to reduce contamination in the atmosphere at or below the "Threshold Limit Values," known as TLV's, as prescribed by the American Conference of Governmental Industrial Hygienists (ACGIH).

Section 45.17(2) of the OHS General Regulations states that every employer shall ensure that where the prevention or elimination of such hazardous conditions is not reasonably practicable, or where the exposure results from temporary or emergency conditions only, every worker exposed shall wear approved protective respiratory equipment.

Section 53.2(1) of the OHS General Regulations states that where a worker is working alone, the employer shall develop and implement written procedures to ensure, as far as is reasonably practicable, the health and safety of the worker from risks arising out of, or in connection with, the work assigned.

SIGNS OF CARBON MONOXIDE



Recommendations

- Educate workers on the symptoms of carbon monoxide poisoning and the importance of getting medical assistance immediately.
- Inform workers of working alone procedures to make sure that they are in contact with someone who can provide assistance in hazardous situations.
- Recognize potential ventilation problems in enclosed areas where gases of burning fuels may be released.
- Use alternative equipment powered by electricity or batteries if possible when working in enclosed spaces.
- Wear personal carbon monoxide monitors with audible alarms if potential exposure to carbon monoxide exists.
- Use appropriate respirator or breathing apparatus depending on the workplace conditions, the carbon monoxide levels and the amount of time spent in the hazardous environment. Make sure workers are adequately trained to properly use respirators, have been fit-tested to confirm that they have a complete seal when wearing a respirator and are clean shaven.

