



HAZARD ALERT

November 2005

Carbon monoxide poisoning from an internal combustion engine

In November 2004, a 50-year-old janitor began working about noon in a 1,000-square-foot office building in Redmond. The man was found dead on the floor at about 8:20 p.m. after his wife called his employer to say that he hadn't come home from work.

Reconstruction of the events leading to his death showed that he began using a propane powered floor buffer/burnisher at about 12:30 p.m. Sometime after that, he collapsed, unconscious from carbon monoxide poisoning and later died. The buffer was still idling next to him when he was found. The building was closed and there was almost no mechanical ventilation.

Tests of the buffer and calculations using the building dimensions indicate that carbon monoxide (CO) concentrations in the building took only a few minutes to reach the level considered immediately dangerous to life or health (IDLH) of 1200 ppm established by the National Institute of Occupational Safety and Health (NIOSH). Carboxyhemoglobin (COHb) is the blood indicator of exposure to CO. The level in the victim's blood was greatly elevated.

Mild exposure to carbon monoxide can cause nausea, dizziness, or headache. Prolonged or high exposure may worsen symptoms and include vomiting, confusion, collapse, loss of consciousness, and muscle weakness. Symptoms vary from person to person. Severe exposure can result in permanent brain and heart damage or death. Medical problems such as heart and lung conditions, vascular disease, anemic conditions, barbiturate and alcohol use, and smoking increase susceptibility to carbon monoxide poisoning.

Deaths like this one are easily prevented using simple precautions like these:

- Teach employees the symptoms of CO poisoning.
- Train employees in the proper use of internal combustion equipment indoors and methods of ventilation.
- Keep all internal combustion equipment for indoor use in good operating condition.
- Use natural or mechanical ventilation when possible to keep CO levels below the PEL.
- Have a procedure to check on the welfare of people who work alone indoors with internal combustion equipment.
- In extreme cases, have the operators use personal CO monitors.
- When possible, locate the internal combustion equipment outside and run the operating lines to the inside location.
- Do not use internal combustion equipment indoors when there is a feasible alternative.

Carbon monoxide is a colorless, odorless, tasteless, poisonous gas. Carbon monoxide is produced by the incomplete burning of any material containing carbon, such as gasoline, natural gas, oil, propane, coal, or wood. It is harmful when breathed because it displaces oxygen in the blood and deprives the heart, brain, and other vital organs of oxygen. It is one of the leading causes of poisoning by toxic inhalation and is a common workplace hazard. Internal combustion engines are a common source of exposure.

This information applies to any device that produces carbon monoxide. Examples are heaters, generators, sprayers, pressure washers, drywall equipment, forklifts, and anything else with an internal combustion engine or that burns a petroleum fuel, gas, wood or coal.

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www.orosha.org
(800) 922-2689