



# Preventing Carbon Monoxide Poisoning from Small Gasoline-Powered Engines and Tools

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## **WARNING!**

Indoor use of gasoline-powered engines and tools is risky business.

Many people using gasoline-powered tools such as high-pressure washers, concrete cutting saws (walk-behind/hand-held), power trowels, floor buffers, welders, pumps, compressors, and generators in buildings or semi-enclosed spaces have been poisoned by carbon monoxide (CO). CO can rapidly accumulate (even in areas that appear to be well ventilated) and build up to dangerous or fatal concentrations within minutes. Examples of such poisonings include the following:

- A farm owner died of CO poisoning while using an 11-horsepower, gasoline-powered pressure washer to clean his barn. He had worked about 30 minutes before being overcome.
- A municipal employee at an indoor water treatment plant lost consciousness while trying to exit from a 59,000-cubic-foot room where he had been working with an 8-horse-power, gasoline-powered pump. Doors adjacent to the work area were open while he worked. His hospital diagnosis was CO poisoning.
- Five workers were treated for CO poisoning after using two 8 horse-power, gasoline-powered, pressure washers in a poorly ventilated underground parking garage.
- A plumber used a gasoline-powered concrete saw in a basement with open doors and windows and a cooling fan. He experienced a severe headache and dizziness and began to act in a paranoid manner. His symptoms were related to CO poisoning.

These examples show a range of effects caused by CO poisoning in a variety of work settings with exposures that occurred over different time periods and with different types of ventilation. Workers in areas with closed doors and windows were incapacitated within minutes. Opening doors and windows or operating fans does NOT guarantee safety. CO is a dangerous poison. Operating gasoline-powered engines and tools indoors is RISKY BUSINESS.

## Recommendations

It is not widely known that small gasoline-powered engines and tools present a serious health hazard. They produce high concentrations of CO—a poisonous gas that can cause illness, permanent neurological damage, and death. Because it is colorless, odorless, and nonirritating, CO can overcome exposed persons without warning. Often there is little time before they experience symptoms that inhibit their ability to seek safety. Prior use of equipment without

incident has sometimes given users a false sense of safety; such users have been poisoned on subsequent occasions. Recommendations for preventing CO poisoning are provided below for employers, equipment users, tool rental agencies, and tool manufacturers.

#### All Employers and Equipment Users Should:

- NOT allow the use of or operate gasoline-powered engines or tools inside buildings or in partially enclosed areas unless gasoline engines can be located outside away from air intakes. Use of gasoline-powered tools indoors where CO from the engine can accumulate can be fatal.

An exception to this rule might be an emergency rescue situation in which other options are not available—and then only when equipment operators, assisting personnel, and the victim are provided with supplied-air respirators.

- Learn to recognize the symptoms and signs of CO overexposure: headache, nausea, weakness, dizziness, visual disturbances, changes in personality, and loss of consciousness. Any of these symptoms and signs can occur within minutes of usage.
- Always place the pump and power unit of high-pressure washers outdoors and away from air intakes so that engine exhaust is not drawn indoors where the work is being done. Run only the high-pressure wash line inside.
- Consider the use of tools powered by electricity or compressed air if they are available and can be used safely. For example, electric-powered tools present an electrocution hazard and require specific precautions for safety.
- If compressed air is used, place the gasoline-powered compressor outdoors and away from air intakes so that engine exhaust is not drawn indoors where the work is being done.
- Use personal CO monitors where potential sources of CO exist. These monitors should be equipped with audible alarms to warn workers when CO concentrations are too high.

#### Employers Should Also:

- Conduct a workplace survey to identify all potential sources of CO exposure.
- Educate workers about the sources and conditions that may result in CO poisoning as well as the symptoms and control of CO exposure.
- Always substitute less hazardous equipment if possible. Use equipment that allows for the placement of gasoline-powered engines outdoors at a safe distance from air entering the building.
- Monitor employee CO exposure to determine the extent of the hazard.

#### Equipment Users Should Also:

- Substitute less hazardous equipment whenever possible. Use electric tools or tools with engines that are separate from the tool and can be located outside and away from air intakes.
- Learn to recognize the warning symptoms of CO poisoning.

- If you have any symptoms, immediately turn off equipment and go outdoors or to a place with uncontaminated air.
- Call 911 or another local emergency number for medical attention or assistance if symptoms occur. Do NOT drive a motor vehicle—get someone else to drive you to a health care facility.
- Stay away from the work area until the tool has been deactivated and measured CO concentrations are below accepted guidelines and standards.
- Watch coworkers for the signs of CO toxicity.

This Alert is the joint product of a combined effort among the following agencies:

- The National Institute for Occupational Safety and Health (NIOSH)
- The Colorado Department of Public Health and Environment (CDPHE)
- The U.S. Consumer Product Safety Commission (CPSC)
- The Occupational Safety and Health Administration (OSHA)
- The U.S. Environmental Protection Agency (EPA)

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