



NIOSH Warns of Deadly Carbon Monoxide Hazard from Using Pressure Washers Indoors¹

National Institute for Occupational Safety and Health²

According to the National Institute for Occupational Safety and Health (NIOSH), Americans who use gasoline-powered pressure washers indoors are risking their lives. A 35-year-old farmer recently died from carbon monoxide poisoning while using one of these washers in an enclosed barn. NIOSH warns all workers not to use these machines indoors -- it can be a deadly mistake.

"We must act before this 'silent killer' strikes again. Workers must be aware of the hazard and prevent exposure to this potentially fatal gas. Carbon monoxide strikes quickly, and it strikes without warning," stressed NIOSH director, Dr. J. Donald Millar. The gas is colorless, odorless, tasteless, and gives no signs of its presence. "It is critical that workers know when carbon monoxide can be a danger and how they can be protected," said Millar.

All gasoline-powered engines produce carbon monoxide. This gas can rapidly build up in an indoor area, and individuals can be overcome without even realizing they are being exposed. Confusion, headache, dizziness, fatigue, and weakness may set in too quickly for victims to save themselves. Each of the victims interviewed by NIOSH expressed shock at how quickly they were overcome. A farm woman recently poisoned in Iowa stressed, "I was amazed at how it affected my ability to think clearly and to get out." Carbon monoxide poisoning can cause permanent brain damage, including changes in personality and memory. Once inhaled, carbon monoxide decreases the ability of the blood to carry oxygen to the brain and other vital organs. Even low levels of carbon monoxide can set off chest pains and heart attacks in people with coronary artery disease.

This document describes five incidents in which farmers were overcome while using gasoline-powered pressure washers to clean buildings used to house animals. While we do not know how many farmers are using this hazardous procedure, we do know that the number of Americans using this type of washer is rising. According to Vernon Meyer, Swine Housing Specialist, Iowa State University, "Two-thirds of swine producers now use pressure washers for cleaning, and that number is expected to go up." As the market for these devices in agriculture and other industries continues to increase, it is essential that users be informed of the carbon monoxide hazard. We must insure that fatalities do not increase with the market.

In each of the injuries identified, the farmer had brought the machine into a building. Though the machines themselves should be placed outside and the hoses brought inside, farmers sometimes place the equipment inside the building because the hose is not long enough to reach all the areas being cleaned or because of concern about water in the machine freezing during cold weather. The following page describes the fatal and near fatal incidents and the methods for preventing future injury and death from this hazard. Though all of these incidents occurred on farms, any indoor use of gasoline powered equipment could be disabling or fatal.

PREVENTABLE POISONINGS

The National Institute for Occupational Safety and Health (NIOSH) has received reports of one fatality and four nonfatal cases of carbon monoxide poisoning from the indoor use of gasoline powered pressure washers in the state of Iowa. Each of the victims was using the washer to clean buildings used to house farm animals.

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- On January 15, 1993, a 35-year-old man was found several hours after dying inside the building he had been cleaning. The victim was using a newly purchased pressure washer with an 11 horsepower engine. He worked alone with closed doors and windows for about one-half hour before being overcome. The medical examiner reported a very high level of carboxyhemoglobin (an indicator of carbon monoxide poisoning) in his blood. After his death, his family sold the farm.
- On December 30, 1992, a 12-year-old boy was found in a coma. He had placed an 11 horsepower gasoline-powered pressure washer in the outside doorway of a building he was cleaning and worked for less than one half-hour before being overcome. Blood tests indicated he had inhaled a great deal of carbon monoxide. Due to the seriousness of his condition, he was taken to a trauma unit where he was given intensive oxygen treatment. He was released from the hospital seven days later.
- On November 3, 1992, a 35-year-old woman came home fatigued, dizzy and confused after working with a 4 horsepower gasoline-powered pressure washer. She had worked on and off for about seven hours with the machine inside a building with a low ceiling, three open doors, and running exhaust fans. Her family brought her to a local emergency room. Blood tests confirmed she had been poisoned by carbon monoxide. She was treated with oxygen and released.
- On April 18, 1992, a 32-year-old woman was found confused and complaining of a severe headache and dizziness. She had been working alone off and on for six and a half hours in a building with exhaust fans running. She was using a 13 horsepower gasoline powered pressure washer with an open outside door. Her husband took her to a local emergency room, where she was diagnosed with carbon monoxide poisoning, treated with oxygen, and released.
- On January 2, 1992, a 37-year-old man operated a 9 horsepower washer in an unventilated room for about 30 minutes. When he attempted to refuel the washer, he became weak, dizzy, and confused. He crawled to his house and was taken to a hospital. He was treated with oxygen for carbon monoxide poisoning and released.

STEPS FOR PREVENTION

While electrically powered pressure washers are available, NIOSH has not evaluated the safety of these devices. If you are using gasoline powered equipment, take the following precautions:

Do not operate machinery with gasoline engines inside any building. Though warning notices in operating manuals advise that the equipment is not to be used without adequate ventilation, it can be difficult to determine how much ventilation is adequate. One episode described in this report occurred with three doors open and exhaust fans on.

Remember that even small engines can produce deadly levels of carbon monoxide. NIOSH will continue to investigate the problem of using gasoline-powered pressure washers in farm buildings and will address ventilation, warning labels, and freezing problems in an upcoming report.

MORE INFORMATION

For further information on this or other occupational safety and health concerns, call 1-800-35-NIOSH.