



The Dangers of Diesel Exhaust

Colorless and odorless, carbon monoxide gas can either kill or cause permanent neurological damage if a work environment does not have a plan to protect its employees from this danger. Carbon monoxide has become a serious concern to employees who work on or around diesel vehicles in enclosed buildings, such as garages. If your agency uses facilities with a potential for carbon monoxide poisoning, it is critical to develop a plan to protect employees or others from exposure to carbon monoxide and other diesel exhaust chemicals.

CHEMICALS IN DIESEL EXHAUST

The Environmental Protection Agency (EPA) has classified the following pollutants in diesel fuel that are known as probable human carcinogens:

1. Formaldehyde
2. Acetaldehyde
3. 1,3-butadiene
4. Carbon Monoxide



Formaldehyde is a colorless, flammable gas with a strong, pungent odor. It can be explosive in some instances when mixed with air and oxygen. Acetaldehyde has a fruity odor and becomes pungent and suffocating in concentrations. 1,3-butadiene is a colorless, noncorrosive, flammable gas; it is soluble in water, methanol, and ethanol. The National Institute for Occupational Safety and Health (NIOSH) identifies all of the above gases as potential carcinogens.

According to the American Medical Association, exhaust from diesel-powered vehicles is the leading cause of accidental poisoning deaths. The gas is colorless and odorless making it difficult to know when it is present. It enters the lungs and inhibits the blood's capacity to carry oxygen to the organs and tissues. Extreme cases of poisoning can lead to death or permanent neurological damage. Small doses of carbon dioxide may impair exercise capacity, manual dexterity, learning functions, visual perception, and the ability to perform complex tasks. This danger makes it very important to have a well-ventilated working area.

OSHA WORK REQUIREMENTS

Because of the danger involved with diesel gas, OSHA has established a maximum working level for carbon monoxide. The level is 35 parts per million over an 8-hour period. Greater concentrations can and will have adverse effects on those exposed. Federal and State authorities can impose fines and penalties up to \$25,000 per day if the workplace is found to have higher concentrations.

GATHER INFORMATION

There are two steps that can be taken to protect workers from gas poisoning. First, gather information on the engines and operating conditions in the facility. From this data create a list of the engine displacement in cubic inches or liters.

Second, select the maximum round per minute (RPM) at which the equipment is tested in the facility. Determine if the vehicle has single or dual exhaust, and if it is tested under load with a dynamometer or by hydraulic testing. Gathering this information will be necessary to define the requirements for developing an evacuation system for removing exhaust gases from the work area.

PROTECT YOUR EMPLOYEES

In order to create an adequate system to remove fuel exhaust, these elements should be considered:

1. Fan selection
2. System layout
3. Duct sizing
4. Points of vehicle exhaust connection
5. Type of collection device



Considering all of these elements will help ensure that the work environment does not become a health hazard. In addition, it is helpful that the system be user friendly so that operators have an understanding of how it functions and use it daily.

CHECK THE SYSTEM

If your agency does not have a ventilation system, consult with an engineer or vehicle exhaust-system expert who will know the best elements of an exhaust system such as fan selection, system layout, duct sizing, collection devices, and points of vehicle exhaust connection.

Once your ventilation system is in place, follow these four steps for proper maintenance:

1. Do routine checks on a regular schedule
2. Check for holes or burns in tubing
3. Verify tailpipe adapters for ability to stay in the tailpipe during test procedures
4. Check fans for excessive noise or vibration

A critical step is to educate employees: teach them about symptoms of poisoning and demonstrate proper procedures for operating diesel equipment.

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