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Safety Bulletin

Ventilation and Carbon Monoxide While Working in Confined Spaces

Carbon monoxide is a product of combustion. It is the most common cause of occupational gas poisoning leading to death. Carbon monoxide can be hard to detect because it has no colour or odour. It is extremely dangerous in confined or poorly ventilated spaces. It's important to recognize the symptoms of carbon monoxide poisoning as it can prevent fatalities.

How are workers exposed?

Running an internal combustion engine indoors and in confined areas will quickly fill a workplace with dangerous levels of the gas. Many possible sources of carbon monoxide on a worksite include:

- Gas-powered engines
- Fires
- Natural gas space heaters
- Furnaces
- Kilns
- Boilers

Workers indoors can also be exposed if vehicles idle next to fresh air intakes on the building.

The risks

When inhaled, carbon monoxide blocks the body's ability to absorb oxygen.

The gas is odourless and invisible. Workers may be unaware that they are in danger until it's too late. Depending on the various factors can determine how fast symptoms develop. How active workers are, how long they've been exposed, and the concentration of carbon monoxide all matter. A headache and nausea are typically the first symptoms. A coma and death can follow.

How to reduce the risks

To reduce the potential for injury or disease, you need to control the risks and hazards in the workplace.

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The first and most effective way to manage the risk of exposure to carbon monoxide is to eliminate the source of exposure. If that's not attainable, use another risk control.

Risk controls

1. **Elimination or Substitution:**
   Involves eliminating the hazard by substituting a safer process or material wherever possible. The most effective control. A question to consider:
   - Can diesel or gas equipment be replaced by electric?

2. **Engineering Controls:**
   Making physical modifications to facilities, equipment and processes can reduce exposure. Some questions to consider:
   - Can the equipment or tools be fitted with emission control devices?
   - Can ventilation be improved?
   - Can building air vents be installed away from loading docks or parking garages?

3. **Administrative Controls:**
   Changing work practices and work policies, awareness tools, and training can limit the risk of carbon monoxide poisoning. Some questions to consider:
   - Have you developed a written exposure control plan for carbon monoxide?
   - Can warning signs be posted in the work area?
   - Can signs explaining exposure symptoms be posted?
   - Can written safe work procedures be posted?
   - Can carbon monoxide monitors be installed?

4. **Personal Protective Equipment (PPE):**
   Least effective control. When used, there must be another control in place as well. Some questions to consider:
   - Do workers have the proper respirators?
   - Has PPE been tested to make sure it's working properly?

****It is important to maintain the proper ventilation systems and conduct regular safety checks within sites to prevent injuries and incidents from occurring.****