



CARBON MONOXIDE DANGERS ASSOCIATED WITH INDOOR USE OF COMBUSTION ENGINES AND HEATERS SAFE WORK PRACTICES

REVISED MARCH 31 2015

Combustion engines are powered by petroleum (gasoline, diesel, and propane) and are used in different types of equipment (bobcat, concrete saw, quick cut saw, etc.).

Engines and heaters powered by propane or natural gas can be very hazardous and should only be connected and started by personnel qualified to do so.

When combustion engines are used in indoor environments or confined spaces there is always a risk of elevated Carbon Monoxide (CO) levels, which can be deadly.

Carbon monoxide is a product of incomplete combustion. It is a toxic, odourless, invisible gas that produces adverse effects by interfering with the ability of the blood to carry oxygen to tissues and the brain.

When CO poisoning symptoms are mild, the victim may not link them to CO poisoning.

CARBON MONOXIDE: POISONING SYMPTOMS

The symptoms associated with CO poisoning are the following:

- Headache
- Nausea
- Feeling of intoxication

More severe poisoning symptoms include the following:

- Severe headache
- Severe nausea
- Progression to mental confusion
- Progression to coma and death

CARBON MONOXIDE: FIRST AID

In the event of CO poisoning, the following procedures should be followed:

1. Move the victim to fresh air.
2. If the victim is not breathing, start artificial respiration (CPR).
3. Keep the victim warm and at rest. (Activity may worsen the effects of CO by increasing the demand for oxygen.)
4. Take victim to the hospital. (The victim will receive enriched oxygen to accelerate the removal of CO from the blood.)
5. If the victim has no pulse, start CPR and have someone call for medical assistance (911).

CARBON MONOXIDE PREVENTION: POWERED EQUIPMENT SAFE WORK PRACTICES

If petroleum powered equipment will be used in an indoor environment or confined space, a risk assessment must be conducted to determine if there is a potential for carbon monoxide build-up.

Carbon monoxide Indoors



If there is a risk of CO build-up, the following practices should be followed:

- Ensure that there is adequate ventilation
- Use a continuous CO monitoring instrument to ensure that workers are not exposed to elevated levels of CO
- If the CO monitor indicates elevated CO levels, evacuate the area until the levels return to normal
- If possible, use local exhaust ventilation systems to remove the equipment exhaust to the outside
- Use dilution ventilation (force fresh air in to the work area), to reduce the build-up of CO

Warning: Carbon monoxide (CO) poisoning is a potential hazard of temporary heating. The most obvious symptom of CO poisoning is headaches. If you suspect high levels of CO notify your Foreman.

Note: A carbon monoxide monitor should be present when a propane or natural gas heater is used in an enclosed area and CO could pose a danger.

CARBON MONOXIDE PREVENTION: HEATERS

Follow these safe work practices when using propane or natural gas heaters:

- Position all temporary heaters on a stable surface
- Propane cylinders under 300 lbs. (136kg) may be used indoors during temporary construction
- A carbon monoxide (CO) monitor should be present when a propane or natural gas heater is used (Carbon monoxide poisoning is a potential hazard of temporary heating, and its most obvious early symptom is headaches)
- Regulators must be used with the propane tank
- A 1st stage regulator is required at the propane tank end to reduce the high pounds tank pressure down to the low pounds pressure for the heater
- Position temporary heaters at least 6 feet (1.83m) away from the fuel cylinder
- Hose length must be a minimum of 10 feet (3.05 m) and a maximum of 50 feet (15.24 m)
- Position fire extinguishers within 30 feet (9.14 m) of a heating unit
- All propane cylinders must be stored outside in a well-ventilated area
- Connection and reconnection of propane tanks must be carried out by a worker trained and certified to do so
- If a manifold system is used, the maximum number of propane cylinders per heater is three (3)
- All propane cylinders must rest on a stable base or be secured when in use or in storage



- When using a gas heater inside a building, the regulator must be vented to the outside (use a garden hose or a black hose)
- Tape the inlets of the gas line and the regulator if the heating unit will not be in use for a period of time
- If heating unit becomes unplugged and will not start, do the following to reset the unit and allow it to start:
 1. Push the “Stop” button.
 2. Push the “Start” button.