

Carbon Dioxide Asphyxiation

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You can suffer an accidental death by asphyxiation from carbon dioxide (CO₂). Customer employees, supplier employees, including drivers that work in or around CO₂ need to know and understand its properties and recognize potential asphyxiation situations. In addition to the facts presented here, you should also review the content of your CO₂ Material Safety Data Sheet (MSDS) with your employees.

CO₂ Need to Know Facts

o It is a colorless, odorless gas and about 1.5 times as heavy as air. Since it is denser than air, high concentrations can occur in open pits and other areas below grade.

o It is an asphyxiant and displaces oxygen, which can cause death. At concentrations of 10 percent and above, it can result in unconsciousness in 1 minute or less.

o It can cause asphyxiation when leaks or discharges occur in enclosed areas, poor or unventilated work areas, or below grade locations that are not confined spaces.

o It can result in impairment in performance during prolonged exposure of 3 percent.

o It can increase the heart rate and blood pressure and can cause headaches, dizziness, sweating, rapid breathing, shortness of breath, dizziness, mental depression, visual disturbance, or shaking depending on the length of exposure and the strength of the concentration.

Other Facts About CO₂

o It is relatively nonreactive and nontoxic.

o It will not burn or support combustion.

o It is normally present in the atmosphere at about 0.035 percent by volume.

o It can cause freeze burns or tissue damage upon contact with dry ice or compressed CO₂.

Driver delivery personnel must also be trained regarding the properties and hazards associated with CO₂. In addition, these are some of the situations that the supplier sales person, driver and customer should be looking for at the customer location.

o Basement container installations should be avoided if at all possible.

o Container installations that are in confined, low or restricted space should have appropriate warning signs and floor-mounted positive ventilation systems to prevent both asphyxiation and pressure buildup.

o If concentrations of CO₂ in the atmosphere are possible, a CO₂ detector with an alarm system should be in place.

o The outlet from the pressure relief device must be piped outdoors for indoors, restricted, confined or limited space installations.

o Any type of built in discharge should be piped outdoors.

o All fill connections should be piped so the connections are made outdoors.

o Suggested wording for warning sign is:

CAUTION
CARBON DIOXIDE GAS
Ventilate before entering
A high CO₂ gas concentration may occur
in this area and may cause asphyxiation.

Additional Information

[OSHA issued an alert on the dangers of carbon dioxide deliveries in 1996](#). The subject of that alert still has merit today.

If you ship and deliver carbon dioxide in tankers or micro bulk units, you should make sure you are following the requirements set out in the latest copies of the CGA pamphlets G6, G6.1, G6.4, G6.5 & G6.6, which can be purchased at www.cganet.com. There is also a CGA Safety Bulletin SB-29, Injury and Loss Prevention Resulting from Carbon Dioxide Delivery to Small Customer Sites, which outlines the precautions when filling carbon dioxide containers indoors at customer sites. SB-29 is available from CGA in electronic form for only \$4, and it is recommend you obtain a copy for review with your workforce.