

# SAFETY MEMO

October 25<sup>th</sup>, 2021 – Carbon Dioxide (CO<sub>2</sub>) – CAS#124-38-9



Did you know?

## What is Carbon Dioxide?

Carbon dioxide is a gas that is naturally occurring in the atmosphere (air) at a concentration of approximately 400ppm. It is colourless and odourless, and often stored under pressure for industrial use. There are a few hazards associated with carbon dioxide, including confined gas under pressure which may explode if heated, frostbite risk, and rapid suffocation caused by the displacement of oxygen (asphyxiation).

## Where do we find it?

Carbon dioxide is often used in the following ways:

- Additive and/or by-product of carbonated beverages
- Refrigerant
- Fire suppressant
- Growth of cell cultures

## How to protect yourself?

- Ensure there is adequate ventilation at points of use or containment.
- Protect storage areas from sunlight.
- Avoid contact with eyes and skin.
- Avoid inhalation. In the case of a leak or a high hazard area, use a self-contained breathing apparatus or respirator and leave the area.
- Install a gas detection and alarm system.

## Why is it a hazard?

Carbon dioxide is heavier than air and therefore can accumulate at low room elevations, enclosed, or areas that are not well ventilated. The air gets displaced, causing localized high concentrations that are above the exposure limits and cause a lack of adequate oxygen concentration, also referred to as asphyxiation. The exposure limit ranges based on exposure time between 30000 ppm for 15 minutes, and 5000 ppm for 8 hours<sup>1</sup> Check your jurisdiction requirements for up-to-date exposure limits.

Additionally, in the case of a sudden leak or release of carbon dioxide, the expanding carbon dioxide cools the surrounding air. This cooling of the surrounding air can, in some cases, cause frostbite.



## Design Considerations

Adequate ventilation to maintain carbon dioxide concentrations below the exposure limit is critical to worker safety. Tanks should also be stored outside, in well-ventilated areas, away from direct sunlight. Carbon dioxide detectors and alarms should be installed in all locations where a leak or high concentration of carbon dioxide is possible. Ensure emission levels are within local code compliance.

Here are some additional examples of typical mitigation and containment measures that can be implemented:

- Equipment Design (instrumentation, automation, detection devices);
- Primary and secondary containment (liquid tight construction, dikes, curbs, dedicated drainage systems);
- SOPs.

<sup>1</sup> Center for Disease Control, Flavorings-related lung disease: occupational exposure limits (June 28, 2018).

<https://www.cdc.gov/niosh/topics/flavorings/limits.html>

