

# SAFETY MEMO

November 8<sup>th</sup>, 2021 – Dioxygen (O<sub>2</sub>) – CAS#7782-44-7



Did you know?

## What is Dioxygen?

Dioxygen, generally known as oxygen, is a gas that is naturally occurring in the atmosphere (air) at a concentration of approximately 21%. It is colourless and odorless, and often stored under pressure for industrial use. There are a few hazards associated with oxygen, including compressed gas under pressure which may explode if heated, and the oxidizing properties of oxygen which can intensify fire<sup>1</sup>.

## Where do we find it?

Oxygen is often used industrially in the following ways:

- Growth of cell cultures
- Packaging inert gas to increase shelf life
- Biological treatment of wastewater

## Why is it a hazard?

Oxygen is an oxidizing agent and therefore increases the risk of fires and aids in combustion. Additionally, in the case of a sudden leak or release of oxygen, the expanding gas cools the surrounding air. This cooling of the surrounding air can, in some cases, cause frostbite. Further O<sub>2</sub> release will develop into an oxygen rich environment, greater than 23.0% will greatly enhance combustion and the potential of a fire. This type of fire will burn hotter than in an atmosphere with less than 23% concentration of oxygen.

## How to protect yourself?

- Ensure there is adequate ventilation at points of use or containment to mitigate fire hazards.
- Protect storage areas from sunlight and other sources of heat.
- Avoid contact with eyes and skin as rapidly expanding gas can cause frostbites.
- Install a high-level O<sub>2</sub> detection and alarm system to mitigate fire hazards.
- Do not store oxygen with flammable substances or near ignition sources.

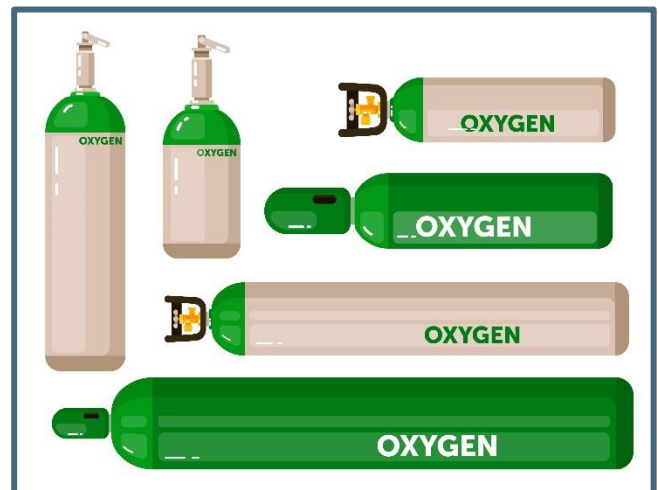
- Always store cylinders in an upright position, with a device to prevent cylinder from falling over.

## Design Considerations

Adequate ventilation is critical to worker safety. Cylinders should also be stored away from sunlight. Oxygen detectors and alarms should be installed in all locations where a leak or high concentration of oxygen is possible. Ensure emission levels are within local code compliance. Finally, ensure oxygen is stored away from combustible materials (reducing compounds, flammable materials) and ignition sources.

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

- Equipment Design adapted for high concentration (instrumentation, automation, detection devices)
- Automatic Venting Systems
- Automatic door closing systems
- SOPs.



<sup>1</sup> Airgas. (2021). Safety data sheet, oxygen. Retrieved from <https://www.airgas.com/sds-search>