



Workplace Safety

## Covering Confined Space Safety

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Many industrial workplaces contain areas not designed for people; however, workers must enter the space to perform specific jobs and tasks to keep operations running smoothly. Maintenance workers often visit these areas when performing standard repairs and upkeep. These work zone areas are called "confined spaces," which pose significant risks to worker safety due to their enclosed nature. If anything *goes amiss* while a worker is inside a confined workspace, escape or rescue may become challenging. In addition, these *work conditions* also present a higher likelihood of accidents because of atmospheric and physical hazards that may cause serious physical harm or even death. For these reasons, the Occupational Safety and Health Administration (OSHA) has established specific safety regulations for those working in confined spaces.

OSHA's General Duty Clause requires employers to provide employees with hazard-free workplaces, which include addressing recognized hazards in confined spaces. This article will discuss what confined spaces are and the potential hazards for workers in these areas. It will also identify OSHA requirements and training opportunities designed to help keep workers safe in these spaces.

### What is a confined space?

# CONFINED SPACE WORK



A confined space is an enclosed area big enough for a person to enter and complete specific tasks, though it isn't intended to contain human occupants regularly. **OSHA** also specifies that a confined space is small, has limited access, and provides very few entries and exit points. Each industry's definition of a confined space may vary. However, they must, at the minimum, comply with OSHA regulations. It's important to note that if you can't fit inside the space, becoming trapped is ruled out, and it is no longer considered a confined space.

These **dangerous work areas** may be classified into two groups: open-topped enclosures and enclosures with limited openings for entry and exit. Open-topped spaces generally have depths that restrict the pure movement of air, such as pits. Confined spaces with limited openings include sewers and silos.

Examples of confined spaces include, but are not limited to, ditches, ductwork, equipment housings, hoppers, pits, tanks, silos, storage bins, vaults, maintenance holes, tunnels, and pipelines. Here are some common industries where these confined spaces exist:

- **Agriculture** – silos, grain bins, manure pits, water tanks, wells
- **Construction** – sewer pipes, septic tanks, open ditches
- **Food and Beverage** – batch cookers, hoppers, mixing vats, storage tanks
- **Paper Mill** – pulp storage chests, **dryer cans**, water tanks, vats
- **Mining** – pits, tunnels
- **Railroad** – tank cars

- **Ships and Shipping**– cargo holds, *chain lockers*, compartments, fuel tanks, freight containers
- **Steel** – dust catchers, pipelines, sewers, *electrostatic precipitators*
- **Oil and Gas** – pipelines, sand storage, mud pits
- **Utility** – manholes

Confined Space	Fatalities
Ditches, channels, and trenches	203
Silo and grain bin	107
Sewers, manholes, and storm drains	61
Underground mines	58
Tanker trucks	20
Septic tank and water tank	19
Manure pits	18
Crawl Spaces	13
Wells and Cisterns	10
Oil storage tank	7
Grain elevator	6

According to the BLS, types of confined spaces causing the most fatalities from 2011-2018

## Hazards and Accidents

First and foremost, workers can become easily trapped, a threat with life and death consequences. Because of the restricted space and limited means of escape, numerous other hazards are associated with entering a confined space. Conditions are worsened due to work activities performed:

- Welding and cutting
- Using chemicals, such as solvents
- Using gas-powered equipment

## Atmospheric Hazards

Atmospheric hazards affect a person's ability to receive oxygen. Dusts, chemicals, fumes, fog, and mist can all negatively impact a person's ability to breathe. When the potential for these hazards exists, a worker must test the oxygen levels in the confined space before entering.

## Flammable Atmosphere

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## Oxygen Deficiency

Hazards caused by a *lack of oxygen* may occur if the air is displaced for gas during chemical reactions or air absorption onto steel surfaces. Some examples of chemical reactions are drying paints, curing concrete, and cleaning with acids.

## Oxygen Enrichment

Hazards occur when too much oxygen is present in the air, creating an environment susceptible to fires and explosions.

## Toxic Gases

Substances used while inside a confined space during *fabrication processes*, such as spray painting and welding, can cause serious health effects for individuals. Toxic sewer gases or leaks from welding torches may be present. Workers may encounter other toxic gases, including hydrogen sulfide, carbon monoxide, and solvents, when working in confined spaces. Industrial products that can seriously harm individuals if inhaled at an elevated concentration include kerosene, petrol, paint, residues, strippers, and degreasers.

## Physical Hazards

Physical hazards present in confined spaces are another safety concern. *Engulfment* is one of the most common ways workers can be injured or killed when working in a confined space. Through a process known as bridging, the material found inside of a confined space begins to collapse, engulfing anyone located at a lower level. Flowing liquid also has the potential to enter confined spaces, drowning those who may be inside. Other physical hazards include excessive heat, fall threats, low temperatures, slippery surfaces, low visibility, noise levels, electricity, and moving equipment.

Click [\*here\*](#) to continue reading this blog in its entirety and learn about OSHA requirements for workers entering a confined space.

*Previously Featured on MCR Safety's blog.*