# Confined Space Entry




## WHAT'S AT STAKE?

Confined spaces can be below or above ground. Confined spaces can be found in almost any workplace. A confined space, despite its name, is not necessarily small. Examples of confined spaces include silos, vats, hoppers, utility vaults, tanks, water supply towers, sewers, pipes, access shafts, truck or rail tank cars, aircraft wings, boilers, manholes, pump stations, digesters, manure pits and storage bins. Ditches and trenches may also be a confined space when access or egress is limited. Barges, shipping containers and fish holds are also considered as possible confined spaces.

Context is important to understand the danger of entering a confined space. One must be, careful to follow the very special precautions and procedures before entering. Even if you just are able to put your head through the opening of a confined space, you are entering. Confined spaces are not designed for someone to work in regularly, but workers may need to enter the confined space for tasks such as inspection, cleaning, maintenance, and repair.

Many confined spaces have small openings, which can make entry and exit difficult and can complicate rescue procedures.

## WHAT'S THE DANGER?

### Hazards in Confined Spaces can include:

- **Poor air quality**: – There may be an insufficient amount of oxygen for the worker to breathe. The atmosphere might contain a poisonous substance that could make the worker ill or even cause the worker to lose consciousness. Natural ventilation alone will often not be sufficient to maintain breathable quality air.
- **Hazards from asphyxiants** – Simple asphyxiants are gases which can become so concentrated that they displace oxygen in the air (normally about 21 percent). Low oxygen levels (19.5 percent or less) can cause symptoms such as rapid breathing, rapid heart rate, clumsiness, emotional upset, and fatigue. As less oxygen becomes available, nausea and vomiting, collapse, convulsions, coma and death can occur. Unconsciousness or death could result within minutes following exposure to a simple asphyxiant. Asphyxiants include argon, nitrogen, or carbon monoxide.
- **Chemical exposures** – Skin contact or ingestion as well as inhalation of 'bad' air.
- **Fire hazard:** – Explosive/flammable atmosphere due to flammable liquids and gases

and combustible dusts which if ignited would lead to fire or explosion.
- **Process-related hazards** – Residual chemicals, release of contents of a supply line.
- **Physical hazards –** noise, heat/cold, radiation, vibration, electrical, and inadequate lighting.
- **Safety hazards –** Moving parts of equipment, structural hazards, engulfment, entanglement, slips, falls.
- **Explosion**
- You can't smell or see some explosive gases so you might not know they are in the air. A spark or other ignition source might result in an explosion. Many dusts and chemicals can also explode.
- **Trapped, Crushed, Or Buried**
- Loose or unstable materials might fall on you and trap or bury you. A liquid, a hazardous gas, or steam might flow into the space. You might get caught in a piece of equipment that starts moving.

# HOW TO PROTECT YOURSELF

The first rule is that one should never enter s confined space without proper training. You are in the "control position if you are equipped with proper training and personal protective equipment. In addition, written procedures and an entry permit system are essential.

## Guidelines

- **Take atmospheric precautions.** The atmosphere should be tested before you enter – by trained people using the right equipment. The confined space should be ventilated until it tests safe, and possibly afterwards. If this is not possible, the right respiratory protection should be worn
- **Lock out energy sources.** Lines carrying gases, liquids or solids should be disconnected or blocked off before you enter. Valves and electrical circuits should be locked out and tagged.
- **Remove possible sources of ignition**. Use non-sparking tools and lighting devices in a potentially flammable atmosphere.
- **Be fully prepared before entry.** Make sure you are wearing the required personal protective equipment (PPE) including a hardhat, safety-toed footwear, gloves and your breathing apparatus
- **Wear a lifeline.** The lifeline should be connected from your body harness to a winch outside the confined entrance so you can be pulled out in case of emergency.
- Have **trained and equipped personnel** standing by outside the confined space, for communication and rescue if necessary

## Overview of Prevention/Controls

The traditional hazard control methods found in regular worksites can be effective in a confined space. **These include engineering controls, administrative controls and personal protective equipment.** Engineering controls are designed to remove the hazard while administrative controls and personal protective equipment try to minimize the contact with the hazard.

However, often because of the nature of the confined space and depending on the hazard, special precautions not normally required in a regular worksite may also need to be taken. The engineering control commonly used in confined spaces is mechanical ventilation. The **Entry Permit** system is an example of an administrative control used in confined spaces. Personal protective equipment (respirators, gloves, ear plugs) is

commonly used in confined spaces as well. However, wearing of PPE sometimes may increase heat and loss of mobility. Those situations should be carefully evaluated. When using PPE, always use as part of a PPE program and be sure to evaluate all possible hazards and risks associated with PPE use.

## FINAL WORD

Many workers are injured and killed each year while working in confined spaces. An estimated 60% of the fatalities have been among the would-be rescuers.  A confined space can be more hazardous than regular workspaces for many reasons. To effectively control the risks associated with working in a confined space, a confined space hazard assessment and control program should be implemented for your workplace. Before putting together this program, make sure to review the specific regulations that apply to your workplace.