

# Confined Space Hazards

## Introduction

Confined space hazards can be divided into four broad and far reaching categories. These categories are Configuration, Biological, Physical and Atmospheric. It is important to understand each of these groupings as they are often used in the classification of specific confined spaces hazards at a worksite. It should also be noted that a confined space is not necessarily limited to the hazards of just one category. After a proper hazard assessment is completed by a qualified person, it may be revealed that a particular confined space possesses hazards from two or more of the categories, or they are being introduced by the work being performed in the space.

## National regulations and Specified Risks

It is important to note that some national regulations specifically provide as part of the definition of a confined space that the presence of one or more specified risks must either be present or be reasonably foreseeable to occur within the space or during the work being undertaken within the space. These can include:

- fire or explosion (gas, vapour, dust, excess of oxygen);
- loss of consciousness of any person at work arising from an increase in body temperature;
- loss of consciousness or asphyxiation of any person at work arising from gas, fume, vapour or the lack of oxygen;
- drowning due to the level of a liquid; or
- asphyxiation from entrapment by a free flowing solid;

This list of specified risks covers the major risks but is not exhaustive; risks associated with configuration and biological hazards being noticeably absent.

If your enclosed space does foreseeably contain one of the above specified risks, but does contain another health or safety hazard, then conduct a risk assessment and as required treat the space as a confined space.



## Configuration Hazards

When the design, shape, or dimensions of a confined space pose a risk to occupants, that space is said to possess a configuration hazard. For example, a worker needing to descend into a vessel through a small opening at the top would need to be lowered using specialized fall protection and access systems.

The main concern with working inside a configuration hazard confined space is the fact that getting into, moving around within, and/or getting out of this type of confined space can be difficult, hazardous, awkward, or abnormally time-consuming. Specific configuration hazards can be identified as, but are not limited to;

- Slippery surfaces
- Long traverses
- Small openings
- Compartments
- Slopes
- Narrow passages
- Low ceilings
- Vertical drop/raises
- Tight spaces
- Bulkheads

Should an incident occur, configuration hazards may complicate or even prevent a simple self-rescue or non-entry rescue (entrant can be directly winched out of the confined space in an emergency), meaning that the only option is to send your rescue team into the confined space to affect a rescue.

## Biological Hazards

Biological hazards found within a confined space can pose a tremendous health risk to workers who encounter them. Although these hazards are most commonly associated with confined spaces such as sewer systems, silos, and culverts, workers should never overlook the possibility of these hazards existing in all other types of confined spaces. Careful assessment of the confined space is critical prior to entry to ensure the biological hazards are identified and properly mitigated. Specific biological hazards can be identified as, but not limited to;

- Rodent droppings
- Poisonous plants
- Molds and Fungi
- Sewage
- Insect infestation
- Sharp objects
- Infectious agents
- Stagnant water
- Stray animals

## Physical Hazard

The term physical hazard encompasses a vast list of many possible sources and mechanisms of injury. Due to the wide array of potential physical hazards, these types of hazards can be found within the confined spaces of almost all industries. Although many of these hazards are present outside of confined spaces, they all pose the same danger within these spaces. The environment, machinery, tools, vehicles, timing, tasks, and other workers can all create and intensify physical hazards. Some examples of physical hazards include, but are not limited to:

- Electricity
- Mechanical equipment
- Radiation
- Stored energy
- Temperature Extremes
- Noise
- Limited visibility
- Engulfment/cave-ins from free-flowing solids and aggregates
- Vibration
- Fluid or air pressure
- Drowning, particularly in sewers and drains where sudden changes in water level may occur



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## Atmospheric Hazard

Atmospheric hazards are one of the most commonly encountered hazards during work in a confined space. They can be difficult to recognize and, in some cases, even harder to control. In fact, many instances of confined space fatalities have occurred as a result of atmospheric hazards. These atmospheric conditions come in a variety of forms, effectively being able to identify and control all atmospheric hazards before any work can be done in a confined space is essential. Some examples of atmospheric hazards include, but are not limited to:

- Oxygen deficiency due to displacement by other gases or being consumed by metals and organic materials
- Asphyxiant atmospheres such as enriched carbon dioxide atmospheres or oxygen displacement
- Toxic atmospheres such as carbon dioxide, hydrogen sulphide, etc.
- Flammable / Explosive atmospheres due to presence of gases, vapours or dusts such as hydrogen, methane, solvent vapours, grain dusts, or oxygen enrichment
- Particulates, such as silica, cement or grain dust
- Welding fume, gases and vapours