

Confined spaces

Confined Spaces are areas that are difficult to get into, as well as to get out of. They are not designed to be continually occupied by humans. Poor ventilation and other hazards in these spaces, such as moving parts, can threaten your life!

Examples of confined spaces are: tanker trucks, process vessels, crawl spaces, silos, bins, boilers, storage tanks, tunnels, pipelines, wells, manholes, sewers, vaults or any underground areas.

You might go into a confined space to inspect, test, repair, for maintenance or cleaning.

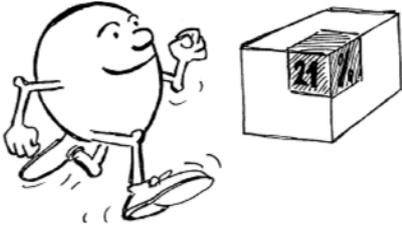


Any space, above or below ground, with poor natural ventilation should be treated as **CONFINED & DANGEROUS**.

Note: Most states of Australia have their own **Confined Spaces legislation**. Please ensure you comply as required.

The five (5) major dangers of confined spaces are:

- Oxygen Deficiency (Example: Asphyxiation in a bank vault)
- Combustibility of the atmosphere (Example: mine explosions)
- Toxicity of the air or things you might touch (Example: benzene vapour inside petrol tanker.)
- Physical Hazards (Example: stumps under floor of house)
- Engulfment (Example: collapse of a trench)



Normal, safe oxygen levels range from 19.5% to 21% of the air in the space.



At 16% you'll start developing symptoms like fast breathing & heartbeat, drowsiness & nausea.



At 12% you'll be unconscious.



At 6% you'll be dead.

Special Notes

- 1) **These symptoms come quickly.** Workers have been killed just in the short time it took to retrieve a dropped tool from the bottom of a tank.
- 2) Be sure to have the confined space *fully* tested by a qualified person trained in 'Confined Space Entry' **before** you enter and while you're working there.

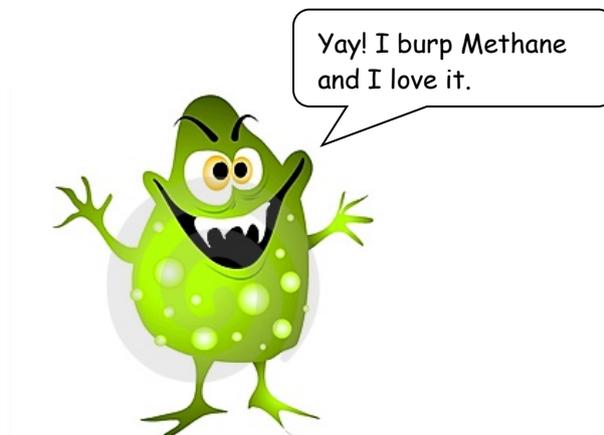
The following is an example from the *Code of Practice for Confined Spaces, No: 20* (Victorian WorkCover Authority)

If a space...

- a) is, or is intended to be, or is likely to be, entered by any person; and
- b) has a limited or restricted means for entry or exit that makes it physically difficult for a person to enter or exit the space; and
- c) is, or is intended to be, at normal atmospheric pressure while any person is in the space; and
- d) contains, or is intended to contain, or is likely to contain -
 - i) an atmosphere that has a harmful level of any contaminant; or
 - ii) an atmosphere that does not have a safe oxygen level; or
 - iii) any stored substance, except liquids, that could cause engulfment

Oxygen Replacement

Living things in enclosed spaces (microbes for example), can use up the oxygen and replace it with Carbon Dioxide or Methane, making it toxic to us.



Underground Works or Pipes

The following is an example of the terminology used within various *state Confined Space Regulations/Codes of Practice* regarding the entry into underground works or pipes.

When men enter any underground works or pipeline which is in commission, has been commissioned or is connected to an operations systems, it is the responsibility of the person directing the party to enter to ensure that the pipeline is discharged and that the hazardous nature of the substance be known, before the party enters and is not recharged until every member has left and been individually accounted for.

No entry to any operational pipeline, storm water drain or live sewer may be made without the knowledge and permission of the responsible operating authority.

Before entry, a surface party must be formed to maintain constant communications between members of the party who have entered so that the immediate action can be taken at the first sign of distress.

The person in charge of the surface party must know the intentions of the group entering, including the anticipated time involved and the point of exit.

The surface party must keep an eye on the weather, particularly rain, and keep the underground party informed of any dramatic changes.

Summary: History provides many examples of the dangers to rescue parties who have entered underground confined spaces ill-prepared.

Slow Oxidation

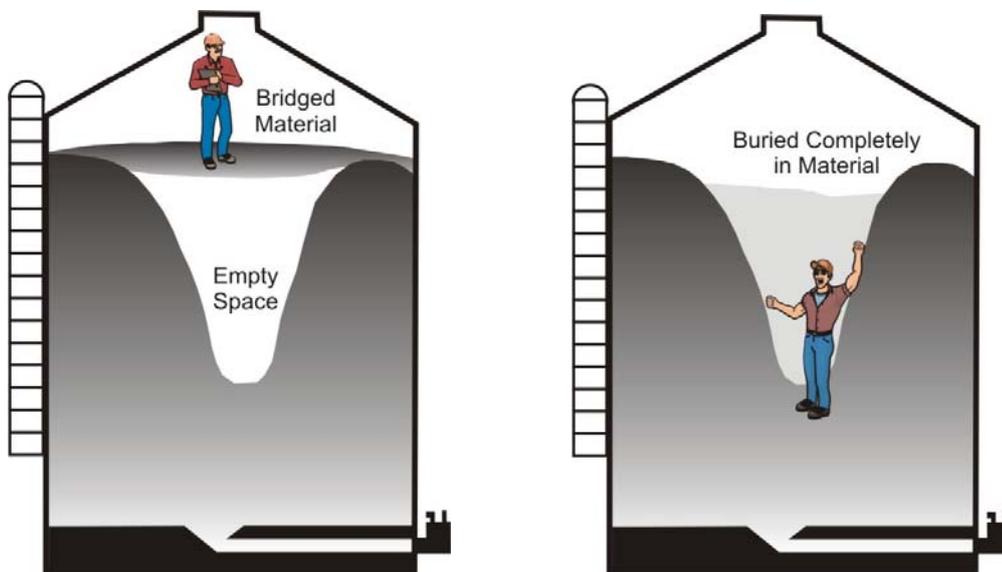
The removal of oxygen by slow oxidation of inorganic matter (rusting of iron) can result in tragic consequences.

Rusting can occur overnight on steel tank walls removing up to 90% of the oxygen from the air.

Engulfment: means to plunge into and be immersed by material. It may result in injury or death from asphyxiation or from being crushed by loose granular material stored in containers such as silos, bins, and hoppers.

Examples of materials which are often stored in a way which results in the risk of engulfment include:

- plastics, chemicals and agricultural products, such as sand, fertiliser, grain;
- coal, coal products and wood chips.



Loose materials can crust or bridge over when a container of stored material is emptied from below leaving the top layer in place. Employees walking on the bridge or employees working below the bridge on the floor of the container may be engulfed if a bridge collapses.

Another engulfment hazard arises from the formation of cavities by other methods.