

FACT SHEET

CONFINED SPACES: PLANNING ENTRY AND WORKING SAFELY IN A CONFINED SPACE

WorkSafe New Zealand accepts AS 2865 *Confined spaces* as the current state of knowledge on confined space entry work.

CONFINED SPACES – SERIAL KILLER

Confined spaces have been likened to a serial killer. Year after year, people die when entering confined spaces to carry out work. In some cases, multiple fatalities occur when would-be rescuers enter the space and become victims themselves.

Consider these cases in New Zealand:

- > A man was killed when he was engulfed in a silo containing sand.
- > Two men were hospitalised after inhaling hydrogen sulphide. One man was cleaning inside a tank that previously stored a substance for cultivating mushrooms. When he lost consciousness, the second man climbed in to rescue him before also losing consciousness.
- > Three men died from lack of oxygen inside a sewer.
- > A man drowned in slurry after being suffocated by fermentation fumes in a tank used to mash pig feed.
- > A winemaker inspecting a vat was suffocated by fumes from fermenting wine.

- > A man steam cleaning the inside of a fuel tank died from lack of oxygen.

ABOUT THIS FACT SHEET

Confined space work is covered by an Australian standard: AS 2865 *Confined spaces*.

This fact sheet will give you a brief overview of the requirements and procedures in the standard. It is not a substitute for the standard itself.

Anyone who carries out confined space work needs to be familiar with the standard, and should have specialist training as well.

WHAT IS A CONFINED SPACE?

A confined space is defined as an enclosed or partially enclosed space that is not intended or designed primarily for human occupancy. It is liable to have an atmosphere that contains harmful contaminants or not contain a safe oxygen level. It may have contents that could cause engulfment. It may have restricted means for entry and exit.

Examples include: storage tanks, tank cars, process vessels, boilers, silos, pits, pipes, sewers, shafts, ducts and shipboard spaces.

WHAT DOES THE STANDARD REQUIRE?

The standard follows the approach of the Health and Safety at Work Act 2015 (HSWA). It requires persons conducting a business or undertaking (PCBUs) to:

- > identify the hazards associated with working in the confined space and conduct a risk assessment
- > control the risks posed by the hazards by:
 - elimination
 - minimisation, including using personal protective equipment (PPE).

IDENTIFYING HAZARDS AND ASSESSING RISK

The standard gives detailed information on hazard identification and risk assessment.

Some of the hazards of confined spaces include:

- > Oxygen-deficient atmospheres, which can cause brain damage and death.
 - Oxygen deficiency can be caused by rust, fire, absorption by grain or soils, consumption by bacteria, or displacement by another gas.
- > Toxic atmospheres, containing gases, vapours, dusts or fumes that have poisonous effects on the body. Cleaning, painting or welding may produce dangerous vapours and fumes.
- > Flammable or explosive atmospheres, containing flammable gases, vapours or dusts which could be ignited by a spark or open flame. The risk of explosion or spontaneous combustion is increased if an oxygen-enriched atmosphere exists (where the oxygen content is greater than 23.5%).
- > Engulfment – workers can be trapped or buried by dry bulk materials such as grain, sand, flour, fertiliser and sawdust.
- > Operation of moving parts, eg being trapped or crushed by augers, mixers, agitators or conveyor belts).
- > Uncontrolled introduction of steam, water, or other gas or liquid.

- > Other hazards could result from the work being done, eg noise, extremes of temperature, radiation, manual handling and falls.

CONTROLLING THE RISKS

The control measures should be applied in the order given earlier (beginning with elimination, followed by minimisation). Consider the following issues:

Can work be done without entry to the confined space?

Always, as a first step, check to see if the work can be done with equipment from outside the confined space. The golden rule is: Don't go in if you don't have to.

Isolate contaminants and moving parts

Prevent accidental introduction of materials, eg steam, water or bulk materials, through piping, ducts, vents, etc. De-energise, lockout or tagout machinery.

Clean and purge the confined space if necessary

Use a suitable cleaning method to remove harmful solids or sludges. Purge to remove harmful gases or vapours.

Warning: Never use oxygen to purge a confined space: this can create a fire and explosion hazard.

Test the atmosphere for oxygen

Use a suitable detector to determine whether the confined space contains a safe oxygen level for breathing.

Where possible, carry out atmospheric testing without entering the confined space.

Test the atmosphere for toxic and combustible contaminants

Test for toxic contaminants (eg hydrogen sulphide, methane, carbon monoxide) and combustible contaminants (eg petroleum vapours).

You need to use appropriate detection equipment, which should be correctly calibrated at regular intervals.

Ventilate the confined space if necessary

Ventilate the confined space by using a fan, by blowing air in with a compressor, or by opening more manhole covers or other entry or exit points. Then test again for levels of oxygen and other gases to ensure that contaminants are reduced to below the Workplace Exposure Standard, or a safe level.

Select appropriate breathing apparatus if necessary

If the space can't be ventilated, or if the work will contaminate the atmosphere (eg hot work, painting, sludge removal), use a suitable self-contained breathing apparatus or supplied-air respirator.

Select personal protective and safety equipment

As well as breathing apparatus, this could include items such as safety helmet, gloves, hearing protectors, safety harness and lifeline.

Personal protective equipment should only be used either as a last resort, when all other control measures fail to control the risk, or in an emergency response.

Issue a written authority for entry to work

The PCBU or person responsible for the work should issue a written authority – or confined space entry permit – as described in the Standard. Essentially, this permit is a safety checklist to make sure nothing is overlooked.

If necessary, have a trained stand-by person outside the confined space

The stand-by person's role is to monitor the safety of the person working inside the confined space and to take action if an emergency arises.

Ensure there is a reliable system of communication – by voice, radio, hand signals, hard-wired communication, etc.

Monitor and maintain control measures

Test the air in a confined space constantly as oxygen and gas levels in a confined space can change quickly. Be alert for any change in conditions.

If conditions change, evacuate the confined space

If necessary, there should be a system for getting a worker out of the space quickly if anything goes wrong. This could include using a safety harness and lifeline attached to a tripod.

FOR FURTHER INFORMATION

This fact sheet is a brief summary of the standard, and does not provide all the information required for safe working in a confined space.

- > AS 2865 *Confined spaces*.
(Available from SAI Global at www.infostore.saiglobal.com)

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