

# CARBON DIOXIDE

Elevated carbon dioxide concentrations can result in engulfment by oxygen displacement with a resultant low oxygen concentration, and are generally dealt with by monitoring oxygen. Carbon dioxide is heavier than air so it can be particularly dangerous where people are working at the bottom of a trench. Trenches deeper than 1.5m must be shored and thus a depth of 1.5m is commonly taken as the allowable depth of trench before monitoring must occur; however this assumption is not always correct. For example, lack of sufficient oxygen can occur in a shallower trench if it is narrow and people are down low on their knees, or if there are several people in the trench.

## CONTACT GETEX FOR ASSISTANCE

*GETEX has the people, the experience, the expertise, the training, the equipment, the availability*

*Confined Spaces are a specialist area, don't take chances*

**GETEX operates 24 hours/day, 7 days per week  
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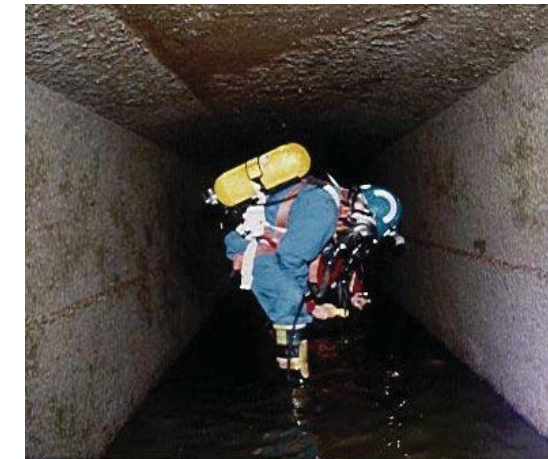


URGENT SOLUTIONS TO URGENT PROBLEMS

# CONFINED SPACES

GETEX provides a range of monitoring, inspection and consultancy services for safe working in Confined Spaces including:

- Assessment of Hazards and Risk
- Advice on Standards and Codes
- Supervision of Confined Space Entry
- Measurement of Toxic Gases and Vapours
- Logging of Oxygen and Explosivity with Safety Alarm
- Tank Entry Clearance
- Trained Qualified Professional Staff and the Latest in House Equipment
- Emergency availability at short notice
- Call out service 24/7
- Experience and Expertise



Confined spaces are fully or partially enclosed spaces at atmospheric pressure not designed or intended primarily as a place of work. They frequently have restricted means of access. Confined spaces are liable to have an atmosphere which contains harmful levels of contaminant, have an oxygen deficiency or excess, or cause engulfment. Partially enclosed spaces can be of a design in which atmospheric contaminants could accumulate, such as heavier than air gases.

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**HIA members**  
the best in the business



The potential percentage of oxygen in the atmosphere is a prime consideration in identification of a confined space. If at any time the oxygen may fall below 20.9% by volume the space must be considered a confined space.

AS/NZS 2865:2001 and the NSW Occupational Health and Safety Regulation 2001 provide the regulatory framework for confined space work, while HB 213:2003 provides Guidelines for safe working in a confined space.

Entry into a confined space is defined as when a person's breathing zone of head or upper body is within the boundary of the confined space.

Prior to entry the hazards associated with working in that space must be identified by a competent person and the risks assessed.

Frequently identified risks are

**Explosion**

**Lack of Oxygen**

**Toxic gases**

A risk assessment identifying the hazards, the work to be done, the methods by which the work can be done, the proposed equipment, the risks, the emergency response procedures, the atmospheric monitoring program, the competency required of the workers, must be prepared. Entry must be controlled by the use of a written permit system.

While the space has people working in it there must be separate standby and designated rescue people equipped with the appropriate rescue equipment. People undertaking Confined Space activities must be trained and competent, and records must be kept.

It must be confirmed in writing that all persons have left the space before authorisation for return to normal service of the space is given.

Some Confined Space issues involve less common situations, such as conducting work in a ship's hold that has been used for transporting coal. The coal dust can not be fully removed and the best approach may be to keep the area very wet with water. The people at GETEX have years of experience and the expertise to deal with these less usual problems.

Confined spaces can be deadly and fatal accidents frequently involving more than one death are common. Death may come quickly and without warning.



Rescuers entering the confined space may also perish if they do not have the appropriate training and equipment.

A USA study some years ago showed that 39% of deaths from entries into confined spaces were caused by attempts to rescue another person.

*The first confined space investigation by one of our principal consultants took place some 30 plus years ago in the Antarctic and involved multiple hazards. The investigation was in response to an incident in which an operator entered a metal storage tank and applied a protective membrane using a solvent based adhesive. He was unsupervised and untrained, there was inadequate ventilation and the electricals were not flame proof. He collapsed dropping the light which shattered causing a small explosion. He managed to escape the tank but later died after being transported to an Auckland hospital.*

*Special requirements apply to measurement of and the allowable levels of oxygen and Explosivity when people are working in a confined space.*

## EXPLOSIVITY

*The concentration of flammable contaminant in the atmosphere of a Confined Space is generally measured as % of the Lower Explosive Limit (LEL), also called Explosivity.*

*LEL < 5%*

*Work is allowed and entry is permitted*

*LEL 5%-10%*

*Work may take place but only while there is continuous monitoring*

*LEL > 10%*

*Get out immediately*

*LEL 100%*

*If ignition source exists an explosion or fire will occur*

## OXYGEN

*The oxygen content of the atmosphere must not exceed 23.5%, and it must not fall below 19.5%. If it is feasible that the percentage of oxygen may fall below 19.5% persons entering the space must wear suitable personal protective equipment including appropriate air supplied respiratory protective equipment.*