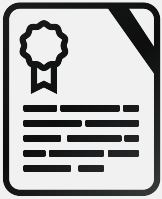


WHITEPAPER:

Working in Confined Spaces

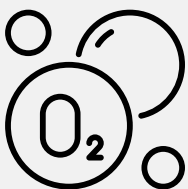
Level: Beginner



You should familiarise yourself with **The Confined Spaces Regulations 1997**.



Always follow the emergency rescue plan.
50% of the injuries sustained in confined spaces are to those people who went in to help.



Reduced oxygen is the most common hazard when working in confined spaces.

Introduction

This whitepaper is a basic introduction to working in confined spaces.

Content includes:

- Keeping yourself and others safe
- Risk assessments and permits
- Roles and responsibilities
- Potential hazards in confined spaces
- Health & safety equipment



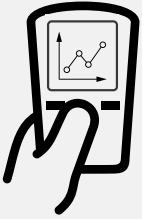
Confined Space Definition:

"Any place, including any chamber, tank, vat, silo, pit, trench, pipe, sewer, flue, well or other similar space in which, by virtue of its enclosed nature, there arises a reasonably foreseeable specified risk".

The Confined Spaces Regulations 1997



Never enter a confined space unless authorised to do so.



Oxygen, flammability and toxicity tests are required, when assessing the atmosphere.



Are you working in a classified zone?

Zone 0: Explosive atmosphere for more than 1000h/yr.

Zone 1: Explosive atmosphere for more than 10, but less than 1000 h/yr.

Zone 2: Explosive atmosphere for less than 10h/yr, but still sufficiently likely as to require controls over ignition sources.

The Rules of Engagement - Keeping Yourself & Others Safe

1

Wherever possible, avoid carrying out tasks in confined spaces. If you must enter, do not do so unless you are permitted to.

2

Be aware of the risks that may occur within a confined space, and ensure you are fully trained & capable of the task in hand.

3

Ensure Risk Assessments have been conducted & permits have been issued.

4

Ensure there is an emergency rescue plan and that first aid & resuscitation equipment is on stand by. Always follow the plan.

5

Always ensure you have standby personnel - they must never leave their post..

Understanding Risk Assessments & Permits

Risk Assessments

A Confined Space Risk Assessment should detail:

- Entry & exit points, and the size, shape & type of environment
- Known residues and contaminants
- Oxygen levels & atmospheric test data (eg. flammability, toxicity)
- Is it a classified hazardous zone? Zone 0, 1, 2?
- Activities being undertaken in the work area
- Materials, tools and equipment being used in the work area
- Health and safety control measures
- Emergency rescue plan

Safe System of Work

A Safe System of Work must; assess the task, identify the hazards, define safe methods, implement the system and monitor the system.

Permit-to-work

A Permit-to-work is a formal check of the Safe System of Work. It authorises certain people to carry out specific work in a given time frame, describes what work will be done and, based on the risk assessment, sets out the precautions required to complete the work safely. It also requires declarations from those authorising the work, those carrying out the work, and those involved in shift handover or extensions to the work. Whilst a Permit-of-work is not compulsory for working in confined spaces, whether one is required or not, should be decided by a competent, trained person - often the supervisor, as detailed on the following page.



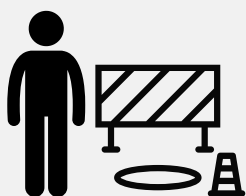
Be aware that a separate hot works permit might also be required.



Keep an eye on your co-workers to ensure that everyone is working safely and feeling healthy.



Ensure that there is an emergency rescue plan and that first aid & resuscitation equipment is on stand-by.



Stand-by Personnel should NEVER leave their post.



Roles and Responsibilities

Supervisor

- Try to eliminate the need for entry into a confined space.
- If unavoidable, conduct a Risk Assessment and develop a 'Safe System of Work'.
- The supervisor should inspect the confined space and is responsible for the permit-to-work system.
- They should check and supervise the work being undertaken.
- They should re-inspect and re-issue permits as required.

Work Team

- You must be authorised to enter the confined space under the permit-to-work system.
- Workers should ensure that they have the correct PPE & safety equipment as specified in the risk assessment.
- Staff should be physically and psychologically fit to work.
- Workers should keep an eye on each other (as well as themselves) to ensure that everyone is working safely and feeling healthy.
- Staff should report any accidents, near misses, equipment faults etc.
- If someone is in danger, raise the alarm.

Stand-by Personnel

- You should be positioned close to the entry and never leave your post.
- You should prevent unauthorised entry and keep a record of who does enter and exit.
- Remain in constant contact with the work team.
- Continuously check safety equipment, monitors and conditions.
- Initiate emergency evacuation procedure if required, but never enter the confined space yourself.

Rescue Personnel

- Rescue personnel must be fully trained in rescue, CPR and first aid, and should take precautions for their own safety.



Methane levels are explosive when they are between 4% - 17%



Never use pure oxygen to ventilate a space, as this will create a risk of explosion.



In a hot environment, it is recommended that you drink 1 litre per hour to keep yourself hydrated.



If you begin to feel dizzy, nauseous, irritable, exhausted, extremely hot or cold, or in pain, leave immediately.



Potential Hazards

- Air may not move freely and gases can build up, therefore creating an oxygen deficient or toxic atmosphere.
- Activities being conducted inside the work area, such as; grinding, welding, spray costing, sandblasting and hydroblasting, can create new risks.
- Machinery can create additional hazards, including; diesel fumes, sparks, electric shocks, collapse, slips, trips and falling objects.
- Dust, gases, fumes, vapours, chemicals, and solvents can create a flammable or explosive atmosphere.
- Oxygen deficient or contaminated atmospheres can create a risk of asphyxiation or suffocation.
- Other respiratory risks include; breathing difficulties, inflammation of the lungs and occupational asthma.
- Granules of sand, flour, dust & other substances pose a risk of suffocation.
- Liquids can create a risk of drowning - they can also be corrosive or toxic.
- Sewage pipes and similar unsanitary environments harbour bacteria and diseases. There is also a risk of skin and eye infections.
- Extreme temperatures (hot or cold) can cause dizziness, nausea, sickness, pain, irritability, confusion or worse.
- Confined spaces have limited entries and exits, and it can be fatal if your escape route(s) become blocked.
- Noise can be amplified inside confined spaces and may damage your hearing.



Masks must be fit-tested and you should be clean shaven, so that you can ensure a tight seal against the skin.



Be aware of dangerous Oxygen levels:

20.9% Oxygen is normal
19.5% Your heartbeat increases
16% You struggle to breathe
14% You are exhausted & sick
11% You lose consciousness



If the air becomes too contaminated or oxygen levels drop too low, an alarm will sound on your monitor and you should escape immediately.



Always ensure that you have the correct PPE as per the risk assessment.

Examples of Health & Safety Equipment for Confined Spaces

Access Equipment

Tripods, winches, harnesses, fall arrest devices and davit arm systems are used to ensure safe entry and exit into/ out of confined spaces, such as shafts, silos, tanks, man-holes etc.



Respiratory Equipment

Air filtering masks (half mask or full mask) contain replaceable cartridges or filters. This type of mask is only designed to filter contaminants.

Air supplying masks supply clean air, either from a self-contained canister, or via compressed air hose. Your risk assessment will specify which is required.



Monitors

The type of monitor required will depend on the hazards in the confined space. In oxygen deficient atmospheres you will require an Oxygen (O2) monitor. To detect an explosive atmosphere you will require a combustible LEL monitor. You may also need additional toxic gas monitors such as hydrogen sulphide (H2S) and carbon monoxide (CO). Most 4-gas monitors can measure a combination of LEL, O2, CO & H2S.

Ventilation

Every project is different and poses its own interesting challenges. Ideally you will be looking to dilute the hazard by forcing clean air into the work space or using positive pressure ventilation to purge out the hazard, however there are many scenarios in which you might also consider extraction..



For more information about Confined Space Safety Equipment, visit:
www.rvtgroup.co.uk/hire-equipment/confinedspaces/equipment

