



Confined spaces can be deadly. On average, work in confined spaces kills 15 people every year in the UK across a wide range of industries, from those involving complex plant through to simple storage vessels. In addition, a number of people are seriously injured. Those killed include not only people working in confined spaces but those who try to rescue them without proper training and equipment.

What is a Confined Space?

It can be any space of an enclosed nature where there is a risk of death or serious injury from hazardous substances or dangerous conditions (e.g. lack of oxygen).

Some confined spaces are fairly easy to identify, e.g. enclosures with limited openings:

Storage tanks. Silos. Reaction vessels. Enclosed drains. Sewers.

Others may be less obvious, but can be equally dangerous. For example:

Open-topped chambers. Vats. Combustion chambers in furnaces, etc. Ductwork. Unventilated or poorly ventilated rooms.

It is not possible to provide a comprehensive list of confined spaces. Some places may become confined spaces when work is carried out, or during their construction, fabrication or subsequent modification.

What are the Dangers from Confined Spaces?

Dangers can arise in confined spaces because of a lack of oxygen. This can occur:

Where there is a reaction between some soils and the oxygen in the atmosphere.

Following the action of groundwater on chalk and limestone, which can produce carbon dioxide and displace normal air.

Inside steel tanks and vessels when rust forms.

Poisonous gas fumes or vapor.

These can:

Build-up in sewers and manholes and in pits connected to the system.

Enter tanks or vessels from connecting pipes.

Leak into trenches and pits in contaminated land, such as old refuse tips and old gas works.

Dangers can also arise from:

Liquids and solids, which can suddenly fill the space, or release gases into it, when disturbed. Free flowing solids such as grain can also partially solidify or 'bridge' in silos causing blockages, which can collapse unexpectedly.

Fire and explosions (e.g. from flammable vapors, excess oxygen, etc.).

Residues left in tanks, vessels, etc., or remaining on internal surfaces, which can give off gas, fume or vapor.

Dust being present in high concentrations, e.g. in flour silos.

Hot conditions leading to a dangerous increase in body temperature.

Some of the above conditions may already be present in the confined space. However, some may arise through the work being carried out, or because of ineffective isolation of plant nearby, e.g. leakage from a pipe connected to the confined space. The enclosure and working space may increase other dangers arising through the work being carried out, for example:

Machinery being used may require special precautions, such as provision of dust extraction for a portable grinder, or special precautions against electric shock.

Gas, fume or vapor can arise from welding, or by use of volatile and often flammable solvents, adhesives, etc.

If access to the space is through a restricted entrance, such as a manhole, escape or rescue in an emergency will be more difficult.

What the Law Says

You must carry out a suitable and sufficient assessment of the risks for all work activities for the purpose of deciding what measures are necessary for safety (The Management of Health and Safety at Work Regulations 1999). For work in confined spaces this means identifying the hazards present, assessing the risks and determining what precautions to take. In most cases the assessment will include consideration of:

The task. The working environment. Working materials and tools. The suitability of those carrying out the task.

Arrangements for emergency rescue.

The HSE's free leaflet '[5 Steps to Risk Assessment](#)' will help guide you through the risk assessment process further. You may need to appoint competent people to help manage the risks and ensure that employees are adequately trained and instructed (The Management of Health and Safety at Work Regulations 1999). If your assessment identifies risks of serious injury from work in confined spaces, such as the dangers highlighted above, the Confined Spaces Regulations 1997 apply.

These regulations contain the following key duties:

Avoid entry to confined spaces, e.g. by doing the work from outside.

If entry to a confined space is unavoidable, follow a safe system of work.

Put in place adequate emergency arrangements before the work starts.

Areas you need to include for Consideration

Avoid entering confined spaces.

Appointment of a Supervisor.

Isolation.

Check the size of the entrance.

Testing the air.

Provision of breathing apparatus.

Provision of rescue harnesses.

Check how the alarm is raised.

Emergency procedures.

Capabilities of rescuers.

First-aid procedures.

Development of a safe system of work.

Are persons suitable for the work?

Cleaning before entry.

Provision of ventilation.

Provision of special tools and lighting.

Preparation of emergency arrangements.

Communications.

Is a 'permit-to-work' necessary?

Rescue and resuscitation equipment.

Shut down of adjacent plant before attempting emergency rescue.

Local emergency services.

Relevant Law

The Confined Spaces Regulations 1997. The Management of Health and Safety at Work Regulations 1999. The Control of Substances Hazardous to Health Regulations 2002. The Personal Protective Equipment at Work Regulations 2002. The Provision and Use of Work Equipment Regulations 1998. Electricity at Work Regulations 1989. Workplace (Health, Safety and Welfare) Regulations 1992.

Some of the above laws are relevant because of the nature of the work to be carried out inside a confined space, e.g. where there are risks from machinery, electricity or from hazardous substances.