

GUIDANCE NOTE No. 57

CONFINED SPACE ENTRY

1. Introduction

The Solvents Industry Association has decided to issue this Guidance Note because of the specific risks involved with entry into a confined space that has contained solvents. This Guidance Note is limited to scenarios associated with the storage and use of solvents. A confined space is defined as a place which is substantially enclosed (though not always entirely), and there will be a reasonably foreseeable risk of serious injury from hazardous substances or conditions within the space or nearby (e.g. lack of oxygen). The confined space could be, for example, any chamber, tank, vat, silo, pit, trench, pipe, sewer, flue, well, duct, manhole, excavation, sump.

The regulations controlling the entry into confined spaces are 'The Confined Space Regulations 1997' and the Health & Safety Executive (HSE) has issued an Approved Code of Practice and detailed guidance in 'Safe Work in Confined Spaces, L101'. This Guidance Note does not replace these legal documents; however highlights the specific risks associated with solvents.

2. Use of Solvents

Solvents are frequently stored and used in areas that could be classified as a confined space, e.g. a tank or pipe. The use of solvents could lead to the following hazards if that confined space required entry and therefore must be considered in the risk assessment:

- Many solvents are classified as flammable. A risk of fire or explosion can arise from the presence of solvents. In addition, there is also a risk of explosion from the solvent vapours.
- In addition, solvents may also be classified as toxic or harmful to health. Hydrocarbon solvent vapour may be present under scale, even after cleaning. Solvent vapour could enter the confined space from adjoining plant that has not been effectively isolated.
- Solvent vapour can also be produced from work inside the confined space, e.g. brush and spray painting, use of adhesives.

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3. Risk Assessment

Where entry into a confined space cannot be avoided, a risk assessment must be carried out by a competent person to determine what measures need to be taken to ensure a safe system of work within the confined space. This risk assessment is generally recorded on a 'permit to work' or 'confined space entry permit' for each separate entry into a confined space to ensure a safe system of work.

The Risk Assessment should be carried out using the 5 steps outlined in the HSE Guidance:

[Identify the hazards](#)

[Decide who might be harmed and how](#)

[Evaluate the risks and decide on precaution](#)

[Record your findings and implement them](#)

[Review your assessment and update if necessary](#)

The assessment must take into account all of the information known about the confined space, for example processes that have taken place with solvents; or will take place in the course of the work to be undertaken and which could affect the condition of the confined space, e.g. solvents in paint or adhesives. Safety Data Sheets must be available for all materials that have been used, or will be used in the confined space. Consideration must be given to the dangers that may arise from chemical residues or scale. In addition, solvents may be present in chemicals used for cleaning purposes – these could affect the atmosphere directly or interact with residual substances present in the confined space.

Hot work within a confined space is an additional hazard (see Guidance Note 58). Hot work such as welding could act as an ignition source for flammable solvent vapours leading to a fire or explosion.

Requirements for emergency rescue arrangements must be assessed. Possible emergencies should be anticipated and appropriate rescue arrangements made. It should be noted that local fire and rescue services may not be trained in confined space entries themselves, even if they form part of the on or off-site emergency plan.

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4. Safe Working in Confined Spaces

The precautions required in a safe system of work will depend on the nature of the confined space and the risk assessment. The main elements are listed in the HSE guidance, however listed below are those precautions specific to working with solvents:

- Adequate training and experience is essential. Training standards must be established so that work can be carried out safely. Knowledge of the risks involved with working with solvents is required.
- The atmosphere within a confined space will need testing by a competent person for flammable or explosive atmospheres with an appropriately calibrated gas monitor prior to entry, and possibly during the entry. The majority of gas monitors are calibrated with Methane, however depending on the solvents commonly used, Pentane may be used. This is because Methane calibrated gas monitors are set at a much higher Lower Explosive Limit (LEL) than if they were calibrated with Pentane. The manufacturer will be able to offer more advice.
- In addition to the above, the atmosphere within the confined space will also need testing by a competent person for oxygen levels and hydrocarbon levels. Again this monitoring may need to continue during the entry. Any gas monitor must be bump tested on a regular basis.
- Where the risk assessment has identified presence or possible presence of flammable or toxic solvent vapour, there may be a need to purge the vapour from the confined space using an inert gas. Purging cannot take place using air, as this may combine with the solvent vapour to produce a flammable mixture within the confined space. Where purging has been carried out, the atmosphere will need to be tested to check that purging has been effective, and that it is safe to breathe before allowing people to enter.
- There may be a risk of solvents from nearby processes or services entering the confined space. Isolations must take place in accordance with HSG253.
- Tools or equipment (including lighting) may need to be intrinsically safe or specially protected if they are to be used in a confined space where a potentially flammable or explosive atmosphere is present from the use of solvents.
- Solvents should not be stored in confined spaces. If they accumulate as a result of work, i.e. cleaning materials or waste arising from cleaning, they should be removed as soon as possible.

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- Static must be considered as a potential ignition source – the SIA have a static DVD and Guidance Note available on the website.
- Respiratory protective equipment (RPE) may be required for a confined space entry or for an emergency or rescue. The RPE must be suitable for the purpose, i.e. correctly selected, appropriate for the task and the wearer must be face fit tested. A canister or cartridge type respirator is not normally appropriate for confined space entry, however if it is selected, care must be taken to select the correct filter type depending on the boiling point of the solvents used.

5. References

The Confined Space Regulations 1997

L101 - Safe Work in Confined Spaces – Confined Space Regulations 1997, Approved Code of Practice and Guidance, HSE

Management of Health and Safety at Work Regulations 1999

Control of Substances Hazardous to Health Regulations 2002

Personal Protective Equipment at Work Regulations 1992 (as amended)

The Selection of Use of Flammable Gas Detectors – HSE

Provision and Use of Work Equipment Regulations 1998

HSG 53 Respiratory protective equipment at work: A practical guide, HSE

HSG 250 Guidance on Permit to Work Systems: A guide for the petroleum, chemical and allied industries, HSE

HSG 253 The Safe Isolation of Plant and Equipment, HSE

Guidance Note 58 Hot Work, SIA

Guidance Note 47 Flammable Solvents and the Hazard of Static Electricity, SIA

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