



What is a solvent?

The term 'solvent' is applied to a large number of chemical substances which are used to dissolve or dilute other substances or materials. They are usually organic liquids. Many solvents are also used as chemical intermediates, fuels, and as components of a wide range of products.

Common examples of solvents

- acetone
- petroleum spirits
- dichloromethane
- 1.1.1-trichloroethane
- hexane
- toluene
- methanol
- trichloroethylene
- methyl ethyl ketone
- xylene
- perchloroethylene
- white spirit

Industrial solvents are often mixtures of several individual substances and can be found under a variety of trade names.

Where are solvents used?

You are most likely to be exposed to solvents if you work in industries where they are used extensively.

Industries where solvents are most likely used

- Engineering
- Construction
- Chemicals
- Printing
- Rubber
- Plastics
- Ink manufacture
- Pharmaceutical manufacture
- Paint manufacture
- Footwear
- Textiles
- Foodstuff
- Woodworking
- Dry cleaning

In the construction industry, for example, solvents act as carriers for surface coatings such as paints, varnishes and adhesives. The most common solvents found in construction are:

- white spirit - in paints, varnishes and cleaning products;
- xylene - in paints and adhesives;
- 1-butanol - in natural and synthetic resins, paints and lacquers.

Solvents are also found in many products including:

- cleaning and degreasing materials;
- paint removers;
- paints, lacquers and varnishes;
- adhesives;
- inks and ink removers;
- pesticides; and
- toiletries.

How can solvents enter your body and make you ill?

Solvents can make you ill by:

- breathing in vapours - paints, paint strippers and glues give off solvent vapours as they dry or cure and these vapours may be harmful. Deliberate inhalation of solvent vapours (glue sniffing) can be fatal;
- skin contact - some solvents can be absorbed through the skin. Repeated or prolonged skin contact with liquid solvents may cause dermatitis;
- eye contact - contact with liquid solvent and solvent vapour can cause irritation and inflammation; and
- ingestion - solvents can be taken into the body on contaminated food, drink and cigarettes.

People have accidentally drunk solvents that have been kept in old, unlabelled drinking containers.



What are the main health effects?

The main effects of solvents are irritation of the skin, eyes and lungs, headache, nausea, dizziness and light-headedness. Exposure can impair co-ordination and this can make people more prone to accidents, such as falling off ladders. People may lose concentration on important or difficult tasks and they may react more slowly to dangerous situations. The effect can vary from person to person and will generally be made worse by drinking alcohol.

Very high exposures can cause unconsciousness and even death, for instance where adhesives are used in unventilated confined spaces or where there are serious spillages. Other possible effects on health vary according to which solvent workers are exposed. Long-term health effects from repeated low-level exposure to particular solvents may include dermatitis, damage to the central nervous system, the kidneys, the liver or the blood, or, in the case of benzene, even cancer.

What precautions should you take?

Preventing exposure

First of all, consider whether the solvent-based products need to be used at all. Can they be replaced by an alternative, less hazardous material? For example, use a water-based formulation if possible, which are widely available and less harmful.

Controlling exposure

- If solvent-based products are used, make sure the work area is well ventilated. Open doors, windows, roof lights, etc. to increase ventilation and make sure that they are kept open. Local exhaust (mechanical) ventilation may be necessary in some cases.
- If possible, avoid spraying solvent-based products, as this causes more vapour to get into the air than using a brush.

- Store solvents in properly labelled, suitable containers. Use dispensers where possible to keep evaporation to a minimum and reduce spillage. Keep lids on containers unless contents are being poured or dipped, etc. Use sealed containers for solvent waste.
- Dispose of solvent-soaked rags in closed containers.
- Train workers in specific handling and use of solvents. Training should include but not be limited to – physical properties, health effects, routes of exposure, how to minimize exposure, PPE, first aid, spillages, and disposal.
- Provide workers with Safety Data Sheets - SDS (previously referred to as Material Safety Data Sheets (MSDS)) for solvents.

Fire

- Many solvents are flammable. Take precautions to avoid fire and explosion risks; in particular, do not smoke in areas where solvents are used.
- Post “No Smoking” and “No Naked Flame” signs where solvents are stored.
- Store products containing solvents in a secure and well-ventilated area.

Personal protective equipment (PPE)

If exposure cannot be adequately controlled in any other way, workers should wear PPE. They may need to wear one or more of the following:

- protective overalls;
- appropriate gloves that have been specially selected for use with solvents;
- face shields; and
- respiratory protective equipment, where ventilation does not provide adequate control.

Half-mask respirators fitted with the appropriate cartridge may be sufficient in many instances, but compressed airline breathing apparatus may be necessary where solvents are sprayed, or when

working in a confined space. Those who need to wear PPE should be trained in its proper use and in its limitations. Store the PPE in clean, dry conditions away from chemicals - a locker would be suitable. PPE should be maintained and kept clean and fit for wear.

Hygiene

Good personal hygiene is very important. Facilities for washing and changing should be provided and workers should wash their hands before eating, drinking, smoking and going to the toilet. Eating, drinking and smoking should take place away from the work area. You should not smoke in areas where solvents are used - solvents passing through a cigarette can break down into even more harmful substances.

Clothes which become heavily contaminated with solvent should be removed immediately. Overalls and contaminated personal clothing should be laundered before being re-worn. It may be necessary to air them in a safe place first, to let the solvent evaporate.

Thinners should not be used to remove paint or grease from the skin, as this can cause the skin to become dry and inflamed. Proper cleaning materials, e.g. soap or other cleansers, should be provided and used.

First aid

Anyone who appears to have been affected by solvents should be taken into the fresh air immediately and given appropriate first-aid treatment. Heavily contaminated clothing should be removed as soon as possible. Wash solvent splashes off the skin with plenty of water and cover any wounds with a suitable dressing. Splashes of solvent in the eye should be treated by washing the eye with water for at least 10 minutes. In serious cases the worker must be taken to the hospital.