

# Working Safely With Hazardous Substances (COSHH)

Level 3 Health and Safety in the Workplace

## Introduction

Hazardous substances have the potential to exist in any workplace in the UK. They can also adversely affect anyone within the workplace, not just those who have direct contact with the substance.

The Control of Substances Hazardous to Health (COSHH) is therefore essential, especially as these substances can have a variety of ill health effects and explosive properties.

This section of the course explains your responsibilities in regards to a COSHH risk assessment, including ensuring that employees are fully competent to carry out their work with hazardous substances safely.

## Topics to be Covered

The topics covered in this section are:

- What is a hazardous substance?
- Ill health effects
- Routes of entry
- Hazardous substances and the law
- Employer and employee responsibilities
- Risk assessment
- Hierarchy of control measures
- Workplace Exposure Limit (WEL)
- Personal protective equipment
- Health surveillance
- Information, instruction and training
- Chemical labelling
- Safety data sheets

## What is a Hazardous Substance?

A hazardous substance is:

- Any mixture that is identified as very toxic, toxic, harmful, an irritant, corrosive, sensitising, mutagenic or toxic to reproduction.
- Any substance which is classified as above the Workplace Exposure Limit (WEL), as defined by the Health and Safety Executive.
- Any biological agents used at work, such as those found in laboratory work.
- Any dust that does not have a WEL and which is at a concentration in air above 10mg/m<sup>3</sup> averaged over 8 hours, or any such respirable dust above 4 mg/m<sup>3</sup> over 8 hours.
- Any other substance that creates a risk to health because of its properties and the way it is used or is present in the workplace.

Hazardous substances have the potential to exist in every workplace in the UK, regardless of the profession, size or environment.

Hazardous substances can be:

- Used directly in work activities, such as solvents, paints, cleaning chemicals and glues.
- Produced by work activities, such as fumes and dust.
- Already present in the fabric of the building, such as asbestos in old ceiling tiles or pipe lagging.

## Ill Health Effects

Hazardous substances can have a variety of ill health effects on those who have exposure to them. For example:

- Skin irritation, such as from contact with solvents, cements or printing inks.
- Asthma, such as from exposure to substances in paint, flour or wood dusts.
- Infection from bacteria.
- Occupational cancers.
- Injury or death from exposure to toxic fumes.

Substances such as paint, varnish and dusts can also, if stored incorrectly, cause a fire or explosion and chemical spills or leaks can also result in serious environmental pollution and damage.

According to the Health and Safety Executive:

- There are around 13,000 deaths each year linked to past exposures at work, primarily to chemicals or dusts.
- In 2014, there were approximately 5,000 deaths due to mesothelioma and lung cancer as a result of exposure to asbestos.
- Around 14,000 new cases of breathing or lung problems are reported each year.
- Over the past three years, there have been around 6,000 new cases of skin problems, such as dermatitis, caused or made worse by work activities.
- Contact with soaps and cleaning materials, and working with wet hands, are the most common causes of occupational contact dermatitis.

## Routes of Entry

The route of entry is the way in which a hazardous substance enters the body and causes harm. The main routes of entry are:

- Inhalation.
- Skin absorption.
- Injection.
- Eye contact, such as from splashes or vapours in the eye.
- Ingestion.

## Hazardous Substances and the Law

The Control of Substances Hazardous to Health Regulations 2002 (COSHH) is the main set of regulations put in place to provide adequate control of the exposure to harmful substances.

The risks and effects caused by exposure to certain dangerous substances, including lead, asbestos, ionising radiation and explosives, are also covered by their own specific regulations:

- The Control of Lead at Work Regulations 2002 (CLAW).
- The Control of Asbestos at Work Regulations 2012.
- The Ionising Radiations Regulations 1999.
- Dangerous Substances and Explosive Atmospheres Regulations 2002 (DSEAR).

## Employer Responsibilities

Under the COSHH regulations, employers have a legal duty to protect their employees and others who may be affected from exposure to hazardous substances. Specific responsibilities include:

- Assessing the risks to people from hazardous substances.
- Ensuring that employees are provided with appropriate training and information on the risks.
- Preventing, supervising, monitoring or controlling people's exposure to hazardous substances.
- Ensuring that suitable control measures are properly used and maintained.
- Drawing up plans and procedures to deal with accidents and emergencies involving hazardous substances.

## Employee Duties

The COSHH regulations state that all employees must:

- Make full and proper use of any control measure or facility provided by the employer.
- Take all reasonable steps to ensure any equipment is returned after use.
- Report any defects in the control measures.

Further employee responsibilities include:

- Wearing and storing personal protective equipment in accordance with instructions and removing any protective equipment that could cause contamination before eating or drinking.
- Making proper use of facilities provided for washing, showering or bathing and by maintaining a high level of personal hygiene.
- Taking full advantage of any information, instruction and training that is received.

## Risk Assessment

All employers are legally required to assess the risks from hazardous substances in their workplace so that they can put in place a plan to control the risks.

In regards to COSHH, employers need to:

- Gather information about the substances, work activities and any specific working practices and consider substances that have been supplied for and/or generated by work processes, e.g. fumes and vapours.
- Evaluate the risk to health, e.g. how many people could be exposed to a hazardous substance and the likelihood of substances being absorbed through the skin or swallowed.
- Decide what actions need to be taken to prevent or control risks.
- Record the significant findings of the assessment (if the organisation employs five or more people).
- Review and update the assessment at regular intervals or whenever a significant change takes place.

COSHH regulations define eight principles of good control practice:

- Design and operate processes and activities to minimise emission, release and spread of substances.
- Take into account all relevant routes of exposure when developing control measures.
- Control exposures by measures that are proportionate to the health risk.
- Choose the most effective and reliable control options which minimise the escape and spread of substances hazardous to health.
- Where appropriate control of exposure cannot be achieved, suitable PPE should be provided in addition to control measures.
- Check and review regularly all elements of control measures for their continuing effectiveness.
- Inform and train all employees on the hazards and risks from the substances they work with and the use of control measures developed to minimise the risks.
- Ensure the introduction of control measures does not increase the overall risk to health and safety.

If reasonably practicable, an employer's first attempt should be to try and prevent exposure to the hazardous substance or process.

If possible, the employer should:

- Change the process or activity so that the substance is no longer required or produced.
- Replace the substance with a safer alternative or use the substance in a safer form, e.g. pellets instead of powder.

Where preventing exposure is not reasonably practicable, then the employer must adequately control it using control measures.

## Hierarchy of Control Measures

If it is not reasonably practicable to prevent exposure to the hazardous substance, then COSHH requires employers to follow a hierarchy of control measures. The hierarchy is as follows:

1. Design and use appropriate work processes, systems and engineering controls and provide and use suitable work equipment and materials.
2. Control exposure to a hazardous substance at its source, e.g. by introducing adequate ventilation systems.
3. Provide suitable personal protective equipment as a last resort where adequate control of exposure to a substance cannot be achieved by other means.

Under the hierarchy, specific duties of the employer include:

- Reducing to a minimum the **number of employees** exposed to a hazardous substance.
- Reducing to a minimum the **amount of times** that employees are exposed to a hazardous substance.
- Reducing to a minimum the **quantity** of hazardous substances used or produced in the workplace.
- Ensuring all control measures are working properly and continue to provide effective solutions, e.g. regular testing of ventilation solutions.

## Workplace Exposure Limit (WEL)

The Workplace Exposure Limit (WEL) sets out the maximum concentration of a hazardous substance allowed in the air, averaged over a reference period. It can be used to help you monitor and decide upon control measures in your risk assessment as WELs must not be exceeded.

Thousands of substances are used in the workplace but only about 500 substances have WELs set. These are listed with more detailed guidance in the HSE document EH40, which can be found online: [hse.gov.uk - EH40/2005 Workplace exposure limits](https://www.hse.gov.uk/e40/)

It is important to remember that the limit defined for any substance must not be exceeded.

## Personal Protective Equipment

Where it is not practicable to control the risk of exposure, employers must issue personal protective equipment (PPE) to their employees.

PPE can be used to protect employees from chemical splashes, gases and vapours.

Employers must ensure that when PPE is used it will:

- Protect the wearer from exposure to hazardous substances.
- Fit the wearer correctly.
- Be appropriate for the task.
- Be maintained and cleaned correctly.
- Be repaired where necessary.

Types of personal protective equipment that can be provided include:

- Eye protection, e.g. spectacles, goggles and face screens.
- Breathing protection, e.g. respirators, air fed helmets and breathing apparatus.
- Body protection, e.g. boiler suits, specialist clothing or disposable overalls.
- Hand and arm protection, e.g. gloves, gauntlets or mittens.
- Foot and leg protection, e.g. safety boots and shoes.

## Health Surveillance

Health surveillance is any activity which involves obtaining information about employees' health and which helps to protect employees from health risks at work. It is done to:

- Protect the health of employees through early detection of adverse changes or diseases.
- Collect data for detecting or evaluating health hazards.
- Evaluate control measures.

Health surveillance for workers is necessary if:

- There is a disease associated with the substance in use, such as asthma, cancer or dermatitis.
- It is possible to detect the disease or adverse change in health and reduce the risk of further harm.
- The conditions in the workplace make it likely that the disease will occur.

Furthermore, the concentration of hazardous substances in the air breathed by workers must be measured if the risk assessment shows:

- There could be serious risks to health if control measures fail.
- Exposure limits might be exceeded.
- Control measures may not be working properly.

Health surveillance must be carried out by a responsible, trained person.

Employers need to keep records of any exposure monitoring for at least five years.

## Information, Instruction and Training

Employees should be aware of the hazardous substances they work with, any health risks that might arise from using them, how to follow control measures and the importance of reporting any faults they discover in the control measures.

Employers must make sure that employees receive sufficient instruction and information on:

- The hazardous substances they work with, including the names of the substances and the health risks they pose, and have access to any safety data sheets that apply.
- The substance exposure limits.
- The main findings of the COSHH risk assessment and the results of any exposure monitoring or health surveillance.
- How to follow control measures and the importance of reporting any faults they discover in the control measures.
- How to use items of PPE that are provided.
- The emergency procedures that should be followed.

## Chemical Labelling

The easiest way to identify whether a chemical poses risks to health is to read the warning label attached to it.

If a product is dangerous, then the manufacturer has a legal requirement to ensure that it is labelled with appropriate hazard symbols, warnings, health and safety advice and any personal protective equipment that must be worn when handling it.

European Regulation (EC) No 1272/2008 on the classification, labelling and packaging of substances and mixtures is known as the CLP Regulation. This regulation developed the red, white and black warning symbols that must be displayed on hazardous substances, as pictured here.

These red and white symbols replaced the existing orange and black symbols as of June 2015.

## Safety Data Sheets

Safety data sheets provide information on chemicals to help the users of those chemicals do a risk assessment of the product.

Safety data sheets describe the hazards that the chemical presents and give information on handling, storage and emergency procedures.

Suppliers of chemicals have a legal requirement to provide an up to date safety data sheet for all hazardous substances.

However, it is important to note that the data sheet itself is not a substitute for a risk assessment. Instead, you should use the information contained on the safety data sheet as a contribution to your own workplace risk assessment.

## Exercise

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What is the first control measure that employers should implement?

- Issue workers with personal protective equipment to protect them from hazardous splashes, gases and vapours.
- Reduce the amount of time that employees are exposed to a hazardous substance
- Prevent exposure to the hazardous substance by changing the work process or replacing the substance with something safer

## Summary

In this module, you've learnt about the importance of identifying and controlling the hazardous substances used or produced in your workplace.

If the risks from hazardous substances aren't controlled in accordance with the Control of Substances Hazardous to Health Regulations 2002 (COSHH), then they can lead to a range of ill health effects, including lung and breathing difficulties, skin problems and infections.

As an employer, you must assess the risks to health, try to prevent or control exposure, monitor the exposure, carry out appropriate health surveillance, and ensure employees are properly trained and instructed in how to handle hazardous substances safely.