Your steps to chemical safety

A guide for small business

HEALTH AND SAFETY AUTHORITY

Our vision

A national culture where all commit to safe and healthy workplaces and the safe and sustainable management of chemicals

Chemical safety is good for business

Safely managing the chemicals in your workplace is good for business and it is good for everyone!

It will improve your employees' safety and health. It will potentially introduce cost savings, through more effective work practices such as correct storage, handling, use and disposal procedures. Potential harm to the environment will also be reduced.

This chemical safety guide is intended for small businesses. In particular, it provides guidance for completing your chemical risk assessment.

This guide will help you:

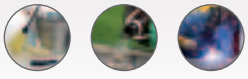
- Create a complete list of the chemicals in your workplace.
- Know where they are located, how much you have, how you are using them and who is potentially exposed to them.
- Know about the risks they pose.
- Check whether the necessary controls are in place.
- Identify corrective actions to be taken where controls are lacking.

Chemical safety: Key duties of employers and employees

There are key duties for employers and employees under the relevant health and safety legislation[1]. Employers are required to:

- Determine which hazardous substances are present in the workplace.
- Assess the risks to employees and others from the presence of these hazardous substances.
- Prevent or control exposure to the hazardous substances to as low a level as is reasonably practicable.
- Have arrangements in place to deal with accidents, incidents and emergencies.
- Provide information, training and consultation to employees.
- Make available health surveillance to employees.

1 Refer to the Safety, Health and Welfare at Work Act 2005 (S.I. No. 10 of 2005) and the Safety, Health and Welfare at Work (Chemical Agents) Regulations 2001 (S.I. No. 619 of 2001) and the Safety, Health and Welfare at Work (General Application) Regulations 2007 (S.I. No 299 of 2007) and amendments.



Employees also have duties. They must:

- Co-operate with their employer e.g. follow procedures.
- Make full and proper use of control measures e.g. using extract ventilation where provided, and report any defects.
- Report any defects in plant/ equipment immediately to the employer as appropriate.
- Report any accident or incident which may have resulted in the release of a dangerous chemical/substance into the workplace.

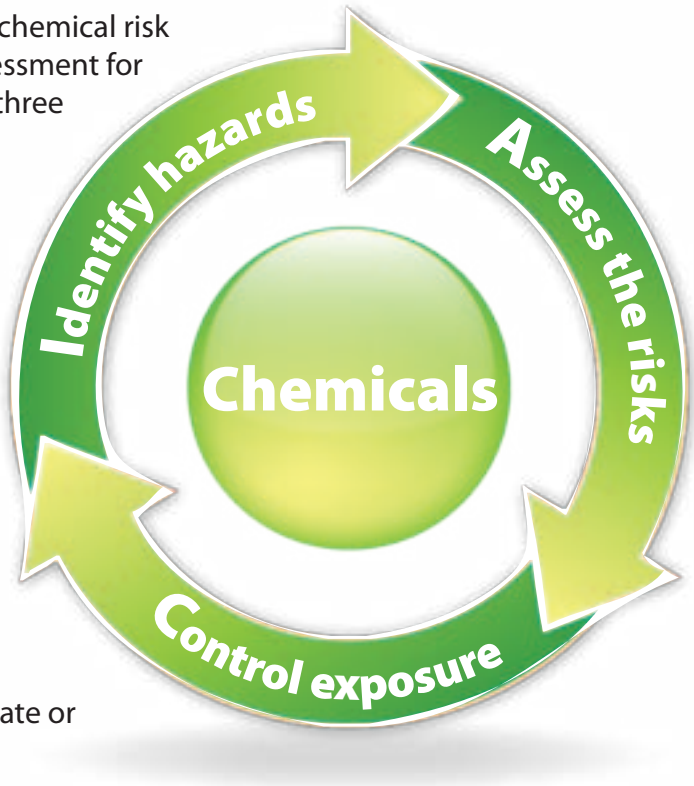
Getting started

In most cases you will be able to manage your chemical safety in-house. You will be familiar with the types of chemicals involved and the type of work activities in which these chemicals are used. In addition, your employees will have experience and knowledge that you can use when deciding on the precautions you are going to take.

You will probably already have precautions in place. You are now checking if these are sufficient and if you need to take further steps to protect people. Small or low-risk businesses will find it straight forward to identify their chemical hazards and put in place appropriate control measures. Larger businesses, and particularly those working in high-risk sectors, may need more resources and competency to manage their chemical safety.

It is important to remember - if you are unsure of any aspect of managing chemicals safely in your workplace, you should seek help from a competent person.

This guide is intended to help you complete a risk assessment for the chemicals you use in your workplace. A chemical risk assessment follows the same steps as a risk assessment for any other hazards in your workplace. There are three basic steps:

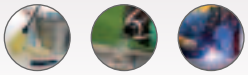


- **Identify the hazard:**
  This involves identifying the chemicals you have in your workplace and the hazards associated with them.
- **Assess the risk:**
  This involves assessing the risk from chemicals or processes in your workplace.
- **Control the exposure:**
  This involves considering the various recognized control measures to eliminate or reduce the risk.

Terms you need to know

Here are some terms that relate to chemical risk assessment.

Term	What this means to you
Hazard	A hazard is anything that has the potential to cause harm, in terms of injury, ill-health or damage to the environment. For example, working with dangerous chemicals or processes which give rise to dusts or fumes.
Risk	Risk is the chance (e.g. high, medium or low) that a person or the environment will be harmed by the hazard. It also considers how severe the harm or ill-health could be.
Likelihood	Likelihood is a measure of how likely it is that an accident or ill-health could happen. When people are working and managing their chemicals safely there is less chance that an accident or ill-health will occur.
Severity / Consequence	Severity is a measure of how serious the injury, ill-health or damage to the environment could be as a consequence of unsafe working with chemicals.
Control measure	Control measures are the steps you are going to take to remove chemical hazards or at least reduce exposure to a low level.
Safety data sheet (SDS)	A safety data sheet (SDS) is a document that must be provided to you with all hazardous chemicals. It provides useful information on the chemical hazards, advice on safe handling, use and storage, and the emergency measures to be followed in case of an accident.
Label	All chemicals should be supplied with a label on the container which clearly identifies the chemical and its hazards.
CAS number	This is a unique identifying number which is assigned to each chemical. Where you encounter more than one chemical or trade name for the same chemical, you can use this number to definitively identify the chemical.
Occupational exposure limit value (OELV)	This is a concentration of a chemical in workplace air to which most people can be exposed without experiencing harmful effects.
Chemical inventory	This is a list of all the chemicals you have in your workplace.



Your next steps

Chapter 2 sets out the different types of chemicals that you might find in your workplace. In addition it shows how different chemicals can effect the body.

Chapter 3 shows how you can manage the chemicals in your workplace.

A template for your chemical inventory is provided in the appendix. You can use this or develop your own version. What is important is that you manage all of your chemical hazards.

When assessing the risk of your chemicals, you should discuss control measures with your employees. Their experience of the process will help you to decide on the appropriate control measures.

Where and in what form are chemicals found?

Chemicals are present in every workplace. Even in the cleanest, most modern office, employees may be routinely exposed to inks, toners and adhesives not to mention a wide range of chemicals used in cleaning and maintenance.

Chemicals can exist in many forms:

- Dust, fumes, fibres, powders.
- Liquids.
- Gases, vapours, mists.

Any chemical, in either gas, liquid or solid form, that has the potential to cause harm is referred to as a hazardous or dangerous chemical. Such chemicals include those:

- Brought directly into the workplace and handled, stored and used for processing e.g. solvents, cleaning agents, glues, resins, paints.
- Generated by a process or work activity e.g. fumes from welding/ soldering, dust from machining of wood, flour dust, solvents.
- Generated as waste or residue e.g. fumes from soldering iron, carbon monoxide from engine or motor exhausts.

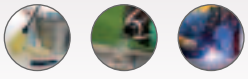
How can chemicals be hazardous to health?

Chemicals can cause many different types of harm, ranging from mild skin irritation to cancer. The effects of hazardous chemicals may be seen:

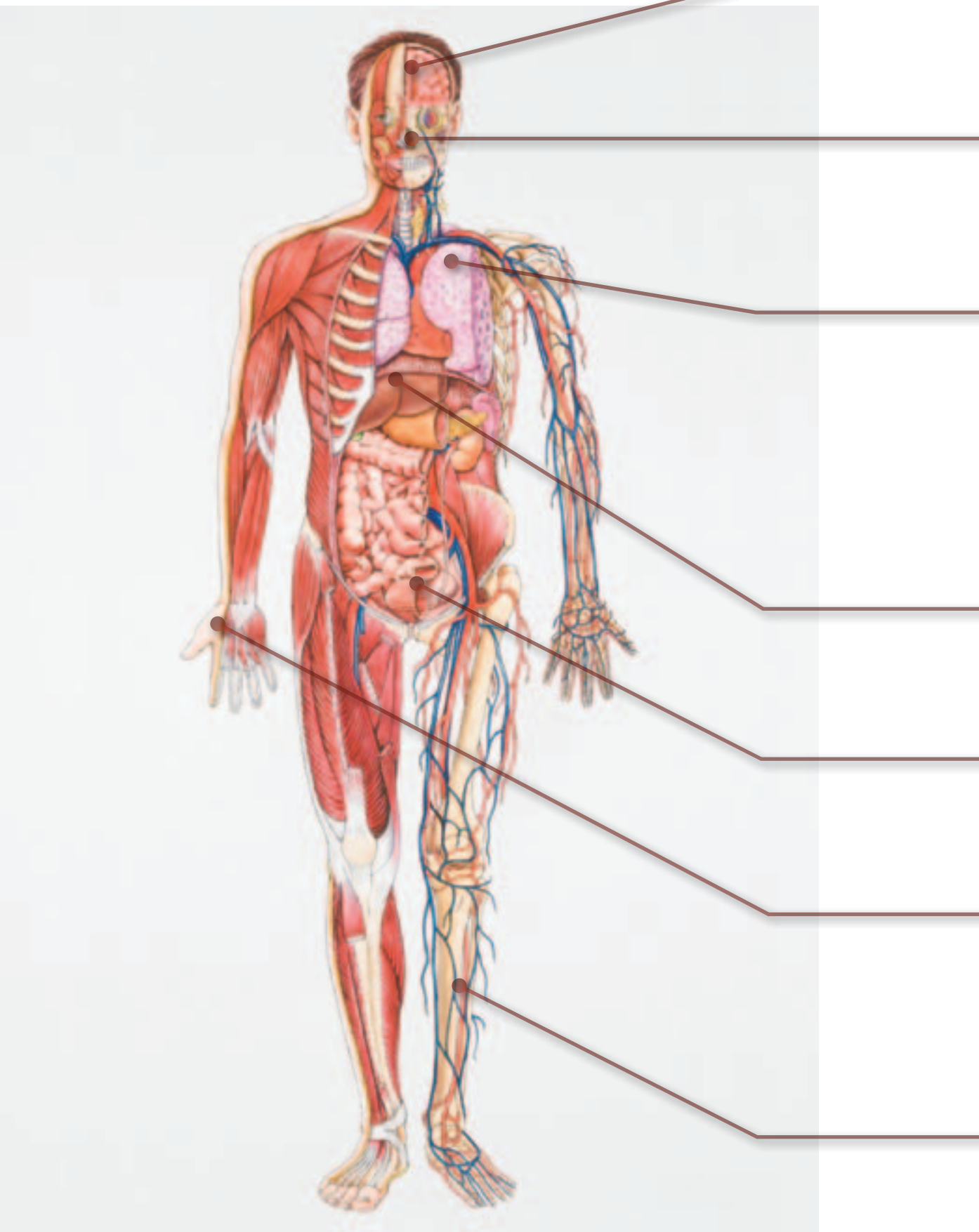
- Immediately after contact (e.g. chemical burn) or many years after the exposure (e.g. lung cancer following exposure to asbestos).
- Following a single short exposure (e.g. infrequent use of a chemical) or longer-term exposures (e.g. daily use of a chemical in the workplace).

Therefore, it is important to minimise exposure to chemicals at all times.

In order for a chemical to be hazardous to a person's health, it must either be in contact with or enter the body.



Here are some examples of how chemicals can affect the body.



Effects on brain and nervous system
For example, exposure to pesticides, mercury, lead, solvents, carbon monoxide gas.

Eye, nose and throat irritation (dryness, soreness or pain)
For example, exposure to acid mists and vapours, welding fumes or diesel exhaust.

Effects on the lung

Lung damage
For example asbestos (lung cancer), welding fume (chronic obstructive pulmonary disease).

Irritant induced asthma
For example acids ("burn effect" on airways).

Allergic asthma
For example flour dust, isocyanate (in 2-pack paints), wood dust.

Liver damage
For example, exposure to vinyl chloride.

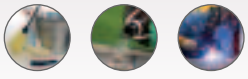
Bladder damage
For example, exposure to some azo dyes (bladder cancer).

Effects on skin

Allergic contact dermatitis
For example nickel, latex, chromate (found in some cements).

Irritant contact dermatitis
For example solvents, detergents, oils, lubricants.

Effects on blood and bone marrow
For example, exposure to benzene in petrol fumes (anaemia and leukaemia).



Your steps to chemical safety

You have seen how chemicals effect the body. There are four ways chemicals can enter the body:

- **Inhalation:**
  Breathing in contaminated air is the most common way that workplace chemicals enter the body.
- **Contact with the skin or eyes:**
  Some chemicals can damage the skin or eyes (e.g. irritation) or pass through the skin into the body.
- **Ingestion:**
  Workplace chemicals may be swallowed accidentally if food or hands are contaminated.
- **Injection:**
  Injection can occur when a sharp object (e.g. needle) punctures the skin and injects a chemical directly into the bloodstream.

Here are some terms that explain the health effects of exposure to chemicals.

Term	What this means to you
Acute toxicity	An adverse health effect following a single exposure to a chemical (e.g. skin contact with insecticides, accidental ingestion of a chemical).
Carcinogen	A chemical that causes or can potentially cause cancer (e.g. breathing in asbestos fibres, skin contact with used motor oils).
Chronic toxicity	An adverse health effect following repeated exposure to a chemical, which can occur following a relatively short exposure (e.g. weeks) or longer term exposure (e.g. years).
CMR	A chemical that is Carcinogenic, Mutagenic or Toxic to Reproduction.
Corrosive	A chemical that causes irreversible damage to skin, eyes or airways (e.g. strong acids and strong bases such as concentrated hydrochloric acid or concentrated hydroxides).
Irritant	A chemical that causes reversible damage to skin, eyes or airways (e.g. detergents or soaps).
Mutagen	A chemical that can cause permanent damage to genetic material in cells, which can possibly lead to heritable genetic damage or cancer (e.g. UV rays from the sun, benzene).

Term	What this means to you
Reproductive toxin	A chemical that can affect adult male or female reproductive systems, their ability to reproduce and/or that can lead to birth defects (e.g. lead or carbon monoxide).
Respiratory sensitiser	A chemical that can cause an allergic reaction in the airways following inhalation of the chemical (e.g. glutaraldehyde or isocyanate).
Skin sensitiser	A chemical that can cause an allergic reaction of the skin following skin contact (e.g. wood dust or adhesives).

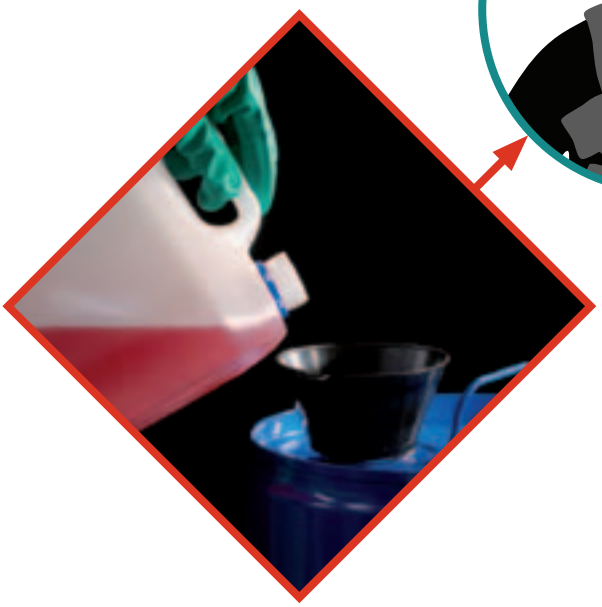
What other hazards are associated with chemicals?

Chemicals may also have physical chemical hazards, e.g. flammable, explosive or have additional hazards if they are mixed or stored with incompatible chemicals.

Chemicals can also have an adverse effect on the environment if they are used, stored or disposed of incorrectly.

Remember, if you are in control of your workplace or have specific responsibilities for managing safety, then you need to ensure that you are controlling all hazards, in whatever form that chemical may exist in the workplace.

Dust, fumes, fibres, powders



Liquids

Gases, vapours, mists

General

Managing chemicals in a safe and sustainable way makes sound business sense and will ensure you, your employees and the environment are protected from the harmful effects of hazardous chemicals.

This section of the guide will assist you in taking a logical approach to assessing the hazards and potential risks, and ensuring the necessary controls are in place to enable you to manage your chemicals safely.

Where can you find information about chemical hazards?

The most important sources of information on the hazards of your chemicals are the **label** and the **safety data sheet (SDS)**.

Labels

Chemicals should be supplied with a label attached to the container. The label gives information on the chemical or product name, the chemical hazards and the precautions you should take into account to ensure safe use.

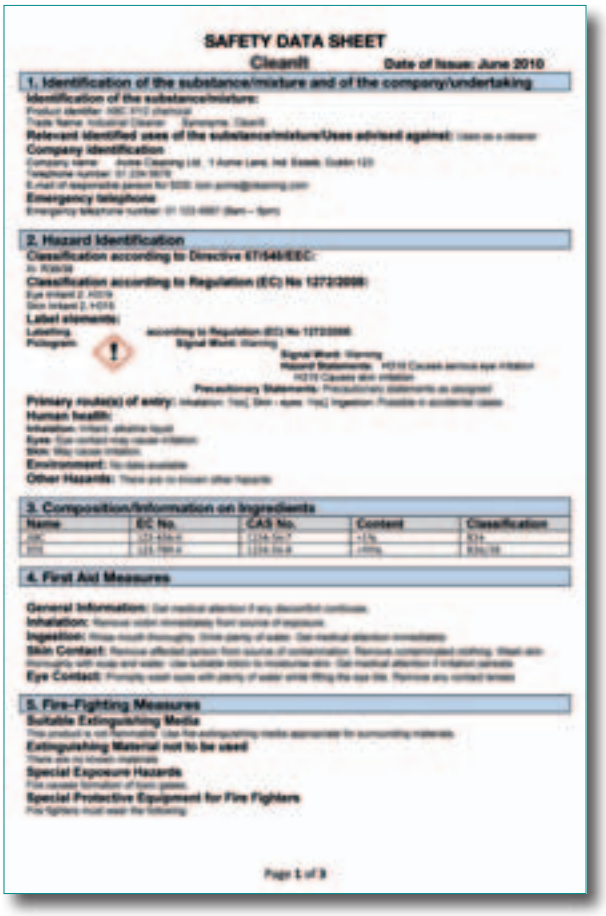
Safety Data Sheets

You must have a SDS for each hazardous chemical that you use. If you don't, contact the supplier, who is required to give you one. You should keep your SDSs in a clearly identified place where they can be easily accessed by your employees and by emergency services - they will require these sheets when they attend a chemical incident.

You should make sure all your employees know where the SDSs are stored and that they have read and understood them, if required.

Safety data sheets must:

- Be provided for chemicals classified as hazardous.
- Contain 16 headings.
- Be prepared by a competent person.
- Be specific to the chemical.


SAFETY DATA SHEET

Cleanit Date of Issue: June 2010

1. Identification of the substance/mixture and of the company/undertaking

Identification of the substance/mixture:

Relevant identified uses of the substance/mixture/Uses advised against:

Company identification

Emergency telephone

2. Hazard Identification

Classification according to Directive 67/548/EEC:

Classification according to Regulation (EC) No 1272/2008:

Label elements:

Labelling

Pictogram

Signal Word: Warning

Hazard Statements:

Precautionary Statements:

Primary route(s) of entry:

Human health:

Environment:

Other Hazards:

3. Composition/Information on Ingredients

Name	EC No.	CAS No.	Content	Classification

4. First Aid Measures

General Information:

Inhalation:

Ingestion:

Skin Contact:

Eye Contact:

5. Fire-Fighting Measures

Suitable Extinguishing Media

Extinguishing Material not to be used

Special Exposure Hazards

Special Protective Equipment for Fire Fighters

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- Be clear and understandable.
- Be provided free of charge.
- Be provided no later than at the time of first delivery.
- Be provided upon update or revision to everyone who has received the chemical during the previous 12 months.
- Be dated and the pages numbered.

Safety data sheets must contain the following headings

1. Identification of the substance/preparation and of the company/ undertaking.
2. Hazards identification.
3. Composition/ information on ingredients.
4. First aid measures.
5. Fire-fighting measures.
6. Accidental release measures.
7. Handling and storage.
8. Exposure controls/ personal protection.
9. Physical and chemical properties.
10. Stability and reactivity.
11. Toxicological information.
12. Ecological information.
13. Disposal consideration.
14. Transport information.
15. Regulatory information.
16. Other information.

The SDS plays a number of roles in managing the safe use of chemicals in your workplace:

- It ensures the product is being used as intended by the manufacturer or importer.
- It is a key tool for risk assessment as it includes detailed hazard information.
- It provides options for appropriate controls measures and procedures to be applied.
- Sufficient information should be provided to select the necessary Personal Protective Equipment (PPE) and to develop necessary emergency procedures.
- It may be used as the basis of a training program for workers as it covers hazards, information on safe handling and storage and emergency procedures.
- Workplace monitoring and health surveillance strategies may often be based on advice contained in the SDS.

This guide will explain which sections of the SDS you should refer to for information on the identity of your chemicals and their hazards, in addition to advice on control measures, safe storage and emergency measures to be followed in case of an accident.

Did you know...

There are lots of sources of information about chemical hazards e.g. from trade associations or technical data sheets provided by manufacturers. However, it is important to follow the advice provided in your SDS in the first instance.

Have you a list of all the chemicals in your workplace?

Before you can identify the chemical hazards in your workplace, you first need to identify the chemicals which you store or use, and the processes which generate dusts or fumes.

You can do this by walking through your workplace and making a note of the chemicals or processes you see. You can also ask your employees to help you identify chemicals which they use or are aware of. Remember: chemicals can be individual substances (e.g. acetone or petrol) or mixtures / products (e.g. paint or degreasers).

You may find it useful to record this information in a **Chemical Inventory**. A sample Chemical Inventory template is included in the appendix of this document.

The following are some tips on preparing a chemical inventory.

Clearly identify each chemical

The chemical inventory in the appendix will help you.

Check the **label** on the container, the **safety data sheet (SDS)** or any documentation which came with the chemical to help identify it. You can request a SDS from your supplier if you don't have one available.

You can find information on the identity of your chemical in **Section 1 and 3 of the SDS** and on **the label**.

[*SDS is for illustrative purposes only*]

Are there chemicals which you cannot identify?

These may be chemicals where the label is no longer visible or attached to the container, or where chemicals are stored in an unmarked container. Remember: it is never safe to use chemicals if you are not sure what they are! It is important to include such "unknowns" on your inventory sheet so that their location is documented. You should arrange to have these unknown chemicals safely removed from your workplace.

Include any dusts, mists, fumes or waste products which are generated as by-products of a process/ work activity

Although these may not be intentionally produced, it is important to record these on your inventory sheet, so that you can check that the correct control measures are in place.

Consider what the chemical is used for

It is useful at this stage to make a note of what the chemical is used for. It may help to identify chemicals which are no longer used and can be disposed of. You should include chemicals used for, or which are generated as part of, maintenance, cleaning or repair work.

Note down how much of the chemical you have, and where and how it is stored

It is good practice to only store the amount of chemical you need. By indicating on your inventory where the chemical is stored you can easily locate it and also avoid storing extra amounts. You can also note the type of container it is stored in (e.g. plastic or glass bottle) and the condition of the container.

Have you identified your chemical hazards?

The label and SDS are the most important sources of information about the hazardous properties of your chemicals, so it is important that you have an up to date SDS for each chemical and that the label attached to the chemical container is visible.

1. **The hazard pictograms or danger symbols** give you a quick indication of the hazards associated with the chemical e.g. irritant.

2. The **hazard statements** or **risk phrases** give more detailed information on the hazard.

3. **Safety phrases** or **precautionary statements** give advice to ensure safe use of your chemicals.

Some chemical hazards don't have a hazard pictogram or symbol associated with them so it is important to read all the hazard information on the label or in **Section 2 and 3** of the SDS to get an overview of the hazardous properties.

Did you know...

A chemical can have more than one hazard associated with it! Therefore, it is important to record all hazards. For example acetone is highly flammable, a severe eye irritant and causes drowsiness or dizziness.

Hazard pictograms - what do they mean?

Until 2015, you will see either hazard symbols or new hazard pictograms on SDSs and labels. The nine pictograms according to the new CLP* Regulation are presented below, along with the existing hazard symbols which you might be familiar with. An example of the type of hazards associated with each are shown below.

"New" CLP hazard pictogram*	Information	"Old" CPL hazard symbols**
	Explosion hazard	
	Chemical is stored as a gas under pressure	No corresponding symbol
	Flammability hazard	

"New" CLP hazard pictogram*	Information	"Old" CPL hazard symbols**
	Oxidising hazard	
	Corrosion hazard	
	Health hazards such as skin and eye irritation, and skin sensitisation	
	Acute toxicity hazard	
	Serious long term health hazards for example carcinogenicity, reproductive toxicity and respiratory sensitisation	
	Environmental hazard	

* CLP – Classification, Labelling and Packaging (CLP) of Substances and Mixtures (EC) No. 1272/2008

** CPL – Dangerous substances Directive (67/548/EEC)

You can use the Chemical Inventory template at the back of this toolkit to record all the chemicals you identify and their hazards.

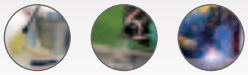
Name of preparation or process	Chemical contained	CAS Number	How much? Where is it stored?	What is it used for?	Hazard information	Supplier's details	SDS available?
Best cleaner	Sodium hypochlorite	7681-52-9	5 x 1 Litre containers stored in cleaning cabinet in kitchen	Cleaning kitchen area	Eye and skin irritant	Acme Cleaning Ltd., 1 Acme Lane, Ind. Estate, Dublin 123	Yes
Unknown chemical	We have no information	Not known	Approx. 1L on top shelf of garage	Not currently used	No information	No information	No. Arrange for chemical to be safely removed

Have you assessed the exposure to the chemical?

Once you have identified your chemicals and their hazards, you then need to assess what the potential exposure to the chemical is.

An exposure assessment involves looking at each chemical which you have identified and considering the following questions:

How you are using the chemical	Potentially lower exposure	Potentially higher exposure
Who uses the chemical? (e.g. how many people?)	A limited number of authorised personnel only.	Anyone can use this chemical.
How long is each user exposed to the chemical? (e.g. full shift or a few minutes?)	Personnel are only exposed for short durations.	Chemical is part of the work activity and personnel are exposed throughout the full shift.
How often is the chemical used?	Chemical is used infrequently.	Chemical is in continuous use.



How you are using the chemical	Potentially lower exposure	Potentially higher exposure
How is the chemical used? (e.g. sprayed, poured?)	Chemical is poured, therefore less likely to be breathed in during use.	Chemical is sprayed and therefore is more likely to be breathed in.
How will the user be exposed? (e.g. breathing it in, contact with skin?)	Effect of exposure will depend on the nature of the chemical. Refer to SDS.	Effect of exposure will depend on the nature of the chemical. Refer to SDS.
How much is used?	Small quantities are used.	Bulk quantities of the chemical are used.
Can non-users be exposed? (e.g. people working near the task, visitors, cleaning or maintenance staff?)	Only trained/authorised personnel are exposed to the chemical.	Chemical is used in general areas where all personnel are exposed.

Did you know...

Cleaning and maintenance staff can potentially be exposed to high levels of chemicals as part of their tasks. Therefore , it is important to consider them in your exposure assessment.

Have you assessed the risk of your chemicals?

Once you have identified your chemical hazards and considered the exposure to them, you then need to assess the risk for each.

Assessing the risk involves:

- Evaluating the information on the hazards and uses (potential exposure) of the chemical.
- Considering the **likelihood** of being exposed to a hazard and the **severity** of that hazard, which may lead to an adverse effect on health or safety.

You can assess the risk in lots of ways; you just need to decide a scale. Here is an example of a possible scale:

- How likely is it that an exposure leading to ill-health could happen?

  High: Exposure to the chemical is likely. For example, very frequent use or use of large quantities where the possibility of exposure to skin or breathing chemical fumes is expected (e.g. cleaning up spills, welding activities with no ventilation control).

  Low: Exposure to the chemical is unlikely. For example, very small amounts used or is used infrequently and under conditions where there is little or no chance of contact (e.g. chemical is used in a closed/contained system).

- How severe is the hazard?

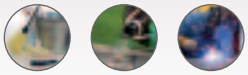
  High: For example, serious, irreversible or potentially fatal health effects (carcinogenicity, mutagenicity, reproductive toxicity, respiratory sensitisation) or serious physical chemical effects (explosion).

  Medium: For example, less serious, potentially irreversible, non-fatal health effects (e.g. skin sensitisation, corrosive to skin or eye); physical chemical effects (e.g. flammable) or environmental effects (e.g. hazardous to aquatic environment).

  Low: Slight/transient, reversible, non-fatal health effects (e.g. irritating to skin or eyes).

There are no definitive rules as to what constitutes a high, medium or low risk. As a general rule:

Level of risk	When would this occur?	What should you do?
High	If you are using chemicals or processes which have a high severity rating, irrespective of whether the likelihood is low or high, this indicates a high level of risk.	You should consider obtaining expert advice in order to complete your risk assessment or replacing the chemical or process with a less hazardous one.
Medium	If you are using chemicals or processes which have a medium or low severity rating, and a high likelihood rating, this indicates a medium level of risk.	You should aim to minimise/reduce exposure.
Low	If you are using chemicals or processes which have a medium or low severity rating and a low likelihood rating, this indicates a low risk rating.	You should still ensure that adequate control measures are in place.



Have you implemented suitable control measures?

Once you have assessed the risk associated with the use of your chemicals, you then need to decide what control measures are required to keep you, your employees and your workplace safe.

At this stage you should also consider any current control measures that are in place, such as:

- Type of engineering controls e.g. enclosures and ventilation – are they effective and maintained regularly?
- Current work practices or procedures.
- Personal protective and safety equipment.
- Training provided to employees.
- Hygiene arrangements e.g. separate meal and wash facilities.
- Storage arrangements.
- Level of housekeeping.
- Disposal of waste.
- Emergency procedures e.g. eyewash, emergency shower.

You need to decide your control strategy for each of your chemicals. The level of control that needs to be put in place depends on the level of risk of exposure.

Hierarchy of controls (in order of preference)

1 - Eliminate the hazardous chemical

2 - Substitute with a less hazardous chemical

3 - Install engineering controls

4 - Put administrative controls in place

5 - Use personal protective equipment (PPE)

Eliminate the hazardous chemical

Remove hazardous chemicals from the process or task.

If you are not using a hazardous chemical, then there is no risk! Eliminating the hazardous chemical is the best way to control the risk. Consider whether you really need to use a chemical at all. For example, in recent years paint manufacturers have been able to eliminate hazardous solvents such as xylene.

You could also consider whether it is possible to use a different process which does not need a hazardous chemical.

Substitute with a less hazardous chemical

Replace a hazardous chemical with a less hazardous one.

It may be possible to replace your hazardous chemical with a less hazardous one. For example, you could replace isocyanate based paints for water based paints. You could also use a less hazardous form of the same chemical. For example, using a pellet rather than a powder form of the chemical could have a significant effect on reducing inhalable dust levels.

It is important that you consider the hazards and potential exposure associated with the replacement chemical to ensure that no new hazard is introduced to the workplace.

Install engineering controls

An engineering control is where some piece of equipment is installed to prevent or reduce exposure.

Engineering controls aim to separate your employees from the chemical hazard by placing a physical barrier between them and the chemical.

Examples of such controls include:

- Carrying out your process in closed containers which are vented to a safe place.
- Using local exhaust ventilation (LEV) at the source of the hazard.
- Using isolation/containment hoods or booths.

A spray booth used in spray painting or a local exhaust system to remove welding fumes is an example of an engineering control.

The correct design and installation of engineering controls which are suitable for your specific use is crucial if it is to give you adequate control. Therefore, you may need to obtain expert advice if you need to install engineering controls.

Put administrative controls in place

Use of management and administrative procedures to reduce or eliminate exposure.

Look how the work is done and consider how employees are exposed to the chemical. Think about how the job could be done differently to avoid exposures.

Where it is not possible to eliminate or isolate the chemical hazard, you should minimize exposure to it. This can be achieved by introducing procedures in your workplace to:

- Minimise the number of employees who might be involved in a task. For example implementing job rotation.
- Exclude other employees not involved in the task from the area where the chemical is being used.
- Provide training to your employees on the hazards and safe use of the chemicals they work with.
- Ensure chemicals with hazardous properties are correctly stored.
- Ensure emergency procedures are in place in the event of an accident e.g. spillage.

A preventative maintenance programme is an important element of administrative control. It prevents emergency breakdowns and keeps engineering controls working efficiently.

Training

Training needs to be well planned so that you and your employees get maximum benefit from it. It is crucial that on completion of the training your employees fully understand:

- What the chemical hazards are.
- What the potential risks to their health could be.
- What controls are in place to protect health and safety.

- How to use, handle, move and store the chemicals in a safe manner, including proper use of equipment (e.g. engineering controls, PPE).
- How to safely clean up spills.
- How to report a problem and who to report it to.
- What to do in an emergency.

Safe Storage of Chemicals

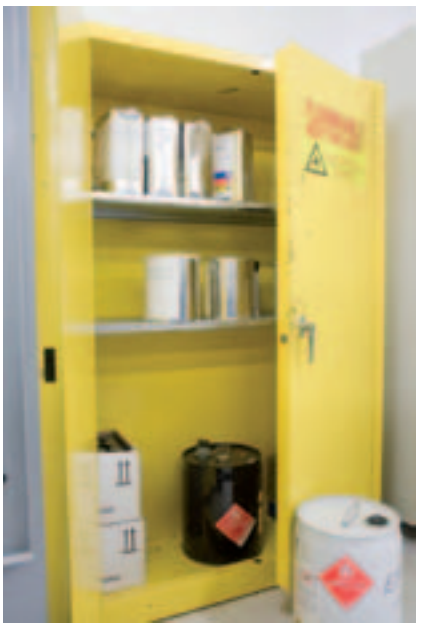
Hazardous chemicals should be stored under appropriate conditions, taking into account the chemicals' specific properties. Instructions on safe storage of chemicals can be found in **Section 7** of the SDS.

It is also important to note if there are conditions under which hazardous reactions may occur. For example, chemicals that can react together to form unstable or toxic products, or produce heat, should be kept segregated. Flammable liquids stored near a heat source could result in a fire. **Section 10** of the SDS gives advice on such conditions that you should take into account when storing your chemicals.

Chemicals known to be carcinogenic, mutagenic or toxic to reproduction should be kept under strict control.

Chemicals with typical properties and characteristics that are relevant include:

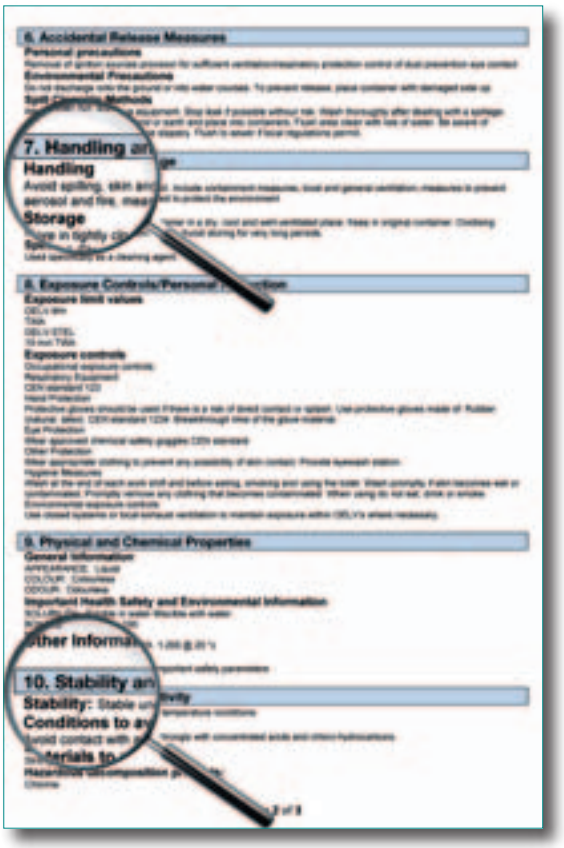
- Flammable chemicals.
- Toxic or corrosive chemicals.
- Chemicals that emit highly toxic fumes in the event of a fire.
- Chemicals which, in contact with water, give off flammable gas.
- Oxidising chemicals.
- Explosives.
- Unstable chemicals.
- Compressed gases.



When storing chemicals you should consider:

- The compatibility of different chemicals. For example, oxidizing chemicals should be kept separate from flammable liquids or other flammable chemicals.

- Limiting the quantities of chemicals to be stored.
- Ensuring there is adequate security of and access to storage areas. Potential ignition sources should be prohibited or controlled.
- A safe location for storage areas. In order to minimise the effects of an incident, storage areas for chemicals should be kept separate from process areas, occupied buildings and other storage areas.
- The appropriate construction, nature and integrity of storage containers.
- Safe loading, unloading and transport around the workplace.
- Adequate precautions and procedures in case of spillage.
- Temperature, humidity and ventilation arrangements. Ventilation arrangements should ensure that there is no accumulation of gases, vapours or fumes in enclosed areas.



Emergency Measures

It is important that you and your employees know what to do in case of an accident, incident or emergency involving chemicals. This may include your evacuation procedure or what to do in case of accidental exposure to the chemical. Relevant training for possible emergencies will significantly improve preparedness and help reduce the effects of such an emergency should one occur.

Did you know...

There are several '**spill kits**' available commercially to deal with a range of hazardous chemicals. You should ensure that you have a suitable spill kit(s) available in the event of an incident.

Section 4 of the SDS describes the necessary first aid measures to be taken in case of an accident. **Section 5** of the SDS gives specific information on fighting a fire caused by the chemical, including the most suitable extinguishing media and protective equipment to use. **Section 6** of the SDS describes what actions need to be taken if there is an accidental release of the chemical.

Safe Disposal of Chemicals

Refer to **Section 13** of your SDS sheet to confirm the correct disposal procedure for your chemicals. You can also record this information on your Chemical Inventory for ease of reference. If you are in doubt as to the safety of any chemical disposal procedure, contact the Environmental Protection Agency for further advice.

Only use a licensed hazardous waste disposal contractor, when one is required.

Personal protective equipment (PPE)

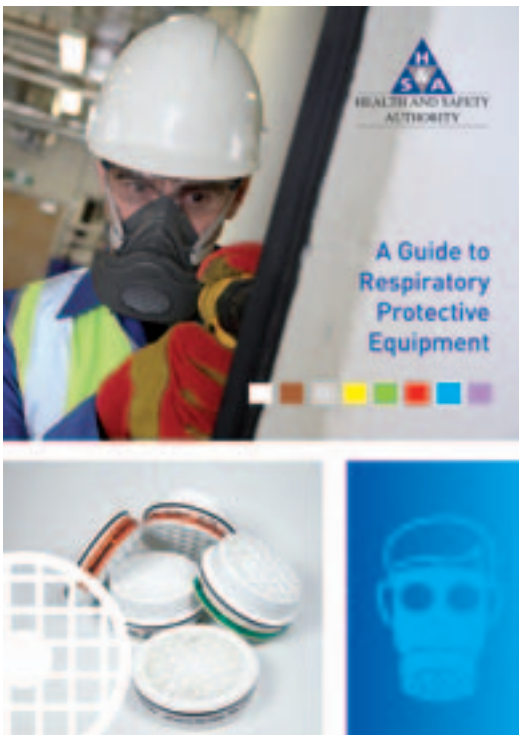
This is the last line of defence!

The use of PPE should be the last line of defence and not regarded as an alternative to other suitable control measures which are higher up the hierarchy. It should provide adequate protection against the risk from the hazardous chemicals to which the wearer is exposed, for the duration of the exposure, taking into account the type of work being carried out.

In practical terms, you may have to apply a number of control measures. For example, even with good engineering controls you may still need to examine whether administrative controls and PPE are also needed. The further up the hierarchy you take action the better. You do not want to be in a situation where you are highly reliant on PPE for protection from chemical hazards.

Section 8 of the SDS gives advice on steps needed to reduce exposure, including advice on appropriate PPE. Personal protective equipment can include:

- Eye/face protection (e.g. safety glasses, goggles, face shields).
- Skin protection (e.g. chemical resistant footwear – shoes/boots/wellingtons, clothing –aprons/suits).
- Hand protection (e.g. gloves or gauntlets, disposable or otherwise, which are suitable for the job).
- Respiratory protection (e.g. respirators, masks or hoods that give adequate protection).
- Thermal protection (employees may need to be protected from excess heat or cold with appropriate clothing).



Ideally, each person should have their own equipment. They should be trained how to use it effectively, how to keep it in good condition, and where and how to store it safely to prevent contamination.

PPE should comply with international standards i.e. be CE Marked. A CE Mark shows that the equipment conforms with the relevant standard. PPE should be suitable for its purpose and there should be a sufficient supply available in the workplace for all employees who require it.

Where employees have been informed that PPE is required for a specific task, they should use the equipment provided throughout the time they are exposed to the chemical hazard and supervision should be provided to ensure that the equipment is properly used.

All personal protective equipment that is necessary for the safe use of chemicals should be provided and maintained by the employer without cost to the employee.

Atmospheric monitoring

It may be necessary for you to carry out atmospheric monitoring (air sampling) of the workplace to determine the level of potential exposure to hazardous chemicals or to check that controls are working effectively e.g. isocyanate levels in a car spraying booth. Some hazardous chemicals have national occupational exposure levels that must not be exceeded. See the HSA Code of Practice for list of chemicals with occupational exposure limit values. These can also be found in **Section 8** of the SDS. You should consult with a qualified occupational hygienist to determine the most appropriate method for sampling and analysis.

Health surveillance

Where exposure to a hazardous chemical can cause an identifiable disease or illness (e.g. skin or respiratory sensitisers) and there is a reasonable likelihood of illness occurring (e.g. where control of exposure relies heavily on PPE and strict work procedures), then health surveillance should be carried out by a occupational healthcare professional.

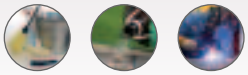
Key point!

A combination of controls is often necessary. Routine checks, regular maintenance and appropriate supervision is necessary for the effectiveness of controls to be demonstrated and sustained.

Controls needed and controls in place

Below is a checklist of controls you should consider to manage your chemical hazards. The control measures you choose should be recorded in your risk assessment.

Control measures	Have you considered?
Are all chemicals listed in your chemical inventory?	☐
Can the process be changed or eliminated so that the work is less hazardous?	☐
Can hazardous chemicals be substituted with less hazardous chemicals?	☐
Can the chemical be handled in enclosures (hoods/booths)?	☐
Can the chemical be isolated from the workforce?	☐
Can ventilation be used to prevent exposure?	☐
Can the number of employees at risk of exposure be reduced?	☐
Is it appropriate to rotate employees and reduce individual exposure?	☐
Can the time spent doing the job be reduced to limit exposure?	☐
Can the work practice be improved?	☐
Are employees trained to recognise the chemical hazards and know how to work safely with chemicals in the workplace?	☐
Do employees have access to the SDS and do they understand them sufficiently?	☐
Have employees been instructed on how to read a chemical label?	☐
Are procedures in place for safe use, handling and storage of chemicals?	☐
Are employees supplied with effective protective work clothing?	☐
Is personal protective equipment required?	☐
Are sufficient personal hygiene facilities in place?	☐
Are chemicals stored correctly?	☐
Are emergency procedures in place?	☐
Is atmospheric monitoring required for certain tasks?	☐
Is health surveillance required for certain tasks?	☐
Have you recorded your chemical hazards and the control measures in place?	☐



Your additional control measures	Have you considered?
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Appendix A

Your chemical inventory

Your chemical inventory

The following table is provided as an example of a chemical inventory sheet. You may use this to record the chemicals that you have on your premises or you can use your own form.

The layout of your inventory is not critical, what is important is that you fully record all of the chemicals that you use and communicate this with your employees and others that may be affected.

Name of preparation or process	Chemical contained	CAS Number	How much? Where is it stored?	What is it used for?	Hazard information	Supplier's details	SDS available?

Further information

For further information or assistance visit the Health and Safety Authority's website at www.hsa.ie or contact us at wcu@hsa.ie or LoCall 1890 289 389.

HEALTH AND SAFETY AUTHORITY

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